



WHANGANUI  
DISTRICT COUNCIL  
Te Kaunihera a Rohe o Whanganui

## IMPORTANT NOTE

These documents are required to be onsite for all inspections and must be a complete and full copy of the WDC stamped “Approved” documents.

Failure to have a full and legible set of documents may result in a terminated inspection. A terminated inspection will incur additional charges.



## INSPECTION RECORD

This record, together with the Building Consent and approved plans, is to remain on the construction site at all times.

<i>Project Location</i>	<i>TO BOOK AN INSPECTION PLEASE PHONE WDC BUILDING CONTROL</i>	<i>BCon19/0212</i>
5A Toi St WHANGANUI	<i>ON 349 0001 AND QUOTE THE FOLLOWING APPLICATION NUMBER:</i>	
<i>Description of Work</i>	Construct a new residential dwelling with detached garage/sleepout.	
<i>Applicant</i>	BuildBIM 1/77 Gloucester Street, Christchurch Central, Christchurch 8013	

## SUMMARY OF CONDITIONS

Building Consent Number BCon19/0212

### PIM Conditions

<i>Code</i>	<i>Condition</i>
	All work on the project must comply with the requirements of the NZ Building Code.
	A PIM only document is not an approval to build. A Building Consent is required before building work commences.
	W.D.C will follow up on building work not completed within two years of building consent issue.
	A Building Consent lapses and is of no effect if the building work has not been started within 12 months of the date of issue.
	If the building is public premises it may not be occupied until either a code compliance certificate or certificate for public use has been issued.
	Please note [Electrical, and Gasfitting subtrades do not form part of the building consent inspection process. However, Council is required to receive <b>'Energy Certificates' from both of these trades before issue of a Code Compliance Certificate</b> ].
PIM2bBLANK	Engineer to provide confirmation of suitable ground conditions prior to pouring the piles located at BH1 on the scala penetrometer test sheet.
PIMconnect	New Water Connection at 1m off the Right hand boundary. New Stormwater Connection at 3.18m off the Right hand boundary. New Sanitary Sewer at 3.45m of the Right hand boundary. (0.8m deep)  New connection shall be arranged directly with a WDC approved connection installer under a Utility Connection Permit.

### Building Consent Information

<i>Code</i>	<i>Information</i>
BCPropBdy	[Informative note: The property boundary must be defined before any construction commences.]



**Your project's inspections are listed on the next page...**



**Please Note:** A minimum of 48 hours notice is required for the booking of an inspection. The inspection record sheet and accompanying building consent documentation must be on site for use by the inspector at the time of the inspection.

All inspections are to be carried out by BCA Building Inspectors unless prior arrangements have been made by the BCA to have an approved qualified person inspect specific items (eg. Engineer). Inspections shall be carried out in accordance with the attached schedule of inspection types. It is the **owner's responsibility to ensure all necessary inspections are** carried out as required. Please contact WDC if you are unsure what requires inspection – do not cover or enclose any building work without inspection.

Note: Further inspections may incur additional cost at time of Code Compliance Certificate issue.

Inspections Record For Building Consent Number BCon19/0212								
<i>Inspection</i>	<i>When to Request</i>	<i>Date</i>	<i>Inspector</i>	<i>Complies with Code</i>	<i>Reinspect</i>	<i>Notes</i>		
PILE AND/OR POST INSPECTION	Prior to placing Concrete					House. Engineer to confirm ground is suitable for piled foundation.		
CONCRETE FOUNDATION INSPECTION	Prior to placing Concrete					Garage		
FRAMING INSPECTION	When all framing is complete.					Garage		
FRAMING INSPECTION	When all framing is complete.					House		
Cladding Cavity Inspection	To inspect drainage cavity before cladding.					Garage		
Cladding Cavity Inspection	To inspect drainage cavity before cladding.					House		
BUILDING PRELINE INSPECTION	Before Internal linings are fixed.					House		



POST LINE INSPECTION	To inspect fixings. Prior to covering up.					Garage		
POST LINE INSPECTION	To inspect fixings. Prior to covering up.					House		
FINAL BUILDING AND PLUMBING COMBINED INSPECTION	Before Internal linings are fixed.					Garage		
PLUMBING SUBFLOOR INSPECTION	Before backfilling drains					Garage		
PLUMBING PRELINE INSPECTION	Before covering up					House		
SANITARY DRAINS INSPECTION	Before backfilling drains							
STORMWATER DISPOSAL INSPECTION	Before backfilling drains							
FINAL BUILDING AND PLUMBING COMBINED INSPECTION	On Completion							
CONSTRUCTION REVIEWS (NO INSPECTION)						<p>Before requesting a final inspection please supply the following information:</p> <ul style="list-style-type: none"> <li>• Application for Code Compliance Certificate (Form 6)</li> <li>• Certificates relating to any gas and electrical work that has been carried out.</li> <li>• As-Built Drainage plan.</li> <li>• Memorandum of Restricted Building Work (RBW) for all required trades.</li> </ul>		



## BUILDING CONSENT NUMBER BCon19/0212

Section 51, Building Act 2004

*The building:*

<i>Street address of building:</i>	<i>Legal description of land where building is located:</i>
5A Toi St WHANGANUI	LOT 1 DP 45374 0.1003 Ha
<i>Building name:</i>	<i>Location of building within site/block number:</i>
<i>Level/unit number:</i>	

*The owner:*

<i>Name of Owner:</i>	
Mr DW Blythe, Mrs EL Blythe	
<i>Mailing address:</i>	<i>Street Address/registered Office:</i>
87 Peakes Road Springvale Whanganui 4501	87 Peakes Road Springvale Whanganui 4501

*Phone numbers:*

<i>Landline:</i>	063485595	<i>Mobile:</i>	0274072412
<i>Daytime:</i>	063439488	<i>After hours:</i>	
<i>Facsimile number:</i>			
<i>Email address:</i>		<i>Website:</i>	

*First point of contact for communications with the building consent authority:*

<i>Contact Person:</i>	
BuildBIM	
<i>Mailing address:</i>	<i>Street Address/registered Office:</i>
1/77 Gloucester Street, Christchurch Central, Christchurch 8013	1/77 Gloucester Street, Christchurch Central, Christchurch 8013

*Phone number:*

<i>Landline:</i>		<i>Mobile:</i>	0211091583 Jody
<i>Daytime:</i>		<i>After hours:</i>	
<i>Facsimile number:</i>			
<i>Email address:</i>	dan@buildbim.co.nz or jody@buildbim.co.nz	<i>Website:</i>	

*Building Work*

The following building work is authorised by this consent

<i>Project</i>
Construct a new residential dwelling with detached garage/sleepout.

101 Guyton Street  
P O Box 637, Whanganui  
Phone: (06) 349 0001  
Fax: (06) 349 0000  
Email: wdc@whanganui.govt.nz  
Web: www.whanganui.govt.nz



**WHANGANUI  
DISTRICT COUNCIL**  
Te Kaunihera a Rohe o Whanganui

<i>Intended Use</i>	<i>Intended Life</i>
Single Detached Residential	50+ Years
<i>Estimated Value (\$)</i>	
\$250000.00	

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 of 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.



## CONDITIONS OF BUILDING CONSENT NUMBER BCon19/0212

Section 51, Building Act 2004

*This Building Consent is issued Subject to the following conditions:*

*Building Act 2004, Section 90:*

### *Inspections by Building Consent Authorities*

Agents authorised by the building consent authority for the purposes of this section are entitled, at all times during normal working hours or while building work is being done, to inspect

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

*Compliance Schedule:*

A compliance schedule (CS) is not required for this building.

### **#Attachments**

- #Copies of the following documents are attached to this building consent:
- #Project information memorandum number BCon19/0212
- #Inspection record
- #Informative notes

Signed for and on behalf of the Whanganui District Council

Bill Leslie

Lead Building Assessments.

Date: 29 August, 2019



## BUILDING CONSENT NUMBER BCon19/0212

*Informative notes:*

- The Building Consent, conditions, inspection sheet, and approved plans must be kept on site at all times until completion of the project.
- Failure to request inspections will risk the non-issuing of a code compliance certificate and the structure may be deemed non-complying.
- Any inspection time required over and above that allowed may incur a further charge.
- Under Section 52, a building consent lapses and is of no effect if the building work to which it relates is not commenced within 12 months after the date of issue.
- Under Section 93, if the owner has not made application within 24 months, the BCA (Building Control Authority), must decide whether or not to issue a CCC (Code Compliance Certificate).



**PROJECT INFORMATION MEMORANDUM NUMBER BCon19/0212**  
 Section 31, Building Act 1991

BuildBIM  
 1/77 Gloucester Street  
 Christchurch Central  
 Christchurch 8013

<i>Project Location</i>	<i>Assessment Number/Legal Description</i>
5A Toi St WHANGANUI	LOT 1 DP 45374 0.1003 Ha
<i>Category</i>	<i>Description of Work</i>
New Residential Dwellings - \$200001 & over	Construct a new residential dwelling with detached garage/sleepout.
<i>Intended Life</i>	<i>Estimated Value (\$)</i>
50+ Years	250000.00

This Project Information Memorandum is confirmation that the proposed work may be undertaken, subject to the provisions of the Building Act 2004 and any requirements of the Building Consent (number BCon19/0212 ), which has been granted.

*This Project Information Memorandum is subject to the following conditions:*

- Engineer to provide confirmation of suitable ground conditions prior to pouring the piles located at BH1 on the scala penetrometer test sheet.
- New Water Connection at 1m off the Right hand boundary.
- New Stormwater Connection at 3.18m off the Right hand boundary.
- New Sanitary Sewer at 3.45m of the Right hand boundary. (0.8m deep)
- New connection shall be arranged directly with a WDC approved connection installer under a Utility Connection Permit.
- All work on the project must comply with the requirements of the NZ Building Code.

Signed for and on behalf of the Whanganui District Council

Bill Leslie

Lead Building Assessments.

Date: 29 August, 2019

**Brad Mosen**

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**From:** Jody Hall <jody@buildbim.co.nz>  
**Sent:** Wednesday, 22 May 2019 4:22 PM  
**To:** OnlineBCApps  
**Cc:** Erin Blythe  
**Subject:** RFI RESPONSE / BCON19/0212 5A TOI STREET, WHANGANUI  
**Attachments:** Further Information Letter 5A Toi St .pdf; 12327 Blyth Truss Layout.pdf; 12327 Blythe PS1.pdf; BLYTHE HOUSE - BUILDING CONSENT.pdf

Hi Kim,

Please find attached documentation with our RFI response and supporting email below.

1. Refer sheet A102, water connection added to the site plan
2. Refer sheet A102, depths and offsets shown to site plan
3. Refer sheet A102, invert levels added to stormwater and sewer
4. Not in this email but will be sent to WDC shortly.
5. Refer sheet A103, footing updated
6. Masonry wall has been removed. The garage/sleepout has been moved north 1.5 off the boundary.
7. Refer sheet A105, garage door lintel table added
8. Truss layout attached
9. Refer sheet A401, trubolts have been removed from bottom plate fixings
10. Refer sheet A109, roof bracing now compliant
11. Refer sheet A401 detail 12
12. Refer sheet A102, stabilized gravel pad added
13. Refer sheet A103
14. Refer sheet A103, AAV added to kitchen sink
15. Refer sheet A102, Earthworks note added and 2 existing photos added
16. Refer yellow fill added to sheet A102 for outdoor living space
17. Resource consent needed for accessory building in front of principle building. The garage/sleepout has been moved 1.5m north of the boundary and no longer intrudes the recession plane.

Kind Regards

**JODY HALL**  
Senior Architectural Designer



O : [03 332 1797](tel:033321797) | M : [021 109 1583](tel:0211091583)  
E : [jody@buildbim.co.nz](mailto:jody@buildbim.co.nz) | W : [www.buildBIM.co.nz](http://www.buildBIM.co.nz)  
O : [Unit 1 /77 Gloucester Street, Christchurch, New Zealand, 8013](https://www.google.com/maps/place/Unit+1+77+Gloucester+Street,+Christchurch,+New+Zealand,+8013)

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**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Search Copy**



  
R. W. Muir  
Registrar-General  
of Land

**Identifier** **WN16B/1214**  
**Land Registration District** **Wellington**  
**Date Issued** 22 July 1976

**Prior References**

WN641/62

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**Estate** Fee Simple  
**Area** 1003 square metres more or less  
**Legal Description** Lot 1 Deposited Plan 45374

**Registered Owners**

Darryl Wesley Blythe, Erin Lee Blythe and Ian Roy Burgess

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**Interests**

11236980.2 Mortgage to Westpac New Zealand Limited - 27.9.2018 at 11:04 am

Identifier

WN16B/1214

**APPROVED**  
 REGISTERED OWNER  
 JOHN HARRISON  
 of WANGANUI

**NOTE: ALL BOYS = C.T.**

**ORIGIN: OLD CADASTRAL**  
 WANGANUI CIRCUIT COORDINATES  
 ORIGIN: MI. STEWART 700000 N  
 300000 E

**Total Area 2163 m<sup>2</sup>**  
 Comprised in CT 64+62 BAL

**J. JOHN HARRISON**  
 of WANGANUI  
 Registered Surveyor and holder of an annual practicing certificate  
 No. 1111. This plan has been made from [redacted] by me or under my direction. [redacted] is correct and has been made in accordance with the regulations under the Survey Act 1988.  
 Dated at WANGANUI this 18<sup>th</sup> day of SEPTEMBER 2019.

**Field Book** p. Traverse Book  
 Reference Plan D.P. 2086, SO 2264.

**Examined by** [redacted] Director  
 Approved as to Survey

6.7.26  
 Deposited this 22<sup>nd</sup> day of [redacted] 1975

**45374**  
 File No.  
 Instructions

**COMPILED PLAN**

**LOCAL AUTHORITY WANGANUI CITY.**  
 COMPILED BY WALL BUIBLE PARNE & SERVICE LTD  
 Scale 1:400 Date SEPT 1975

**LOTS 1 & 2 BEING PLAN OF LOTS 117 & 119 D.P. 2086 AND PTS. SEC. 260 RIGHT BANK WANGANUI RIVER**

LAND DISTRICT WELLINGTON  
 SURVEY BLK. & DIST. IX WESTMERE  
 NZMS 177 SHEET NO. N.138  
Printed by Shing Hing & Co. Ltd., New Zealand

# AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

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

DATE: 29/8/2018

VENDOR: Sophany Churton

PURCHASER: D W & E L Blythe

and/or nominee

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

**PROPERTY**

Address: 5A Toi Street, Wanganui

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

Legal Description:

Area (more or less):  
1003 sqm

Lot/Flat/Unit:  
1

DP:  
45374

Unique Identifier or CT:  
WN16B/1214

**PAYMENT OF PURCHASE PRICE**

Purchase price: \$ 80,000 (Eighty thousand dollars)

*nb. 82,500*  
*E-L*

Plus GST (if any) OR  Inclusive of GST (if any)  
 If neither is deleted, the purchase price includes GST (if any).  
 GST date (refer clause 14.0):



Deposit (refer clause 2.0): \$ 8,000 (Eight thousand dollars) Payable to For Farms NZ Ltd Trust Account 060729 0324886 00 on confirmation of this Agreement.

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

(1) By payment in cleared funds on the settlement date which is the 27th Day of September 2018

OR  
 (2) In the manner described in the Further Terms of Sale. Interest rate for late settlement: 14.00% p.a.

**CONDITIONS (refer clause 10.0)**

Finance condition	LIM required: (refer clause 10.2)	Yes/No
Lender:	Building report required: (refer clause 10.3)	Yes/No
Amount required:	OIA Consent required: (refer clause 10.4)	Yes/No
Finance date:	Land Act/OIA date:	

**TENANCIES (if any)**

Name of tenant:

Bond:	Rent:	Term:	Right of renewal:
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SALE BY:	For Farms (Nz) Limited	Manager: Peter Clayton Salesperson: John Thornton  office@forfarms.co.nz Licensed Real Estate Agent under Real Estate Agents Act 2008
	For Farms (NZ) Ltd	
	138 High Street	
	DANNEVIRKE 4930 Ph: 06 374 4104	

It is agreed that the vendor sells and the purchaser purchases the property, and the chattels listed in Schedule 2, on the terms set out above and in the General Terms of Sale and any Further Terms of Sale.

Release date: 14 November 2017

*E-L nb.*

## GENERAL TERMS OF SALE

### 1.0 Definitions, time for performance, notices, and interpretation

#### 1.1 Definitions

- (1) Unless the context requires a different interpretation, words and phrases not otherwise defined have the same meanings ascribed to those words and phrases in the Goods and Services Tax Act 1985, the Property Law Act 2007, the Resource Management Act 1991 or the Unit Titles Act 2010.
  - (2) "Agreement" means this document including the front page, these General Terms of Sale, any Further Terms of Sale, and any schedules and attachments.
  - (3) "Building Act" means the Building Act 1991 and/or the Building Act 2004.
  - (4) "Building warrant of fitness" means a building warrant of fitness supplied to a territorial authority under the Building Act.
  - (5) "Cleared funds" means:
    - (a) An electronic transfer of funds that has been made strictly in accordance with the requirements set out in the PLS Guidelines; or
    - (b) A bank cheque, but only in the circumstances permitted by the PLS Guidelines and only if it has been paid strictly in accordance with the requirements set out in the PLS Guidelines.
  - (6) "Default GST" means any additional GST, penalty (civil or otherwise), interest, or other sum imposed on the vendor (or where the vendor is or was a member of a GST group its representative member) under the GST Act or the Tax Administration Act 1994 by reason of non-payment of any GST payable in respect of the supply made under this agreement but does not include any such sum levied against the vendor (or where the vendor is or was a member of a GST group its representative member) by reason of a default or delay by the vendor after payment of the GST to the vendor by the purchaser.
  - (7) "Electronic instrument" has the same meaning as ascribed to that term in the Land Transfer (Computer Registers and Electronic Lodgement) Amendment Act 2002.
  - (8) "GST" means Goods and Services Tax arising pursuant to the Goods and Services Tax Act 1985 and "GST Act" means the Goods and Services Tax Act 1985.
  - (9) "Landonline Workspace" means an electronic workspace facility approved by the Registrar-General of Land pursuant to the provisions of the Land Transfer (Computer Registers and Electronic Lodgement) Amendment Act 2002.
  - (10) "LIM" means a land information memorandum issued pursuant to the Local Government Official Information and Meetings Act 1987.
  - (11) "LINZ" means Land Information New Zealand.
  - (12) "Local authority" means a territorial authority or a regional council.
  - (13) "OIA Consent" means consent to purchase the property under the Overseas Investment Act 2005.
  - (14) "PLS Guidelines" means the most recent edition, as at the date of this agreement, of the Property Transactions and E-Dealing Practice Guidelines prepared by the Property Law Section of the New Zealand Law Society.
  - (15) "Property" means the property described in this agreement.
  - (16) "Purchase price" means the total purchase price stated in this agreement which the purchaser has agreed to pay the vendor for the property and the chattels included in the sale.
  - (17) "Regional council" means a regional council within the meaning of the Local Government Act 2002.
  - (18) "Remote settlement" means settlement of the sale and purchase of the property by way of the purchaser's lawyer paying the moneys due and payable on the settlement date directly into the trust account of the vendor's lawyer, in consideration of the vendor agreeing to meet the vendor's obligations under subclause 3.8(2), pursuant to the protocol for remote settlement recommended in the PLS Guidelines.
  - (19) "Secure web document exchange" means an electronic messaging service enabling messages and electronic documents to be posted by one party to a secure website to be viewed by the other party immediately after posting.
  - (20) "Settlement date" means the date specified as such in this agreement.
  - (21) "Settlement statement" means a statement showing the purchase price, plus any GST payable by the purchaser in addition to the purchase price, less any deposit or other payments or allowances to be credited to the purchaser, together with apportionments of all incomings and outgoings apportioned at the settlement date.
  - (22) "Territorial authority" means a territorial authority within the meaning of the Local Government Act 2002.
  - (23) "Unit title" means a unit title under the Unit Titles Act 2010.
  - (24) The terms "principal unit", "accessory unit", "owner", "unit plan", and "unit" have the meanings ascribed to those terms in the Unit Titles Act 2010.
  - (25) The term "rules" includes both body corporate rules under the Unit Titles Act 1972 and body corporate operational rules under the Unit Titles Act 2010.
  - (26) The terms "building", "building consent", "code compliance certificate", "compliance schedule", "household unit", and "commercial on-seller" have the meanings ascribed to those terms in the Building Act.
  - (27) The term "title" includes where appropriate a computer register within the meaning of the Land Transfer (Computer Registers and Electronic Lodgement) Amendment Act 2002.
  - (28) The terms "going concern", "goods", "principal place of residence", "recipient", "registered person", "registration number", "supply", and "taxable activity" have the meanings ascribed to those terms in the GST Act.
  - (29) The terms "tax information" and "tax statement" have the meanings ascribed to those terms in the Land Transfer Act 1952.
  - (30) The terms "associated person", "conveyancer", "residential land purchase amount", "offshore RLWT person", "RLWT", "RLWT certificate of exemption" and "RLWT rules" have the meanings ascribed to those terms in the Income Tax Act 2007.
  - (31) The term "Commissioner" has the meaning ascribed to that term in the Tax Administration Act 1994.
  - (32) "Working day" means any day of the week other than:
    - (a) Saturday, Sunday, Waitangi Day, Good Friday, Easter Monday, Anzac Day, the Sovereign's Birthday, and Labour Day;
    - (b) if Waitangi Day or Anzac Day falls on a Saturday or Sunday, the following Monday;
    - (c) a day in the period commencing on the 24th day of December in any year and ending on the 5th day of January (or in the case of subclause 10.2(2) the 15th day of January) in the following year, both days inclusive; and
    - (d) the day observed as the anniversary of any province in which the property is situated.
 A working day shall be deemed to commence at 9.00 am and to terminate at 5.00 pm.
- Unless a contrary intention appears on the front page or elsewhere in this agreement:
- (a) the interest rate for late settlement is equivalent to the interest rate charged by the Inland Revenue Department on unpaid tax under the Tax Administration Act 1994 during the period for which the interest rate for late settlement is payable, plus 5% per annum; and
  - (b) a party is in default if it did not do what it has contracted to do to enable settlement to occur, regardless of the cause of such failure.

#### 1.2 Time for Performance

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

#### 1.3 Notices

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

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

- (e) in the case of sending by document exchange, on the second working day following the date of sending to the document exchange number of the lawyer's office;
  - (f) in the case of sending by secure web document exchange, at the time when in the ordinary course of operation of that secure web document exchange, a notice posted by one party is accessible for viewing or downloading by the other party.
- (5) Any period of notice required to be given under this agreement shall be computed by excluding the day of service.
- (6) In accordance with section 222 of the Contract and Commercial Law Act 2017, the parties agree that any notice or document that must be given in writing by one party to the other may be given in electronic form and by means of an electronic communication, subject to the rules regarding service set out above.

1.4 Interpretation

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

2.0 Deposit

- 2.1 The purchaser shall pay the deposit to the vendor or the vendor's agent immediately upon execution of this agreement by both parties and/or at such other time as is specified in this agreement.
- 2.2 If the deposit is not paid on the due date for payment, the vendor may at any time thereafter serve on the purchaser notice requiring payment. If the purchaser fails to pay the deposit on or before the third working day after service of the notice, time being of the essence, the vendor may cancel this agreement by serving notice of cancellation on the purchaser. No notice of cancellation shall be effective if the deposit has been paid before the notice of cancellation is served.
- 2.3 The deposit shall be in part payment of the purchase price.
- 2.4 The person to whom the deposit is paid shall hold it as a stakeholder until:
- (1) the requisition procedure under clause 6.0 is completed without either party cancelling this agreement; and
  - (2) where this agreement is entered into subject to any condition(s) expressed in this agreement, each such condition has been fulfilled or waived; and
  - (3) where the property is a unit title:
    - (a) a pre-settlement disclosure statement, certified correct by the body corporate, under section 147 of the Unit Titles Act 2010; and
    - (b) an additional disclosure statement under section 148 of the Unit Titles Act 2010 (if requested by the purchaser within the time prescribed in section 148(2)),
 have been provided to the purchaser by the vendor within the times prescribed in those sections or otherwise the purchaser has given notice under section 149(2) of the Unit Titles Act 2010 to postpone the settlement date until after the disclosure statements have been provided; or
  - (4) this agreement is cancelled pursuant to subclause 6.2(3)(c) or avoided pursuant to subclause 10.8(5) or, where the property is a unit title and the purchaser having the right to cancel this agreement pursuant to section 151(2) of the Unit Titles Act 2010 has cancelled this agreement pursuant to that section, or has waived the right to cancel by giving notice to the vendor, or by completing settlement of the purchase.

3.0 Possession and Settlement

Possession

- 3.1 Unless particulars of a tenancy are included in this agreement the property is sold with vacant possession and the vendor shall so yield the property on the settlement date.
- 3.2 If the property is sold with vacant possession, then subject to the rights of any tenants of the property, the vendor shall permit the purchaser or any person authorised by the purchaser in writing, upon reasonable notice:
- (1) to enter the property on one occasion prior to the settlement date for the purposes of examining the property, chattels and fixtures which are included in the sale; and
  - (2) to re-enter the property on or before the settlement date to confirm compliance by the vendor with any agreement made by the vendor to carry out any work on the property and the chattels and the fixtures.
- 3.3 Possession shall be given and taken on the settlement date. Outgoings and incomings in respect of the settlement date are the responsibility of and belong to the vendor.
- 3.4 On the settlement date, the vendor shall make available to the purchaser keys to all exterior doors that are locked by key, electronic door openers to all doors that are opened electronically, and the keys and/or security codes to any alarms. The vendor does not have to make available keys, electronic door openers, and security codes where the property is tenanted and these are held by the tenant.

Settlement

- 3.5 The vendor shall prepare, at the vendor's own expense, a settlement statement. The vendor shall tender the settlement statement to the purchaser or the purchaser's lawyer a reasonable time prior to the settlement date.
- 3.6 The purchaser's lawyer shall:
- (1) within a reasonable time prior to the settlement date create a Landonline Workspace for the transaction, notify the vendor's lawyer of the dealing number allocated by LINZ, and prepare in that workspace a transfer instrument in respect of the property; and
  - (2) prior to settlement:
    - (a) lodge in that workspace the tax information contained in the transferee's tax statement; and
    - (b) certify and sign the transfer instrument.
- 3.7 The vendor's lawyer shall:
- (1) within a reasonable time prior to the settlement date prepare in that workspace all other electronic instruments required to confer title on the purchaser in terms of the vendor's obligations under this agreement; and
  - (2) prior to settlement:
    - (a) lodge in that workspace the tax information contained in the transferor's tax statement; and
    - (b) have those instruments and the transfer instrument certified, signed and, where possible, pre-validated.
- 3.8 On the settlement date:
- (1) the balance of the purchase price, interest and other moneys, if any, shall be paid by the purchaser in cleared funds or otherwise satisfied as provided in this agreement (credit being given for any amount payable by the vendor under subclause 3.12 or 3.14);
  - (2) the vendor's lawyer shall immediately thereafter:
    - (a) release or procure the release of the transfer instrument and the other instruments mentioned in subclause 3.7(1) so that the purchaser's lawyer can then submit them for registration;
    - (b) pay to the purchaser's lawyer the LINZ registration fees on all of the instruments mentioned in subclause 3.7(1), unless these fees will be invoiced to the vendor's lawyer by LINZ directly; and
    - (c) deliver to the purchaser's lawyer any other documents that the vendor must provide to the purchaser on settlement in terms of this agreement.
- 3.9 All obligations under subclause 3.8 are interdependent.
- 3.10 The parties shall complete settlement by way of remote settlement, provided that where payment by bank cheque is permitted under the PLS Guidelines, payment may be made by the personal delivery of a bank cheque to the vendor's lawyer's office, so long as it is accompanied by the undertaking from the purchaser's lawyer required by those Guidelines.

Last Minute Settlement

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




## Purchaser Default: Late Settlement

- 3.12 If any portion of the purchase price is not paid upon the due date for payment, then, provided that the vendor provides reasonable evidence of the vendor's ability to perform any obligation the vendor is obliged to perform on that date in consideration for such payment:
- (1) the purchaser shall pay to the vendor interest at the interest rate for late settlement on the portion of the purchase price so unpaid for the period from the due date for payment until payment ("the default period"); but nevertheless, this stipulation is without prejudice to any of the vendor's rights or remedies including any right to claim for additional expenses and damages. For the purposes of this subclause, a payment made on a day other than a working day or after the termination of a working day shall be deemed to be made on the next following working day and interest shall be computed accordingly; and
  - (2) the vendor is not obliged to give the purchaser possession of the property or to pay the purchaser any amount for remaining in possession, unless this agreement relates to a tenanted property, in which case the vendor must elect either to:
    - (a) account to the purchaser on settlement for incomings in respect of the property which are payable and received during the default period, in which event the purchaser shall be responsible for the outgoings relating to the property during the default period; or
    - (b) retain such incomings in lieu of receiving interest from the purchaser pursuant to subclause 3.12(1).
- 3.13 Where subclause 3.12(1) applies and the parties are unable to agree upon any amount claimed by the vendor for additional expenses and damages:
- (1) an interim amount shall on settlement be paid to a stakeholder by the purchaser until the amount payable is determined;
  - (2) the interim amount must be a reasonable sum having regard to all of the circumstances;
  - (3) if the parties cannot agree on the interim amount, the interim amount shall be determined by an experienced property lawyer appointed by the parties. The appointee's costs shall be met equally by the parties. If the parties cannot agree on the appointee, the appointment shall be made on the application of either party by the president for the time being of the New Zealand Law Society;
  - (4) the stakeholder shall lodge the interim amount on interest-bearing call deposit with a bank registered under the Reserve Bank of New Zealand Act 1989 in the joint names of the vendor and the purchaser;
  - (5) the interest earned on the interim amount net of any withholding tax and any bank or legal administration fees and commission charges shall follow the destination of the interim amount;
  - (6) the amount determined to be payable shall not be limited by the interim amount; and
  - (7) if the parties cannot agree on a stakeholder, the interim amount shall be paid to a stakeholder nominated on the application of either party by the president for the time being of the New Zealand Law Society.

## Vendor Default: Late Settlement or Failure to Give Possession

- 3.14 (1) For the purposes of this subclause 3.14:
- (a) the default period means:
    - (i) in subclause 3.14(2), the period from the settlement date until the date when the vendor is able and willing to provide vacant possession and the purchaser takes possession; and
    - (ii) in subclause 3.14(3), the period from the date the purchaser takes possession until the date when settlement occurs; and
    - (iii) in subclause 3.14(5), the period from the settlement date until the date when settlement occurs; and
  - (b) the vendor shall be deemed to be unwilling to give possession if the vendor does not offer to give possession.
- (2) If this agreement provides for vacant possession but the vendor is unable or unwilling to give vacant possession on the settlement date, then, provided that the purchaser provides reasonable evidence of the purchaser's ability to perform the purchaser's obligations under this agreement:
- (a) the vendor shall pay the purchaser, at the purchaser's election, either:
    - (i) compensation for any reasonable costs incurred for temporary accommodation for persons and storage of chattels during the default period; or
    - (ii) an amount equivalent to interest at the interest rate for late settlement on the entire purchase price during the default period; and
  - (b) the purchaser shall pay the vendor an amount equivalent to the interest earned or which would be earned on overnight deposits lodged in the purchaser's lawyer's trust bank account on such portion of the purchase price (including any deposit) as is payable under this agreement on or by the settlement date but remains unpaid during the default period less:
    - (i) any withholding tax; and
    - (ii) any bank or legal administration fees and commission charges; and
    - (iii) any interest payable by the purchaser to the purchaser's lender during the default period in respect of any mortgage or loan taken out by the purchaser in relation to the purchase of the property.
- (3) If this agreement provides for vacant possession and the vendor is able and willing to give vacant possession on the settlement date, then, provided the purchaser provides reasonable evidence of the purchaser's ability to perform the purchaser's obligations under this agreement, the purchaser may elect to take possession in which case the vendor shall not be liable to pay any interest or other moneys to the purchaser but the purchaser shall pay the vendor the same amount as that specified in subclause 3.14(2)(b) during the default period. A purchaser in possession under this subclause 3.14(3) is a licensee only.
- (4) Notwithstanding the provisions of subclause 3.14(3), the purchaser may elect not to take possession when the purchaser is entitled to take it. If the purchaser elects not to take possession, the provisions of subclause 3.14(2) shall apply as though the vendor were unable or unwilling to give vacant possession on the settlement date.
- (5) If this agreement provides for the property to be sold tenanted then, provided that the purchaser provides reasonable evidence of the purchaser's ability to perform the purchaser's obligations under this agreement, the vendor shall on settlement account to the purchaser for incomings which are payable and received in respect of the property during the default period less the outgoings paid by the vendor during that period. Apart from accounting for such incomings, the vendor shall not be liable to pay any other moneys to the purchaser but the purchaser shall pay the vendor the same amount as that specified in subclause 3.14(2)(b) during the default period.
- (6) The provisions of this subclause 3.14 shall be without prejudice to any of the purchaser's rights or remedies including any right to claim for any additional expenses and damages suffered by the purchaser.
- (7) Where the parties are unable to agree upon any amount payable under this subclause 3.14:
- (a) an interim amount shall on settlement be paid to a stakeholder by the party against whom it is claimed until the amount payable is determined;
  - (b) the interim amount shall be the lower of:
    - (i) the amount claimed; or
    - (ii) an amount equivalent to interest at the interest rate for late settlement for the relevant default period on such portion of the purchase price (including any deposit) as is payable under this agreement on or by the settlement date.
  - (c) the stakeholder shall lodge the interim amount on interest-bearing call deposit with a bank registered under the Reserve Bank of New Zealand Act 1989 in the joint names of the vendor and the purchaser;
  - (d) the interest earned on the interim amount net of any withholding tax and any bank or legal administration fees and commission charges shall follow the destination of the interim amount;
  - (e) the amount determined to be payable shall not be limited by the interim amount; and
  - (f) if the parties cannot agree on a stakeholder the interim amount shall be paid to a stakeholder nominated on the application of either party by the president for the time being of the New Zealand Law Society.

## Deferment of Settlement and Possession

- 3.15 If
- (1) this is an agreement for the sale by a commercial on-seller of a household unit; and
  - (2) a code compliance certificate has not been issued by the settlement date in relation to the household unit,
- then, unless the parties agree otherwise (in which case the parties shall enter into a written agreement in the form (if any) prescribed by the Building (Forms) Regulations 2004), the settlement date shall be deferred to the fifth working day following the date upon which the vendor has given the purchaser notice that the code compliance certificate has been issued (which notice must be accompanied by a copy of the certificate).
- 3.16 In every case, if neither party is ready, willing, and able to settle on the settlement date, the settlement date shall be deferred to the third working day following the date upon which one of the parties gives notice it has become ready, willing, and able to settle.
- 3.17 If
- (1) the property is a unit title;
  - (2) the settlement date is deferred pursuant to either subclause 3.15 or subclause 3.16; and
  - (3) the vendor considers on reasonable grounds that an extension of time is necessary or desirable in order for the vendor to comply with the warranty by the vendor in subclause 9.2(3),
- (4) then the vendor may extend the settlement date:
- (a) where there is a deferment of the settlement date pursuant to subclause 3.15, to the tenth working day following the date upon which the vendor gives the purchaser notice that the code compliance certificate has been issued, provided the vendor gives notice of the extension to the purchaser no later than the second working day after such notice; or
  - (b) where there is a deferment of the settlement date pursuant to subclause 3.16, to the tenth working day following the date upon which one of the parties gives notice that it has become ready, willing, and able to settle, provided the vendor gives notice of the extension to the purchaser no later than the second working day after such notice.

## New Title Provision

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

**4.0 Residential Land Withholding Tax**

- 4.1 If the vendor does not have a conveyancer or the vendor and the purchaser are associated persons, then:
- (1) the vendor must provide the purchaser or the purchaser's conveyancer, on or before the second working day before the due date for payment of the first residential land purchase amount payable under this agreement, with:
    - (a) sufficient information to enable the purchaser or the purchaser's conveyancer to determine to their reasonable satisfaction whether section 54C of the Tax Administration Act 1994 applies to the sale of the property; and
    - (b) if the purchaser or the purchaser's conveyancer determines to their reasonable satisfaction that section 54C of the Tax Administration Act 1994 does apply, all of the information required by that section and either an RLWT certificate of exemption in respect of the sale or otherwise such other information that the purchaser or the purchaser's conveyancer may reasonably require to enable the purchaser or the purchaser's conveyancer to determine to their reasonable satisfaction the amount of RLWT that must be withheld from each residential land purchase amount;
  - (2) the vendor shall be liable to pay any costs reasonably incurred by the purchaser or the purchaser's conveyancer in relation to RLWT, including the cost of obtaining professional advice in determining whether there is a requirement to withhold RLWT and the amount of RLWT that must be withheld, if any; and
  - (3) any payments payable by the purchaser on account of the purchase price shall be deemed to have been paid to the extent that:
    - (a) RLWT has been withheld from those payments by the purchaser or the purchaser's conveyancer as required by the RLWT rules; and
    - (b) any costs payable by the vendor under subclause 4.1(2) have been deducted from those payments by the purchaser or the purchaser's conveyancer.
- 4.2 If the vendor does not have a conveyancer or the vendor and the purchaser are associated persons and if the vendor fails to provide the information required under subclause 4.1(1), then the purchaser may:
- (1) defer the payment of the first residential land purchase amount payable under this agreement (and any residential land purchase amount that may subsequently fall due for payment) until such time as the vendor supplies that information; or
  - (2) on the due date for payment of that residential land purchase amount, or at any time thereafter if payment has been deferred by the purchaser pursuant to this subclause and the vendor has still not provided that information, treat the sale of the property as if it is being made by an offshore RLWT person where there is a requirement to pay RLWT.
- 4.3 If pursuant to subclause 4.2 the purchaser treats the sale of the property as if it is being made by an offshore RLWT person where there is a requirement to pay RLWT, the purchaser or the purchaser's conveyancer may:
- (1) make a reasonable assessment of the amount of RLWT that the purchaser or the purchaser's conveyancer would be required by the RLWT rules to withhold from any residential land purchase amount if the sale is treated in that manner; and
  - (2) withhold that amount from any residential land purchase amount and pay it to the Commissioner as RLWT.
- 4.4 Any amount withheld by the purchaser or the purchaser's conveyancer pursuant to subclause 4.3 shall be treated as RLWT that the purchaser or the purchaser's conveyancer is required by the RLWT rules to withhold.
- 4.5 The purchaser or the purchaser's conveyancer shall give notice to the vendor a reasonable time before payment of any sum due to be paid on account of the purchase price of:
- (1) the costs payable by the vendor under subclause 4.1(2) that the purchaser or the purchaser's conveyancer intends to deduct; and
  - (2) the amount of RLWT that the purchaser or the purchaser's conveyancer intends to withhold.

**5.0 Risk and insurance**

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

**6.0 Title, boundaries and requisitions**

- 6.1 The vendor shall not be bound to point out the boundaries of the property except that on the sale of a vacant residential lot which is not limited as to parcels the vendor shall ensure that all boundary markers required by the Cadastral Survey Act 2002 and any related rules and regulations to identify the boundaries of the property are present in their correct positions at the settlement date.
- 6.2 (1) The purchaser is deemed to have accepted the vendor's title except as to objections or requisitions which the purchaser is entitled to make and notice of which the purchaser serves on the vendor on or before the earlier of:
- (a) the tenth working day after the date of this agreement; or
  - (b) the settlement date.
- (2) Where the transfer of the property is to be registered against a new title yet to be issued, the purchaser is deemed to have accepted the title except as to such objections or requisitions which the purchaser is entitled to make and notice of which the purchaser serves on the vendor on or before the fifth working day following the date the vendor has given the purchaser notice that the title has been issued and a search copy of it as defined in section 172A of the Land Transfer Act 1952 is obtainable.
- (3) If the vendor is unable or unwilling to remove or comply with any objection or requisition as to title, notice of which has been served on the vendor by the purchaser, then the following provisions will apply:
- (a) the vendor shall notify the purchaser ("a vendor's notice") of such inability or unwillingness on or before the fifth working day after the date of service of the purchaser's notice;
  - (b) if the vendor does not give a vendor's notice the vendor shall be deemed to have accepted the objection or requisition and it shall be a requirement of settlement that such objection or requisition shall be complied with before settlement;
  - (c) if the purchaser does not on or before the fifth working day after service of a vendor's notice notify the vendor that the purchaser waives the objection or requisition, either the vendor or the purchaser may (notwithstanding any intermediate negotiations) by notice to the other, cancel this agreement.
- (4) In the event of cancellation under subclause 6.2(3), the purchaser shall be entitled to the immediate return of the deposit and any other moneys paid under this agreement by the purchaser and neither party shall have any right or claim against the other arising from this agreement or its cancellation. In particular, the purchaser shall not be entitled to any interest or to the expense of investigating the title or to any compensation whatsoever.
- 6.3 (1) If the title to the property being sold is a cross lease title or a unit title and there are:
- (a) in the case of a cross lease title:
    - (i) alterations to the external dimensions of any leased structure; or
    - (ii) buildings or structures not intended for common use which are situated on any part of the land that is not subject to a restricted user covenant;
  - (b) in the case of a unit title, encroachments out of the principal unit or accessory unit title space (as the case may be);
- then the purchaser may requisition the title under subclause 6.2 requiring the vendor:
- (c) in the case of a cross lease title, to deposit a new plan depicting the buildings or structures and register a new cross lease or cross leases (as the case may be) and any other ancillary dealings in order to convey good title; or
  - (d) in the case of a unit title, to deposit an amendment to the unit plan, a redevelopment plan or new unit plan (as the case may be) depicting the principal and/or accessory units and register such transfers and any other ancillary dealings in order to convey good title.

- (2) The words "alterations to the external dimensions of any leased structure" shall only mean alterations which are attached to the leased structure and enclosed.
- 6.4 Except as provided by sections 36 to 42 of the Contract and Commercial Law Act 2017, no error, omission, or misdescription of the property or the title shall enable the purchaser to cancel this agreement but compensation, if claimed by notice before settlement in accordance with subclause 8.1 but not otherwise, shall be made or given as the case may require.
- 6.5 The vendor shall not be liable to pay for or contribute towards the expense of erection or maintenance of any fence between the property and any contiguous land of the vendor but this proviso shall not enure for the benefit of any subsequent purchaser of the contiguous land; and the vendor shall be entitled to require the inclusion of a fencing covenant to this effect in any transfer of the property.

## 7.0 Vendor's warranties and undertakings

- 7.1 The vendor warrants and undertakes that at the date of this agreement the vendor has not:
- (1) received any notice or demand and has no knowledge of any requisition or outstanding requirement:
    - (a) from any local or government authority or other statutory body; or
    - (b) under the Resource Management Act 1991; or
    - (c) from any tenant of the property; or
    - (d) from any other party; or
  - (2) given any consent or waiver, which directly or indirectly affects the property and which has not been disclosed in writing to the purchaser.
- 7.2 The vendor warrants and undertakes that at settlement:
- (1) The chattels and all plant, equipment, systems or devices which provide any services or amenities to the property, including, without limitation, security, heating, cooling, or air-conditioning, are delivered to the purchaser in reasonable working order, but in all other respects in their state of repair as at the date of this agreement (fair wear and tear excepted) but failure so to deliver them shall only create a right of compensation.
  - (2) All electrical and other installations on the property are free of any charge whatsoever.
  - (3) There are no arrears of rates, water rates or charges outstanding on the property.
  - (4) Where an allowance has been made by the vendor in the settlement statement for incomings receivable, the settlement statement correctly records those allowances including, in particular, the dates up to which the allowances have been made.
  - (5) Where the vendor has done or caused or permitted to be done on the property any works:
    - (a) any permit, resource consent, or building consent required by law was obtained; and
    - (b) to the vendor's knowledge, the works were completed in compliance with those permits or consents; and
    - (c) where appropriate, a code compliance certificate was issued for those works.
  - (6) Where under the Building Act, any building on the property sold requires a compliance schedule:
    - (a) the vendor has fully complied with any requirements specified in any compliance schedule issued by a territorial authority under the Building Act in respect of the building;
    - (b) the building has a current building warrant of fitness; and
    - (c) the vendor is not aware of any reason, that the vendor has not disclosed in writing to the purchaser, which would prevent a building warrant of fitness from being supplied to the territorial authority when the building warrant of fitness is next due.
  - (7) Since the date of this agreement, the vendor has not given any consent or waiver which directly or indirectly affects the property.
  - (8) Any notice or demand received by the vendor, which directly or indirectly affects the property, after the date of this agreement:
    - (a) from any local or government authority or other statutory body; or
    - (b) under the Resource Management Act 1991; or
    - (c) from any tenant of the property; or
    - (d) from any other party,
 has been delivered forthwith by the vendor to either the purchaser or the purchaser's lawyer, unless the vendor has paid or complied with such notice or demand. If the vendor fails to so deliver or pay the notice or demand, the vendor shall be liable for any penalty incurred.
  - (9) Any chattels included in the sale are the unencumbered property of the vendor.
- 7.3 If the property is or includes part only of a building, the warranty and undertaking in subclause 7.2(6) does not apply. Instead the vendor warrants and undertakes at the date of this agreement that, where under the Building Act the building of which the property forms part requires a compliance schedule:
- (1) to the vendor's knowledge, there has been full compliance with any requirements specified in any compliance schedule issued by a territorial authority under the Building Act in respect of the building;
  - (2) the building has a current building warrant of fitness; and
  - (3) the vendor is not aware of any reason, that the vendor has not disclosed in writing to the purchaser, which would prevent a building warrant of fitness from being supplied to the territorial authority when the building warrant of fitness is next due.
- 7.4 The vendor warrants and undertakes that on or immediately after settlement:
- (1) If the water and wastewater charges are determined by meter, the vendor will have the water meter read and will pay the amount of the charge payable pursuant to that reading; but if the water supplier will not make special readings, the water and wastewater charges shall be apportioned.
  - (2) Any outgoings included in the settlement statement are paid in accordance with the settlement statement and, where applicable, to the dates shown in the settlement statement, or will be so paid immediately after settlement.
  - (3) The vendor will give notice of sale in accordance with the Local Government (Rating) Act 2002 to the territorial authority and regional council in whose district the land is situated and will also give notice of the sale to every other authority that makes and levies rates or charges on the land and to the supplier of water.
  - (4) Where the property is a unit title, the vendor will notify the body corporate in writing of the transfer of the property and the name and address of the purchaser.
- 7.5 If the purchaser has not validly cancelled this agreement, the breach of any warranty or undertaking contained in this agreement does not defer the obligation to settle but that obligation shall be subject to the rights of the purchaser at law or in equity, including any rights under subclause 6.4 and any right of equitable set-off.

## 8.0 Claims for compensation

- 8.1 If the purchaser claims a right to compensation either under subclause 6.4 or for an equitable set-off:
- (1) the purchaser must serve notice of the claim on the vendor on or before the last working day prior to settlement; and
  - (2) the notice must:
    - (a) in the case of a claim for compensation under subclause 6.4, state the particular error, omission, or misdescription of the property or title in respect of which compensation is claimed;
    - (b) in the case of a claim to an equitable set-off, state the particular matters in respect of which compensation is claimed;
    - (c) comprise a genuine pre-estimate of the loss suffered by the purchaser; and
    - (d) be particularised and quantified to the extent reasonably possible as at the date of the notice.
- 8.2 For the purposes of subclause 8.1(1), "settlement" means the date for settlement fixed by this agreement unless, by reason of the conduct or omission of the vendor, the purchaser is unable to give notice by that date, in which case notice may be given on or before the last working day prior to the date for settlement fixed by a valid settlement notice served by either party pursuant to subclause 11.1.
- 8.3 If the amount of compensation is agreed, it shall be deducted on settlement.
- 8.4 If the amount of compensation is disputed:
- (1) an interim amount shall be deducted on settlement and paid by the purchaser to a stakeholder until the amount of the compensation is determined;
  - (2) the interim amount must be a reasonable sum having regard to all of the circumstances;
  - (3) if the parties cannot agree on the interim amount, the interim amount shall be determined by an experienced property lawyer appointed by the parties. The appointee's costs shall be met equally by the parties. If the parties cannot agree on the appointee, the appointment shall be made on the application of either party by the president for the time being of the New Zealand Law Society;
  - (4) the stakeholder shall lodge the interim amount on interest-bearing call deposit with a bank registered under the Reserve Bank of New Zealand Act 1989 in the joint names of the vendor and the purchaser;
  - (5) the interest earned on the interim amount net of any withholding tax and any bank or legal administration fees and commission charges shall follow the destination of the interim amount;
  - (6) the amount of compensation determined to be payable shall not be limited by the interim amount; and
  - (7) if the parties cannot agree on a stakeholder, the interim amount shall be paid to a stakeholder nominated on the application of either party by the president for the time being of the New Zealand Law Society.
- 8.5 The procedures prescribed in subclauses 8.1 to 8.4 shall not prevent either party taking proceedings for the specific performance of the contract.

## 9.0 Unit title and cross lease provisions

### Unit Titles

- 9.1 If the property is a unit title, sections 144 to 153 of the Unit Titles Act 2010 ("the Act") require the vendor to provide to the purchaser a pre-contract disclosure statement, a pre-settlement disclosure statement and, if so requested by the purchaser, an additional disclosure statement.
- 9.2 If the property is a unit title, the vendor warrants and undertakes as follows:
- (1) The information in the pre-contract disclosure statement provided to the purchaser was complete and correct.
  - (2) Apart from regular periodic contributions, no contributions have been levied or proposed by the body corporate that have not been disclosed in writing to the purchaser.
  - (3) Not less than five working days before the settlement date, the vendor will provide:
    - (a) a certificate of insurance for all insurances effected by the body corporate under the provisions of section 135 of the Act; and
    - (b) a pre-settlement disclosure statement from the vendor, certified correct by the body corporate, under section 147 of the Act. Any periodic contributions to the operating account shown in that pre-settlement disclosure statement shall be apportioned. There shall be no apportionment of contributions to any long-term maintenance fund, contingency fund or capital improvement fund.
  - (4) There are no other amounts owing by the owner under any provision of the Act or the Unit Titles Act 1972.
  - (5) There are no unsatisfied judgments against the body corporate and no proceedings have been instituted against or by the body corporate.
  - (6) No order or declaration has been made by any Court against the body corporate or the owner under any provision of the Act or the Unit Titles Act 1972.
  - (7) The vendor has no knowledge or notice of any fact which might give rise to or indicate the possibility of:
    - (a) the owner or the purchaser incurring any other liability under any provision of the Act or the Unit Titles Act 1972; or
    - (b) any proceedings being instituted by or against the body corporate; or
    - (c) any order or declaration being sought against the body corporate or the owner under any provision of the Act or the Unit Titles Act 1972.
  - (8) The vendor is not aware of proposals to pass any body corporate resolution relating to its rules nor are there any unregistered changes to the body corporate rules which have not been disclosed in writing to the purchaser.
  - (9) No lease, licence, easement, or special privilege has been granted by the body corporate in respect of any part of the common property which has not been disclosed in writing to the purchaser.
  - (10) No resolution has been passed and no application has been made and the vendor has no knowledge of any proposal for:
    - (a) the transfer of the whole or any part of the common property;
    - (b) the addition of any land to the common property;
    - (c) the cancellation of the unit plan; or
    - (d) the deposit of an amendment to the unit plan, a redevelopment plan, or a new unit plan in substitution for the existing unit plan, which has not been disclosed in writing to the purchaser.
  - (11) As at settlement, all contributions and other moneys payable by the vendor to the body corporate have been paid in full.
- 9.3 If the property is a unit title, in addition to the purchaser's rights under sections 149 and 150 of the Act, and if the vendor does not provide the certificates of insurance and the pre-settlement disclosure statement under section 147 in accordance with the requirements of subclause 9.2(3), the purchaser may:
- (1) postpone the settlement date until the fifth working day following the date on which that information is provided to the purchaser; or
  - (2) elect that settlement shall still take place on the settlement date.
- 9.4 If the property is a unit title, each party specifies that:
- (1) the facsimile number of the office of that party's lawyer shall be an address for service for that party for the purposes of section 205(1)(d) of the Act; and
  - (2) if that party is absent from New Zealand, that party's lawyer shall be that party's agent in New Zealand for the purposes of section 205(2) of the Act.
- 9.5 If the property is a unit title, any costs owing by the purchaser to the vendor pursuant to section 148(5) of the Act for providing an additional disclosure statement shall be included in the moneys payable by the purchaser on settlement pursuant to subclause 3.8(1). Such costs may be deducted from the deposit if the purchaser becomes entitled to a refund of the deposit upon cancellation or avoidance of this agreement.

### Unauthorised Structures – Cross Leases and Unit Titles

- 9.6 (1) Where structures (not stated in clause 6.0 to be requisitionable) have been erected on the property without:
- (a) in the case of a cross lease title, any required lessors' consent; or
  - (b) in the case of a unit title, any required body corporate consent,
- the purchaser may demand within the period expiring on the earlier of:
- (i) the tenth working day after the date of this agreement; or
  - (ii) the settlement date,
- that the vendor obtain the written consent of the current lessors or the body corporate (as the case may be) to such improvements ("a current consent") and provide the purchaser with a copy of such consent on or before the settlement date.
- (2) Should the vendor be unwilling or unable to obtain a current consent then the procedure set out in subclauses 6.2(3) and 6.2(4) shall apply with the purchaser's demand under subclause 9.6(1) being deemed to be an objection and requisition.

## 10.0 Conditions and mortgage terms

### Particular Conditions

- 10.1 If particulars of any finance condition(s) are inserted on the front page of this agreement, this agreement is conditional upon the purchaser arranging finance in terms of those particulars on or before the finance date.
- 10.2 (1) If the purchaser has indicated on the front page of this agreement that a LIM is required:
- (a) that LIM is to be obtained by the purchaser at the purchaser's cost;
  - (b) the purchaser is to request the LIM on or before the fifth working day after the date of this agreement; and
  - (c) this agreement is conditional upon the purchaser approving that LIM provided that such approval must not be unreasonably or arbitrarily withheld.
- (2) If, on reasonable grounds, the purchaser does not approve the LIM, the purchaser shall give notice to the vendor ("the purchaser's notice") on or before the fifteenth working day after the date of this agreement stating the particular matters in respect of which approval is withheld and, if those matters are capable of remedy, what the purchaser reasonably requires to be done to remedy those matters. If the purchaser does not give a purchaser's notice the purchaser shall be deemed to have approved the LIM. If through no fault of the purchaser, the LIM is not available on or before the fifteenth working day after the date of this agreement and the vendor does not give an extension when requested, this condition shall not have been fulfilled and the provisions of subclause 10.8(5) shall apply.
- (3) The vendor shall give notice to the purchaser ("the vendor's notice") on or before the fifth working day after receipt of the purchaser's notice advising whether or not the vendor is able and willing to comply with the purchaser's notice by the settlement date.
- (4) If the vendor does not give a vendor's notice, or if the vendor's notice advises that the vendor is unable or unwilling to comply with the purchaser's notice, and if the purchaser does not, on or before the tenth working day after the date on which the purchaser's notice is given, give notice to the vendor that the purchaser waives the objection to the LIM, this condition shall not have been fulfilled and the provisions of subclause 10.8(5) shall apply.
- (5) If the vendor gives a vendor's notice advising that the vendor is able and willing to comply with the purchaser's notice, this condition is deemed to have been fulfilled, and it shall be a requirement of settlement that the purchaser's notice shall be complied with, and also, if the vendor must carry out work on the property, that the vendor shall obtain the approval of the territorial authority to the work done, both before settlement.
- 10.3 If the purchaser has indicated on the front page of this agreement that a building report is required, this agreement is conditional upon the purchaser obtaining at the purchaser's cost on or before the tenth working day after the date of this agreement a report on the condition of the buildings and any other improvements on the property that is satisfactory to the purchaser, on the basis of an objective assessment. The report must be prepared in good faith by a suitably-qualified building inspector in accordance with accepted principles and methods. Subject to the rights of any tenants of the property, the vendor shall allow the building inspector to inspect the property at all reasonable times upon reasonable notice for the purposes of preparation of the report. The building inspector may not carry out any invasive testing in the course of inspection without the vendor's prior written consent. If the purchaser avoids this agreement for non-fulfilment of this condition pursuant to subclause 10.8(5), the purchaser must provide the vendor immediately upon request with a copy of the building inspector's report.
- 10.4 (1) If the purchaser has indicated on the front page of this agreement that OIA Consent is required, this agreement is conditional upon OIA Consent being obtained on or before the Land Act/OIA date shown on the front page of this agreement, the purchaser being responsible for payment of the application fee.
- (2) If the purchaser has indicated on the front page of this agreement that OIA Consent is not required, or has failed to indicate whether it is required, then the purchaser warrants that the purchaser does not require OIA Consent.
- 10.5 If this agreement relates to a transaction to which the Land Act 1948 applies, this agreement is subject to the vendor obtaining the necessary consent by the Land Act/OIA date shown on the front page of this agreement.
- 10.6 If the Land Act/OIA date is not shown on the front page of this agreement that date shall be the settlement date or a date 65 working days from the date of this agreement whichever is the sooner.
- 10.7 If this agreement relates to a transaction to which section 225 of the Resource Management Act 1991 applies then this agreement is subject to the appropriate condition(s) imposed by that section.

## Operation of Conditions

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

## Mortgage Terms

- 10.9 Any mortgage to be arranged pursuant to a finance condition shall be upon and subject to the terms and conditions currently being required by the lender in respect of loans of a similar nature.
- 10.10 If the vendor is to advance mortgage moneys to the purchaser then, unless otherwise stated, the mortgage shall be in the appropriate "fixed sum" form currently being published by Auckland District Law Society Incorporated.

## 11.0 Notice to complete and remedies on default

- 11.1 (1) If the sale is not settled on the settlement date, either party may at any time thereafter serve on the other party a settlement notice.  
 (2) The settlement notice shall be effective only if the party serving it is at the time of service either in all material respects ready, able, and willing to proceed to settle in accordance with this agreement or is not so ready, able, and willing to settle only by reason of the default or omission of the other party.  
 (3) If the purchaser is in possession, the vendor's right to cancel this agreement will be subject to sections 28 to 36 of the Property Law Act 2007 and the settlement notice may incorporate or be given with a notice under section 28 of that Act complying with section 29 of that Act.
- 11.2 Subject to subclause 11.1(3), upon service of the settlement notice the party on whom the notice is served shall settle:  
 (1) on or before the twelfth working day after the date of service of the notice; or  
 (2) on the first working day after the 13th day of January if the period of twelve working days expires during the period commencing on the 6th day of January and ending on the 13th day of January, both days inclusive,  
 time being of the essence, but without prejudice to any intermediate right of cancellation by either party.
- 11.3 (1) If this agreement provides for the payment of the purchase price by instalments and the purchaser fails duly and punctually to pay any instalment on or within one month from the date on which it fell due for payment then, whether or not the purchaser is in possession, the vendor may immediately give notice to the purchaser calling up the unpaid balance of the purchase price, which shall upon service of the notice fall immediately due and payable.  
 (2) The date of service of the notice under this subclause shall be deemed the settlement date for the purposes of subclause 11.1.  
 (3) The vendor may give a settlement notice with a notice under this subclause.  
 (4) For the purpose of this subclause a deposit is not an instalment.
- 11.4 If the purchaser does not comply with the terms of the settlement notice served by the vendor then, subject to subclause 11.1(3):  
 (1) Without prejudice to any other rights or remedies available to the vendor at law or in equity, the vendor may:  
 (a) sue the purchaser for specific performance; or  
 (b) cancel this agreement by notice and pursue either or both of the following remedies namely:  
 (i) forfeit and retain for the vendor's own benefit the deposit paid by the purchaser, but not exceeding in all 10% of the purchase price; and/or  
 (ii) sue the purchaser for damages.  
 (2) Where the vendor is entitled to cancel this agreement, the entry by the vendor into a conditional or unconditional agreement for the resale of the property or any part thereof shall take effect as a cancellation of this agreement by the vendor if this agreement has not previously been cancelled and such resale shall be deemed to have occurred after cancellation.  
 (3) The damages claimable by the vendor under subclause 11.4(1)(b)(ii) shall include all damages claimable at common law or in equity and shall also include (but shall not be limited to) any loss incurred by the vendor on any bona fide resale contracted within one year from the date by which the purchaser should have settled in compliance with the settlement notice. The amount of that loss may include:  
 (a) interest on the unpaid portion of the purchase price at the interest rate for late settlement from the settlement date to the settlement of such resale; and  
 (b) all costs and expenses reasonably incurred in any resale or attempted resale; and  
 (c) all outgoings (other than interest) on or maintenance expenses in respect of the property from the settlement date to the settlement of such resale.  
 (4) Any surplus money arising from a resale as aforesaid shall be retained by the vendor.
- 11.5 If the vendor does not comply with the terms of a settlement notice served by the purchaser, then, without prejudice to any other rights or remedies available to the purchaser at law or in equity the purchaser may:  
 (1) sue the vendor for specific performance; or  
 (2) cancel this agreement by notice and require the vendor forthwith to repay to the purchaser any deposit and any other money paid on account of the purchase price and interest on such sum(s) at the interest rate for late settlement from the date or dates of payment by the purchaser until repayment.
- 11.6 The party serving a settlement notice may extend the term of the notice for one or more specifically stated periods of time and thereupon the term of the settlement notice shall be deemed to expire on the last day of the extended period or periods and it shall operate as though this clause stipulated the extended period(s) of notice in lieu of the period otherwise applicable; and time shall be of the essence accordingly. An extension may be given either before or after the expiry of the period of the notice.
- 11.7 Nothing in this clause shall preclude a party from suing for specific performance without giving a settlement notice.
- 11.8 A party who serves a settlement notice under this clause shall not be in breach of an essential term by reason only of that party's failure to be ready and able to settle upon the expiry of that notice.

## 12.0 Non-merger

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

## 13.0 Agent

- 13.1 If the name of a licensed real estate agent is recorded on this agreement, it is acknowledged that the sale evidenced by this agreement has been made through that agent whom the vendor appoints as the vendor's agent to effect the sale. The vendor shall pay the agent's charges including GST for effecting such sale.
- 13.2 The agent may provide statistical data relating to the sale to the Real Estate Institute of New Zealand Incorporated.

## 14.0 Goods and Services Tax

- 14.1 If this agreement provides for the purchaser to pay (in addition to the purchase price stated without GST) any GST which is payable in respect of the supply made under this agreement then:  
 (1) the purchaser shall pay to the vendor the GST which is so payable in one sum on the GST date;  
 (2) where the GST date has not been inserted on the front page of this agreement the GST date shall be the settlement date;  
 (3) where any GST is not so paid to the vendor, the purchaser shall pay to the vendor:  
 (a) interest at the interest rate for late settlement on the amount of GST unpaid from the GST date until payment; and  
 (b) any default GST;  
 (4) it shall not be a defence to a claim against the purchaser for payment to the vendor of any default GST that the vendor has failed to mitigate the vendor's damages by paying an amount of GST when it fell due under the GST Act; and  
 (5) any sum referred to in this clause is included in the moneys payable by the purchaser on settlement pursuant to subclause 3.8(1).
- 14.2 If the supply under this agreement is a taxable supply, the vendor will deliver a tax invoice to the purchaser on or before the GST date or such earlier date as the purchaser is entitled to delivery of an invoice under the GST Act.
- 14.3 The vendor warrants that any dwelling and curtilage or part thereof supplied on sale of the property are not a supply to which section 5(16) of the GST Act applies.

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

### 15.0 Zero-rating

- 15.1 The vendor warrants that the statement on the front page regarding the vendor's GST registration status in respect of the supply under this agreement is correct at the date of this agreement.
- 15.2 The purchaser warrants that any particulars stated by the purchaser in Schedule 1 are correct at the date of this agreement.
- 15.3 Where the particulars stated on the front page and in Schedule 1 indicate that:
- (1) the vendor is and/or will be at settlement a registered person in respect of the supply under this agreement;
  - (2) the recipient is and/or will be at settlement a registered person;
  - (3) the recipient intends at settlement to use the property for making taxable supplies; and
  - (4) the recipient does not intend at settlement to use the property as a principal place of residence by the recipient or a person associated with the recipient under section 2A(1)(c) of the GST Act,
- GST will be chargeable on the supply under this agreement at 0% pursuant to section 11(1)(mb) of the GST Act.
- 15.4 If GST is chargeable on the supply under this agreement at 0% pursuant to section 11(1)(mb) of the GST Act, then on or before settlement the purchaser will provide the vendor with the recipient's name, address, and registration number if any of those details are not included in Schedule 1 or they have altered.
- 15.5 If any of the particulars stated by the purchaser in Schedule 1 should alter between the date of this agreement and settlement, the purchaser shall notify the vendor of the altered particulars and of any other relevant particulars in Schedule 1 which may not have been completed by the purchaser as soon as practicable and in any event no later than two working days before settlement. The purchaser warrants that any altered or added particulars will be correct as at the date of the purchaser's notification. If the GST treatment of the supply under this agreement should be altered as a result of the altered or added particulars, the vendor shall prepare and deliver to the purchaser or the purchaser's lawyer an amended settlement statement if the vendor has already tendered a settlement statement, and a credit note or a debit note, as the case may be, if the vendor has already issued a tax invoice.
- 15.6 If
- (1) the particulars in Schedule 1 state that part of the property is being used as a principal place of residence at the date of this agreement; and
  - (2) that part is still being so used at the time of the supply under this agreement,
- the supply of that part will be a separate supply in accordance with section 5(15)(a) of the GST Act.
- 15.7 If
- (1) the particulars stated in Schedule 1 indicate that the recipient intends to use part of the property as a principal place of residence by the recipient or a person associated with the recipient under section 2A(1)(c) of the GST Act; and
  - (2) that part is the same part as that being used as a principal place of residence at the time of the supply under this agreement,
- then the references in subclauses 15.3 and 15.4 to "the property" shall be deemed to mean the remainder of the property excluding that part and the references to "the supply under this agreement" shall be deemed to mean the supply under this agreement of that remainder.

### 16.0 Supply of a Going Concern

- 16.1 If there is a supply under this agreement to which section 11(1)(mb) of the GST Act does not apply but which comprises the supply of a taxable activity that is a going concern at the time of the supply, then, unless otherwise expressly stated herein:
- (1) each party warrants that it is a registered person or will be so by the date of the supply;
  - (2) each party agrees to provide the other party by the date of the supply with proof of its registration for GST purposes;
  - (3) the parties agree that they intend that the supply is of a taxable activity that is capable of being carried on as a going concern by the purchaser; and
  - (4) the parties agree that the supply made pursuant to this agreement is the supply of a going concern on which GST is chargeable at 0%.
- 16.2 If it subsequently transpires that GST is payable in respect of the supply and if this agreement provides for the purchaser to pay (in addition to the purchase price without GST) any GST which is payable in respect of the supply made under this agreement, then the provisions of clause 14.0 of this agreement shall apply.

### 17.0 Limitation of Liability

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

### 18.0 Counterparts

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

## FURTHER TERMS OF SALE

19.0 This agreement is conditional upon the Purchasers arranging finance on terms and conditions satisfactory to the Purchaser within 4 working days from the date of this agreement. This condition is inserted for the sole benefit of the Purchasers.





**SCHEDULE 2**

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

~~Stove~~      ~~Fixed floor coverings~~      ~~Blinds~~      ~~Curtains~~      ~~Light fittings~~

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

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

**Acknowledgements**

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

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

Signature of Purchaser(s):

Director / Trustee / Authorised Signatory / Attorney\*  
*Delete the options that do not apply*  
*If no option is deleted, the signatory is signing in their personal capacity*

Signature of Vendor(s):

Director / Trustee / Authorised Signatory / Attorney\*  
*Delete the options that do not apply*  
*If no option is deleted, the signatory is signing in their personal capacity*

Director / Trustee / Authorised Signatory / Attorney\*  
*Delete the options that do not apply*  
*If no option is deleted, the signatory is signing in their personal capacity*

Director / Trustee / Authorised Signatory / Attorney\*  
*Delete the options that do not apply*  
*If no option is deleted, the signatory is signing in their personal capacity*

\*If this agreement is signed under:

- (i) a Power of Attorney – please attach a **Certificate of non-revocation** (available from ADLS: 4098WFP or REINZ); or
- (ii) an Enduring Power of Attorney – please attach a **Certificate of non-revocation and non-suspension of the enduring power of attorney** (available from ADLS: 4997WFP or REINZ).

Also insert the following wording for the Attorney's Signature above:  
*Signed by [full name of the donor] by his or her Attorney [attorney's signature].*

**BEFORE SIGNING THE AGREEMENT**

- It is recommended both parties seek professional advice before signing. This is especially so if:
  - there are any doubts. Once signed, this will be a binding contract with only restricted rights of termination.
  - property such as a hotel or a farm is being sold. The agreement is designed primarily for the sale of residential and commercial property.
  - the property is vacant land in the process of being subdivided or there is a new unit title or cross lease to be issued. In these cases additional clauses may need to be inserted.
  - there is any doubt as to the position of the boundaries.
  - the purchaser wishes to check the weathertightness and soundness of construction of any dwellings or other buildings on the land.
- The purchaser should investigate the status of the property under the Council's District Plan. The property and those around it are affected by zoning and other planning provisions regulating their use and future development.
- The purchaser should investigate whether necessary permits, consents and code compliance certificates have been obtained from the Council where building works have been carried out. This investigation can be assisted by obtaining a LIM from the Council.
- The purchaser should compare the title plans against the physical location of existing structures where the property is a unit title or cross lease. Structures or alterations to structures not shown on the plans may result in the title being defective.
- In the case of a unit title, before the purchaser enters into the agreement:
  - the vendor **must** provide to the purchaser a pre-contract disclosure statement under section 146 of the Unit Titles Act 2010;
  - the purchaser should check the minutes of the past meetings of the body corporate, enquire whether there are any issues affecting the units and/or the common property, check the body corporate's long term maintenance plan and enquire whether the body corporate has imposed or proposed levies for a long term maintenance fund or any other fund for the maintenance of, or remedial or other work to, the common property.
- The vendor should ensure the warranties and undertakings in clauses 7.0 and 9.0:
  - are able to be complied with; and if not
  - the applicable warranty is deleted from the agreement and any appropriate disclosure is made to the purchaser.
- Both parties should ensure the chattels list in Schedule 2 is accurate.
- Before signing this agreement, both parties should seek professional advice regarding the GST treatment of the transaction. This depends upon the GST information supplied by the parties and could change before settlement if that information changes.

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

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

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

**AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE**

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**DATE:**

**VENDOR:**  
Sophany Churton

Contact Details:

Ph: m: , b: 06 347 6563

**VENDOR'S LAWYERS:**

Firm: Bullock & Associates

Individual Acting: Rob Handley

Contact Details:  
P O Box 5  
Wanganui 4540

Ph: 06 345 8049  
Fax: 06 345 5410

Email: rob@bullockassociates.co.nz

**PURCHASER:**  
D W & E-L Blythe

Contact Details:

Ph: m: , b: 06 348 5595

Email: erin.daz.b@gmail.com

**PURCHASER'S LAWYERS:**

Firm: Bullock & Associates

Individual Acting: Ian Burgess

Contact Details:  
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Wanganui 4540

Email: admin@bullockassociates.co.nz  
Ph: 345 8049 Fax: 345 5410

**LICENSED REAL ESTATE AGENT:**  
For Farms (Nz) Limited

Agent's Name: For Farms (NZ) Ltd

Manager: Peter Clayton

Salesperson: John Thornton (027 443 0045)

Contact Details:  
138 High Street

DANNEVIRKE 4930  
office@forfarms.co.nz  
Ph: 06 374 4104  
Fax: 06 374 4109

# Vehicle Crossing Permit

Whanganui District Council — Streets Infrastructure Bylaw 2008



WHANGANUI DISTRICT COUNCIL  
Te Kaunihera a Rohe o Whanganui

Permit No.

### 1. Property owner details

1a. Name

1b. Contact Person/agent (If owner is a corporation, partnership or trust)

1c. Postal address

1d. Contact numbers  Phone  Mobile  Fax

1e. Email

### 2. Property details

2a. Site Address (Specify unit/level number, location of building within site/block number, building name and street name)

2b. Currently lawfully established use

2c. Legal description

2d. Rapid number (rural)

### 3. Description of project

3a. Detailed description of the development/project (tick one)  Urban  Rural  
 Commercial  Other (please specify)

3b. Width of proposed vehicle crossing

3c. Estimated value of the work \$  including GST.

### 4. Council approved contractor undertaking the work

4a. (Refer to list of approved contractors provided in the guide)

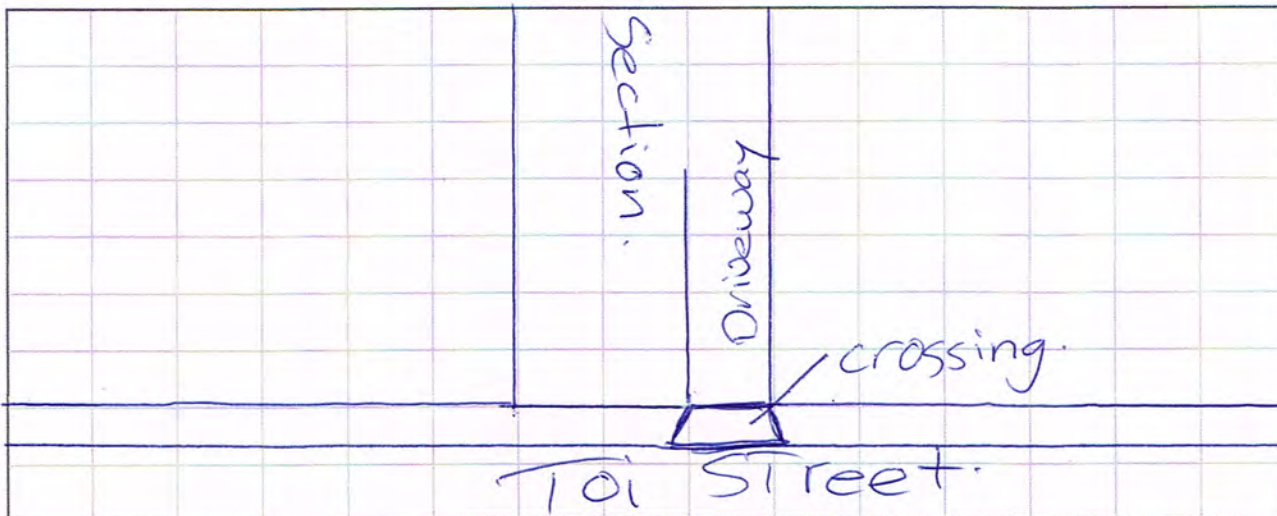
#### OFFICE USE ONLY

Date received  Application #  Document #  Other

Property ID  Legal ID  Receipt #  Amount Paid \$

5. Diagram for vehicle crossing location

5a. Provide a site plan to show the location of the proposed vehicle crossing, and, if applicable, location of water toby, trees, streetlights or poles, stormwater sump and other services/street furniture, such as bus stops, signs etc.



6. Applicant's declaration

**PRIVACY STATEMENT**

Information on this form is required to be provided under the acts, regulations and bylaw administered by the Council and is required to process your application. This information has to be made available to members of the public, including business organisations. In appropriate circumstances, it may also be made available to other units of the council, council's approved contractors and other government agencies.

Under the Privacy Act 1993, you have the right to access the personal information held about you by the council and you can also request that the council correct any personal information it holds about you.

I understand that as the applicant, all correspondence related to this application will be made to me.

I confirm that I have read and understood the Privacy Statement and that the information provided on the application form is true and correct.

*Erin Blythe* - Erin Blythe

Signature

*Parryl Blythe* Parryl Blythe 17/04/19.

Name of person signing: (please print clearly)

Dated

**OFFICE USE ONLY**

Reference no:

Owner ID:

Parcel Prop ID

Tax Invoice GST No: 51 700 449 Credit No: 778030.921 VX

Date Received:

Fee Payable (incl. GST) \$

Received by:

Receipt no:

Loaded by:

Date Paid:

Date Loaded:

**Roading and Assets**

Approved by WDC:

Notes:

Logged:

First inspection date:

Final inspection date:

Infrastructure Bond and Acceptance of Liability Agreement  
Streets Infrastructure Bylaw 2009  
Form IG-001



WHANGANUI DISTRICT COUNCIL  
Te Kaunihera a Rohe o Whanganui

Agreement details

Building Consent

Resource Consent  (Please tick)

I Darryl Wesley & Erin Lee Blythe  
(applicant's full name)

Company name (if applicable)

of 87 Peakes Rd, Wanganui  
(address of applicant)

34 95595  
Phone

erin.daz.b@gmail.com  
Email

give notice that I will be undertaking work at:

5A Tai St, Wanganui  
(address of where work is to be carried out)

and that I agree to abide fully with the following conditions:

1. Prior to any work being undertaken I will request Council to undertake an initial inspection of its infrastructure assets located in the road corridor to identify any pre-existing damage;
2. At the completion of the scheduled work I will request Council to undertake a final inspection of its infrastructure assets to determine whether any damage has occurred since the initial inspection;
3. To take responsibility for the building related care of infrastructure assets for the duration of the above building and/or resource consents;
4. To pay a non-refundable inspection and administration fee of **\$200.00**;
5. To pay a refundable Infrastructure Bond of **\$1,500.00**;
6. That the refundable Infrastructure Bond can be used by Council to offset the cost of damaged assets relating to other building or resource consents that I am also responsible for;
7. To pay the full cost of making good any damage caused to Council's infrastructure assets to an appropriate standard as determined by Council;
8. The refund of the Infrastructure Bond is subject to the making good of any damage to Council's infrastructure assets (as determined by Council) within a period of 4 (four) weeks from the date of Council's written notification to above address.

**Note:** Council should be contacted at the completion of the building work so that it may undertake an inspection of its infrastructure assets to confirm that no damage has occurred. (Please telephone 06 349 0001 to book an inspection)

[Signature]  
Signature

Darryl Blythe Erin Blythe 17/04/19  
Name of person signing: (please print clearly) Dated

OFFICE USE ONLY

Preferred Applicant

Yes

No

(Please tick)

**Please Read IMPORTANT INFORMATION ON THE INFRASTRUCTURE BOND**

**Explanation**

1. The Whanganui District Council has significant infrastructure assets in its road corridor. Damage to those assets from building works can come at a cost to the ratepayers of the Whanganui District.
2. The purpose of the Infrastructure Bond is to encourage the applicant to ensure that the infrastructure assets are not damaged. Further, in the event of damage, the infrastructure bond will ensure that the cost of repairing rests with the party responsible for its damage.
3. **Damage includes but is not limited to the following:** damage to footpaths, kerbing and channel, road surface, street furniture, tobies, trees, berms and other Council assets in the road corridor.
4. The Infrastructure Bond applies to all building consents (and/or resource consents) for demolition, removal, relocation and construction of buildings, and structures (including commercial) in the urban zone.

**Review of Bond Amount**

5. Pursuant to a Resolution of the Whanganui District Council (17 June 2008) a builder who is a preferred applicant may apply for an exemption from paying an infrastructure bond on each consent. The resolution states: "That the Chief Executive has delegated authority to waive the refundable bond amount for builders with multiple consents".
6. An application for waiver of the Bond amount can be made on the appropriate form obtainable from the Council building at 101 Guyton Street, Whanganui.
7. To find out if you are eligible for a waiver of the bond amount, please talk to a member of the Customer Services team in the first instance.

**OFFICE USE ONLY**

Date received

IBR No:

Receipt No:

Received by:

(print name)

**COMMENTS**



# Agent Authorisation

Date: 11/04/19.

Project: Blythe House - <sup>SA</sup> Tai St, Wanganui

Erin authorize buildBIM to act as agent in respect of;

Darryl Blythe

- Filing of all documentation with the relevant territorial authority in respect of Project Memorandum of Building Consent and any other territorial authority requirements for the construction of the project mentioned above.
- Any other matters incidental to the consenting and construction of the dwelling at the above address.

### Signed by

Darryl Blythe      Erin Blythe

Print Name Here

*[Handwritten signature]*      *[Handwritten signature]*

Sign Name Here

# Memorandum from licensed building practitioner: Certificate of design work

## Section 45 and section 30C, Building Act 2004

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

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

THE BUILDING	
Street Address:	5a Toi Street
Suburb:	Tawhero
Town/City:	Whanganui
Postcode:	

THE OWNER(S)	
Name(s): Erin & Darryl Blythe	
Mailing Address: 87 Peakes Rd	
Suburb: Springvale,	PO Box:
Town/City: , Whanganui	Postcode: 4501
Phone Number:	Email address: erin.daz.b@gmail.com

BASIS FOR PROVIDING MEMORANDUM	
I am providing this memorandum in my role as the: Please tick the option that applies	
<input type="checkbox"/>	<b>sole</b> designer of all of the RBW design outlined in the memorandum - I carried out all of the RBW design work myself - no other person will be providing any additional memoranda for the project
<input type="checkbox"/>	<b>lead</b> designer who carried out some of the RBW design myself but also supervised other designers - this memorandum covers their RBW design work as well as mine, and no other person will be providing any additional memoranda for the project
<input checked="" type="checkbox"/>	<b>lead</b> designer for all but specific elements of RBW - this memorandum only covers the RBW design work that I carried out or supervised and the other designers will provide their own memorandum relating to the specific RBW design
<input type="checkbox"/>	<b>specialist</b> designer who carried out specific elements of RBW design work as outlined in the 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 **Daniel Peter McCormick** carried out / supervised the following design work that is restricted building work

**Primary Structure: B1**

Design work that is RBW	Description of RBW	Carried out of spupervised	Reference to plans and specification
Tick <input checked="" type="checkbox"/> if included Cross <input type="checkbox"/> if excluded	If appopriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work of supervised someone else carrying out the design work	If appropriate, specify references
<b>All RBW design work relating to B1</b> <input type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	
Foundations and subfloor framing <input checked="" type="checkbox"/>	Timber subfloor to dwelling & concrete slab to garage to NZS3604:2011	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A103 & Supporting Docs
Walls <input checked="" type="checkbox"/>	Timber Wall framing to NZS:3604 2011.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A104 - A105
Roof <input checked="" type="checkbox"/>	Rafters as per CHH Wood design IT. H1.2 Trusses @ 900mm crs. designed by truss fabricator.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A110, A111 & Supporting Docs
Columns and beams <input checked="" type="checkbox"/>	Timber lintels to NZS:3604 2011.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A105
Bracing <input checked="" type="checkbox"/>	Wall bracing only to GIB bracing calcs.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A106, A107
Other <input type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2			
Design work that is RBW	Description of RBW	Carried out of spupervised	Reference to plans and specification
Tick <input checked="" type="checkbox"/> if included Cross <input type="checkbox"/> if excluded	If appopriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work of supervised someone else carrying out the design work	If appropriate, specify references
<b>All RBW design work relating to E2</b> <input type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	
Damp proofing <input checked="" type="checkbox"/>	DPM under slab. Ventilated subfloor.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A103 & Supporting Docs
Roof cladding or roof cladding system <input checked="" type="checkbox"/>	Trapezoidal Longrun roofing on self supporting roofing underlay	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A111, A401, A421
Ventilation system (for example, subfloor or cavity) <input checked="" type="checkbox"/>	20mm drained and vented cavity system	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A401, A411, A412
Wall cladding or wall cladding system <input checked="" type="checkbox"/>	Vertical Abodo Vulcan weatherboard on 20mm cavity. Tricald board & batten on 20mm cavity.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A401, A411, A412
Waterproofing <input checked="" type="checkbox"/>	Tiled bath over Ardex Superflex. Ceramic tiles installed over membrane to concrete slab/H3.2 17mm Ply supported at max 400crs. Water resistant wall lining. Molded plastic shower.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	A431
Other <input type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	

FIRE SAFETY SYSTEMS: C1 - C6			
Design work that is RBW	Description of RBW	Carried out of supervised	Reference to plans and specification
Tick <input checked="" type="checkbox"/> if included Cross <input type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work of supervised someone else carrying out the design work	If appropriate, specify references
Emergency warning systems  Evacuation and fire service operation systems <input type="checkbox"/>  Suppression or control systems  Other		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	
<b>Note:</b> The design of fire safety systems is only restricted building work when it involves small-to-medium 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. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, provide details of the waivers or modifications below:	
Clause	Waiver/modification required
List relevant clause numbers of building code	Specify nature of waiver or modification of building code required

ISSUED BY	
Name and contact details of the licensed building practitioner who is licensed to carry out or supervise design work that is restricted building work.	
Name: Daniel McCormick	LBP or Registration number: BP129403
The practitioner is a: <input checked="" type="checkbox"/> Design LBP <input type="checkbox"/> Registered architect <input type="checkbox"/> Chartered professional engineer	
Design Entity or Company (optional): buildBIM Ltd.	
Mailing address (if different from below):	
Street address/Registered office: 1/77 Gloucester Street	
Suburb: Christchurch City	Town/City: Christchurch
PO Box/Private Bag:	Postcode: 8013
Phone number: 0273395924	Mobile: 0273395924
After hours: 0273395924	Fax: -
Email address: dan@buildbim.co.nz	Website: www.buildbim.co.nz

DECLARATION
<p>I <u>Daniel Peter McCormick</u> LBP, state that I have applied the skill and care reasonably required of a competent design professional in carrying out or supervising the Restricted Building Work (RBW) described in this form, and that based on this, I also state that the RBW:</p> <ul style="list-style-type: none"> <li>&gt; Complies with the building code, or</li> <li>&gt; Complies with the building code subject to any waiver or modification of the building code recorded on this form</li> </ul> <p>Signature:  _____</p> <p>Date:                      10/04/2019</p>

IT | DP 56197  
 833976.45 mN  
 360178.73 mE  
 RL 86.78

Toi Street

116  
 DP 2086

118  
 DP 2086

2  
 DP 2086

Pt Sec 396  
 RBWR

Email: admin@nzsurveyor.co.nz  
 PO Box 4136 Wanganui 4541  
 Ph: 06 345 8828 Fax: 06 345 3606



Drawing Title:

Site Plan  
 Lot 1 DP 45374  
 5A Toi Street

Scale: 1:250

Date: 25 Feb 2019

Project No. M O'S

Drawn By: Sht 1 of 1

Version:

Drawing No. 19-009

Note: All areas and dimensions subject to final survey.  
 The contractor shall check all dimensions on site.

**Brad Mosen**

---

**From:** Ben Nyssen  
**Sent:** Wednesday, 28 August 2019 4:53 PM  
**To:** Brad Mosen  
**Subject:** FW: EMAIL 02. 5A Toi

**From:** Erin & Darryl [mailto:erin.daz.b@gmail.com]  
**Sent:** Wednesday, 28 August 2019 3:17 PM  
**To:** Ben Nyssen <Ben.Nyssen@whanganui.govt.nz>  
**Subject:** Fwd: EMAIL 02

Another email

----- Forwarded message -----

**From:** Jody Hall <jody@buildbim.co.nz>  
**Date:** Wed, 28 Aug 2019 at 08:22  
**Subject:** EMAIL 02  
**To:** Jordan Cawley <jcawleyconstruction@gmail.com>  
**Cc:** Erin Blythe <erin.daz.b@gmail.com>

Kind Regards

**JODY HALL**  
Senior Architectural Designer



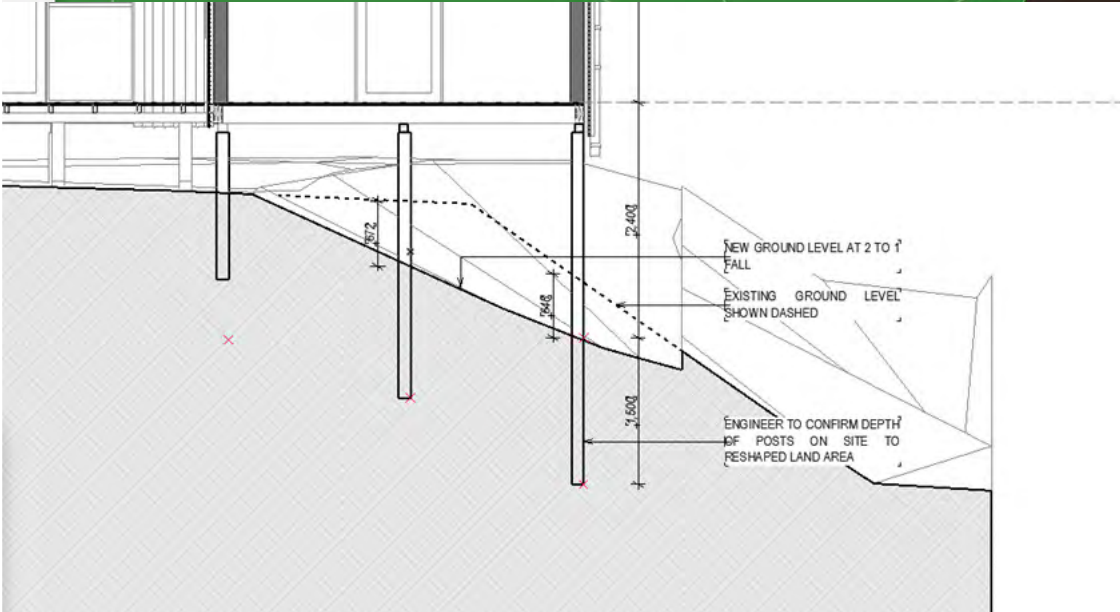
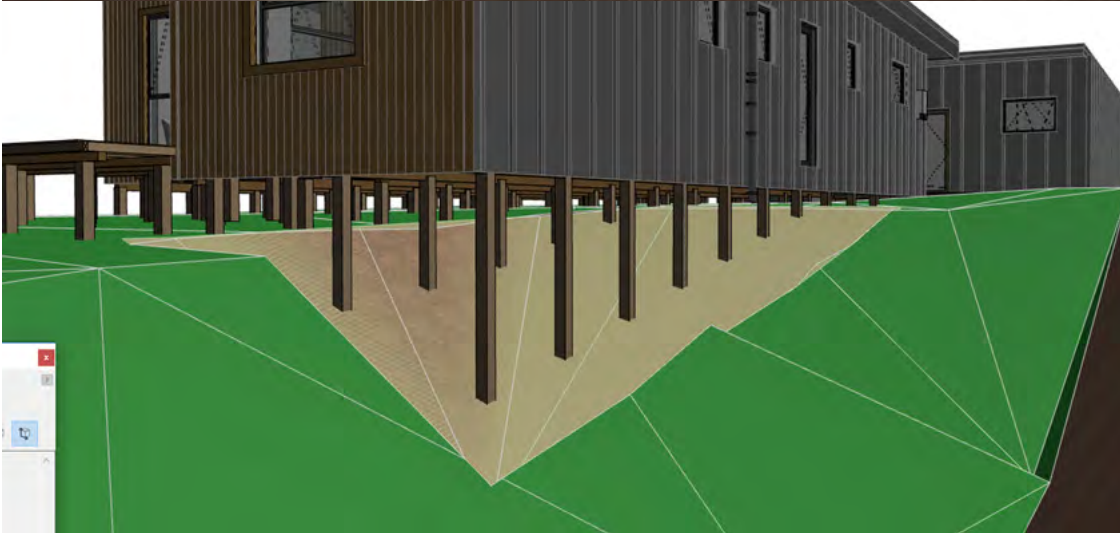
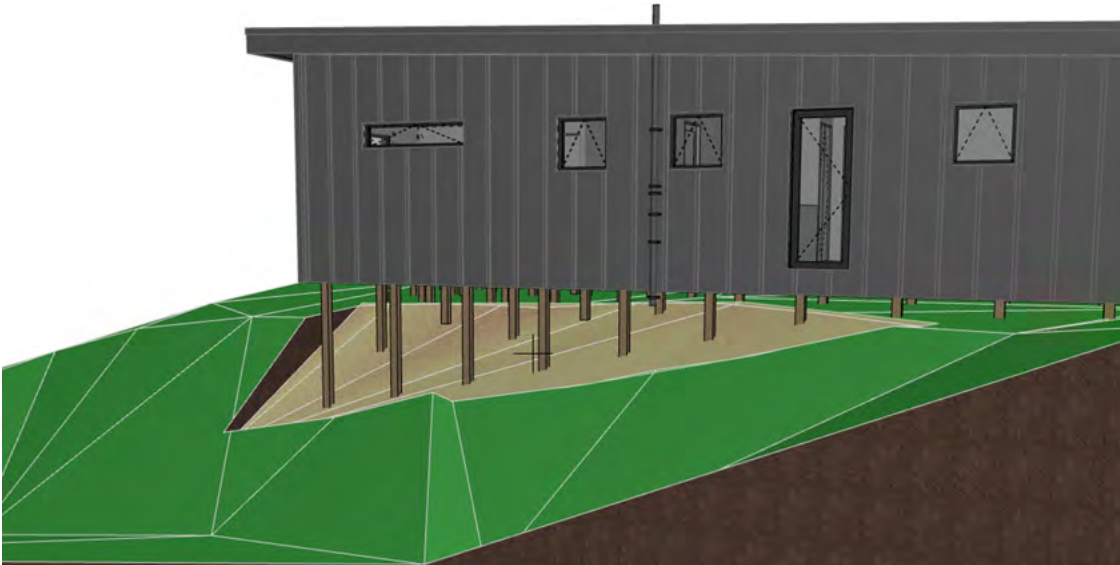
O: [03 332 1797](tel:033321797) | M: [021 109 1583](tel:0211091583)  
E: [jody@buildbim.co.nz](mailto:jody@buildbim.co.nz) | W: [www.buildBIM.co.nz](http://www.buildBIM.co.nz)  
O: [Unit 1 /77 Gloucester Street, Christchurch, New Zealand, 8013](#)

----- Forwarded message -----

**From:** Jody Hall <jody@buildbim.co.nz>  
**Date:** Tue, Aug 20, 2019 at 11:34 AM  
**Subject:** Re: FW: Blythe house  
**To:** Stuart Mackintosh <StuartM@bplgroup.co.nz>  
**Cc:** Jordan Cawley <jordan@cawleyconstruction.co.nz>, Erin Blythe <erin.daz.b@gmail.com>

Hi Stuart,

Just thought I would send you through some images to confirm this is what we are wanting to do ?



Kind Regards

**JODY HALL**  
Senior Architectural Designer



O: [03 332 1797](tel:033321797) | M: [021 109 1583](tel:0211091583)  
E: [jody@buildbim.co.nz](mailto:jody@buildbim.co.nz) | W: [www.buildBIM.co.nz](http://www.buildBIM.co.nz)  
O: [Unit 1 /77 Gloucester Street, Christchurch, New Zealand, 8013](#)

On Fri, Aug 16, 2019 at 10:59 AM Stuart Mackintosh <[StuartM@bplgroup.co.nz](mailto:StuartM@bplgroup.co.nz)> wrote:

Hi Jody,

We have been asked by Jordan to look at foundation options for the above property.

When you have had a chance to open the attached, could you please give me a call – the sketch needs a commentary!

Kind regards,  
Stuart Mackintosh

**BPL Group**

Engineers and Valuers

86 Victoria Avenue

Wanganui, New Zealand

Phone: 06 345 3959

[stuartm@bplgroup.co.nz](mailto:stuartm@bplgroup.co.nz)

[www.bplgroup.co.nz](http://www.bplgroup.co.nz)



RECEIVED 29/08/2019

**From:** Jordan Cawley [mailto:[jordan@cawleyconstruction.co.nz](mailto:jordan@cawleyconstruction.co.nz)]

**Sent:** Monday, 12 August 2019 7:29 AM

**To:** Stuart Mackintosh <[StuartM@bplgroup.co.nz](mailto:StuartM@bplgroup.co.nz)>

**Subject:** Re: Blythe house

Morning Stuart,

Erin, Darryl and myself are happy with your proposal of works at Toi st. Can you please liase with the architect Jody Hall at BuildBIM with any documentation etc for consent purposes.

His email is

[Jody@buildbim.co.nz](mailto:Jody@buildbim.co.nz)

0211091583

Feel free to call anytime

Many thanks

Jordan

On Thu, 8 Aug 2019, 08:40 Stuart Mackintosh, <[StuartM@bplgroup.co.nz](mailto:StuartM@bplgroup.co.nz)> wrote:

Great. 1.30pm on Friday out my office would be great.

Thanks,

Stuart

**From:** Jordan Cawley [mailto:[jcawleyconstruction@gmail.com](mailto:jcawleyconstruction@gmail.com)]

**Sent:** Wednesday, 7 August 2019 3:50 PM

**To:** Stuart Mackintosh <[StuartM@bplgroup.co.nz](mailto:StuartM@bplgroup.co.nz)>

**Subject:** Re: Blythe house

Heya, sure Friday sounds great. Shall I call into your offices? What time would suit you?

RECEIVED 29/08/2019

Thanks,

Jordan

On Wed, 7 Aug 2019, 14:34 Stuart Mackintosh, <[StuartM@bplgroup.co.nz](mailto:StuartM@bplgroup.co.nz)> wrote:

Hi Jordan,

I have spoken with David and stated to look at options here.

Do you have any time on Friday to catch up?

Early am or early pm? – or next week,

Thanks, Stuart

**From:** Jordan Cawley [mailto:[jordan@cawleyconstruction.co.nz](mailto:jordan@cawleyconstruction.co.nz)]  
**Sent:** Monday, 29 July 2019 6:22 AM  
**To:** Stuart Mackintosh <[StuartM@bplgroup.co.nz](mailto:StuartM@bplgroup.co.nz)>  
**Subject:** Blythe house

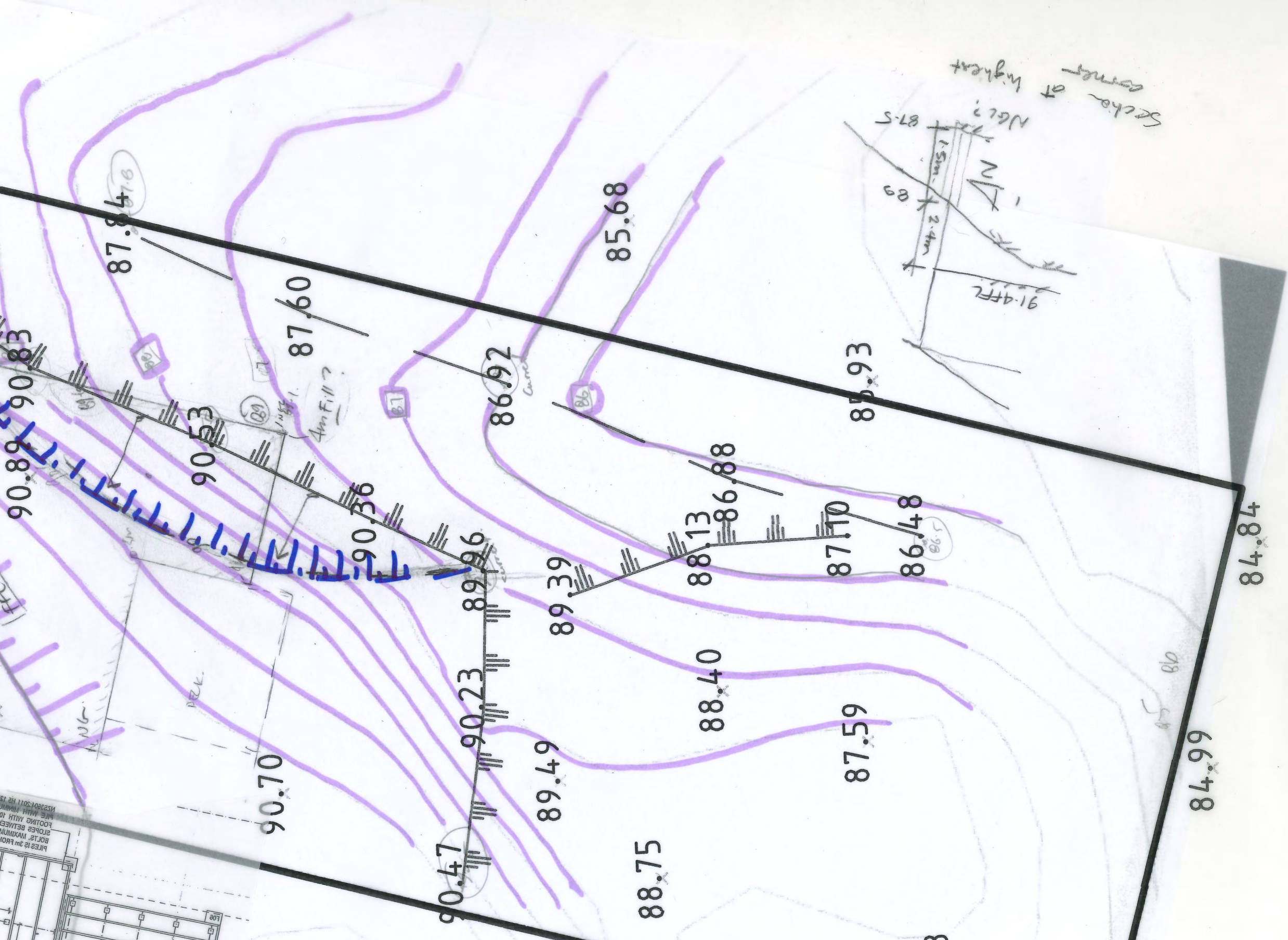
Morning Stuart,

Just checking in to see if you have had a chance to look at mums place to see if you think there is another way to acheive lateral bracing in the subfloor design where the screw piles are that is different to Davids idea? If so I would like to hear your thoughts, sign an agreement and get your recommendation through to council asap.

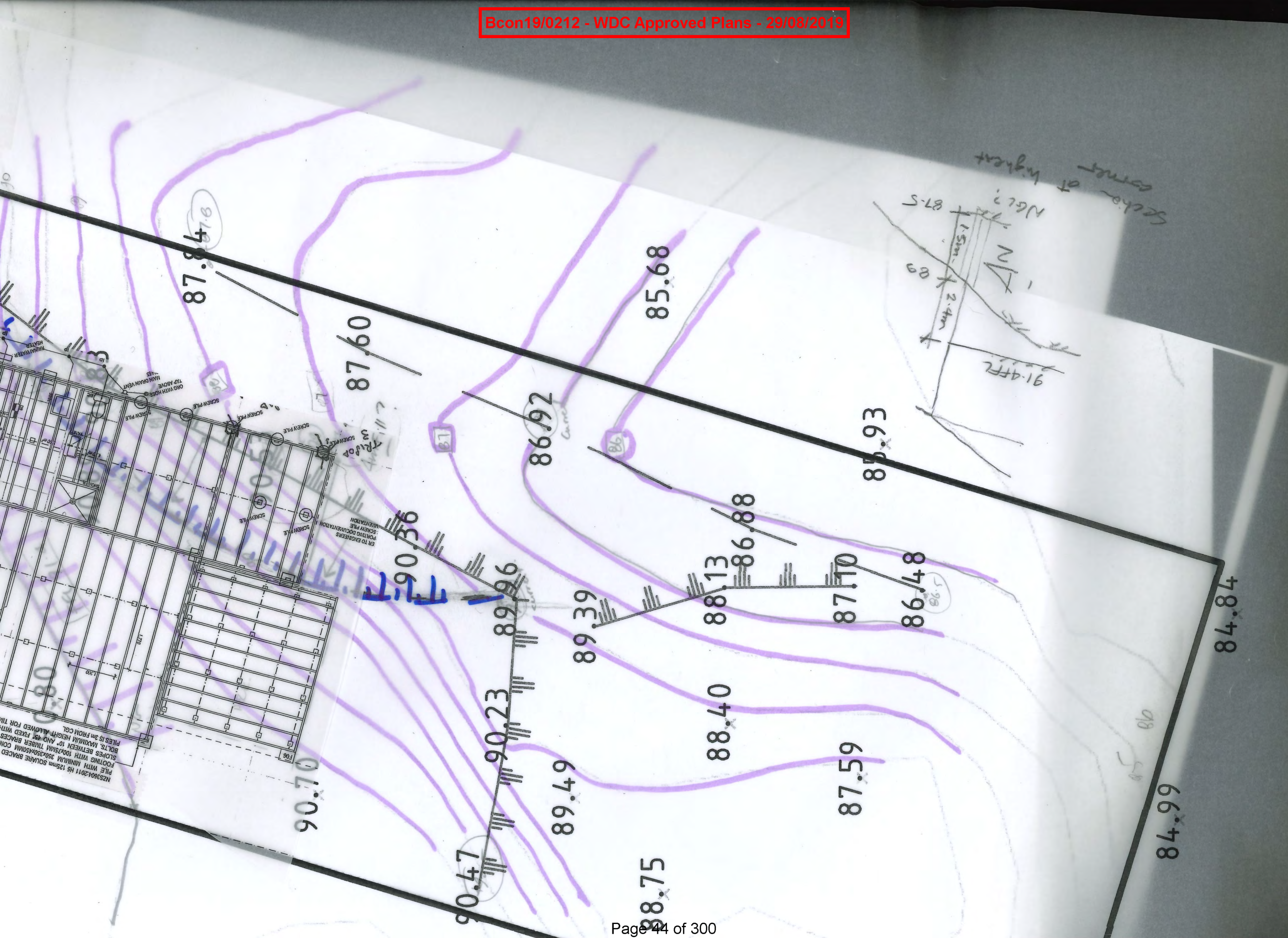
Many thanks,

Jordan.

RECEIVED 29/08/2019



RECEIVED 29/08/2019

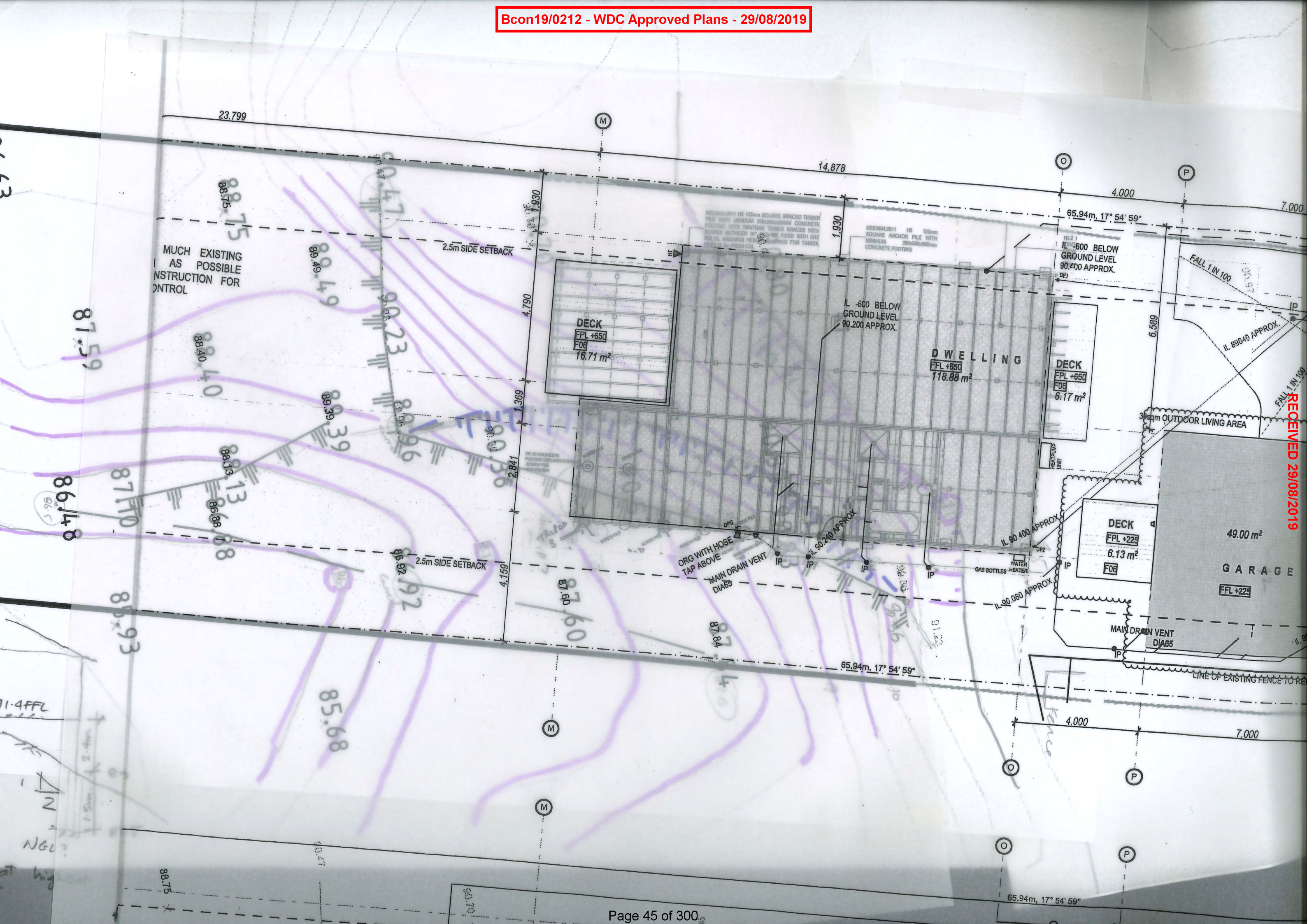


PILE WITH MINIMUM 500x500x150MM CON-  
 FOOTING WITH 100x25MM TIGER BRACES  
 BOLTS BETWEEN 10" AND 45" FIXED WITH  
 PILES IS 3m FROM CGL  
 MAXIMUM HEIGHT ALLOWED FOR TH-  
 N2396x2011 IS 125mm SQUARE BRACED

EA TO ENGINEERS  
 FORMING OCCUPANTION  
 INVESTIGATION  
 SCREW PILE  
 TRIP 04  
 11/11/17

Section at height  
 NGL?  
 91.4FFL  
 1.5m  
 2.4m  
 87.5

RECEIVED 29/08/2019





andrew mulholland <bumicouplers@gmail.com>

5A TOI STREET / LEVELS

1 message

Jody Hall <jody@buildbim.co.nz>  
To: bumicouplers@gmail.com  
Cc: Erin Blythe <erin.daz.b@gmail.com>

Tue, Jun 11, 2019 at 8:55 AM

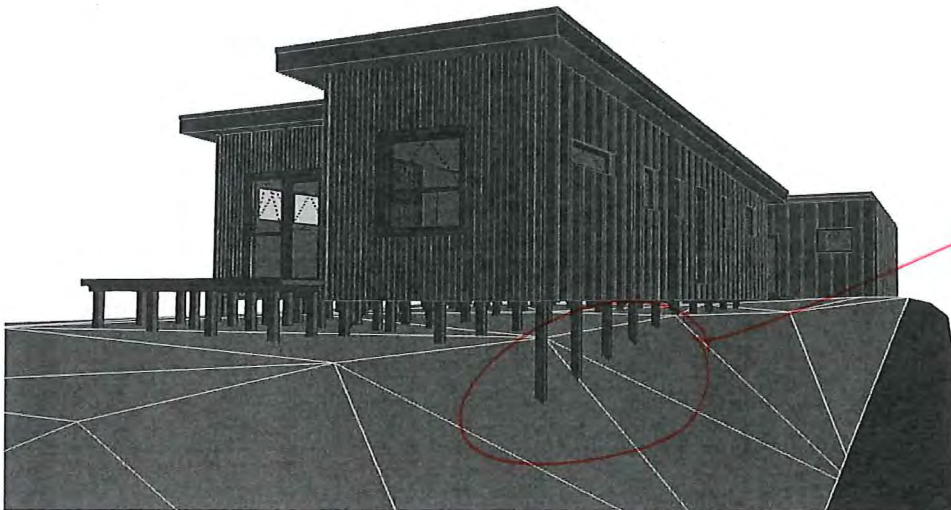
Hi David

Levels requested

- BH1 / FL 91500 GL 89650 (1850m)
- BH2 / FL 91500 GL 90850 (650mm)
- BH3 / FL 91260 GL 91000 (260mm)

*1850 high  
650*

Image below showing BH1 location, corner of dwelling



*18/6/19.  
this will  
be a  
problem  
- I fear  
doubt the  
soil on  
bank is  
adequately  
compacted !!*

Kind Regards

JODY HALL  
Senior Architectural Designer



O: 03 332 1797 | M: 021 109 1583  
E: jody@buildbim.co.nz | W: www.buildBIM.co.nz  
O : Unit 1 /77 Gloucester Street, Christchurch, New Zealand, 8013

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RECEIVED 28/08/2019

**DAVID MULHOLLAND CONSULTING ENGINEER LIMITED**

Suite 3, 36 RIDGWAY STREET, P O Box 991, WANGANUI [bumicouplers@gmail.com](mailto:bumicouplers@gmail.com)

Phone 021 299 5603

**Scala Penetrometer Test Sheet**

Our Ref: 19050

Project Name: BLYTHE HOUSE

Date Tested: 19TH June 2019

Project Location: 5A TOI STREET

Time Tested: 4pm

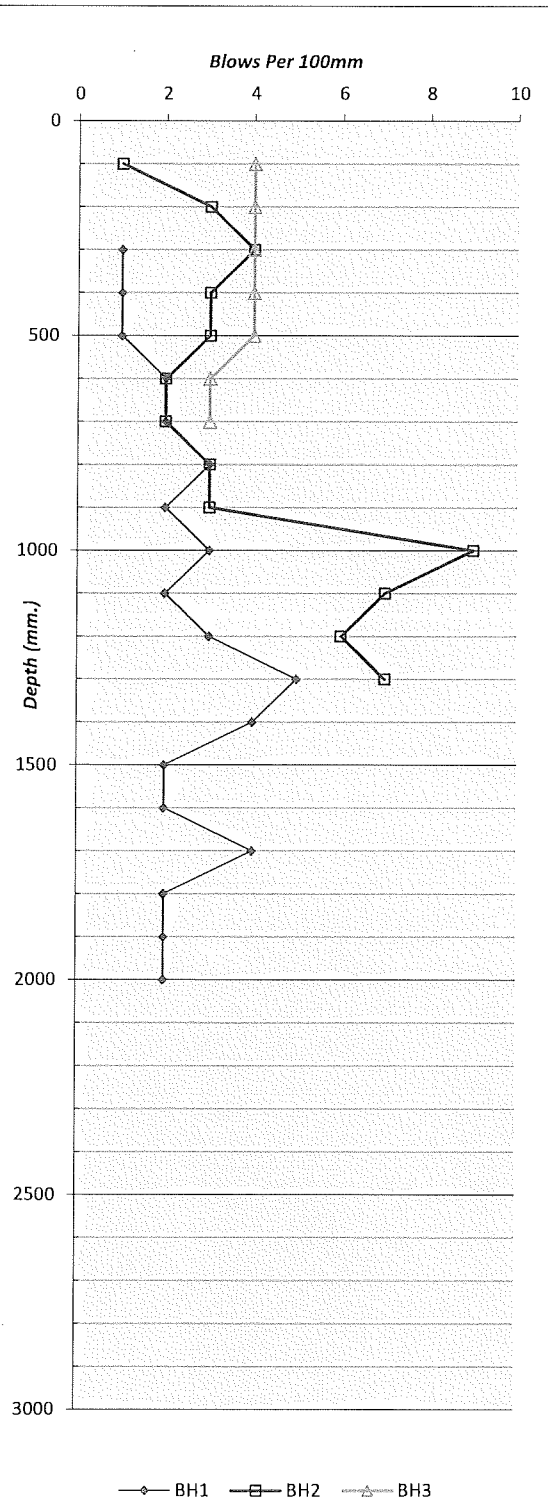
Wanganui

Tested By: david

Report Date: 19th june

Tests: NZS4402:1986 Test 6.5.2 Hand Method Using a Scala Penetrometer

Depth (mm)	Test Hole (Blows / 100mm : Bearing Capacity (Kpa))					
	BH1		BH2		BH3	
	Blows per 100mm	Safe Bearing Capacity (Kpa)	Blows per 100mm	Safe Bearing Capacity (Kpa)	Blows per 100mm	Safe Bearing Capacity (Kpa)
100			1	35	4	125
200			3	100	4	125
300	1	35	4	125	4	125
400	1	35	3	100	4	125
500	1	35	3	100	4	125
600	2	70	2	70	3	100
700	2	70	2	70	3	100
800	3	100	3	100		
900	2	70	3	100		
1000	3	100	9	230		
1100	2	70	7	190		
1200	3	100	6	175		
1300	5	150	7	190		
1400	4	125				
1500	2	70				
1600	2	70				
1700	4	125				
1800	2	70				
1900	2	70				
2000	2	70				
2100						
2200						
2300						
2400						
2500						



Test Location Diagrams: Attached

BH1 shows steep bank is not well compacted. BH2 and BH3 are quite adequate to support single storey buildings

RECEIVED 27/08/2019

**Brad Mosen**

---

**From:** Jody Hall <jody@buildbim.co.nz>  
**Sent:** Tuesday, 20 August 2019 2:43 PM  
**To:** Brad Mosen  
**Cc:** erin.daz.b@gmail.com; Jordan Cawley  
**Subject:** Re: RFI RESPONSE / BCON19/0212 5A TOI STREET, WHANGANUI  
**Attachments:** BLYTHE HOUSE - BUILDING CONSENT.pdf

Hi Brad,

Please see BLYTHE HOUSE - BUILDING CONSENT.pdf attachment for the last item on the request for further information letter from council, project number: BCon19 / 0212

Dear Sir or Madam:

**1st Request for further information on Application.**

Project Number: **BCon19/0212**  
Project Location: **5A Toi St WHANGANUI**  
Project Description: **Construct a new residential dwelling with detached garage/sleepout.**

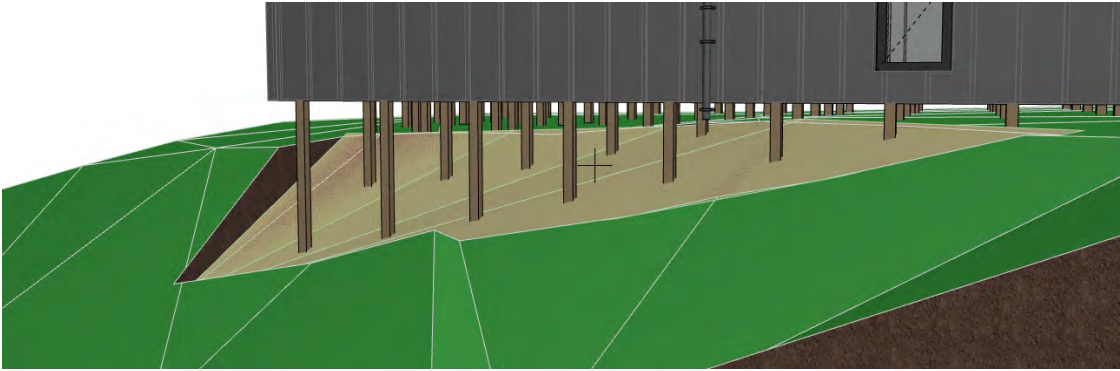
The building consent application is currently being assessed. Please supply the answers to the questions below in a specific covering letter clearly cross-referencing our questions and ensure that the altered drawings are also cross-referenced and have appropriate 'clouding' or **highlighting** etc. to clearly identify changes. All **RBW** questions **MUST** be addressed by the **LBP** responsible for the design and confirmation supplied. Please ensure that you quote this Project Number BCon19/0212 on all changes made to the documents.

1. **Please show water connection offset at the boundary on site plan. Clear of vehicle crossing. (Jordan Heihei - IG)**
2. **Please show depths and offsets at the boundary for sanitary sewer and stormwater connections on site plan. (Jordan Heihei - IG)**
3. **Please show invert level and ground level of the sanitary sewer at the head of line. (Jordan - IG)**
4. **Council records identify extensive earthworks to this site. This application requires confirmation that the building platform is suitable for this type of foundation construction or what might need to be done to achieve it. (Ben Nyssen - Cadet Building Control Officer)**
5. **The 165mm footing detail on sheet A103 was superseded in 2011. Please provide the acceptable solution foundation detail. (Ben Nyssen - Cadet Building Control Officer)**

Please refer below sheets for item 4:  
A102 Site Plan  
A103 Foundation Plumbing Drainage Plan

Item 4 was the remaining item, we are going to reshape the land to the south east corner and be able to use H5 125mm square timber posts for the sub structure which will give us a suitable building platform. Before posts are put in place in this area, the engineer is to do an inspection.

RECEIVED 20/08/2019



Kind Regards

**JODY HALL**  
Senior Architectural Designer



O: [03 332 1797](tel:033321797) | M: [021 109 1583](tel:0211091583)  
E: [jody@buildbim.co.nz](mailto:jody@buildbim.co.nz) | W: [www.buildBIM.co.nz](http://www.buildBIM.co.nz)  
O: [Unit 1 / 77 Gloucester Street, Christchurch, New Zealand, 8013](#)

On Mon, Jun 10, 2019 at 11:24 AM Brad Mosen <[Brad.Mosen@whanganui.govt.nz](mailto:Brad.Mosen@whanganui.govt.nz)> wrote:

Hi Erin

I have spoken to Ben Nyssen who is assessing your application (he has read email from Dave) and he has said a Penetrometer test is required for this application at the location of the proposed dwelling.

Kind Regards

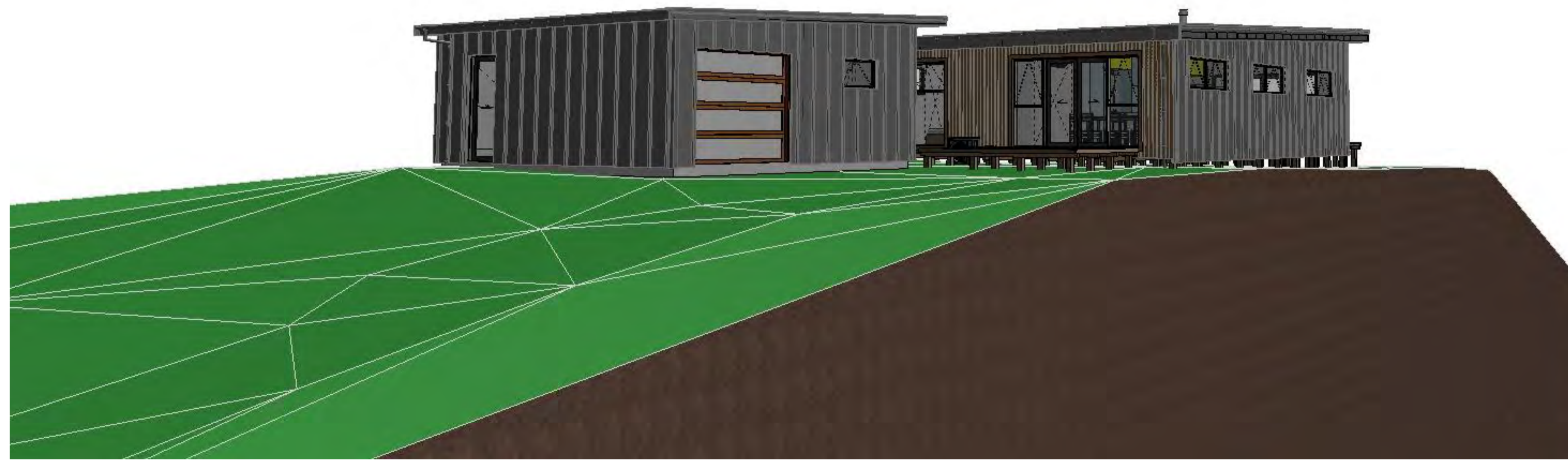
Brad Mosen

**From:** Erin & Darryl [mailto:[erin.daz.b@gmail.com](mailto:erin.daz.b@gmail.com)]  
**Sent:** Sunday, 9 June 2019 3:22 PM  
**To:** Brad Mosen <[Brad.Mosen@whanganui.govt.nz](mailto:Brad.Mosen@whanganui.govt.nz)>  
**Cc:** Jody Hall <[jody@buildbim.co.nz](mailto:jody@buildbim.co.nz)>  
**Subject:** Re: RFI RESPONSE / BCON19/0212 5A TOI STREET, WHANGANUI

Hi Brad

I will forward onto you a recent email I received from David Mullholland regarding our property 5a Toi St.

RECEIVED 20/08/2019



2 NORTH WEST

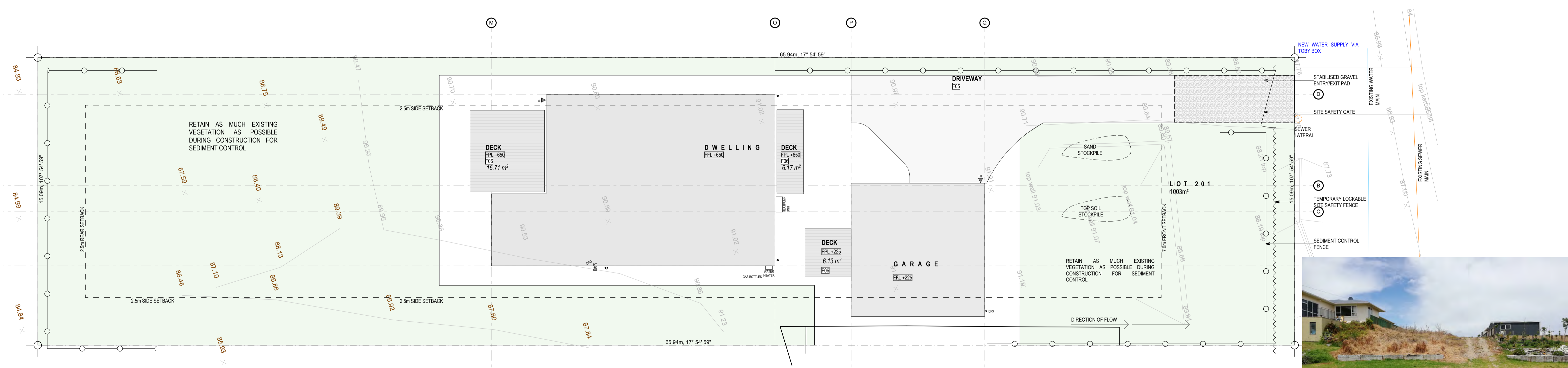
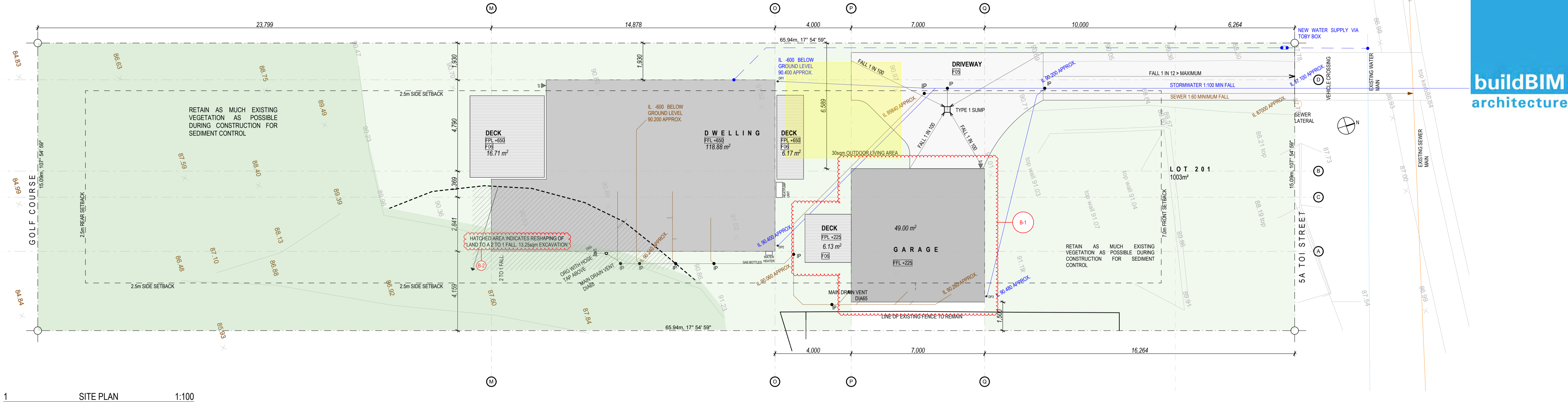
Drawing List

Sheet	Title	REV	Change ID
A101	COVER SHEET	B	
A102	SITE AND SEDIMENT PLAN	B	10, 12
A103	FOUNDATION, PLUMBING, AND DRAINAGE PL...	B	12
A104	GROUND FLOOR PLAN	B	
A105	FRAMING PLAN	B	11
A106	BRACING PLAN	B	
A107	BRACING CALCULATIONS	B	
A108	ELECTRICAL PLAN	B	
A109	ROOF FRAMING PLAN	B	
A110	ROOF PLAN	B	
A201	ELEVATIONS	B	
A202	ELEVATIONS	B	
A301	SECTIONS	B	
A302	SECTIONS	B	
A401	CLADDING DETAILS	B	
A402	DOOR AND WINDOW DETAILS	B	
A403	DOOR AND WINDOW DETAILS	B	
A404	ROOF AND FRAMING DETAILS	B	
A405	WET AREA AND PLUMBING DETAILS	B	
A501	DOOR AND WINDOW SCHEDULE	B	



PROJECT:  
**BLYTHE HOUSE**  
 5A TOI STREET ,TAWHERO ,WHANGANUI

20/08/2019



**LEGEND:**

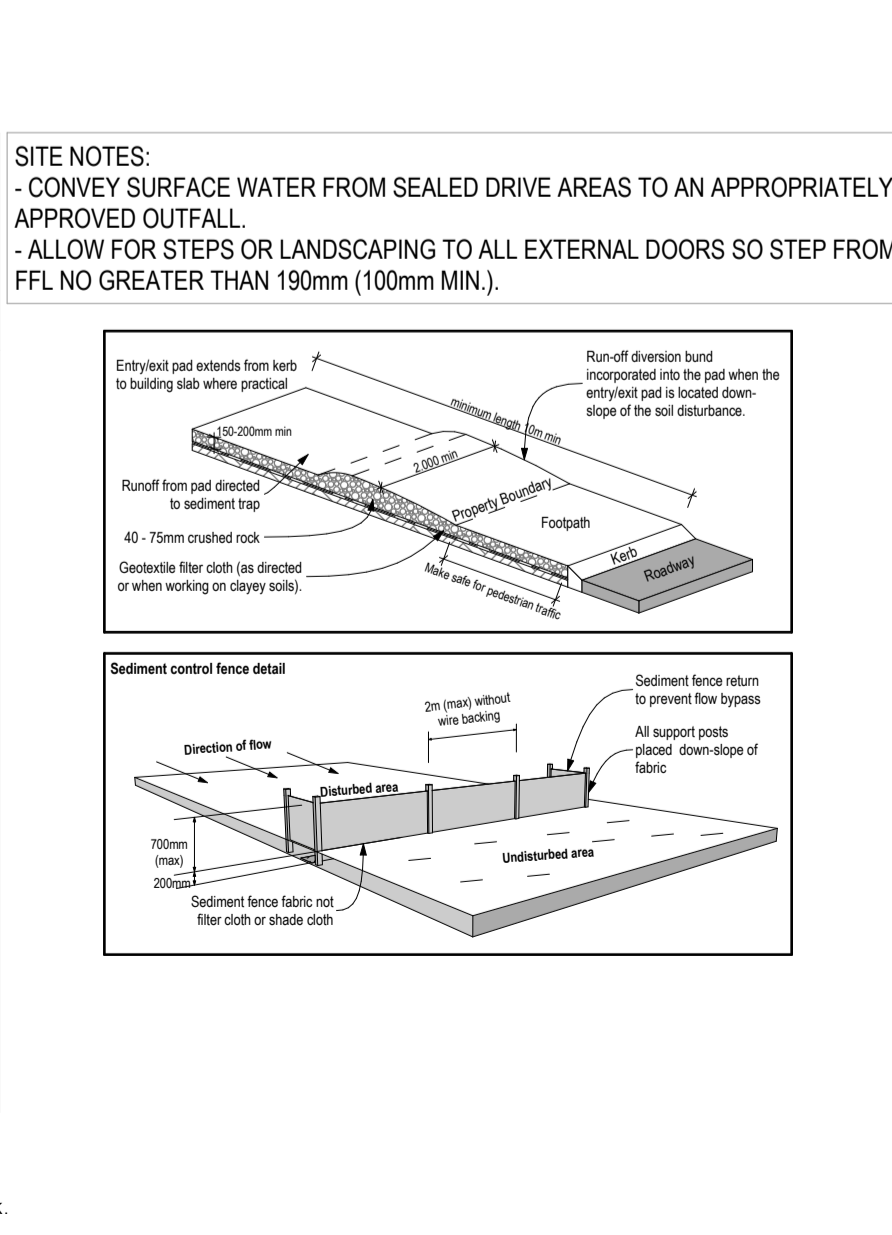
- TEMPORARY FENCE
- SEDIMENT CONTROL FENCE
- ENTRY/EXIT PAD

**GENERAL:**

- BOUNDARY DIMENSIONS & BEARINGS TO BE CONFIRMED AGAINST CERTIFICATE OF TITLE.
- ALL DIMENSIONS AND LEVELS TO BE CONFIRMED ON SITE, INCLUDING SW & FW LATERAL LOCATIONS.
- RUMBLE PAD TO BE CREATED AT POINT OF ENTRY & EXIT ON SITE (REMOVED ON COMPLETION OF FORMED DRIVEWAY)
- RUMBLE PAD TO BE CREATED IN ACCORDANCE TO GUIDELINES PROVIDED BY THE LOCAL COUNCIL & MAINTAINED IN GOOD CONDITION THROUGHOUT ITS PERIOD OF USE.
- ALL GROUND COVER/VEGETATION OUTSIDE OF IMMEDIATE BUILD AREA TO BE MAINTAINED THROUGHOUT PERIOD OF HOUSE BUILD. THIS INCLUDES GRASS VERGES ON THE STREET FRONTAGE.
- ROOF DOWNPIPES ARE TO BE CONNECTED TO THE INSTALLED STORMWATER DRAINAGE AS SOON AS PRACTICAL ONCE ROOF CLADDING HAS BEEN INSTALLED. UNTIL THIS POINT ENSURE WATER RUN-OFF FROM DOWNPIPES IS DIRECTED AWAY FROM BUILD AREA BUT NOT ON TO NEIGHBOURING PROPERTIES.
- NO BUILDING WORK WILL BE STARTED ON THIS PROJECT UNTIL THE CONSTRUCTION OF AN APPROVED STORMWATER OUTFALL HAS BEEN COMPLETED FOR THIS PROPOSED LOT.
- EXTERIOR PAVED SLABS TO SLOPE AWAY FROM HOUSE AT A GRADIENT OF 1 IN 25 MINIMUM 1M. SEE 3604 SECTIONS 7.5.2.2.

**GENERAL:**

- BOUNDARY DIMENSIONS & BEARINGS TO BE CONFIRMED AGAINST CERTIFICATE OF TITLE.
- ALL DIMENSIONS AND LEVELS TO BE CONFIRMED ON SITE, INCLUDING SW & FW LATERAL LOCATIONS.
- RUMBLE PAD TO BE CREATED AT POINT OF ENTRY & EXIT ON SITE (REMOVED ON COMPLETION OF FORMED DRIVEWAY)
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- ROOF DOWNPIPES ARE TO BE CONNECTED TO THE INSTALLED STORMWATER DRAINAGE AS SOON AS PRACTICAL ONCE ROOF CLADDING HAS BEEN INSTALLED. UNTIL THIS POINT ENSURE WATER RUN-OFF FROM DOWNPIPES IS DIRECTED AWAY FROM BUILD AREA BUT NOT ON TO NEIGHBOURING PROPERTIES.
- NO BUILDING WORK WILL BE STARTED ON THIS PROJECT UNTIL THE CONSTRUCTION OF AN APPROVED STORMWATER OUTFALL HAS BEEN COMPLETED FOR THIS PROPOSED LOT.
- EXTERIOR PAVED SLABS TO SLOPE AWAY FROM HOUSE AT A GRADIENT OF 1 IN 25 MINIMUM 1M. SEE 3604 SECTIONS 7.5.2.2.



**NOTES**

**F05 CONCRETE**  
EXPOSED AGGREGATE CONCRETE

**F06 DECK**  
SELECTED 19mm TIMBER DECKING OVER H3.2 SGB  
90x45mm TIMBER JOISTS AT 450 CENTRES ON H4 SGB  
90x90mm TIMBER BEARERS AT 900 CENTRES ON H5 SGB  
125x125mm TIMBER POSTS AT 1200 CENTRES

**LEGAL DESCRIPTION:**  
ADDRESS: 5A TOI STREET, TAWHERO, WHANGANUI LOT: 116 DP: 2086

**SITE AREA:** 995m²  
**GROUND FLOOR AREA:** 118.88m²  
**GARAGE AREA:** 49m²  
**TOTAL AREA:** 167.88m²

**SITE COVERAGE:** 16.89% (40% Allowable)  
**IMPERVIOUS SURFACE AREA:** 91.07m² (9.15% Excluding Dwelling & Garage)

**LEGEND**

- BOUNDARY MARKER
- BOUNDARY LINE
- BUILDING AREA
- FFL FINISH FLOOR LEVEL
- FPL FINISHED PAVED LEVEL

**SITE INFORMATION:**

TERRITORIAL AUTHORITY: WHANGANUI DISTRICT COUNCIL  
PLANNING ZONE: RESIDENTIAL ZONE  
FLOOD MANAGEMENT AREA: N/A  
WIND ZONE: HIGH 2  
EARTHQUAKE ZONE: N1  
SNOW ZONE: C  
EXPOSURE ZONE: N/A  
SEA SPRAY ZONE: N/A  
COSTAL HAZARD: N/A

**GENERAL:**

ALL DIMENSIONS, SITE LEVELS, POSITION OF ROAD CROSSING, SERVICES LOCATIONS (SS & SW), STREET TREES, LAPS POST, PARKING BAYS, PEDESTRIAN ISLANDS, ETC... TO BE CONFIRMED ON SITE

**BOUNDARY INFORMATION:**  
DIMENSIONS AND BEARINGS SUBJECT TO CONFIRMATION, UPON ISSUE OF CERTIFICATE OF TITLE.

**STEPS & PATHS:**

- A STEPS OR APPROPRIATE LANDSCAPING IS TO BE PROVIDED IF DROP FROM EXTERNAL DOORS IS GREATER THAN 190mm FROM FFL TO FGL.
- ALL ACCESS ROUTES MUST PROVIDE A NON-SLIP SURFACE IN ACCORDANCE TO NZBC D1/AS TABLE 2. CONVEY SURFACE WATER FROM SEALED DRIVE TO AN APPROPRIATE APPROVED OUTFALL.

**IMPORTANT:**  
TIMBER DECK AREAS ARE TO BE FREESTANDING ELEMENTS - NOT CONNECTED TO THE MAIN BUILDING AND UNDER 1.5m IN HEIGHT. THEREFORE THESE ARE EXEMPT FROM BUILDING CONSNT APPLICATION AS PER THE BUILDING ACT 2004, SCHEDULE 1. DECK & STEPS ARE HOWEVER ARE TO BE CONSTRUCTED IN FULL ACCORDANCE WITH NZBC D1/AS 1.1, 4.1.1, 4.1.1.8, 6.0 & FIG. 26 AND NZBC SIMPLE HOUSE AS1 SECTION 3.4



**EXISTING PHOTO FROM STREET**

EARTHWORKS / RFI 15  
14.5.1(A) - GARAGE EARTHWORKS 49sqm / COMPLIANT  
14.5.2(A) - THERE ARE NO CUTS HIGHER THAN 1.5m OR FILLS HIGHER THAN 600mm  
14.5.2(B) - NO CUTS OR FILLS ON SLOPES EXCEEDING 20 DEGREES / COMPLIANT  
14.5.2(E) - TOES OF CUTS OR FILLS / COMPLIANT

Date	Change Name	Chd	RevD
29/03/2019			A
20/08/2019	GARAGE NEW LOCATION	B-1	B
	LAND RESHAPE	B-2	B

ENGINEER:  
NZS3604:2011  
SURVEY:

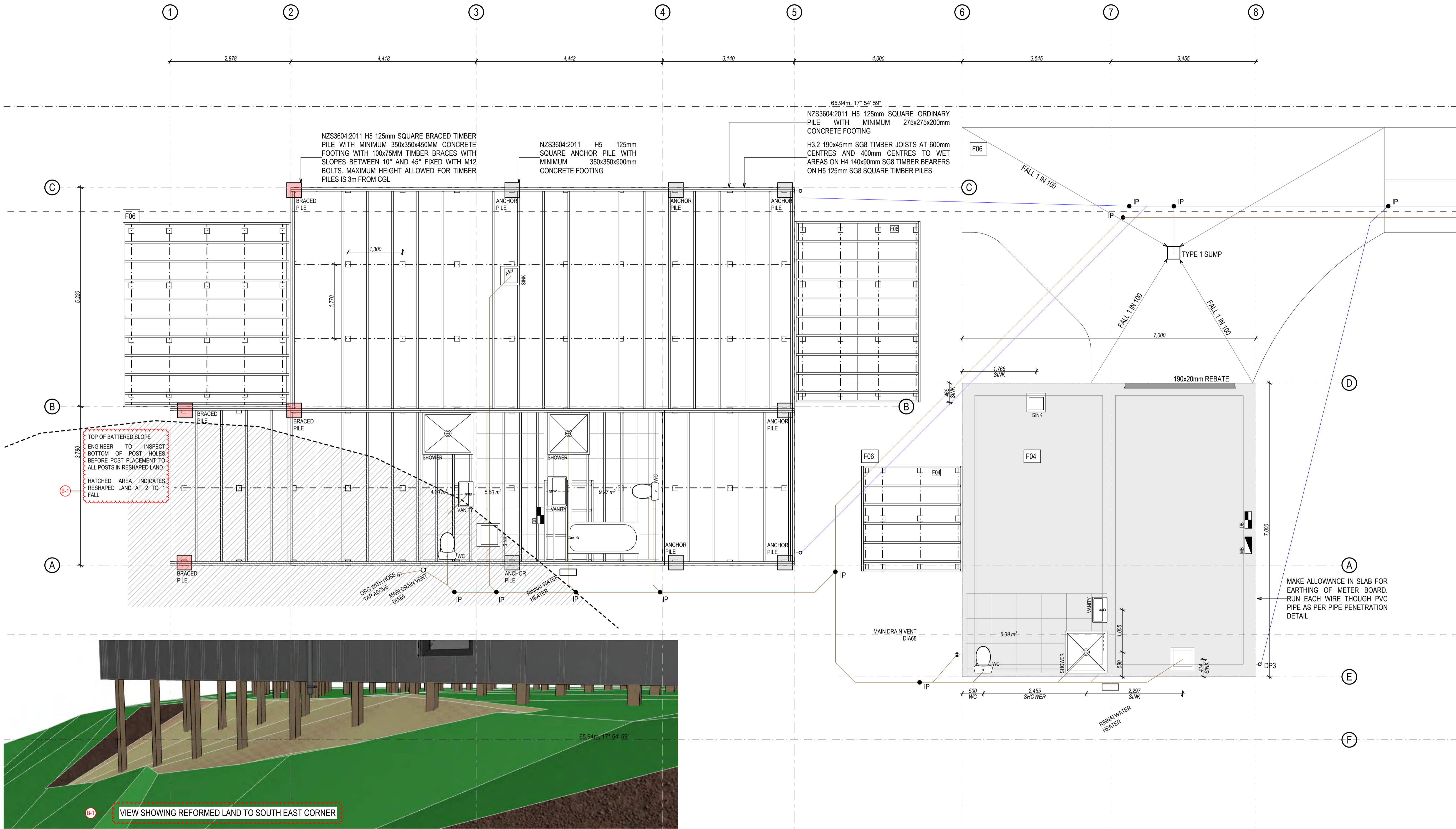
PROJECT:  
**BLTYE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
RFI RESPONSE

TITLE:  
**SITE AND SEDIMENT PLAN**

REVISION:  
ISSUED: 20/08/2019  
SCALE: 1:100, 1:1.2277 @ A1  
SHEET NUMBER: A102

RECEIVED 20/08/2019



**FOUNDATION TYPE:** NZS3604:2011 CONCRETE FOUNDATION  
NZS3604:2011 TIMBER SUB FLOOR FOUNDATION

**FOUNDATION NOTES:**

- FOUNDATION FOOTING AS PER NZS3604:2011
- CONCRETE SLAB THICKNESS TO BE AS PER NZS3604:2011
- CONCRETE STRENGTH FOR SLAB & FOOTINGS TO BE AS PER NZS3604:2011
- SLAB THICKENINGS TO COMPLY WITH NZS3604:2011 AND TRUSS DESIGN.
- MESH IN FLOOR SLAB MUST BE EARTHED. EARTH WITH 16mm REO ROD BROUGHT UP INTO GARAGE WALL BELOW METERBOX & WIRED TO THE MESH. AT PREWIRE, CONNECT A CLAMP & PIECE OF WIRE TO ROD & EARTH IT TO THE METERBOX.
- VERIFY ALL DIMENSIONS, SIZES AND LEVELS ON SITE PRIOR TO COMMENCING ANY WORK.

**CLEARANCES AND FALLS:**

- MINIMUM HEIGHTS OF CONCRETE SLAB ON GROUND ABOVE SURROUNDING GROUND LEVELS TO BE:
  - \*150mm TO SEALED SURFACE & 225mm TO UNSEALED GROUND AS PER NZBC E2
  - \*FINISHED FLOOR LEVEL TO BE 150mm MINIMUM ABOVE CROWN OF ROAD AS PER NZBC E1/A/S1.
- FALL ALL GROUND AWAY FROM BUILDING AT MINIMUM SLOPE OF 1 IN 25 FOR A DISTANCE OF AT LEAST 1M FROM THE BUILDING.

**DRAINS BELOW SLAB:**

- TO BE 25mm AWAY FROM FOUNDATION FOOTINGS.
- PIPE TO BE SLEEVED/WRAPPED IN DURABLE FLEXIBLE MATERIAL.
- INSPECTION POINT WITHIN 1M OF ENTRY AND EXIT OF FOOTING PENETRATION.
- REFER TO PIPE PENETRATION DETAIL.

**GENERAL NOTES:**

- ALL PLUMBING AND DRAINAGE TO COMPLY WITH A3500 BY QUALIFIED TRADESMAN.
- FOR FOUL WATER VENTILATION REFER TO AS/NZS3500 FOR VENTILATION.
- FOR WATER SUPPLIES REFER TO AS/NZS3500 TABLE 4 FOR SIZES AND MATERIALS.
- REFER TO GEOTECH REPORT FOR SITE-SPECIFIC DRAINAGE AND BEDDING REQUIREMENTS.
- CONTRACTOR TO CONFIRM AVAILABLE SERVICES, CABLING, EXISTING SEWER & STORMWATER POSITIONS AND DEPTH ON SITE BEFORE ANY WORK COMMENCES, TO ENSURE CORRECT FALLS CAN BE ACHIEVED.
- ALL DIMENSIONS, FALLS OF DRAINS & WASTE POSITIONS ARE APPROXIMATE ONLY & ARE TO BE CONFIRMED BY NZ QUALIFIED PLUMBER, PRIOR TO COMMENCEMENT OF CONSTRUCTION OR INSTALLATION.

**INSPECTION POINT (IP):**

- INSPECTION OPENING TO BE RAISED TO GROUND LEVEL ON SEWER LATERAL DRAIN. OPENING SHALL BE PROVIDED WITH AIRTIGHT REMOVABLE CAPS AND PROTECTED BY A SUITABLE COVER AND SURROUND IN SUCH A MANNER THAT NO TRAFFIC OR STRUCTURAL LOADS CAN BE TRANSMITTED TO THE DRAIN.

**VENT PIPES:**

- MAIN DRAIN VENT NOT LESS THAN 50mmØ

**NEW SW & FW DRAINS:**

- TO CONNECT INTO EXISTING NEW SW & FW LATERALS ON SITE.

**TABLE 3.5 AS/NZS 3,500:**

**SIZE AND RATING OF VENTS:**

SIZE OF VENT PIPE	FIXTURE UNITS DISCHARGING TO DRAIN	VENT RATING
40	>1 ≤ 10	0.5
50	>10 ≤ 30	1
65	>30 ≤ 175	2
80	>175 ≤ 400	3
100	>400 -	6

**ALL PLUMBING & DRAINAGE TO COMPLY WITH AS/NZS3500**

SANITARY FIXTURE	MIN. PIPE DIA.	MIN. GRADE	LINE
BASIN/VANITY	32mm	1:40	-----
BATH	40mm	1:40	-----
WASHINE MACHINE	40mm	1:40	-----
KITCHEN SINK/DISHWASHER	50mm	1:40	-----
LAUNDRY SINK/WASHINE MACHINE	50mm	1:40	-----
SHOWER	40mm	1:40	-----
WC	100mm	1:60	-----
SEWER PIPE	100mm	1:60	-----
STORMWATER PIPE	100mm	1:100	-----

- DP 80mm METAL DOWNPIPES
- ▼ HT HOSE TAP LOCATION (CONFIRM WITH CLIENT)
- ORG OVERFLOW RELIEF GULLY
- TV TERMINAL VENT STACK 65mm
- IP INSPECTION POINT
- AAV AIR ADMITTANCE VALVE
- MB METER BOARD
- DB DISTRIBUTION BOARD

Date	Change Name	Chd	RevD
29/03/2019		A	
29/08/2019	LAND RESHAPE	B-1	B

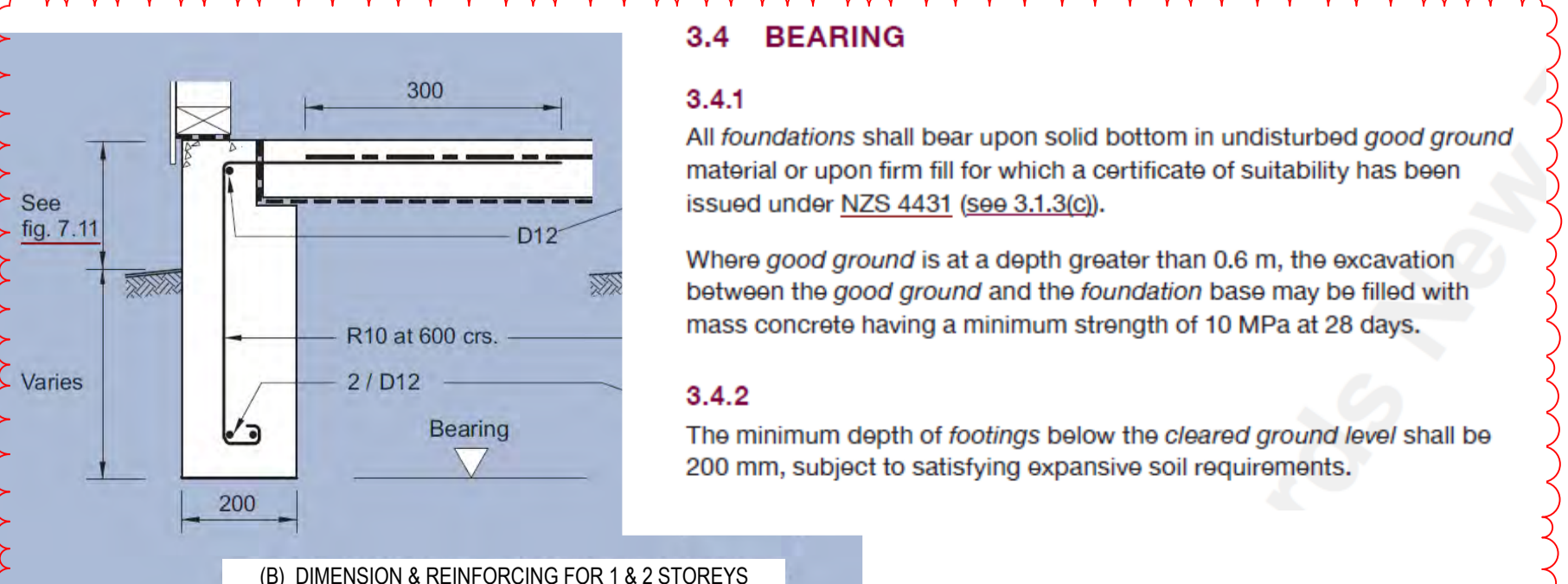
ENGINEER: NZS3604:2011 SURVEY:

PROJECT: **BLTYE HOUSE**  
ADDRESS: LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS: RFI RESPONSE  
TITLE: **FOUNDATION, PLUMBING, AND DRAINAGE PLAN**

REVISION: B  
ISSUED: 29/08/2019  
SCALE: 1:50, 1:100 @ A1  
SHEET NUMBER

1 TIMBER SUB FLOOR / PLUMBING AND DRAINAGE PLAN 1:50



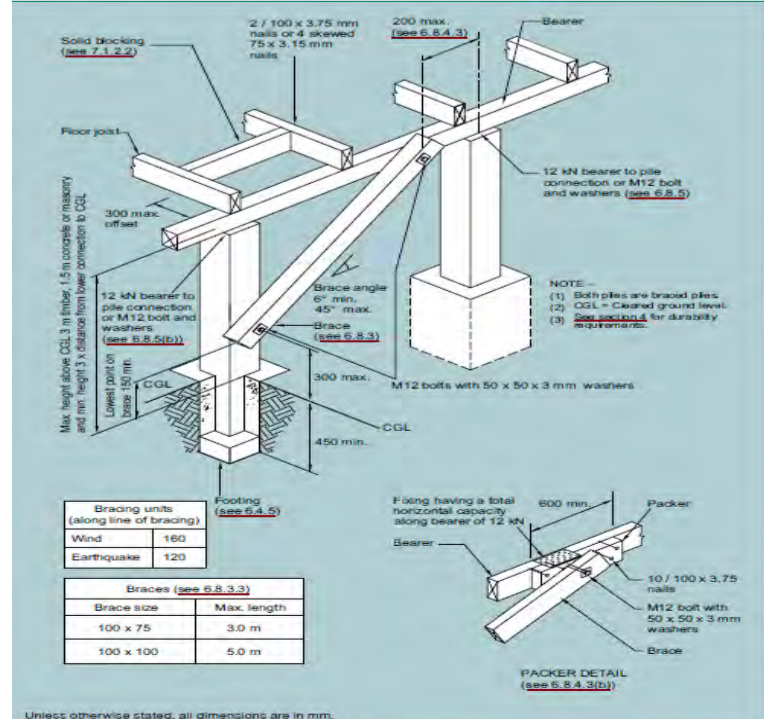
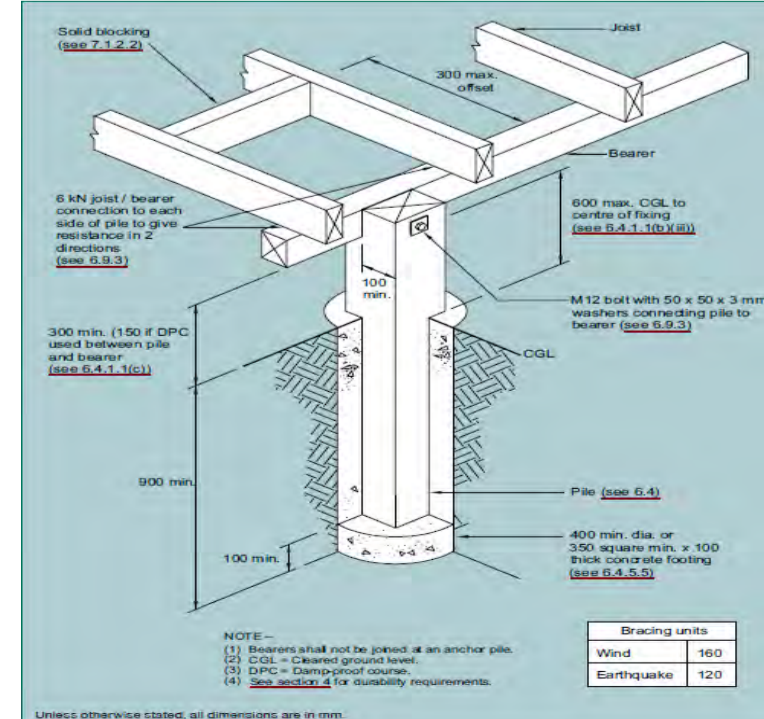
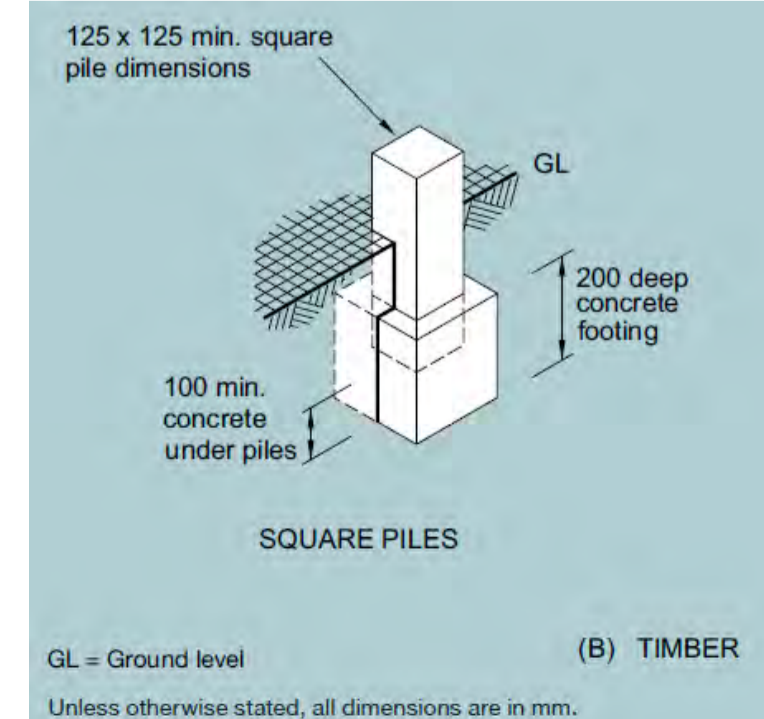
**3.4 BEARING**

**3.4.1**  
All foundations shall bear upon solid bottom in undisturbed good ground material or upon firm fill for which a certificate of suitability has been issued under NZS 4431 (see 3.1.3(c)).

Where good ground is at a depth greater than 0.6 m, the excavation between the good ground and the foundation base may be filled with mass concrete having a minimum strength of 10 MPa at 28 days.

**3.4.2**  
The minimum depth of footings below the cleared ground level shall be 200 mm, subject to satisfying expansive soil requirements.

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THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS & LEVELS ARE CORRECT PRIOR TO COMMENCING ANY WORK.  
THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION WITHOUT LOCAL TERRITORIAL CONSENT.  
ALL CONSTRUCTION IS TO COMPLY WITH NEW ZEALAND BUILDING CODE AND ALL RELEVANT DOCUMENTS, AND WITH THE LOCAL TERRITORIAL AUTHORITY REGULATIONS.

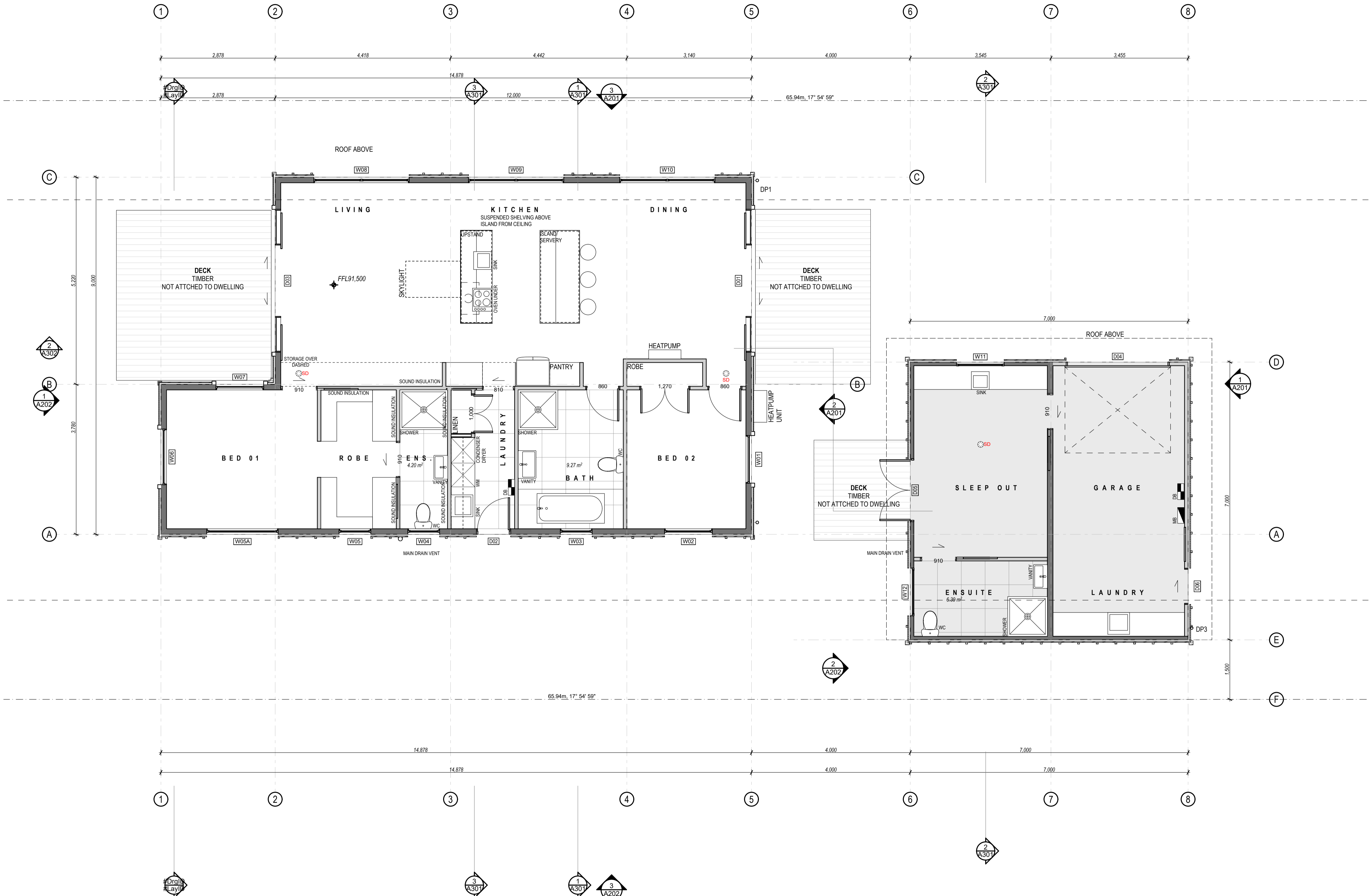


ANCHOR PILES INDICATED IN GREY  
BRACED PILES INDICATED IN RED

**NOTES**

**F04 CONCRETE**  
PLAIN CONCRETE. 100mm REINFORCED CONCRETE FOUNDATION ON COMPACT FILL. DESIGN AS PER NZS3604:2011. REFER TO MANUAL FOR ALL DETAILS AND SPECIFICATIONS.

**F06 DECK**  
SELECTED 19mm TIMBER DECKING OVER H3.2 SG8 90x45mm TIMBER JOISTS AT 450 CENTRES ON H4 SG8 90x90mm TIMBER BEARERS AT 900 CENTRES ON H5 SG8 125x125mm TIMBER POSTS AT 1200 CENTRES



**GENERAL:**

FLOOR AREA (OVER FRAMING) 118.88m<sup>2</sup>  
 GARAGE AREA: 49m<sup>2</sup>  
 TOTAL AREA: 167.88m<sup>2</sup>  
 MAXIMUM BUILDING HEIGHT 10m  
 PERIMETER (OVER FOUNDATION) 75.76m<sup>2</sup>

**PROJECT INFORMATION:**

GENERAL: ALL DIMENSIONS TO BE CONFIRMED ON SITE  
 HEATING: HEATPUMP TO BE FIXED IN POSITION SHOWN ON THE DRAWINGS. REFER TO SPECIFICATIONS FOR MORE INFORMATION.  
 CEILING VENTS: BATHROOM & ENSUITE TO VENT DIRECTLY TO EXTERIOR. RANGE HOOD TO EXIT THROUGH ROOF. BATHROOM & ENSUITE EXTRACTION SYSTEMS TO BE AUTOMATED AND PLACED TO ADEQUATELY DEAL WITH STEAM.  
 SMOKE DETECTORS: REQUIRED WITHIN 3M OF ALL SLEEPING AREAS. CHANGE IN LEVEL & ENTRY/EXITS AS PER NZS 4514 & BRANZ BULLETINS NO'S 252 & 309

**FLOOR PLAN NOTES:**

- ALL HARD FLOOR FINISHES TO COMPLY WITH NZBC D1/AS TABLE 2. FLOOR TILES TO BE NON-SLIP & HAVE A SLIP COEFFICIENT VALUE OF 0.35 - 0.65 FOR GRIT FINISHED CERAMIC TILES.
- HOT WATER PIPES TO BE SIZED ACCORDING TO NZBC G12 & NZS4305:1996. MAINS PRESSURE: 15mm DIA. ALLOWS 12mm MAXIMUM PIPE LENGTH. PIPE LENGTH BEYOND THIS MUST BE LAGGED.
- SATIN ENAMEL WALL FINISH TO BATHROOM, ENSUITE & THOSE WALLS ADJACENT TO SINKS ETC. IN KITCHEN & LAUNDRY. BOTTOM EDGE TO BE FILLED WITH FUNGUS/MOLD RESISTANT SEALANT.
- ALL SMOKE DETECTORS TO COMPLY WITH EITHER AS3786, ISO 12239 OR BS EN 14604 & NZBC F7 3.0

**WATERPROOFING MEMBRANE NOTE:**  
 ARDEX SUPERFLEX WATERPROOFING MEMBRANE REQUIRED TO TILED BATHROOMS.

**FIXING DURABILITY:**  
 ALL SHELTERED OR EXPOSED FIXINGS SHALL MEET THE REQUIREMENTS OF NZS 3604:2011 EXPOSURE ZONE C

RECEIVED 20/08/2019

1 GROUND FLOOR PLAN 1:50

Date	Change Name	ChID	RevID
29/08/2019			A
29/08/2019			B

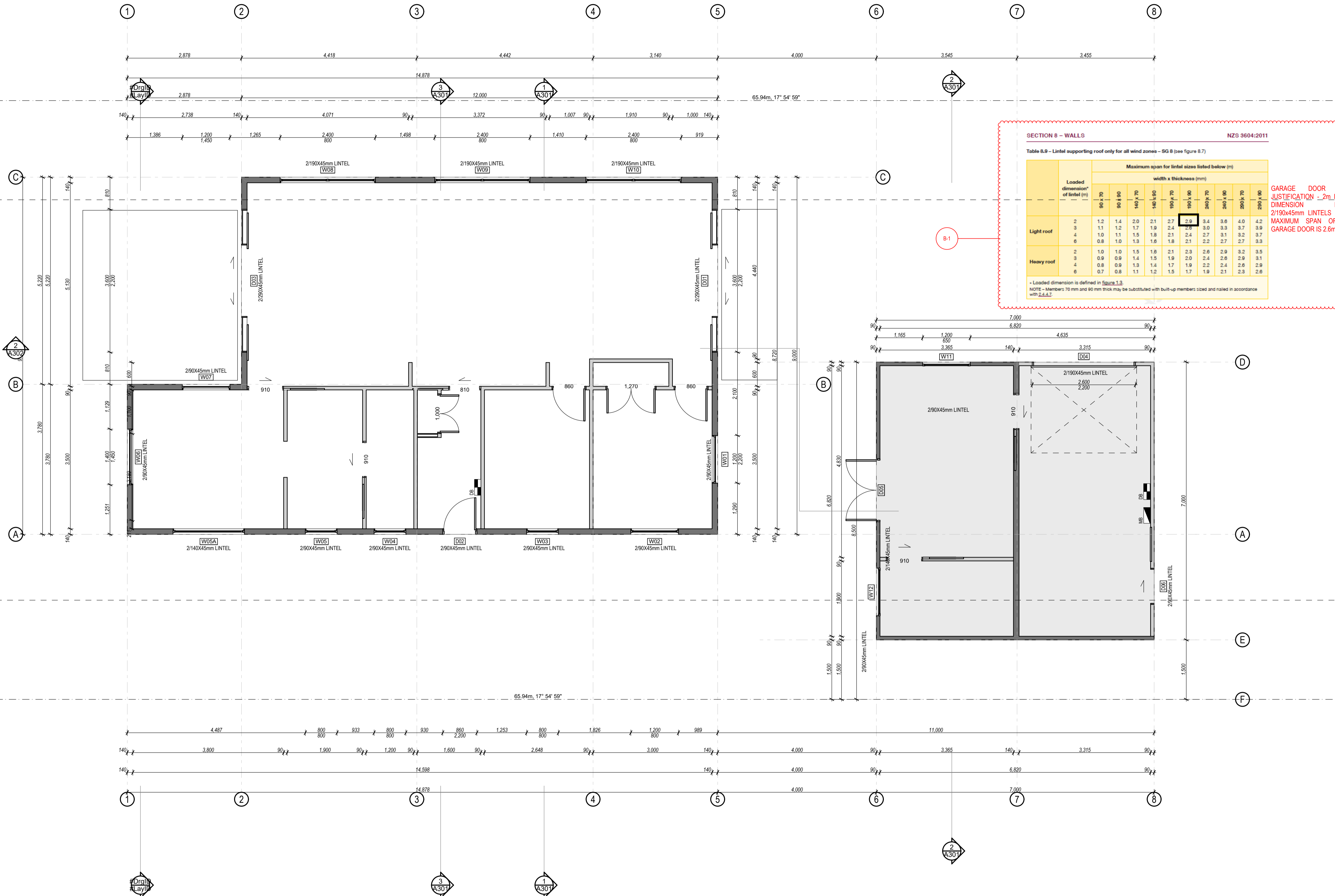
ENGINEER:  
 NZS3604:2011  
 SURVEY:

PROJECT:  
**BLYTHE HOUSE**  
 ADDRESS:  
 LOT: 116 DP: 2086  
 5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
 RFI RESPONSE  
 TITLE:  
**GROUND FLOOR PLAN**

REVISION:	ISSUED:	SCALE:	SHEET NUMBER:
	20/08/2019	1:50 @ A1	<b>A104</b>

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 \* THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS & LEVELS ARE CORRECT PRIOR TO COMMENCING ANY WORK.  
 \* THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION WITHOUT LOCAL TERRITORIAL CONSENT.  
 \* ALL CONSTRUCTION IS TO COMPLY WITH NEW ZEALAND BUILDING CODE AND ALL RELEVANT DOCUMENTS, AND WITH THE LOCAL TERRITORIAL AUTHORITY REGULATIONS.



**WALL LEGEND**

	EXT: STUD 90 - INSULATED WALLS
	INT: STUD 90 - INTERNAL WALLS
	EXT: 20 SERIES MASONRY BLOCK WITH INSULATED STRAPPING

**GENERAL NOTES:**

- ALL TIMBER WALL FRAMING IS DESIGNED IN ACCORDANCE WITH NZS3604:2011. IF WALLS EXIST OUTSIDE THE ABOVE DESIGN LIMITATIONS, THEY ARE TO SED DESIGN - REFER TO STRUCTURAL ENGINEERS CALCULATIONS FOR REQUIREMENTS.
- ALL FIXINGS AND HOLD DOWNS SHALL MEET THE CRITERIA SET OUT IN NZS3604:2011 OR TO SED AS REQUIRED.
- HOLES OR NOTCHES IN WALL STUDS AND PLATES SHALL BE NO LARGER THAN 25mm DIA. OR 25mm DEEP WITH A MAXIMUM LENGTH OF 200mm. FOR HOLES LARGER THAN THIS, USE LUMBERLOK FRAMING STUD/TOP PLATE STIFFENERS (INSTALLED AS PER MANUFACTURER REQUIREMENT) OR USE 600mm LONG 40X40X1mm STEEL ANGLE & TIMBER BLOCKING (FIG 8.20 NZS3604:2011) FOR TOP PLATE SITUATIONS.
- INSTALL ALL NOGGINS/SOLID BLOCKING AS REQUIREMENT. FOR FIXING OF WALL LINING & CLADDING SYSTEMS, AND TO PROVIDE FOR ALL OTHER INSTALLATIONS (E.G.. STAIR HANDRAILS, JOINERY UNITS, PERGOLAS ETC)

**SECTION 8 - WALLS** NZS 3604:2011

Table 8.9 - Lintel supporting roof only for all wind zones - S9.8 (see figure 8.7)

Loaded dimension* of lintel (m)	Maximum span for lintel sizes listed below (m)													
	width x thickness (mm)													
Light roof	2	1.2	1.4	2.0	2.1	2.7	2.9	3.4	3.6	4.0	4.2			
	3	1.1	1.2	1.7	1.9	2.4	2.6	3.0	3.3	3.7	3.9			
	4	1.0	1.1	1.5	1.8	2.1	2.4	2.7	3.1	3.2	3.7			
	6	0.8	1.0	1.3	1.6	1.8	2.1	2.2	2.7	2.7	3.3			
	Heavy roof	2	1.0	1.0	1.5	1.6	2.1	2.3	2.6	2.9	3.2	3.5		
		3	0.9	0.9	1.4	1.5	1.9	2.0	2.4	2.6	2.9	3.1		
4		0.8	0.9	1.3	1.4	1.7	1.9	2.2	2.4	2.6	2.9			
6		0.7	0.8	1.1	1.2	1.5	1.7	1.9	2.1	2.3	2.6			

\* Loaded dimension is defined in Figure 1.3  
NOTE - Members 70 mm and 90 mm thick may be substituted with built-up members sized and named in accordance with 2.4.4.1

**GARAGE DOOR LINTEL JUSTIFICATION - 2m LOADED DIMENSION**  
2/190x45mm LINTELS WITH A MAXIMUM SPAN OF 2.9m  
GARAGE DOOR IS 2.6m WIDE

1 FRAMING PLAN 1:50

Date	Change Name	ChID	RevID
29/08/2019			A
29/08/2019	RFI	B-1	B

ENGINEER:  
NZS3604:2011  
SURVEY:

PROJECT:  
**BLTYE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
RFI RESPONSE  
TITLE:  
**FRAMING PLAN**

REVISION:  
ISSUED:  
SCALE:  
SHEET NUMBER

B  
20/08/2019  
1:50 @ A1  
**A105**

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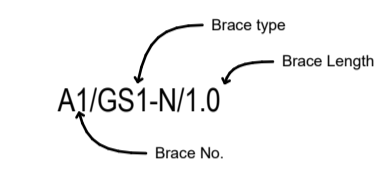
RECEIVED 20/08/2019



**BRACING NOTES:**

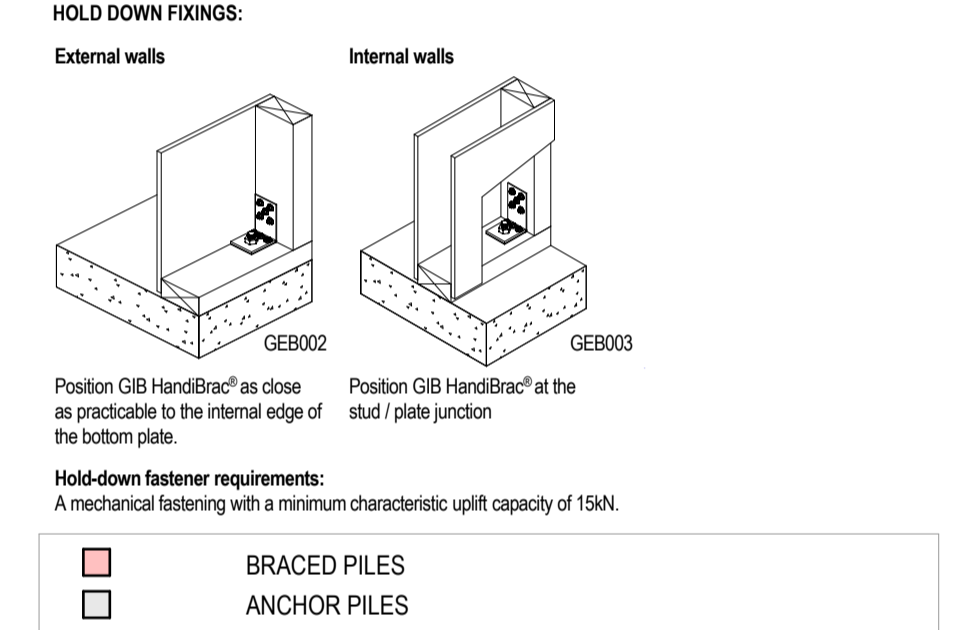
- GS1 - 0.4m MINIMUM LENGTH. ANY 10mm OR 13mm GIB STANDARD PLASTERBOARD FIXED TO ONE SIDE ONLY.
- GS2 - 0.4m MINIMUM LENGTH. ANY 10mm OR 13mm GIB STANDARD PLASTERBOARD FIXED TO BOTH SIDES
- EP1 - 0.6m MINIMUM LENGTH. 7mm PLY FIXED TO ONE SIDE ONLY.
- BL1-H - 0.4m MINIMUM LENGTH. 10mm OR 13mm GIB BRACELINE® TO ONE SIDE ONLY.
- BLP-H - 0.4m MINIMUM LENGTH. 10mm OR 13mm GIB BRACELINE FIXED TO INTERIOR SIDE WITH 7mm PLY & GIB HANDIBRAC HOLD DOWNS TO EXTERIOR SIDE OF THE WALL FRAMING.
- BLG-H - 0.4m MINIMUM LENGTH. 10mm OR 13mm GIB BRACELINE TO ONE SIDE OF THE FRAME PLUS ANY 10mm OR 13mm GIB STANDARD PLASTERBOARD FIXED TO THE OTHER SIDE

OPENINGS IN BRACING ELEMENTS:  
(AS PER GIB EZYBRACE SYSTEM)  
OPENINGS ARE ALLOWED WITHIN THE MIDDLE THIRD OF A WALL BRACING ELEMENTS LENGTH & HEIGHT. NEITHER OPENING DIMENSION SHALL BE MORE THAN ONE-THIRD OF THE ELEMENT HEIGHT. WALL LININGS ARE FIXED TO OPENING TRIMMERS AT 150mm CENTRES. SMALL OPENINGS (E.G. POWER OUTLETS) OF 90 X 90mm OR LESS MAY BE PLACED NO CLOSER THAN 90mm TO THE EDGE OF THE BRACED ELEMENT.



**FIXING SCHEDULE: BRACING TYPE**

EACH WALL THAT CONTAINS BRACING ELEMENTS SHALL BE CONNECTED AT THE TOP PLATE LEVEL, EITHER DIRECTLY OR THROUGH FRAMING MEMBERS (CEILING BATTENS) IN THE LINE OF THE WALL, TO EXTERNAL WALL AT RIGHT ANGLES TO IT. TOP PLATE FIXINGS OF THE CAPACITY IN TENSION OR COMPRESSION ALONG THE LINE OF THE WALL BRACING ELEMENT ARE TO BE AS PER NZS:3604:2011 8.7.3.4



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1 BRACING PLAN 1:50

Date	Change Name	ChID	RevID
29/08/2019			A
29/08/2019			B

ENGINEER:  
NZS3604:2011  
SURVEY:

PROJECT:  
**BLYTHE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
RFI RESPONSE  
TITLE:  
**BRACING PLAN**

REVISION:  
ISSUED:  
SCALE:  
SHEET NUMBER

B  
20/08/2019  
1:50 @ A1  
**A106**

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### GIB EzyBrace® Bracing Software

#### Demand Calculation Sheet

**Job Details**

Name: BLYTHE HOUSE  
 Street and Number: 5A TOI STREET  
 Lot and DP Number: LOT 201 DP  
 City/Town/District: WHANGANUI  
 Designer:  
 Company: BB  
 Date: 06/03/2019

**Building Specification**

Number of Storeys: 1  
 Floor Loading: 2 kPa  
 Foundation Type: Subfloor  
 Subfloor Cladding Weight: Light

**Single**

Cladding Weight: Light  
 Roof Weight: Light  
 Room in Roof Space: No  
 Roof Pitch (degrees): 3  
 Roof Height above Eaves (m): 1  
 Building Height to Apex (m): 5.3  
 Ground to Lower Floor (m): 1.4

Average Stud Height (m): 2.4  
 Building Length (m): 14.878  
 Building Width (m): 9  
 Building Plan Area (m<sup>2</sup>): 118.88

**Building Location**

**Wind Zone = High**      **Earthquake Zone 2**  
 Soil Type: D & E (Deep to Very Soft)  
 Annual Prob. of Exceedance: 1 in 500 ( Default)

Bracing Units required for Wind		Bracing Units required for Earthquake	
	Along	Across	Along & Across
Single Level	392	548	833
Subfloor Level	856	1063	1247

GIB EzyBrace® Version 11/7

### GIB EzyBrace® Bracing Software

#### Single Level Along Resistance Sheet

**Job Name: BLYTHE HOUSE**

**Timber Floor Limit of 120 BUs/m Applied**

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	Demand		Achieved	
									1118	1144	285%	137%
A	1	1.00		2.4	JHD 0.6	HomeRAB	99	107				
	2	1.00		2.4	JHD 0.6	HomeRAB	99	107				
	3	0.50		2.4	JHD 0.4	HomeRAB	42	54				
	4	0.60		2.4	JHD 0.6	HomeRAB	59	64				
	5	1.00		2.4	JHD 0.6	HomeRAB	99	107				
										877 OK	824 OK	
B	1	1.20		2.4	GS1-N	GIBB	83	72				
	2	1.90		2.4	GS1-N	GIBB	131	114			214 OK	188 OK
C	1	1.50		2.4	JHD 1.2	HomeRAB	180	180				
	2	1.40		2.4	JHD 1.2	HomeRAB	168	168				
	3	0.80		2.4	JHD 0.6	HomeRAB	79	86			427 OK	434 OK

### GIB EzyBrace® Bracing Software

#### Single Level Across Resistance Sheet

**Job Name: BLYTHE HOUSE**

**Timber Floor Limit of 120 BUs/m Applied**

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	Demand		Achieved	
									1063	1059	194%	127%
1	1	1.10		2.4	JHD 0.6	HomeRAB	109	118				
	2	1.00		2.4	JHD 0.6	HomeRAB	99	107			208 OK	225 OK
2	1	0.80		2.4	JHD 0.6	HomeRAB	79	86				
	2	0.70		2.4	JHD 0.6	HomeRAB	69	75			149 OK	161 OK
3	1	1.10		2.4	GS1-N	GIBB	74	66				
	2	0.60		2.4	GS1-N	GIBB	34	35			108 OK	101 OK
4	1	3.50		2.4	GS1-N	GIBB	242	210				
	2	0.60		2.4	JHD 1.2	HomeRAB	144	144				
5	1	1.20		2.4	JHD 1.2	HomeRAB	144	144				
	2	1.20		2.4	JHD 1.2	HomeRAB	144	144				
										357 OK	363 OK	

### GIB EzyBrace® Bracing Software

#### Subfloor Level Along Resistance Sheet

**Job Name: BLYTHE HOUSE**

Line	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind (BUs)	EQ (BUs)	Demand		Achieved	
								1760	1320	206%	106%
A	1	1.00		Braced Piles	NZS3604	160	120				
	2	3.00		Anchor Pile	NZS3604	490	360			640 OK	480 OK
B	1	2.00		Braced Piles	NZS3604	320	240				
	2	1.00		Anchor Pile	NZS3604	160	120			480 OK	360 OK
C	1	1.00		Braced Piles	NZS3604	160	120				
	2	3.00		Anchor Pile	NZS3604	480	360			640 OK	480 OK

### GIB EzyBrace® Bracing Software

#### Subfloor Level Across Resistance Sheet

**Job Name: BLYTHE HOUSE**

Line	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind (BUs)	EQ (BUs)	Demand		Achieved	
								1760	1320	166%	106%
1	1	2.00		Braced Piles	NZS3604	320	240			320 OK	240 OK
	2	1.00		Anchor Pile	NZS3604	160	120			320 OK	240 OK
2	1	2.00		Braced Piles	NZS3604	320	240			320 OK	240 OK
	2	1.00		Anchor Pile	NZS3604	160	120			320 OK	240 OK
3	1	2.00		Braced Piles	NZS3604	320	240			320 OK	240 OK
	2	1.00		Anchor Pile	NZS3604	160	120			320 OK	240 OK
4	1	2.00		Braced Piles	NZS3604	320	240			320 OK	240 OK
	2	1.00		Anchor Pile	NZS3604	160	120			320 OK	240 OK
5	1	3.00		Braced Piles	NZS3604	480	360			480 OK	360 OK
	2	1.00		Anchor Pile	NZS3604	160	120			480 OK	360 OK

1 BRACING - HOUSE

### GIB EzyBrace® Bracing Software

#### Demand Calculation Sheet

**Job Details**

Name: BLYTHE HOUSE - GARAGE  
 Street and Number: 5A TOI STREET  
 Lot and DP Number: LOT 201 DP  
 City/Town/District: WHANGANUI  
 Designer:  
 Company: BB  
 Date: 06/03/2019

**Building Specification**

Number of Storeys: 1  
 Floor Loading: 2 kPa  
 Foundation Type: Slab

**Single**

Cladding Weight: Light  
 Roof Weight: Light  
 Room in Roof Space: No  
 Roof Pitch (degrees): 3  
 Roof Height above Eaves (m): 1  
 Building Height to Apex (m): 3.6  
 Ground to Lower Floor (m): 0.2

Average Stud Height (m): 2.4  
 Building Length (m): 7  
 Building Width (m): 7  
 Building Plan Area (m<sup>2</sup>): 49

**Building Location**

**Wind Zone = High**      **Earthquake Zone 2**  
 Soil Type: D & E (Deep to Very Soft)  
 Annual Prob. of Exceedance: 1 in 500 ( Default)

Bracing Units required for Wind		Bracing Units required for Earthquake	
	Along	Across	Along & Across
Single Level	266	219	184

GIB EzyBrace® Version 11/7

### GIB EzyBrace® Bracing Software

#### Single Level Along Resistance Sheet

**Job Name: BLYTHE HOUSE - GARAGE**

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	Demand		Achieved	
									266	184	641	596
D	1	1.10		2.4	GS1-N	GIBB	74	66				
	2	1.10		2.4	GS1-N	GIBB	74	66			147 OK	131 OK
E	1	1.20		2.4	BL1-H	GIBB	154	125			154 OK	125 OK
	1	3.40		2.4	BLK	ConcreteBlock	340	340			340 OK	340 OK

### GIB EzyBrace® Bracing Software

#### Single Level Across Resistance Sheet

**Job Name: BLYTHE HOUSE - GARAGE**

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	Demand		Achieved	
									219	184	660	586
6	1	0.90		2.4	GS1-N	GIBB	57	53				
	2	1.00		2.4	GS1-N	GIBB	65	60			122 OK	113 OK
7	1	3.60		2.4	GS1-N	GIBB	248	216			248 OK	216 OK
	1	0.70		2.4	GS1-N	GIBB	41	41				
8	1	0.70		2.4	GS1-N	GIBB	41	41				
	2	3.60		2.4	GS1-N	GIBB	248	216			290 OK	257 OK

6 BRACING - GARAGE

RECEIVED 20/08/2019

Date	Change Name	Chd	RevID
29/03/2019			A
29/08/2019			B

ENGINEER:  
 NZS3604:2011  
 SURVEY:

PROJECT:  
**BLYTHE HOUSE**

ADDRESS:  
 LOT: 116 DP: 2086  
 5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
 RFI RESPONSE

TITLE:  
**BRACING CALCULATIONS**

REVISION:  
 ISSUED: 20/08/2019  
 SCALE: 1:1111 @ A1

SHEET NUMBER:  
**A107**



**NOTE:**  
 AUTO EXTRACTOR FANS SHALL TERMINATE THROUGH WALL WITH AN EXTRACTION RATE AS SET OUT IN NZBC G4

**ELECTRICAL LEGEND:**

- MB METER BOARD
- DB DISTRIBUTION BOARD
- SD SMOKE DETECTOR
- HTR HEATED TOWEL RAIL
- A AUTOMATIC DOOR OPENER
- SP SINGLE SWITCH POLE
- 2WS 2 WAY SWITCH
- DPP DOUBLE POWER PLUG
- TVO TV/SKY OUTLET
- FO FIBRE OUTLET
- PO PHONE OUTLET
- MS MOTION SENSOR
- CDL CA RATED DOWNLIGHT

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1 ELECTRICAL PLAN 1:50

Date	Change Name	ChID	RevID
29/08/2019			A
29/08/2019			B

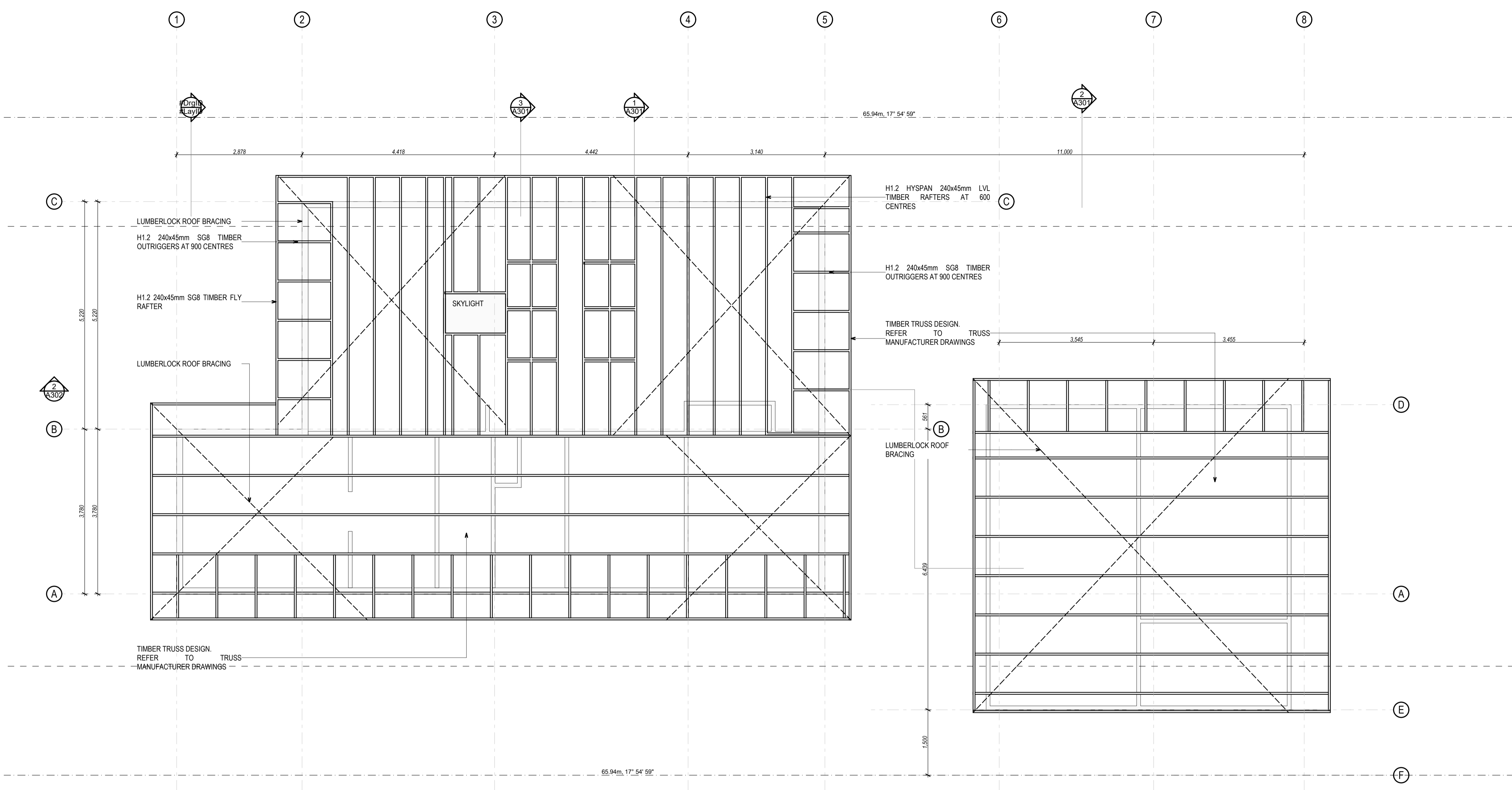
ENGINEER:  
 NZS3604:2011  
 SURVEY:

PROJECT:  
**BLYTHE HOUSE**  
 ADDRESS:  
 LOT: 116 DP: 2086  
 5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
 RFI RESPONSE  
 TITLE:  
**ELECTRICAL PLAN**

REVISION:	ISSUED:	SCALE:	SHEET NUMBER:
	20/08/2019	1:50 @ A1	<b>A108</b>

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**LEGEND:**

- DP 80mm METAL DOWNPIPES
- MDV MAIN DRAIN VENT 65mm
- INDICATES DIRECTION OF FALL

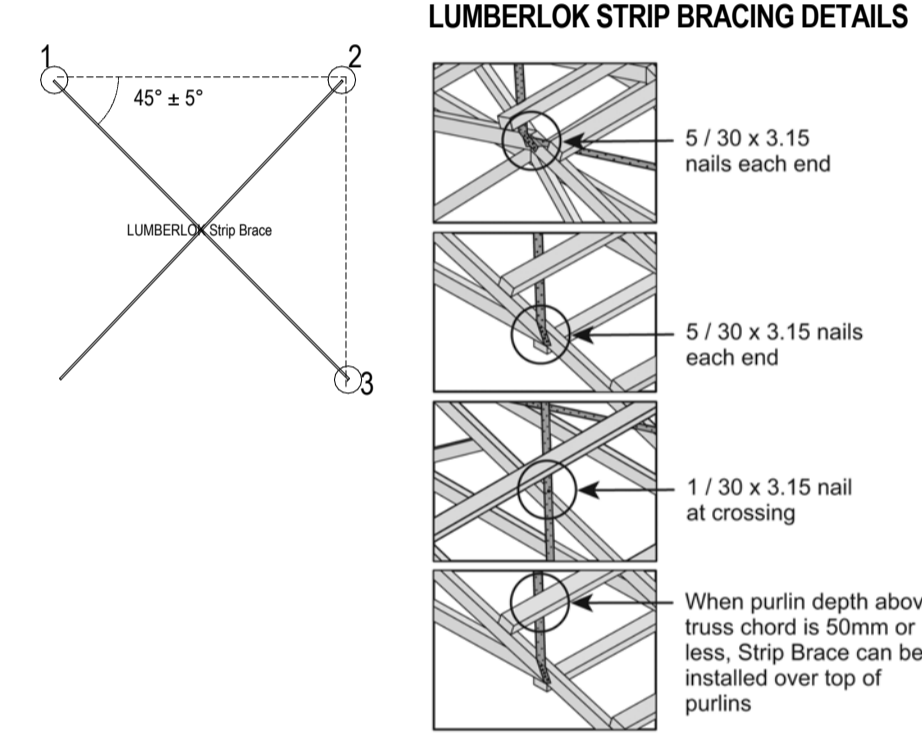
**NOTES:**

- ALL ROOF PENETRATIONS SHALL BE FLASHED AS PER NZBC E2/AS1 EXTERNAL MOISTURE SECTION 8.4.
- PROFILED METAL ROOF CLADDING (8.4.17 ROOF PENETRATIONS) AS SHOWN IN FIGURE 53 & 54.
- ALL TRUSSES TO BE DESIGNED & APPROVED BY A QUALIFIED TRUSS MANUFACTURER ABLE TO ISSUE A PRODUCER STATEMENT PRIOR TO BUILDING CONSENT APPROVAL WHICH SHALL GUARANTEE SATISFACTORY PERFORMANCE WITHIN THE PARAMETERS OF THIS DESIGN. THE TRUSS SYSTEM DESIGN SHALL INCLUDE BRACING IN ACCORDANCE WITH NZS 3604:2011.
- REFER TO TRUSS MANUFACTURER TO: ROOF BRACING, TRUSS FIXINGS & PURLINS FIXINGS.
- DRAINS VENTS TO TERMINATE EITHER:
  - 3.0m ABOVE GROUND LEVEL
  - 600mm ABOVE WINDOWS/OPENINGS
  - 150mm ABOVE ROOF
  - 600mm ABOVE EAVES/PARAPETS

**BRACING:**

REFER TO:

- LUMBERLOK ROOF BRACING SPECIFICATIONS BROCHURE 08/2006 FOR END FIXING DETAILS.
- THE BRACE MUST BE LOCATED SUCH THAT IT FORMS AN ANGLE OF 45° ± 5° TO THE WALL.
- ALL OTHER AREAS MUST HAVE AT THE MINIMUM 2/ 90x3.15mm SKEW NAILS + 2 WIRE DOGS FOR TRUSS TO TOP PLATE CONNECTIONS.
- REFER TO LUMBERLOK TIMBER CONNECTORS CHARACTERISTIC LOADINGS DATA BROCHURE 03/4



1 ROOF FRAMING PLAN 1:50

Date	Change Name	ChD	RevID
29/03/2019			A
29/08/2019			B

ENGINEER:  
NZS3604:2011  
SURVEY:

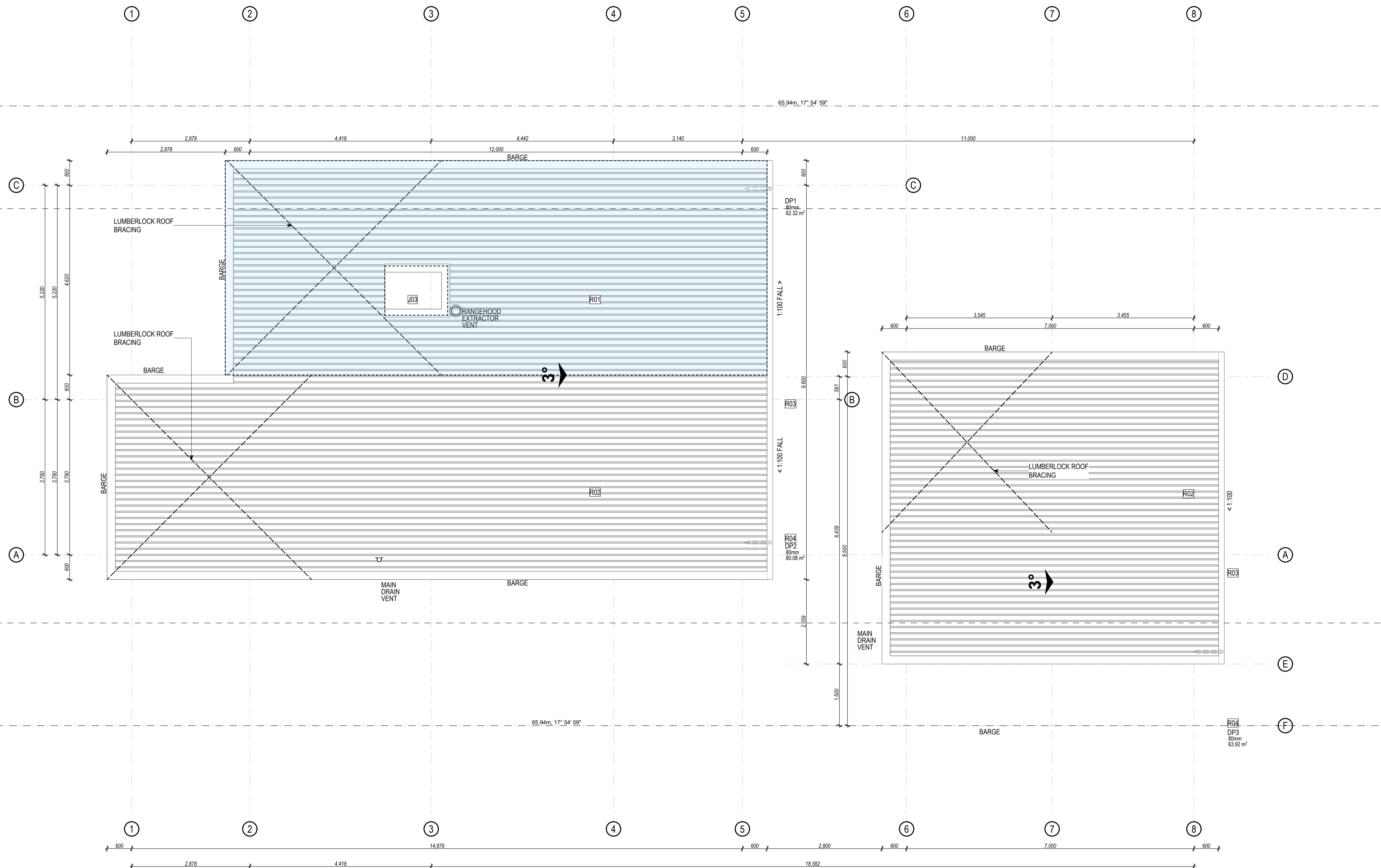
PROJECT:  
**BLYTHE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
RFI RESPONSE  
TITLE:  
**ROOF FRAMING PLAN**

REVISION:  
ISSUED: 20/08/2019  
SCALE: 1:50 @ A1  
SHEET NUMBER: **A109**

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**LEGEND:**

- DP 80mm METAL DOWNPIPES
- MDV MAIN DRAIN VENT 65mm
- INDICATES DIRECTION OF FALL

**NOTES:**

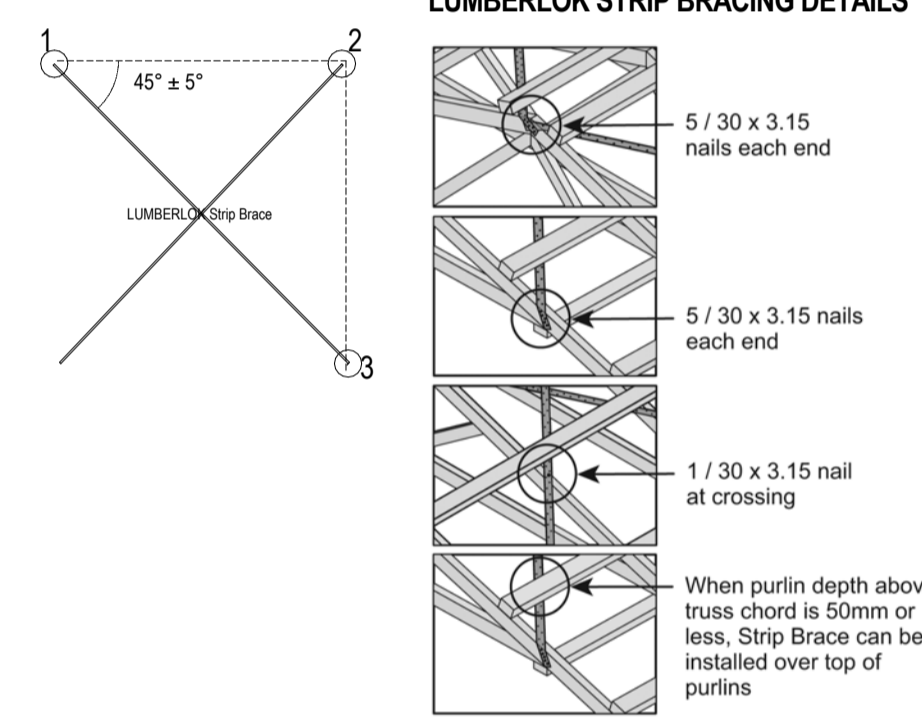
- ALL ROOF PENETRATIONS SHALL BE FLASHED AS PER NZBC E2/AS1 EXTERNAL MOISTURE SECTION 8.4.
- PROFILED METAL ROOF CLADDING (8.4.17 ROOF PENETRATIONS) AS SHOWN IN FIGURE 53 & 54.
- ALL TRUSSES TO BE DESIGNED & APPROVED BY A QUALIFIED TRUSS MANUFACTURER ABLE TO ISSUE A PRODUCER STATEMENT PRIOR TO BUILDING CONSENT APPROVAL, WHICH SHALL GUARANTEE SATISFACTORY PERFORMANCE WITHIN THE PARAMETERS OF THIS DESIGN. THE TRUSS SYSTEM DESIGN SHALL INCLUDE BRACING IN ACCORDANCE WITH NZS 3604:2011.

REFER TO TRUSS MANUFACTURER TO:  
 ROOF BRACING, TRUSS FIXINGS & PURLINS FIXINGS.

DRAINS VENTS TO TERMINATE EITHER:  
 -3.0m ABOVE GROUND LEVEL  
 -600mm ABOVE WINDOWS/OPENINGS  
 -150mm ABOVE ROOF  
 -600mm ABOVE EAVES/PARAPETS

**BRACING:**

REFER TO:  
 - LUMBERLOK ROOF BRACING SPECIFICATIONS BROCHURE 08/2006 FOR END FIXING DETAILS.  
 - THE BRACE MUST BE LOCATED SUCH THAT IT FORMS AN ANGLE OF 45° ± 5° TO THE WALL.  
 - ALL OTHER AREAS MUST HAVE AT THE MINIMUM 2/ 90x3.15mm SKEW NAILS + 2 WIRE DOGS FOR TRUSS TO TOP PLATE CONNECTIONS.  
 - REFER TO LUMBERLOK TIMBER CONNECTORS CHARACTERISTIC LOADINGS DATA BROCHURE 03/4



**NOTES**

**J03 SKYLIGHTS**  
 POWDER COATED ALUMINIUM FRANE

**R01 COLORSTEEL 5-RIB**  
 OVER COVERTEK 407 ROOFING UNDERLAY OVER VB20 VENTILATED BATTEN FIXED WITH 1/10G x80mm SELF DRILLING SCREWS ON H1.2 70x45mm SGB TIMBER PURLINS AT 900mm CENTRES OVER H1.2 HYSPLAN 240x45mm LVL TIMBER RAFTERS AT 600mm CENTRES WITH R3.6 INSULATION INFILL.

**R02 COLORSTEEL 5-RIB**  
 OVER COVERTEK 407 ROOFING UNDERLAY OVER H1.2 70x45mm SGB TIMBER PURLINS AT 900mm CENTRES FIXED WITH 1/10G x80mm SELF DRILLING SCREWS OVER TIMBER TRUSSES BY TRUSSES DESIGNER WITH R3.6 INSULATION INFILL. REFER TO ATTACHED DOCUMENTATION FOR TRUSS DESIGN AND LAYOUT.

**R03 GUTTERS**  
 PVC HALF ROUND GUTTER WITH BRACKETS AT 800mm CENTRES FIXED TO FASCIA. COLOUR TO MATCH ROOF AND CLADDING

**R04 DOWNPIPES**  
 PVC 80mm ROUND DOWNPIPES. COLOUR TO MATCH ROOF AND CLADDING

RECEIVED 20/08/2019

Date	Change Name	Chd	Rev'd
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29/08/2019			B

ENGINEER:  
 NZS3604:2011  
 SURVEY:

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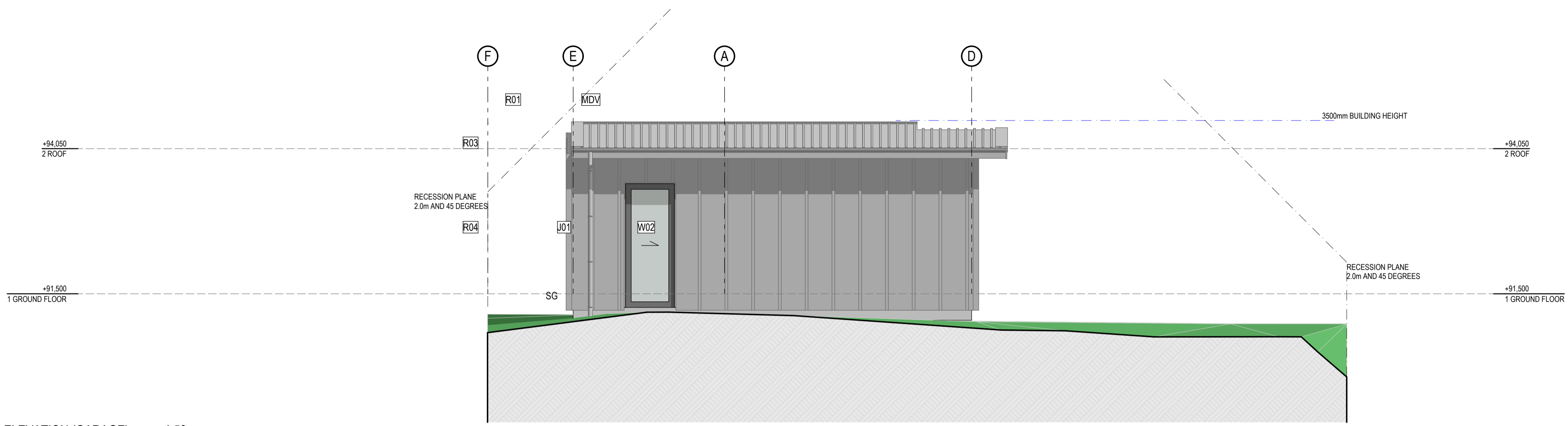
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 RFI RESPONSE  
 TITLE:  
**ROOF PLAN**

REVISION:  
 ISSUED:  
 SCALE:  
 SHEET NUMBER

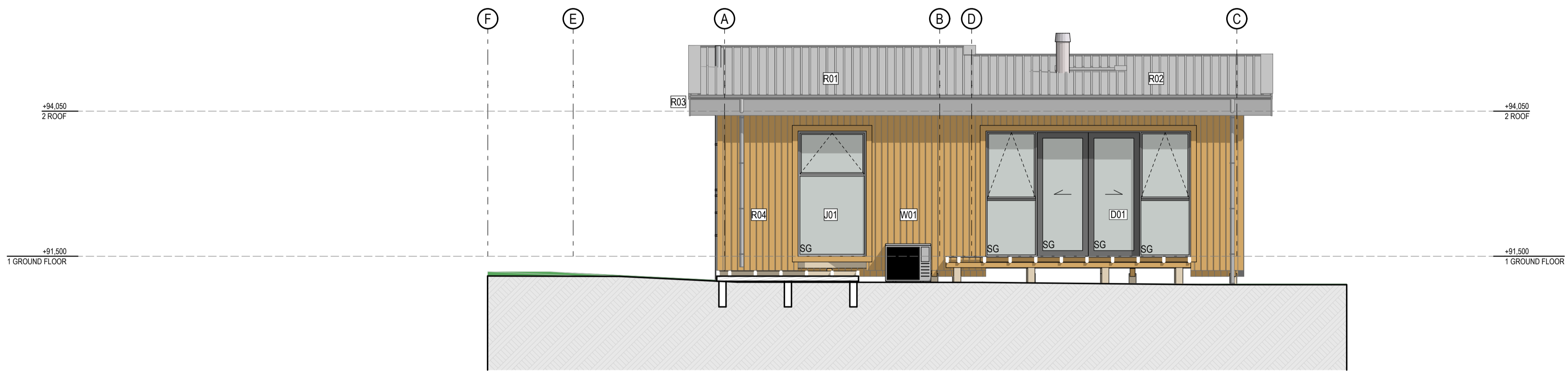
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 20/08/2019  
 1:50 @ A1  
**A110**

1 ROOF PLAN 1:50

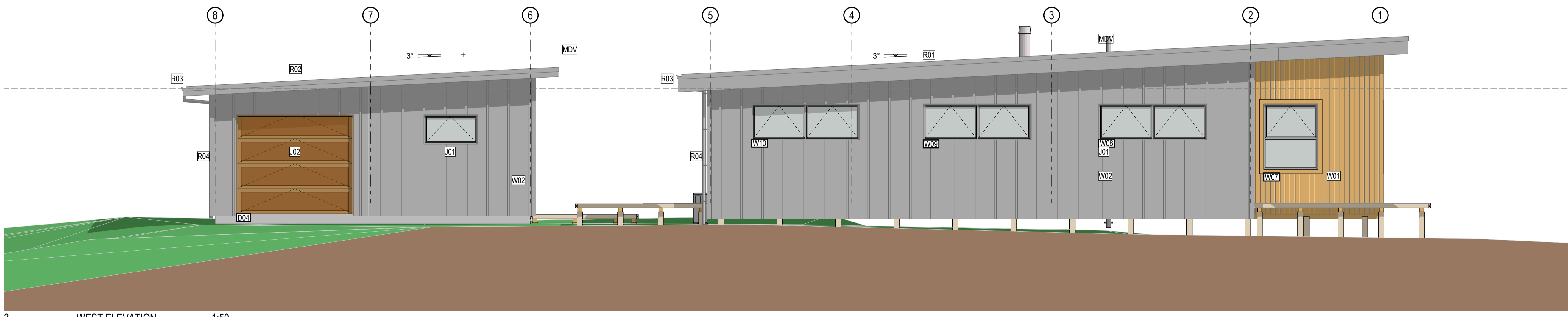
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1 NORTH ELEVATION (GARAGE) 1:50



2 NORTH ELEVATION 1:50



3 WEST ELEVATION 1:50

- NOTES**
- J01 JOINERY**  
DOUBLE GLAZED POWDER COATED ALUMINIUM  
JOINERY RECESSED 50mm INTO TIMBER FRAMING
  - J02 GARAGE DOOR**  
POWDER COATED ALUMINIUM FRAME WITH TIMBER  
INSERT. RECESSED 50mm INTO TIMBER FRAMING
  - R01 COLORSTEEL 5-RIB**  
OVER COVERTEK 407 ROOFING UNDERLAY OVER VB20  
VENTILATED BATTEN FIXED WITH 1/10G x80mm SELF  
DRILLING SCREWS ON H1.2 70x45mm SG8 TIMBER  
PURLINS AT 900mm CENTRES OVER H1.2 HYPSPAN  
240x45mm LVL TIMBER RAFTERS AT 600mm CENTRES  
WITH R3.6 INSULATION INFILL.
  - R02 COLORSTEEL 5-RIB**  
OVER COVERTEK 407 ROOFING UNDERLAY OVER H1.2  
70x45mm SG8 TIMBER PURLINS AT 900mm CENTRES  
FIXED WITH 1/10G x80mm SELF DRILLING SCREWS  
OVER TIMBER TRUSSES BY TRUSS DESIGNER WITH  
R3.6 INSULATION INFILL. REFER TO ATTACHED  
DOCUMENTATION FOR TRUSS DESIGN AND LAYOUT.
  - R03 GUTTERS**  
PVC HALF ROUND GUTTER WITH BRACKETS AT 800mm  
CENTRES FIXED TO FASCIA. COLOUR TO MATCH ROOF  
AND CLADDING
  - R04 DOWNPIPES**  
PVC 80mm ROUND DOWNPIPES. COLOUR TO MATCH  
ROOF AND CLADDING
  - W01 ABODO VULCAN WEATHERBOARD CLADDING**  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER  
JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm  
SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM  
CENTRES AND NOGS AT 800mm CENTRES MAXIMUM  
WITH R3.2 INSULATION INFILL ON 10mm GIB  
PLASTERBOARD LEVEL 4 PAINT FINISH
  - W02 TRICLAD BOARD AND BATTEN**  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER  
JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm  
SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM  
CENTRES AND NOGS AT 800mm CENTRES MAXIMUM  
WITH R3.2 INSULATION INFILL ON 10mm GIB  
PLASTERBOARD LEVEL 4 PAINT FINISH

Element	Area (m <sup>2</sup> )	Proposed building heat loss (W/°C)	Reference building heat loss (W/°C)
Roofs/ceilings	155.1	46.0	47.4
Walls	110.9	27.9	56.4
Floors	118.0	42.0	90.8
Vertical glazing	32.8	126.1	168.1
Skylights	1.2	8.3	-
Doors (Attributable)	2.0	0.0	-
<b>Total</b>		<b>250.2</b>	<b>362.6</b>

Glazing percentage: 23%  
 Glazing <50%: Yes  
 Minimum R-values OK: Yes  
 Issues to check: Some R-values appear to be very high. Check highlighted values.

PASS/FAIL  PASS

**BLYTHE HOUSE**

Element	Area (m <sup>2</sup> )	Proposed building heat loss (W/°C)	Reference building heat loss (W/°C)
Roofs/ceilings	33.4	9.9	10.1
Walls	49.5	15.6	25.7
Floors	24.5	16.2	18.8
Vertical glazing	7.2	27.7	67.7
Skylights	0.0	0.0	-
Doors (Attributable)	2.0	0.0	-
<b>Total</b>		<b>69.4</b>	<b>122.3</b>

Glazing percentage: 12%  
 Glazing <50%: Yes  
 Minimum R-values OK: Yes  
 Issues to check: Some R-values appear to be very high. Check highlighted values.

PASS/FAIL  PASS

**BLYTHE HOUSE (GARAGE)**

Element	Area (m <sup>2</sup> )	Proposed building heat loss (W/°C)	Reference building heat loss (W/°C)
Roofs/ceilings	33.4	9.9	10.1
Walls	49.5	15.6	25.7
Floors	24.5	16.2	18.8
Vertical glazing	7.2	27.7	67.7
Skylights	0.0	0.0	-
Doors (Attributable)	2.0	0.0	-
<b>Total</b>		<b>69.4</b>	<b>122.3</b>

Glazing percentage: 12%  
 Glazing <50%: Yes  
 Minimum R-values OK: Yes  
 Issues to check: Some R-values appear to be very high. Check highlighted values.

PASS/FAIL  PASS

Date	Change Name	ChD	RevID
29/08/2019			A
29/08/2019			B

ENGINEER:  
 NZS3604:2011  
 SURVEY:  
 PROJECT:  
**BLYTHE HOUSE**  
 ADDRESS:  
 LOT: 116 DP: 2086  
 5A TOI STREET, TAWHERO, WHANGANUI

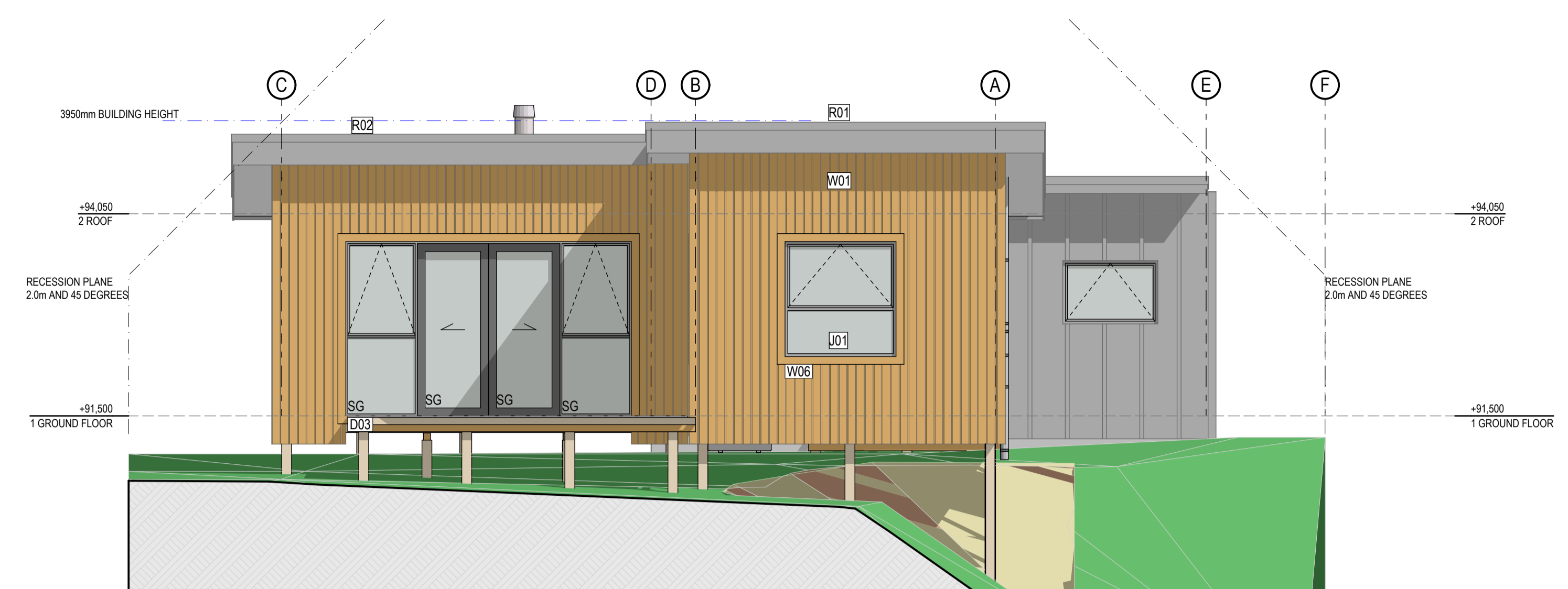
STATUS:  
 RFI RESPONSE  
 TITLE:  
**ELEVATIONS**

REVISION:  
 ISSUED: 29/08/2019  
 SCALE: 1:50 @ A1  
 SHEET NUMBER: **A201**

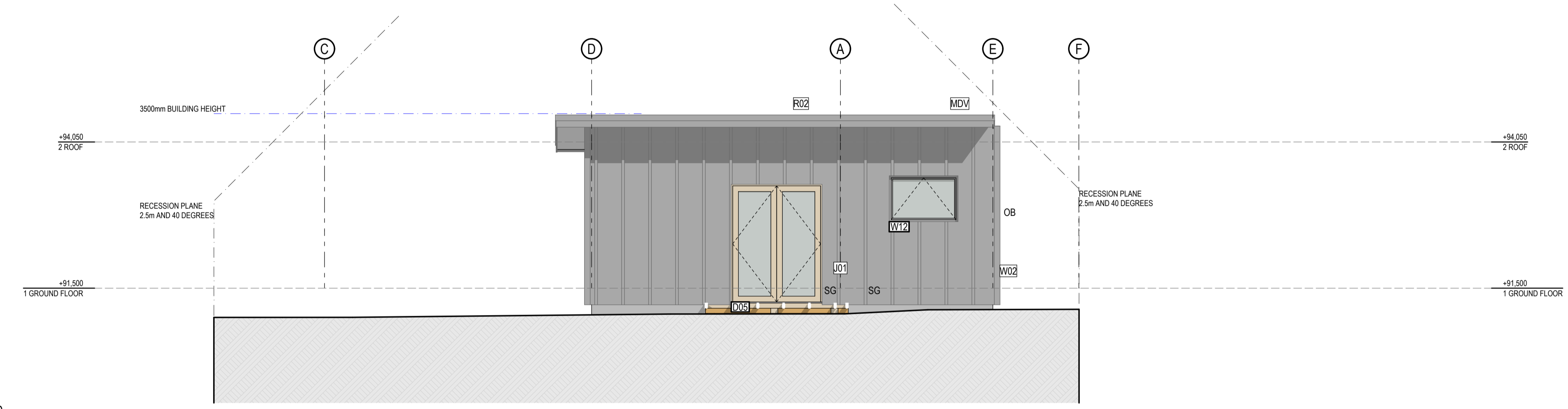
BUILDING ENVELOPE RISK MATRIX				BUILDING ENVELOPE RISK MATRIX				BUILDING ENVELOPE RISK MATRIX				BUILDING ENVELOPE RISK MATRIX			
NORTH ELEVATION				NORTH ELEVATION (GARAGE)				WEST ELEVATION				WEST ELEVATION (GARAGE)			
Risk Factor	Risk Severity	Risk Score	Risk Factor	Risk Severity	Risk Score	Risk Factor	Risk Severity	Risk Score	Risk Factor	Risk Severity	Risk Score	Risk Factor	Risk Severity	Risk Score	
Wind zone (per NZS 3604)	High risk	1	Wind zone (per NZS 3604)	High risk	1	Wind zone (per NZS 3604)	High risk	1	Wind zone (per NZS 3604)	High risk	1	Wind zone (per NZS 3604)	High risk	1	
Number of storeys	Low risk	0	Number of storeys	Low risk	0	Number of storeys	Low risk	0	Number of storeys	Low risk	0	Number of storeys	Low risk	0	
Roof/wall intersection design	Low risk	0	Roof/wall intersection design	Very high risk	5	Roof/wall intersection design	Low risk	0	Roof/wall intersection design	Very high risk	5	Roof/wall intersection design	Very high risk	5	
Eaves width	Medium risk	1	Eaves width	Very high risk	5	Eaves width	Medium risk	1	Eaves width	Medium risk	1	Eaves width	Medium risk	1	
Envelope complexity	Medium risk	1	Envelope complexity	Low risk	0	Envelope complexity	Medium risk	1	Envelope complexity	Low risk	0	Envelope complexity	Low risk	0	
Deck design	Low risk	0	Deck design	Low risk	0	Deck design	Low risk	0	Deck design	Low risk	0	Deck design	Low risk	0	
<b>Total Risk Score:</b>		<b>3</b>	<b>Total Risk Score:</b>		<b>11</b>	<b>Total Risk Score:</b>		<b>3</b>	<b>Total Risk Score:</b>		<b>7</b>	<b>Total Risk Score:</b>		<b>7</b>	

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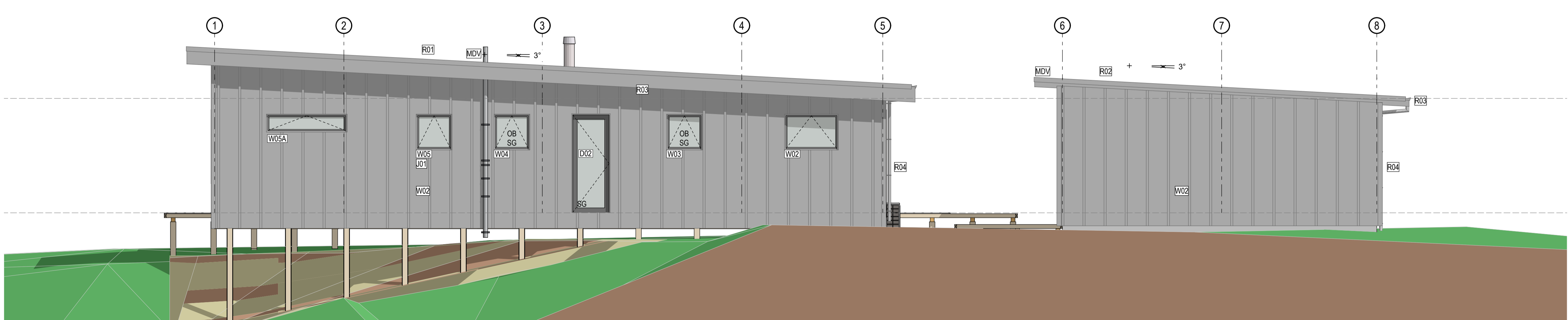
RECEIVED 20/08/2019



1 SOUTH ELEVATION 1:50



2 SOUTH ELEVATION (GARAGE) 1:50



3 EAST ELEVATION 1:50

- NOTES**
- J01 JOINERY**  
DOUBLE GLAZED POWDER COATED ALUMINIUM  
JOINERY RECESSED 50mm INTO TIMBER FRAMING
  - R01 COLORSTEEL 5-RIB**  
OVER COVERTEK 407 ROOFING UNDERLAY OVER VB20 VENTILATED BATTEN FIXED WITH 1/10G x80mm SELF DRILLING SCREWS ON H1.2 70x45mm SG8 TIMBER PURLINS AT 900mm CENTRES OVER H1.2 HYPSPAN 240x45mm LVL TIMBER RAFTERS AT 600mm CENTRES WITH R3.6 INSULATION INFILL.
  - R02 COLORSTEEL 5-RIB**  
OVER COVERTEK 407 ROOFING UNDERLAY OVER H1.2 70x45mm SG8 TIMBER PURLINS AT 900mm CENTRES FIXED WITH 1/10G x80mm SELF DRILLING SCREWS OVER TIMBER TRUSSES BY TRUSS DESIGNER WITH R3.6 INSULATION INFILL. REFER TO ATTACHED DOCUMENTATION FOR TRUSS DESIGN AND LAYOUT.
  - R03 GUTTERS**  
PVC HALF ROUND GUTTER WITH BRACKETS AT 800mm CENTRES FIXED TO FASCIA. COLOUR TO MATCH ROOF AND CLADDING
  - R04 DOWNPIPES**  
PVC 80mm ROUND DOWNPIPES. COLOUR TO MATCH ROOF AND CLADDING
  - W01 ABODO VULCAN WEATHERBOARD CLADDING**  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM WITH R3.2 INSULATION INFILL ON 10mm GIB PLASTERBOARD LEVEL 4 PAINT FINISH
  - W02 TRICLAD BOARD AND BATTEN**  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM WITH R3.2 INSULATION INFILL ON 10mm GIB PLASTERBOARD LEVEL 4 PAINT FINISH

Element	Area (m <sup>2</sup> )	Proposed building heat loss (W/°C)	Reference building heat loss (W/°C)
Roofs/ceilings	155.1	46.0	47.4
Walls	110.9	27.9	56.4
Floors	118.0	42.0	90.8
Vertical glazing	32.8	126.1	168.1
Skylights	1.2	8.3	-
Doors (Attributable)	2.0	0.0	-
<b>Total</b>		<b>250.2</b>	<b>362.6</b>

Glazing percentage: 23%  
 Glazing <50%: Yes  
 Minimum R-values OK: Yes  
 Issues to check: Some R-values appear to be very high. Check highlighted values.

PASS/FAIL  PASS

**BLYTHE HOUSE**

Element	Area (m <sup>2</sup> )	Proposed building heat loss (W/°C)	Reference building heat loss (W/°C)
Roofs/ceilings	33.4	9.9	10.1
Walls	49.5	15.6	25.7
Floors	24.5	16.2	18.8
Vertical glazing	7.2	27.7	67.7
Skylights	0.0	0.0	-
Doors (Attributable)	2.0	0.0	-
<b>Total</b>		<b>69.4</b>	<b>122.3</b>

Glazing percentage: 12%  
 Glazing <50%: Yes  
 Minimum R-values OK: Yes  
 Issues to check: Some R-values appear to be very high. Check highlighted values.

PASS/FAIL  PASS

**BLYTHE HOUSE (GARAGE)**

Element	Area (m <sup>2</sup> )	Proposed building heat loss (W/°C)	Reference building heat loss (W/°C)
Roofs/ceilings	33.4	9.9	10.1
Walls	49.5	15.6	25.7
Floors	24.5	16.2	18.8
Vertical glazing	7.2	27.7	67.7
Skylights	0.0	0.0	-
Doors (Attributable)	2.0	0.0	-
<b>Total</b>		<b>69.4</b>	<b>122.3</b>

Glazing percentage: 12%  
 Glazing <50%: Yes  
 Minimum R-values OK: Yes  
 Issues to check: Some R-values appear to be very high. Check highlighted values.

PASS/FAIL  PASS

Date	Change Name	Chd	RevD
29/08/2019			A
29/08/2019			B

ENGINEER:  
 NZS3604:2011  
 SURVEY:  
 PROJECT:  
**BLYTHE HOUSE**  
 ADDRESS:  
 LOT: 116 DP: 2086  
 5A TOI STREET, TAWHERO, WHANGANUI

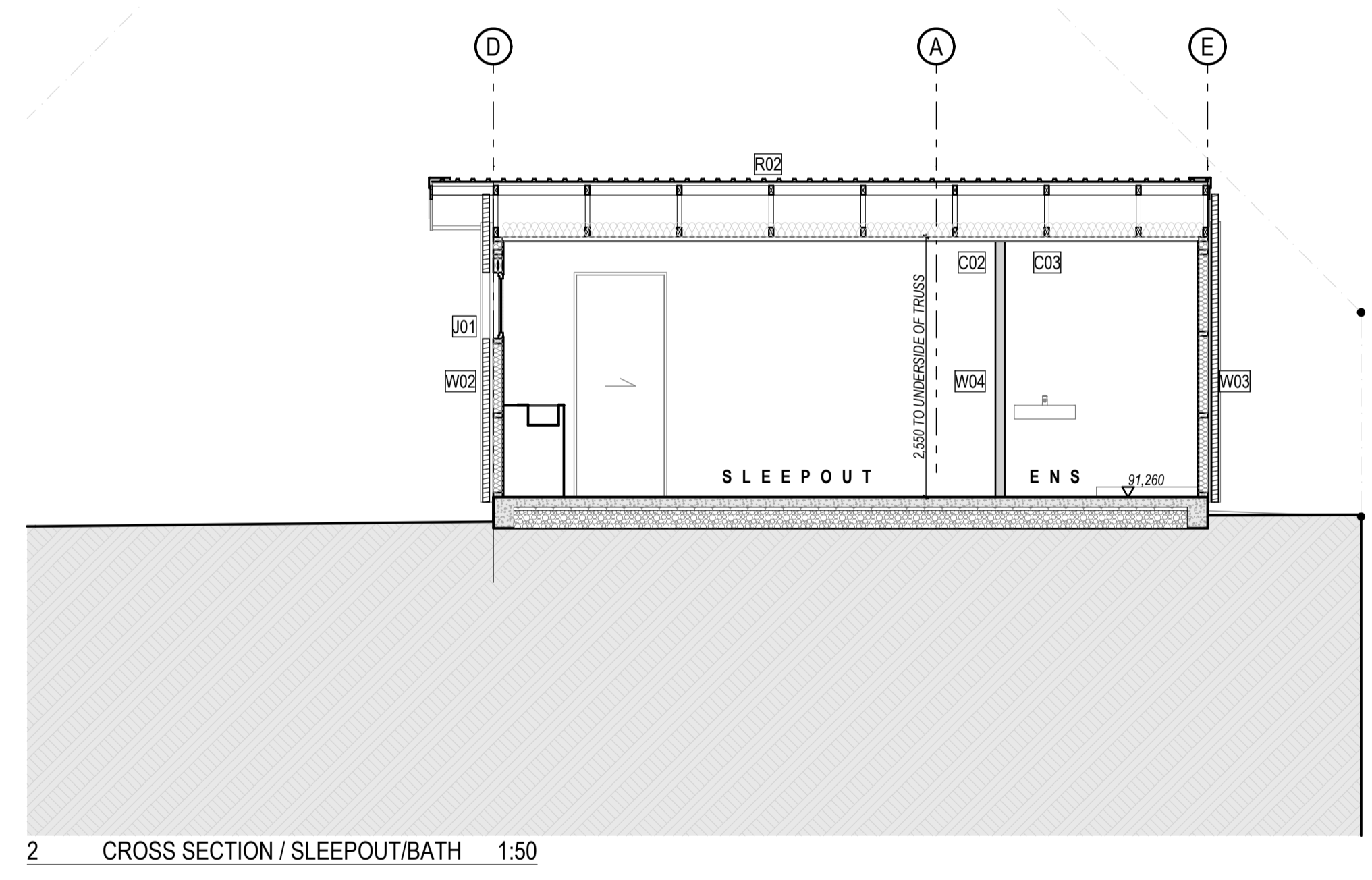
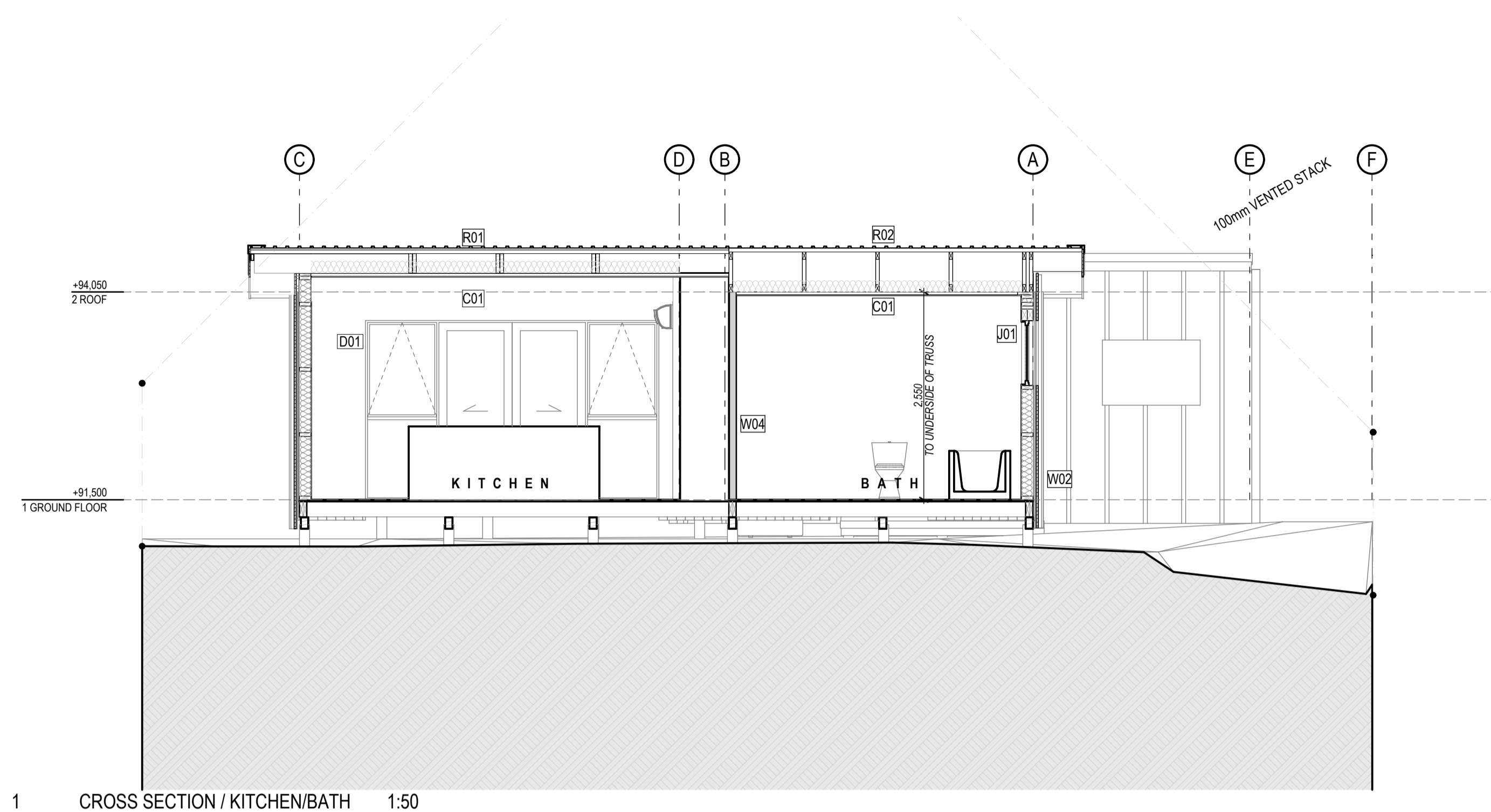
STATUS:  
 RFI RESPONSE  
 TITLE:  
**ELEVATIONS**

REVISION:  
 ISSUED: 29/08/2019  
 SCALE: 1:50 @ A1  
 SHEET NUMBER: **A202**

BUILDING ENVELOPE RISK MATRIX SOUTH ELEVATION			BUILDING ENVELOPE RISK MATRIX SOUTH ELEVATION (GARAGE)			BUILDING ENVELOPE RISK MATRIX EAST ELEVATION			BUILDING ENVELOPE RISK MATRIX EAST ELEVATION (GARAGE)		
Risk Factor	Risk Severity	Risk Score	Risk Factor	Risk Severity	Risk Score	Risk Factor	Risk Severity	Risk Score	Risk Factor	Risk Severity	Risk Score
Wind zone (per NZS 3604)	High risk	1	Wind zone (per NZS 3604)	High risk	1	Wind zone (per NZS 3604)	High risk	1	Wind zone (per NZS 3604)	High risk	1
Number of storeys	Low risk	0	Number of storeys	Low risk	0	Number of storeys	Low risk	0	Number of storeys	Low risk	0
Roof/wall intersection design	Low risk	0	Roof/wall intersection design	Very high risk	5	Roof/wall intersection design	Low risk	0	Roof/wall intersection design	Very high risk	5
Eaves width	Medium risk	1	Eaves width	Very high risk	5	Eaves width	Medium risk	1	Eaves width	Medium risk	1
Envelope complexity	Medium risk	1	Envelope complexity	Low risk	0	Envelope complexity	Medium risk	1	Envelope complexity	Low risk	0
Deck design	Low risk	0	Deck design	Low risk	0	Deck design	Low risk	0	Deck design	Low risk	0
<b>Total Risk Score:</b>		<b>3</b>	<b>Total Risk Score:</b>		<b>11</b>	<b>Total Risk Score:</b>		<b>3</b>	<b>Total Risk Score:</b>		<b>7</b>

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RECEIVED 20/08/2019



- NOTES**
- C01 PLWOOD CEILING**  
12mm PLWOOD ON H1.2 SG8 70x35 TIMBER BATTENS AT 600mm CENTRES.
  - C02 STANDARD CEILING**  
13mm STANDARD GIB PLASTERBOARD ON H1.2 SG8 70x35 TIMBER BATTENS AT 600mm CENTRES.
  - C03 WET AREA CEILING**  
13mm AQUALINE GIB PLASTERBOARD ON H1.2 SG8 70x35 TIMBER BATTENS AT 600mm CENTRES.
  - J01 JOINERY**  
DOUBLE GLAZED POWDER COATED ALUMINIUM JOINERY RECESSED 50mm INTO TIMBER FRAMING
  - R01 COLORSTEEL 5-RIB**  
OVER COVERTEK 407 ROOFING UNDERLAY OVER VB20 VENTILATED BATTEN FIXED WITH 1/10G x80mm SELF DRILLING SCREWS ON H1.2 70x45mm SG8 TIMBER PURLINS AT 900mm CENTRES OVER H1.2 HYSpan 240x45mm LVL TIMBER RAFTERS AT 600mm CENTRES WITH R3.6 INSULATION INFILL.
  - R02 COLORSTEEL 5-RIB**  
OVER COVERTEK 407 ROOFING UNDERLAY OVER H1.2 70x45mm SG8 TIMBER PURLINS AT 900mm CENTRES FIXED WITH 1/10G x80mm SELF DRILLING SCREWS OVER TIMBER TRUSSES BY TRUSS DESIGNER WITH R3.6 INSULATION INFILL. REFER TO ATTACHED DOCUMENTATION FOR TRUSS DESIGN AND LAYOUT.
  - W02 TRICLAD BOARD AND BATTEN**  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM WITH R3.2 INSULATION INFILL ON 10mm GIB PLASTERBOARD LEVEL 4 PAINT FINISH
  - W03 INTERNAL WALL**  
H1.2 90x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM LEVEL 4 PAINT FINISH

RECEIVED 20/08/2019

Date	Change Name	ChID	RevID
29/08/2019			A
29/08/2019			B

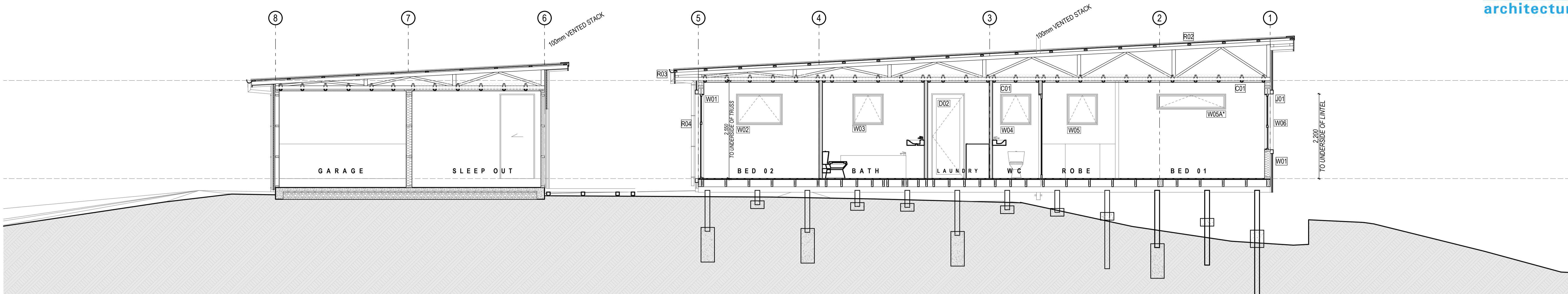
ENGINEER:  
NZS3604:2011  
SURVEY:

PROJECT:  
**BLYTHE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

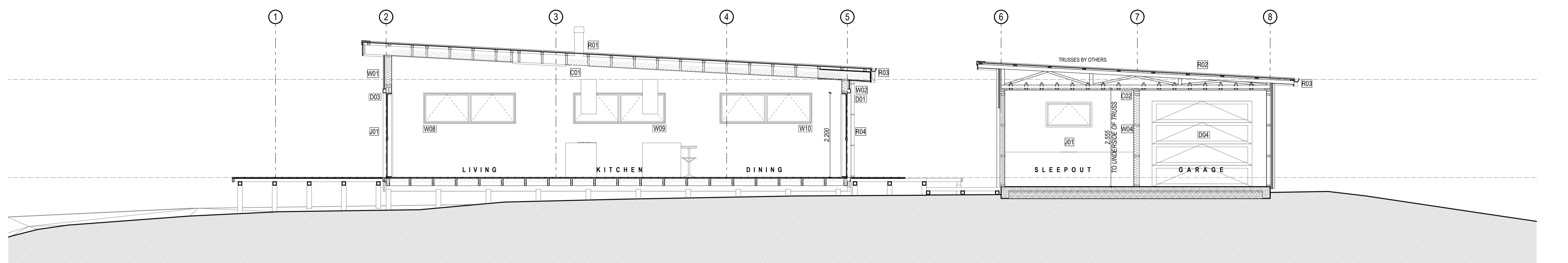
STATUS:  
RFI RESPONSE  
TITLE:  
**SECTIONS**

REVISION:  
ISSUED: 20/08/2019  
SCALE: 1:50 @ A1  
SHEET NUMBER: **A301**

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1 LONG SECTION / BEDROOMS 1:50



2 LONG SECTION LIVING / DINING/DINING/SLEEPOUT 1:50

NOTES	
<b>C01</b>	<b>PLWOOD CEILING</b> 12mm PLAWOOD ON H1.2 SG8 70x35 TIMBER BATTENS AT 600mm CENTRES.
<b>C02</b>	<b>STANDARD CEILING</b> 13mm STANDARD GIB PLASTERBOARD ON H1.2 SG8 70x35 TIMBER BATTENS AT 600mm CENTRES.
<b>J01</b>	<b>JOINERY</b> DOUBLE GLAZED POWDER COATED ALUMINIUM JOINERY RECESSED 50mm INTO TIMBER FRAMING
<b>R01</b>	<b>COLORSTEEL 5-RIB</b> OVER COVERTEK 407 ROOFING UNDERLAY OVER VB20 VENTILATED BATTEN FIXED WITH 1/10G x80mm SELF DRILLING SCREWS ON H1.2 70x45mm SG8 TIMBER PURLINS AT 900mm CENTRES OVER H1.2 HYPAN 240x45mm LVL TIMBER RAFTERS AT 600mm CENTRES WITH R3.6 INSULATION INFILL.
<b>R02</b>	<b>COLORSTEEL 5-RIB</b> OVER COVERTEK 407 ROOFING UNDERLAY OVER H1.2
	70x45mm SG8 TIMBER PURLINS AT 900mm CENTRES FIXED WITH 1/10G x80mm SELF DRILLING SCREWS OVER TIMBER TRUSSES BY TRUSS DESIGNER WITH R3.6 INSULATION INFILL. REFER TO ATTACHED DOCUMENTATION FOR TRUSS DESIGN AND LAYOUT.
<b>R03</b>	<b>GUTTERS</b> PVC HALF ROUND GUTTER WITH BRACKETS AT 800mm CENTRES FIXED TO FASCIA. COLOUR TO MATCH ROOF AND CLADDING
<b>R04</b>	<b>DOWNPIPES</b> PVC 80mm ROUND DOWNPIPES. COLOUR TO MATCH ROOF AND CLADDING
<b>W01</b>	<b>ABODO VULCAN WEATHERBOARD CLADDING</b> ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM WITH R3.2 INSULATION INFILL ON 10mm GIB PLASTERBOARD LEVEL 4 PAINT FINISH
<b>W02</b>	<b>TRICLAD BOARD AND BATTEN</b> ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM WITH R3.2 INSULATION INFILL ON 10mm GIB PLASTERBOARD LEVEL 4 PAINT FINISH
<b>W03</b>	<b>INTERNAL WALL</b> H1.2 90x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM LEVEL 4 PAINT FINISH

RECEIVED 20/08/2019

Date	Change Name	ChID	RevID
29/03/2019			A
29/08/2019			B

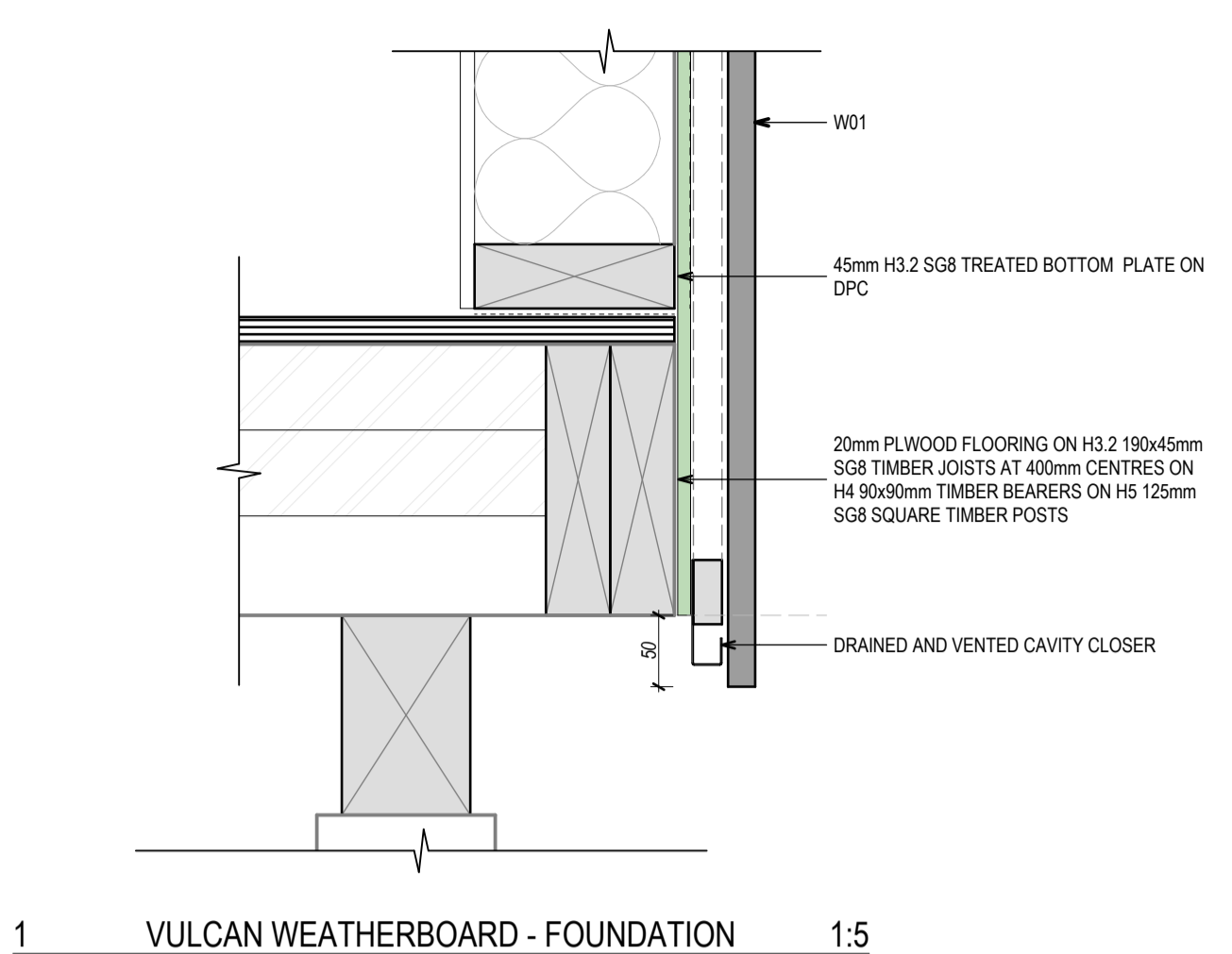
ENGINEER:  
NZS3604:2011  
SURVEY:  
  
PROJECT:  
**BLYTHE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
RFI RESPONSE  
TITLE:  
**SECTIONS**

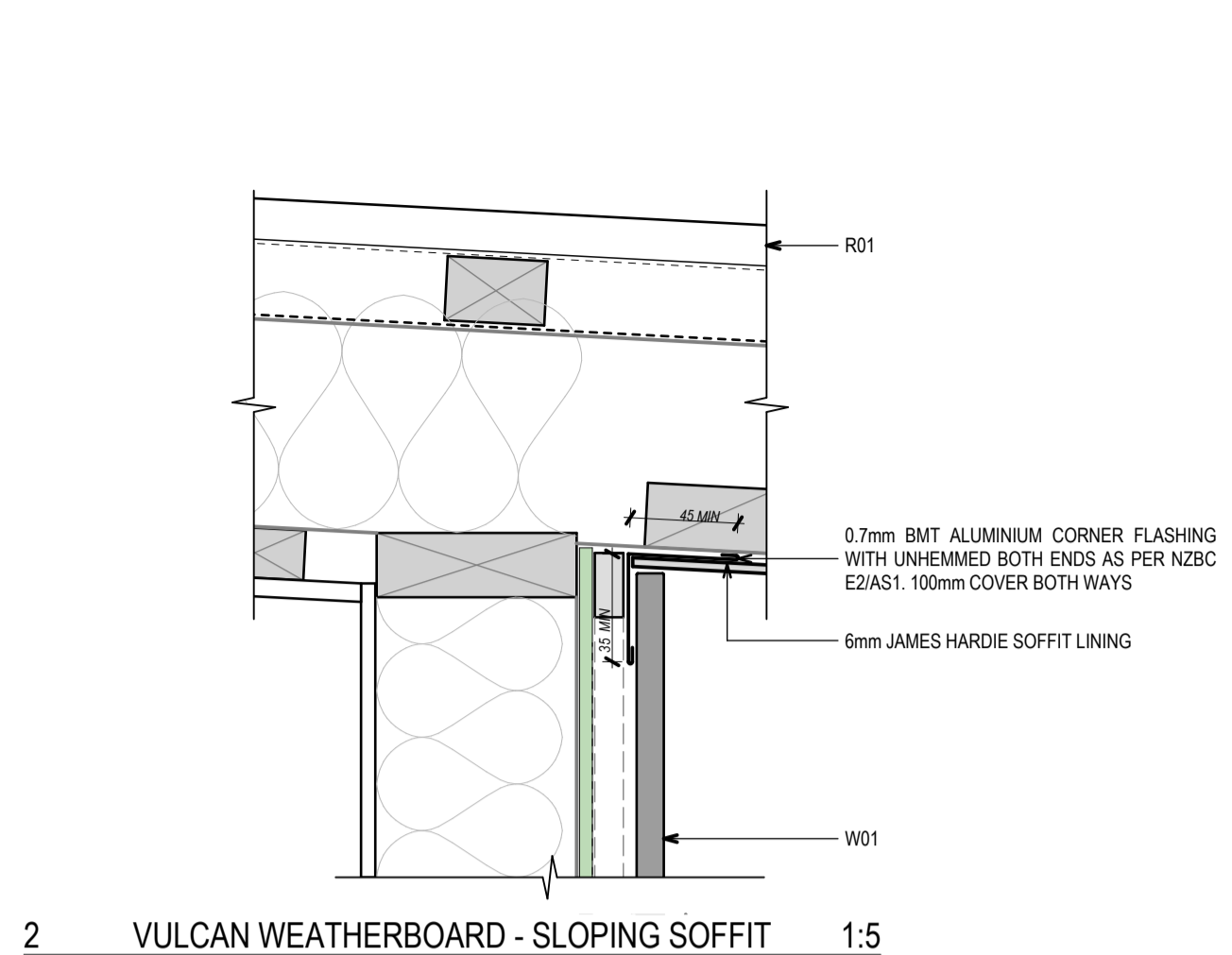
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SCALE:  
SHEET NUMBER

B  
20/08/2019  
1:50 @ A1  
**A302**

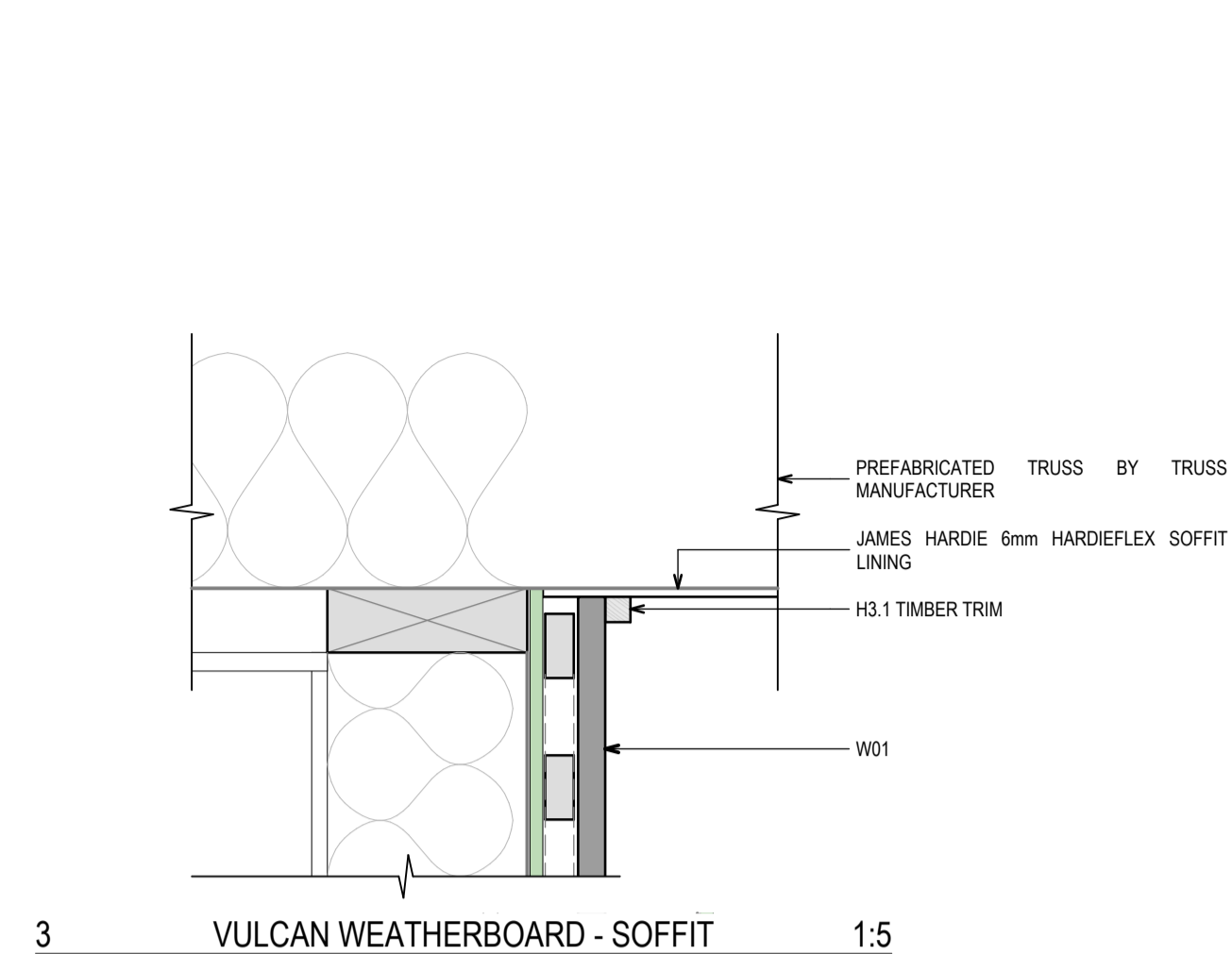
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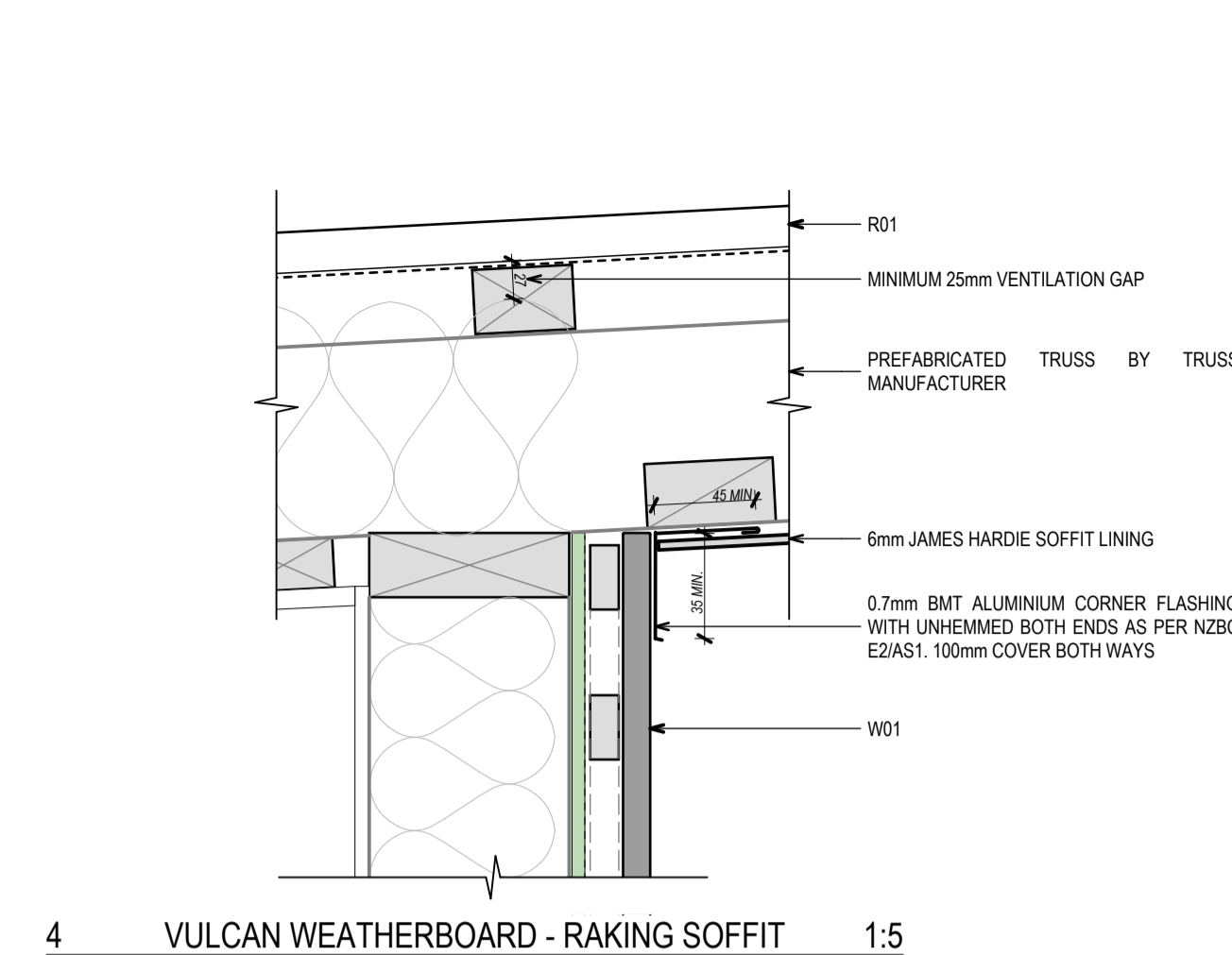
1 VULCAN WEATHERBOARD - FOUNDATION 1:5



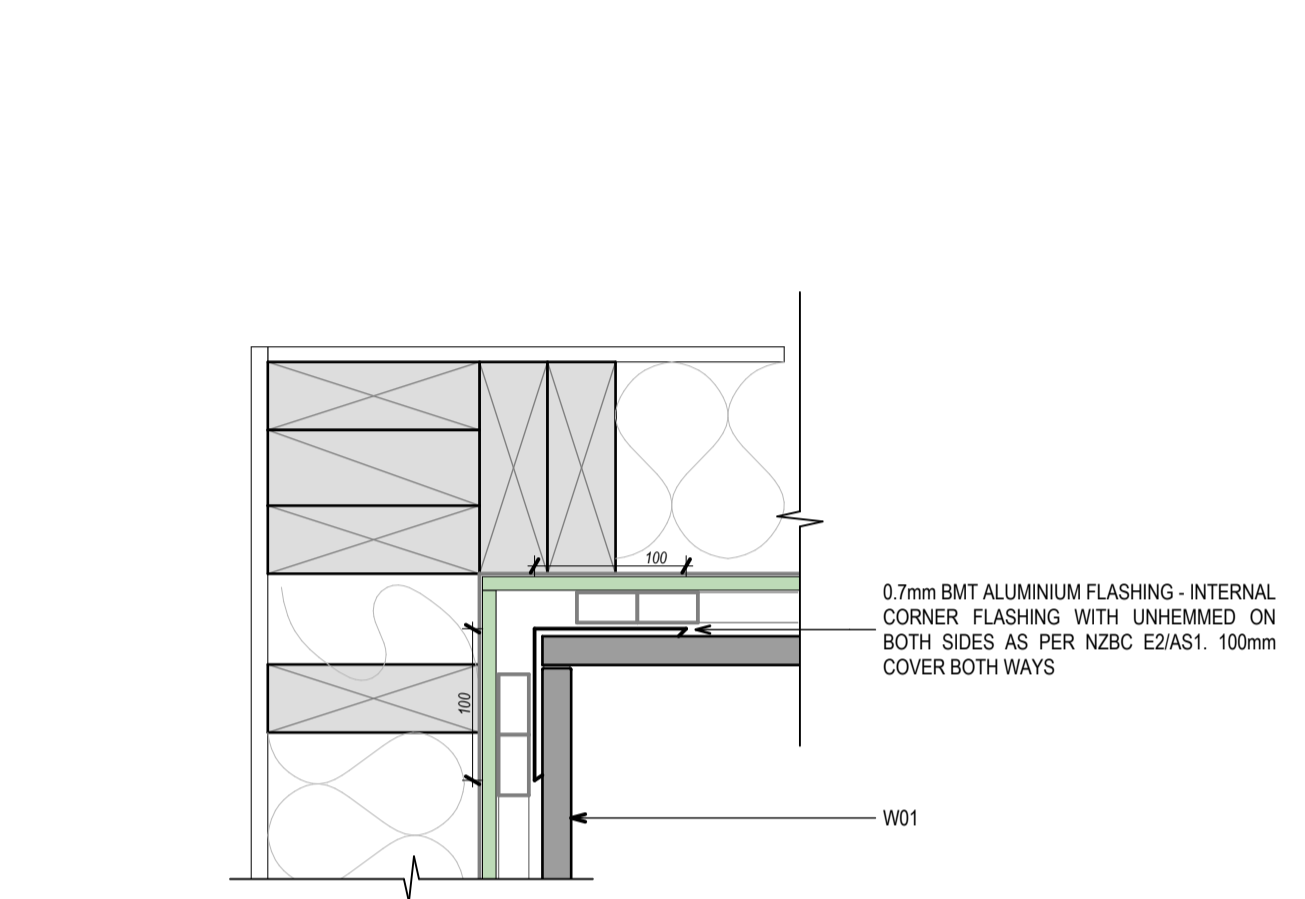
2 VULCAN WEATHERBOARD - SLOPING SOFFIT 1:5



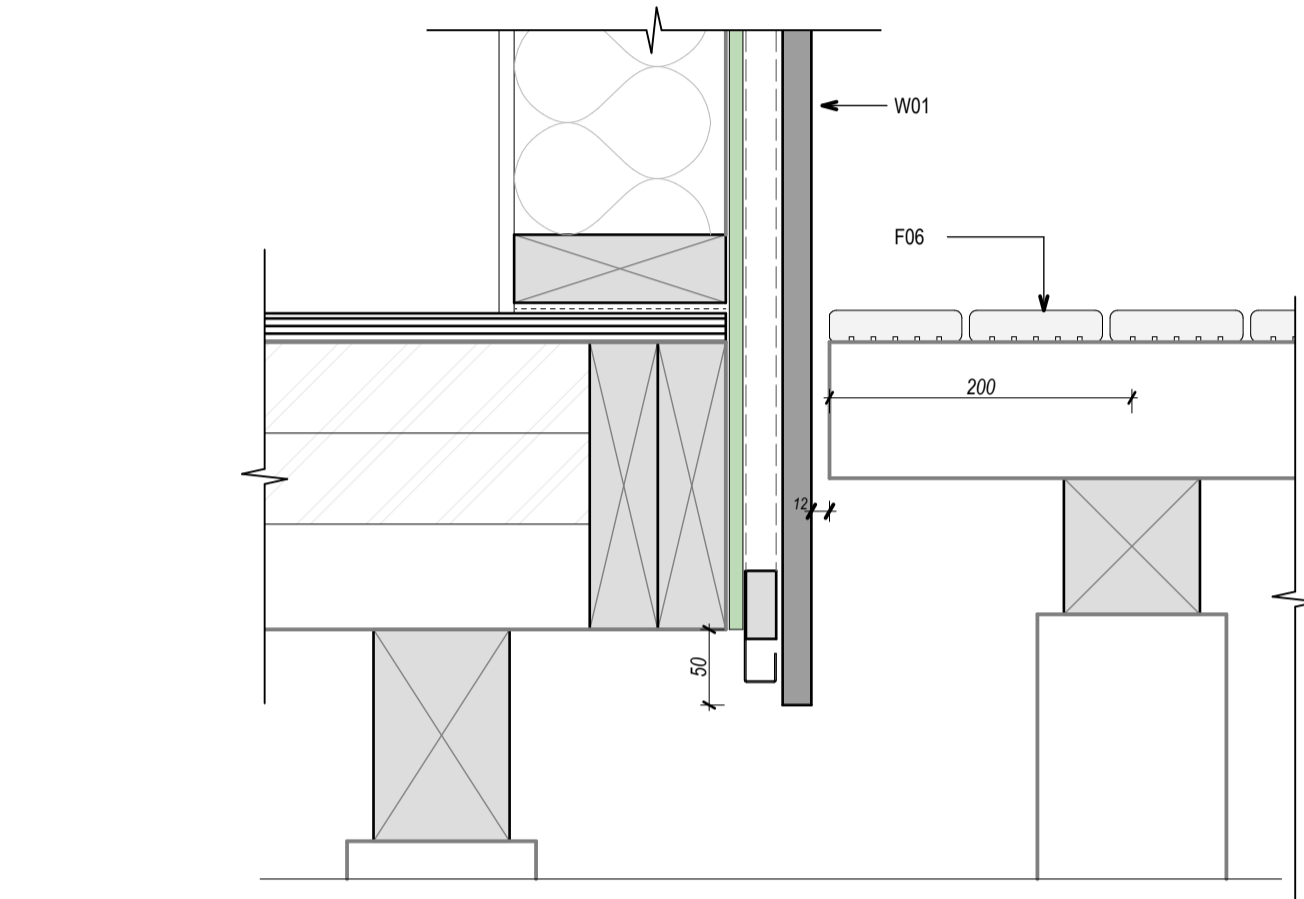
3 VULCAN WEATHERBOARD - SOFFIT 1:5



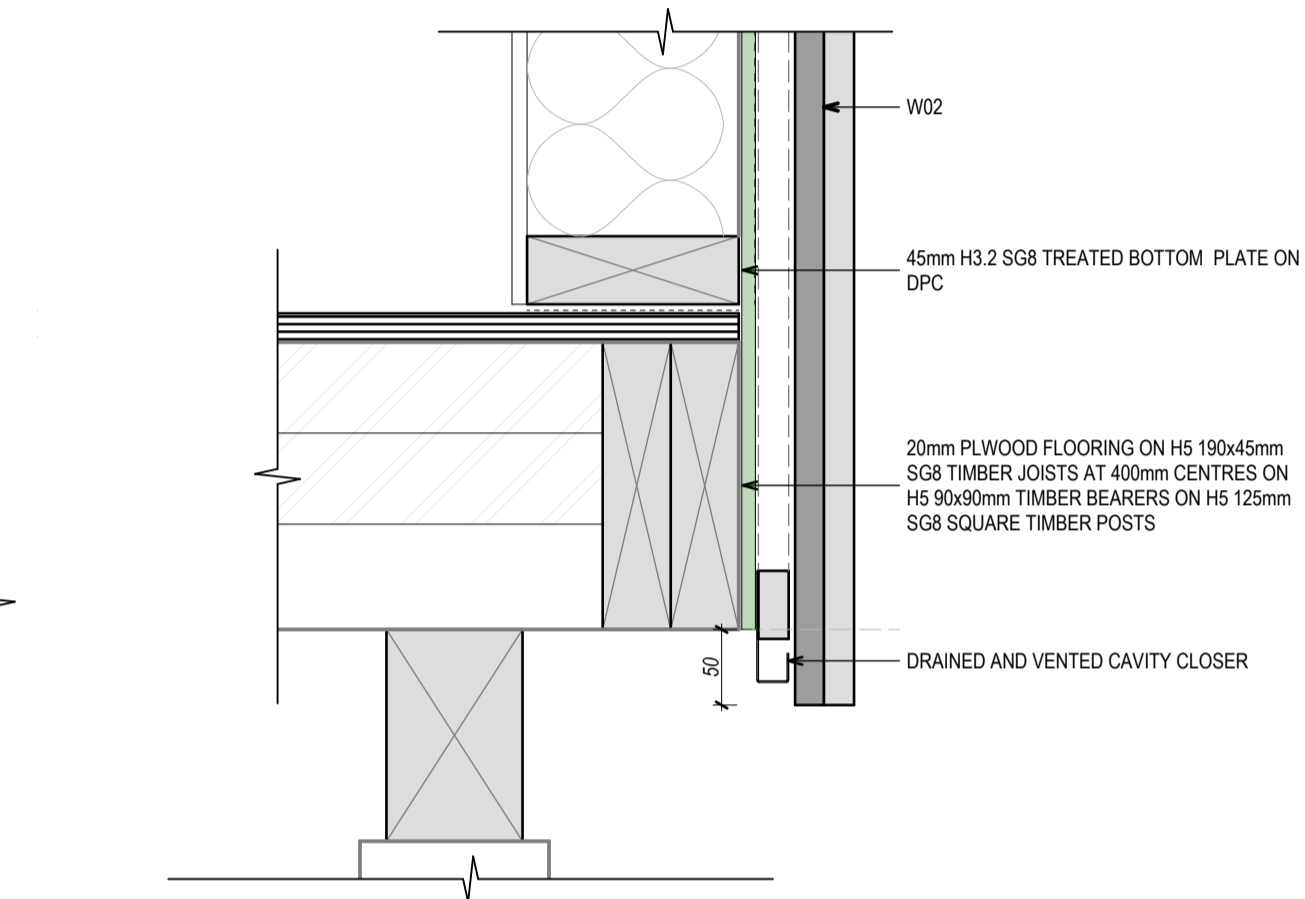
4 VULCAN WEATHERBOARD - RAKING SOFFIT 1:5



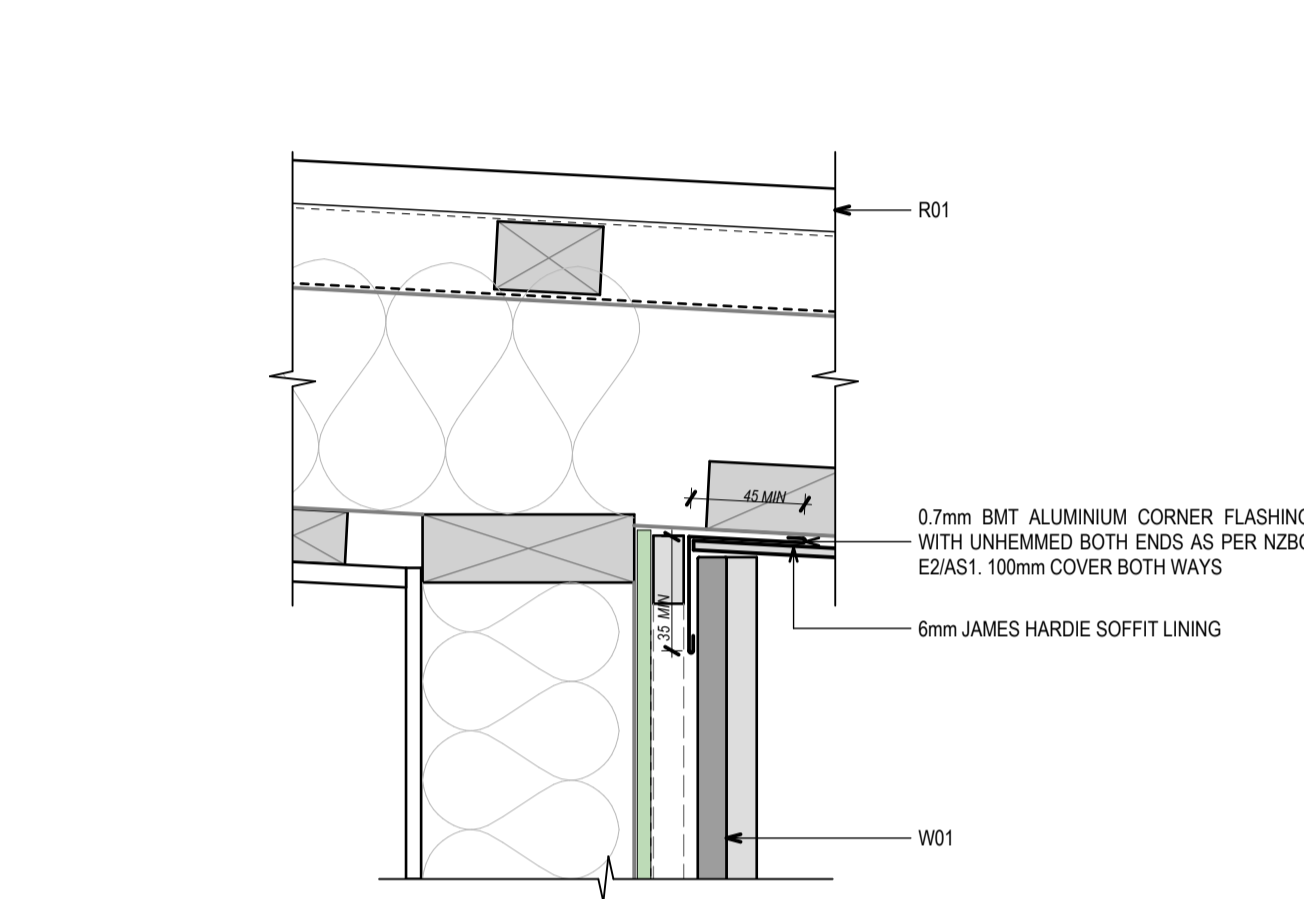
5 VULCAN WEATHERBOARD - INTERNAL CORNER 1:5



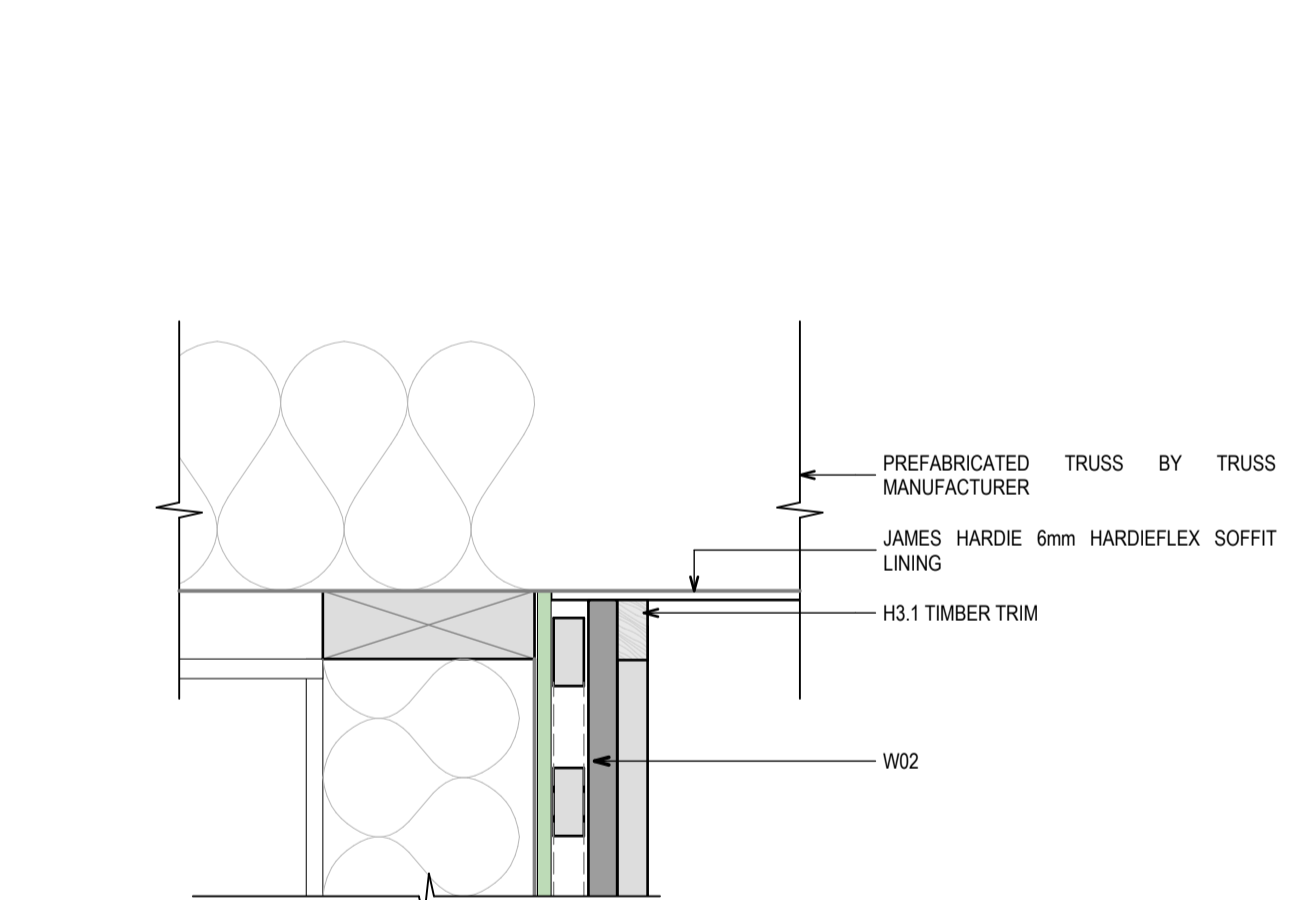
6 VULCAN WEATHERBOARD - THRESHOLD TO DECK 1:5



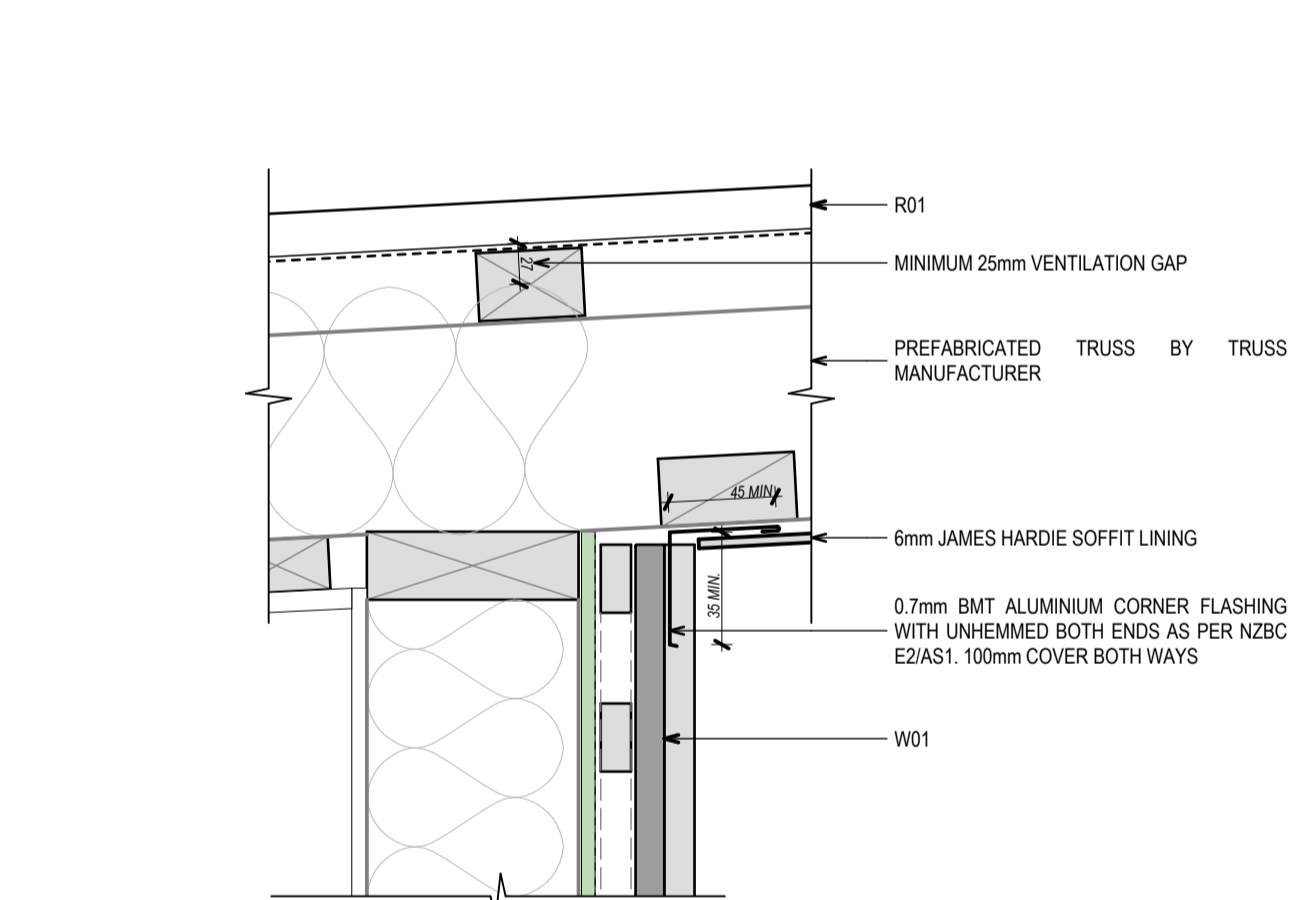
7 TRICLAD - FOUNDATION 1:5



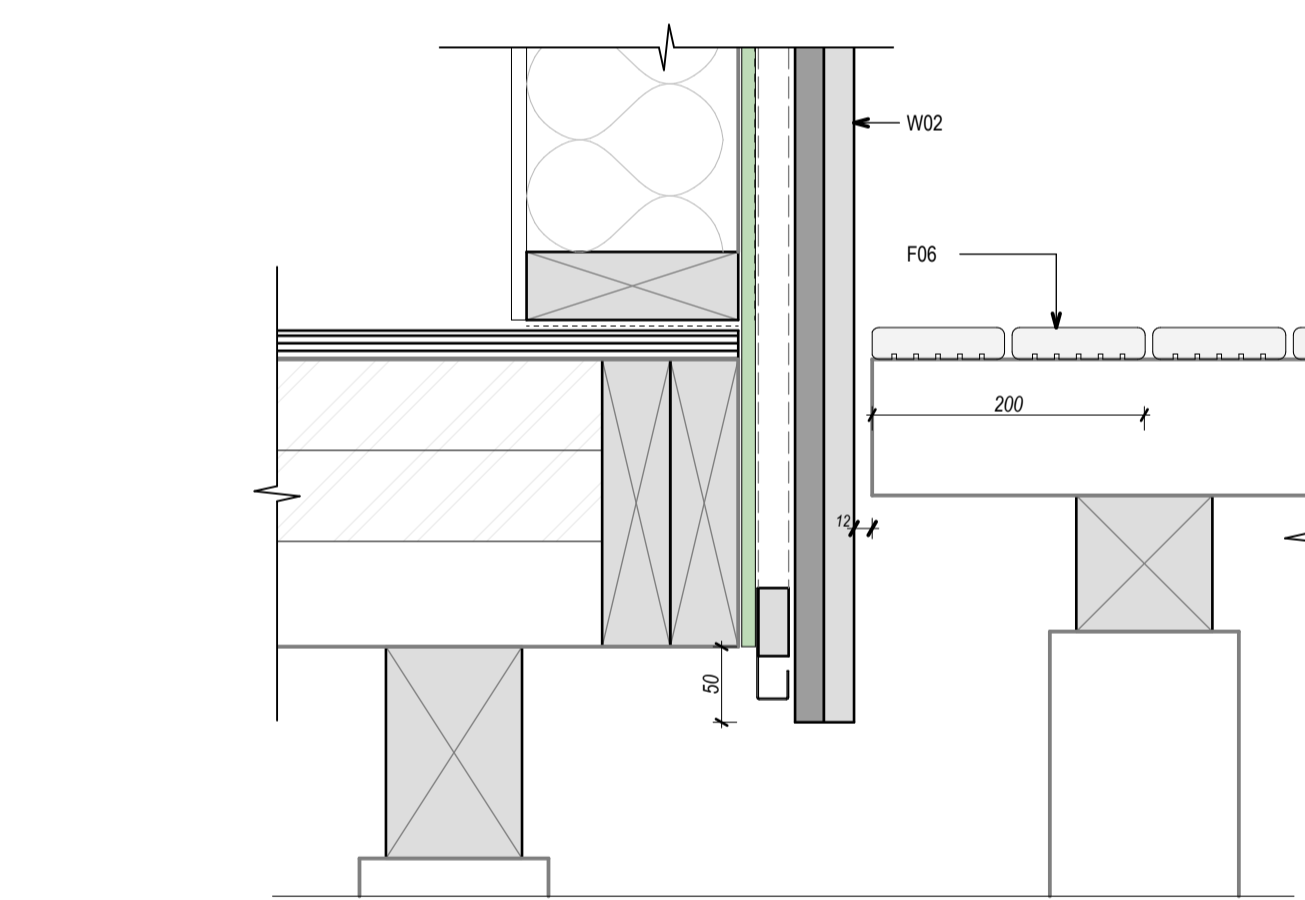
8 TRICLAD - SLOPING SOFFIT 1:5



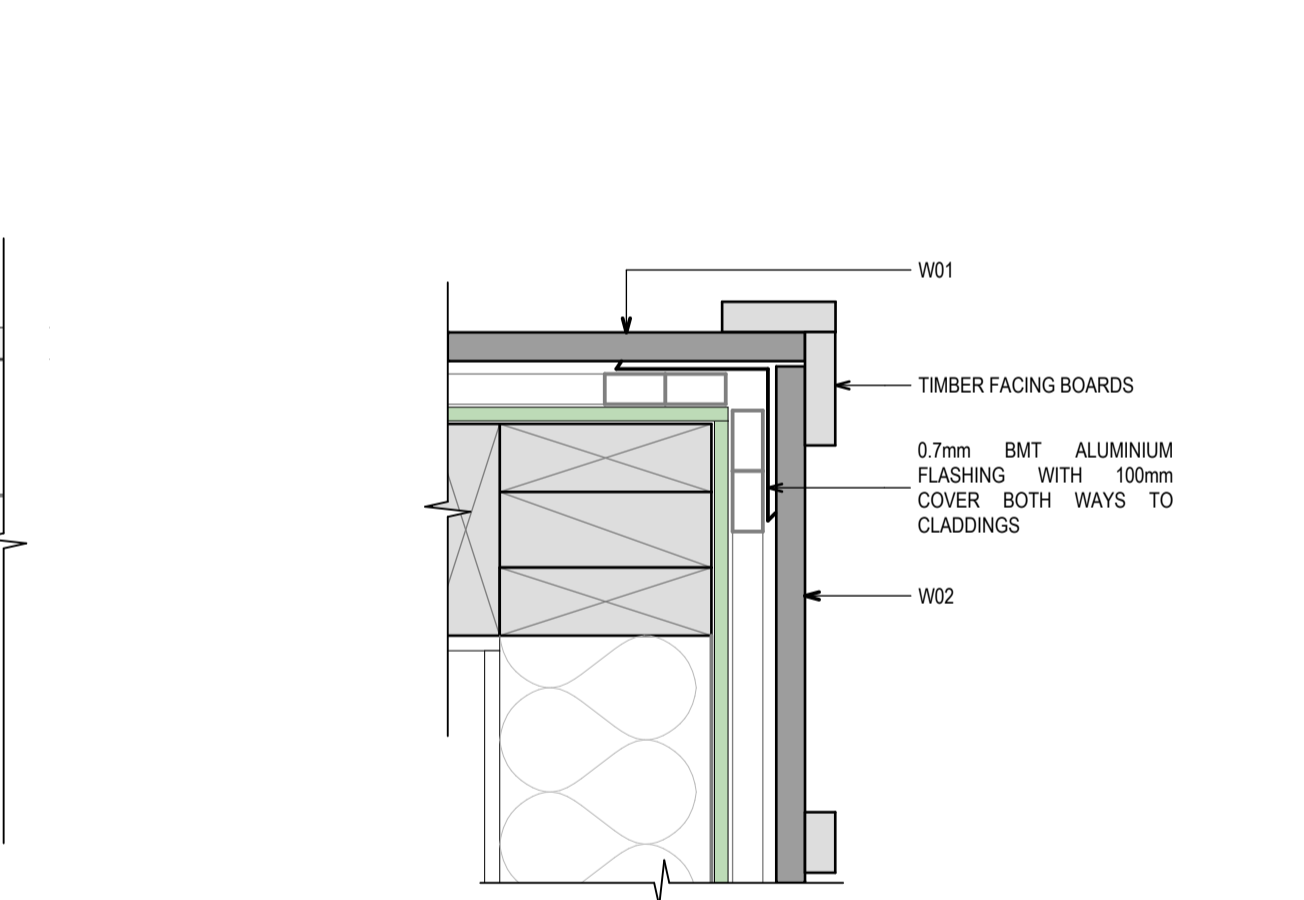
9 TRICLAD - SOFFIT 1:5



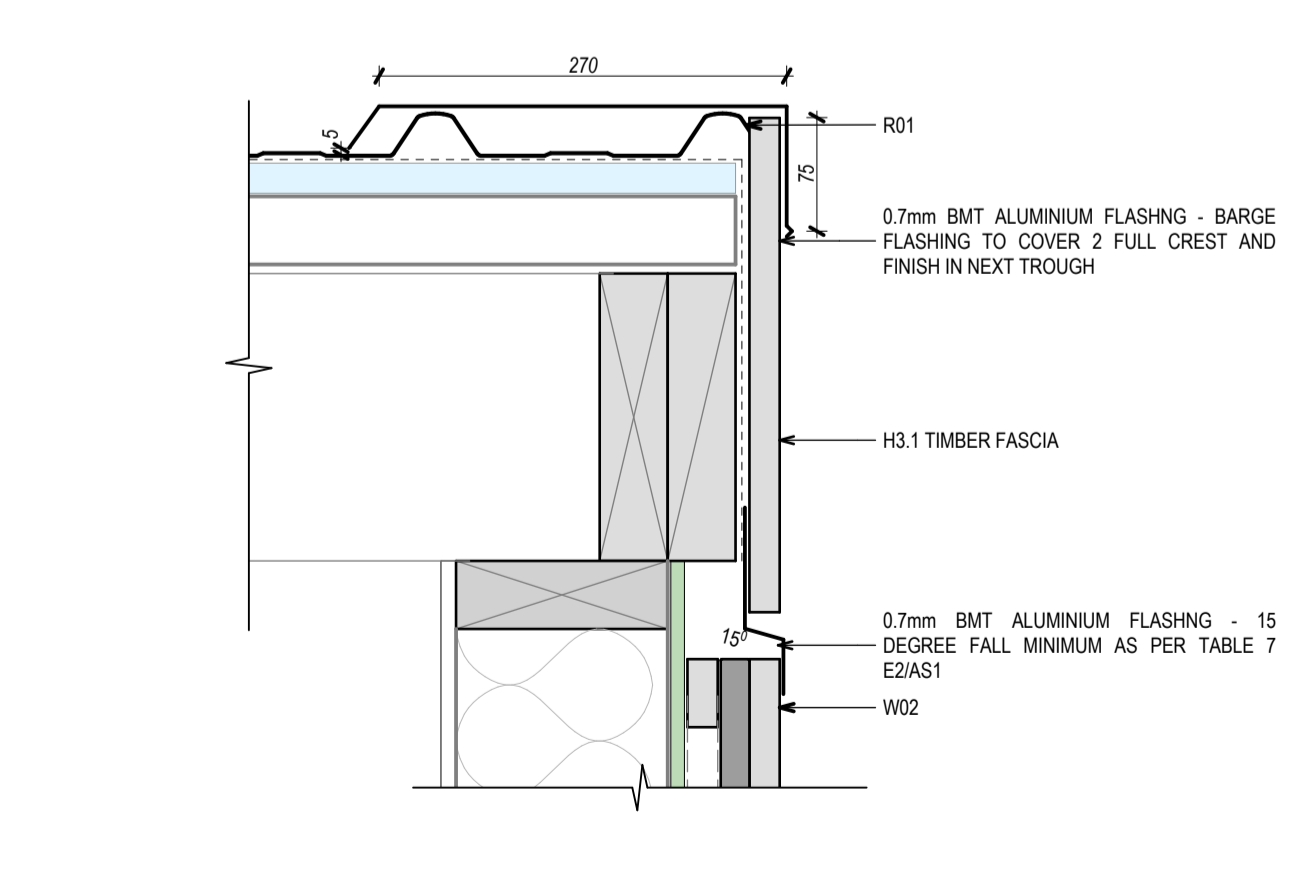
10 TRICLAD - RAKING SOFFIT 1:5



11 TRICLAD - THRESHOLD TO DECK 1:5



12 EXTERNAL CORNER DETAIL / BOARD AND BATTEN/WEATHERBOARD 1:5



13 TRICLAD - NO EAVE BARGE 1:5

**NOTES**

**F06** DECK  
SELECTED 19mm TIMBER DECKING OVER H3.2 SG8 90x45mm TIMBER JOISTS AT 450 CENTRES ON H4 SG8 90x90mm TIMBER BEARERS AT 900 CENTRES ON H5 SG8 125x125mm TIMBER POSTS AT 1200 CENTRES

**R01** COLORSTEEL 5-RIB  
OVER COVERTEK 407 ROOFING UNDERLAY OVER VB20 VENTILATED BATTEN FIXED WITH 1/10G x80mm SELF DRILLING SCREWS ON H1.2 70x45mm SG8 TIMBER PURLINS AT 900mm CENTRES OVER H1.2 HYPSPAN 240x45mm LVL TIMBER RAFTERS AT 600mm CENTRES WITH R3.6 INSULATION INFILL.

**W01** ABODO VULCAN WEATHERBOARD CLADDING  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM WITH R3.2 INSULATION INFILL ON 10mm GIB PLASTERBOARD LEVEL 4 PAINT FINISH

**W02** TRICLAD BOARD AND BATTEN  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM CENTRES AND NOGS AT 800mm CENTRES MAXIMUM WITH R3.2 INSULATION INFILL ON 10mm GIB PLASTERBOARD LEVEL 4 PAINT FINISH

**NOTE**  
0.7mm BMT ALUMINIUM FLASHINGS MAYBE SUBSTITUTED FOR 0.55mm BMT COLORSTEEL FLASHING

Table 8.19 - Nailing schedule for hand-driven and power-driven nails (see 8.8.6)

Joint	Hand-driven nails		Power-driven nails	
	Length (mm) x diameter (mm) and type	Number/ Location	Length (mm) x diameter (mm) and type	Number/ Location
Bottom plate to floor framing at: (a) External walls and internal wall bracing elements (b) Internal walls (may be nailed to floor decking) (c) Trimmer not exceeding 4.2 m long	100 x 3.75	2 at 600 mm centres	90 x 3.15	3 at 600 mm centres
	100 x 3.75	1 at 600 mm centres	90 x 3.15	1 at 600 mm centres
	100 x 3.75	4 (and nailed)	90 x 3.15	6 (and nailed)

BOTTOM PLATE NAILING SCHEDULE

Date	Change Name	ChID	RevID
29/03/2019			A
29/08/2019			B

ENGINEER:  
NZS3604:2011  
SURVEY:

PROJECT:  
**BLTYE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
CONCEPT

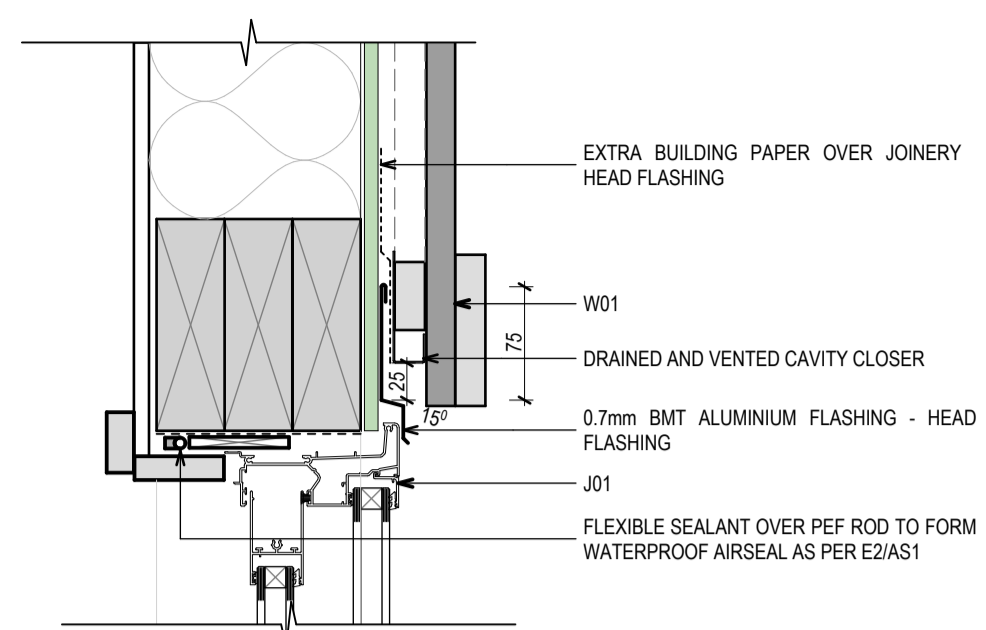
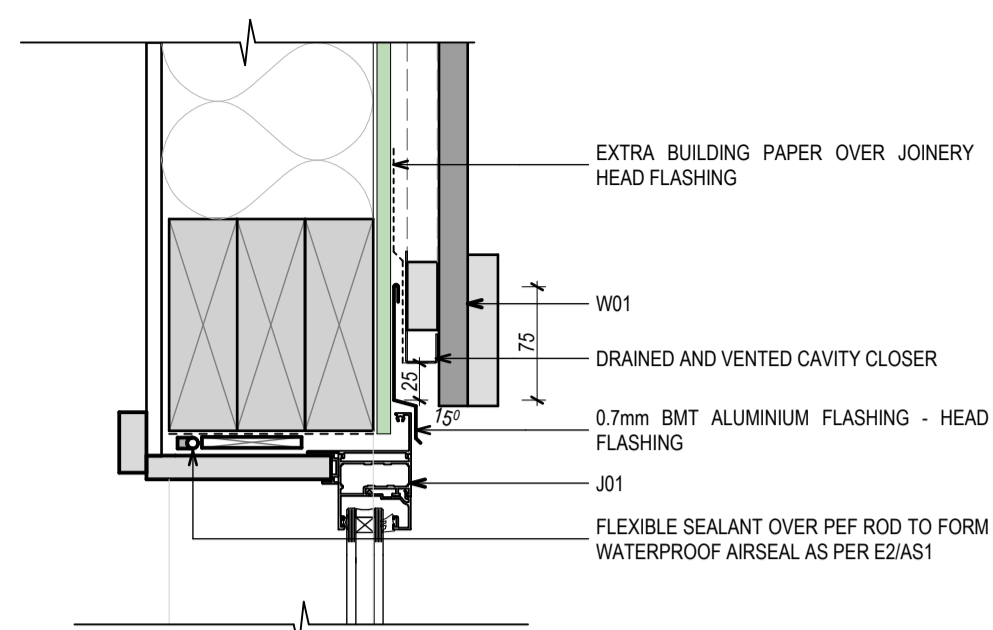
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**CLADDING DETAILS**

REVISION:  
ISSUED:  
SCALE:  
SHEET NUMBER

B  
20/08/2019  
1:5 @ A1  
**A401**

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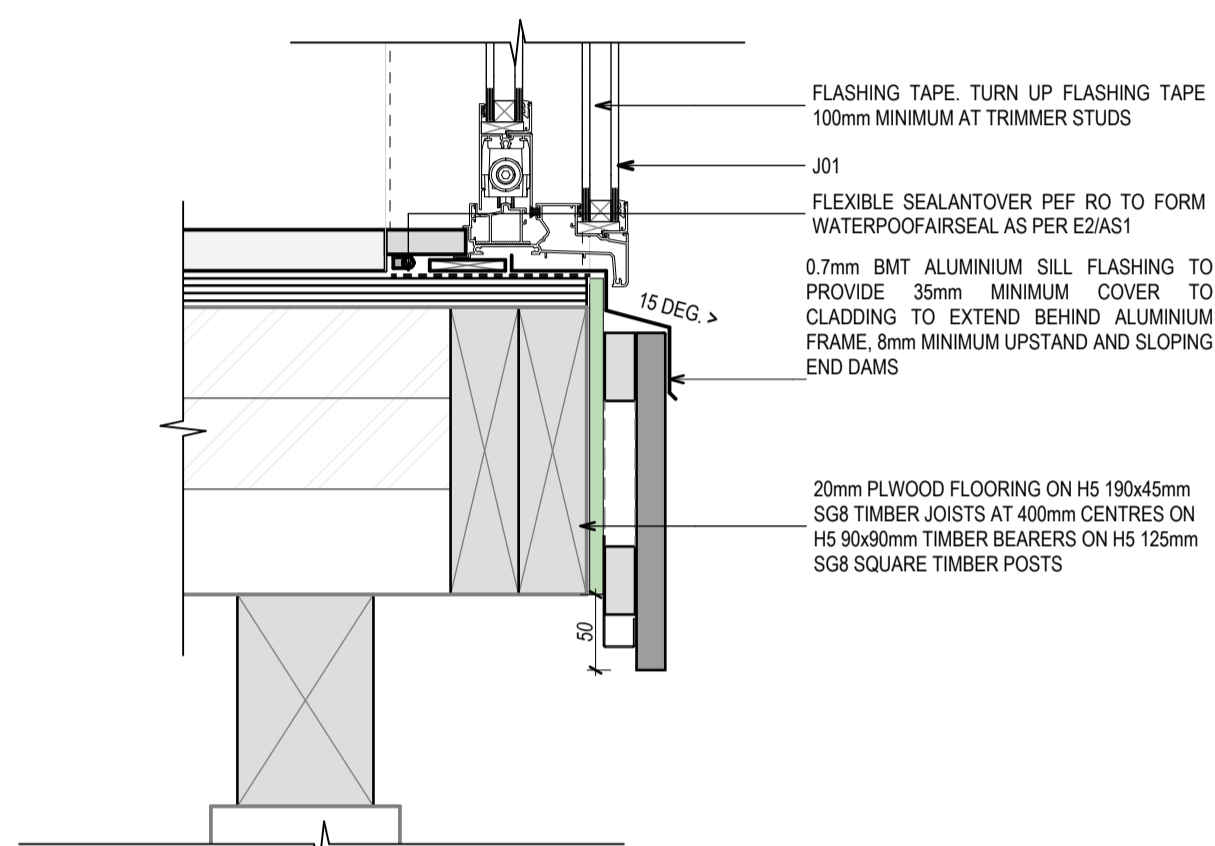
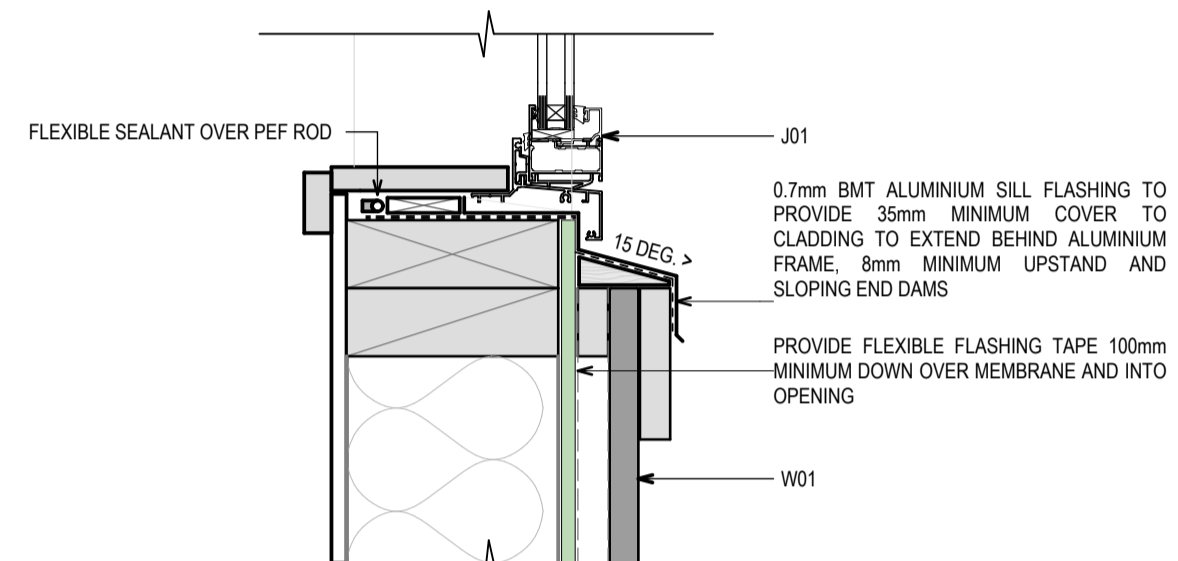
**NOTES**

**J01** JOINERY  
DOUBLE GLAZED POWDER COATED ALUMINIUM  
JOINERY RECESSED 50mm INTO TIMBER FRAMING

**W01** ABODO VULCAN WEATHERBOARD CLADDING  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER  
JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm  
SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM  
CENTRES AND NOGS AT 800mm CENTRES MAXIMUM  
WITH R3.2 INSULATION INFILL ON 10mm GIB  
PLASTERBOARD LEVEL 4 PAINT FINISH

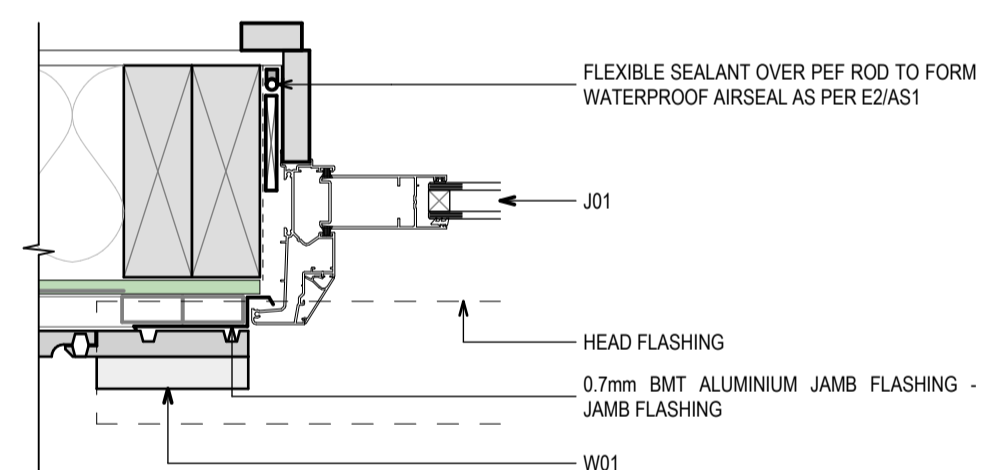
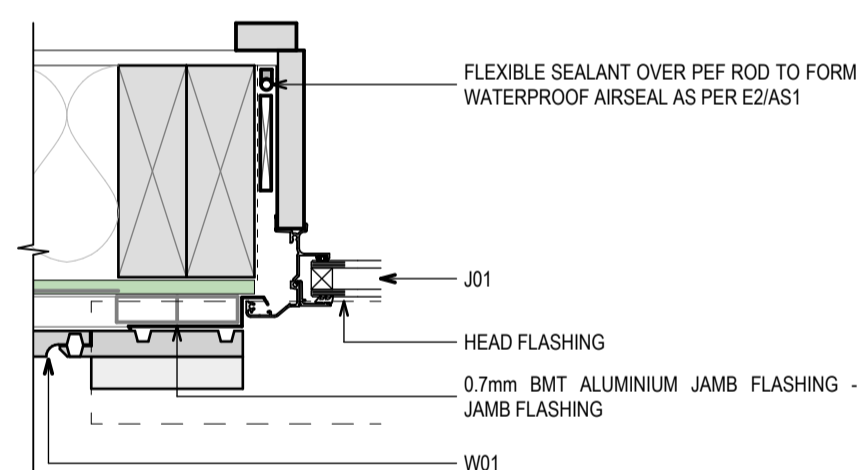
1 VULCAN WEATHERBOARD - WINDOW HEAD 1:5

2 VULCAN WEATHERBOARD - SLIDING DOOR HEAD 1:5



3 VULCAN WEATHERBOARD - WINDOW SILL 1:5

4 STANDARD - SLIDING DOOR REABTE 1:5



5 VULCAN WEATHERBOARD - WINDOW JAMB 1:5

6 VULCAN WEATHERBOARD - SLIDING DOOR JAMB 1:5

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Date	Change Name	ChID	RevID
29/03/2019			A
29/08/2019			B

ENGINEER:  
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SURVEY:

PROJECT:  
**B L Y T H E H O U S E**

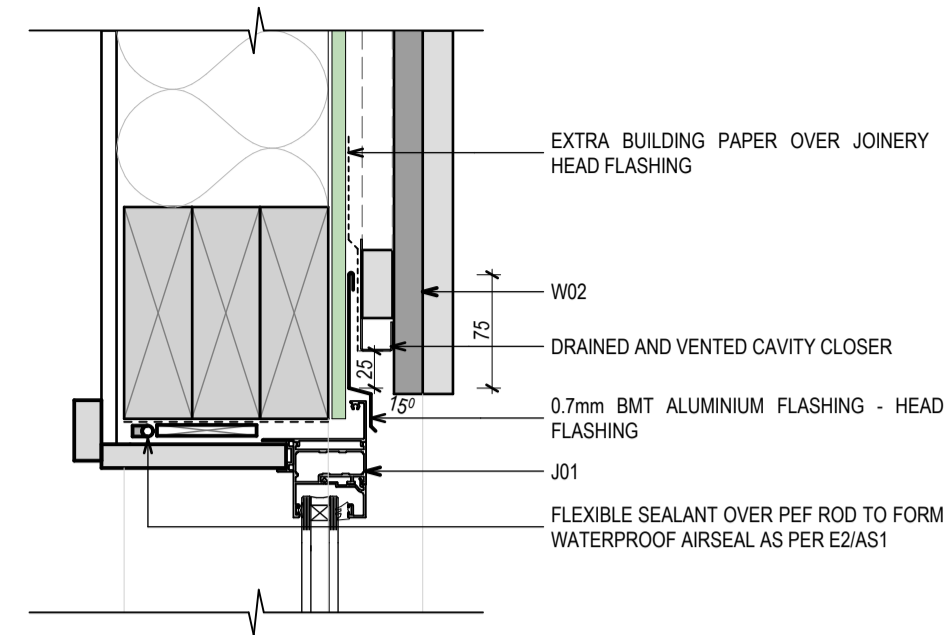
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5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
CONCEPT

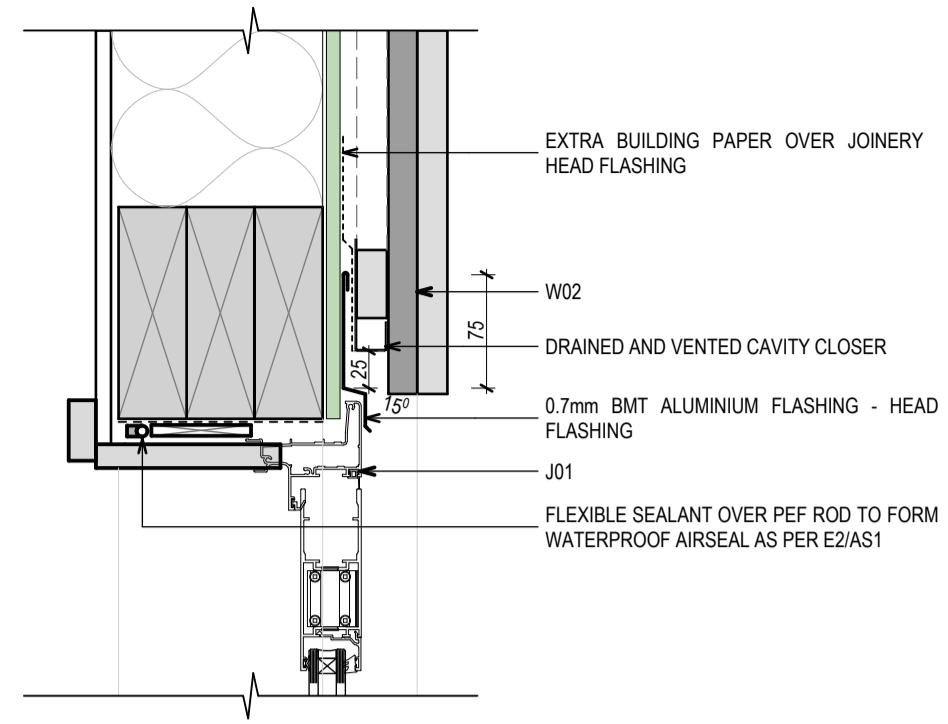
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**DOOR AND WINDOW DETAILS**

REVISION: B  
ISSUED: 20/08/2019  
SCALE: 1:5 @ A1  
SHEET NUMBER: **A402**

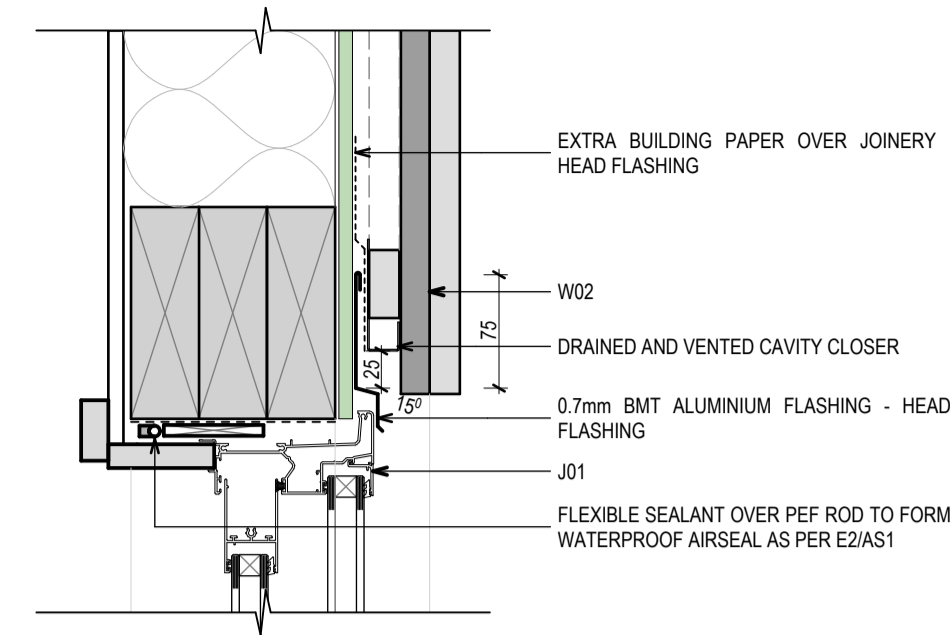
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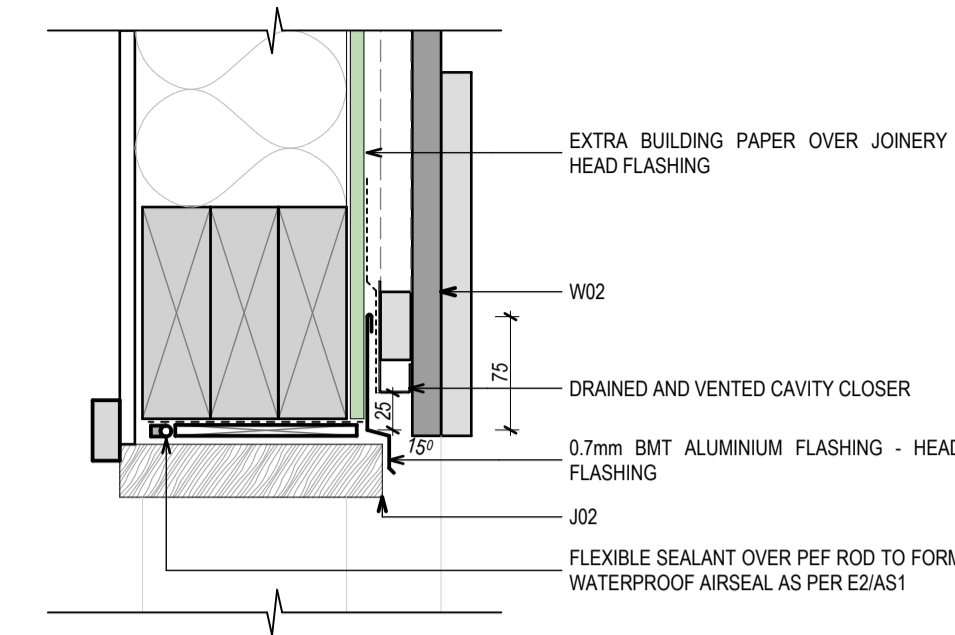
1 TRICLAD - WINDOW HEAD 1:5



2 TRICLAD - DOOR HEAD 1:5



3 TRICLAD - SLIDING DOOR HEAD 1:5



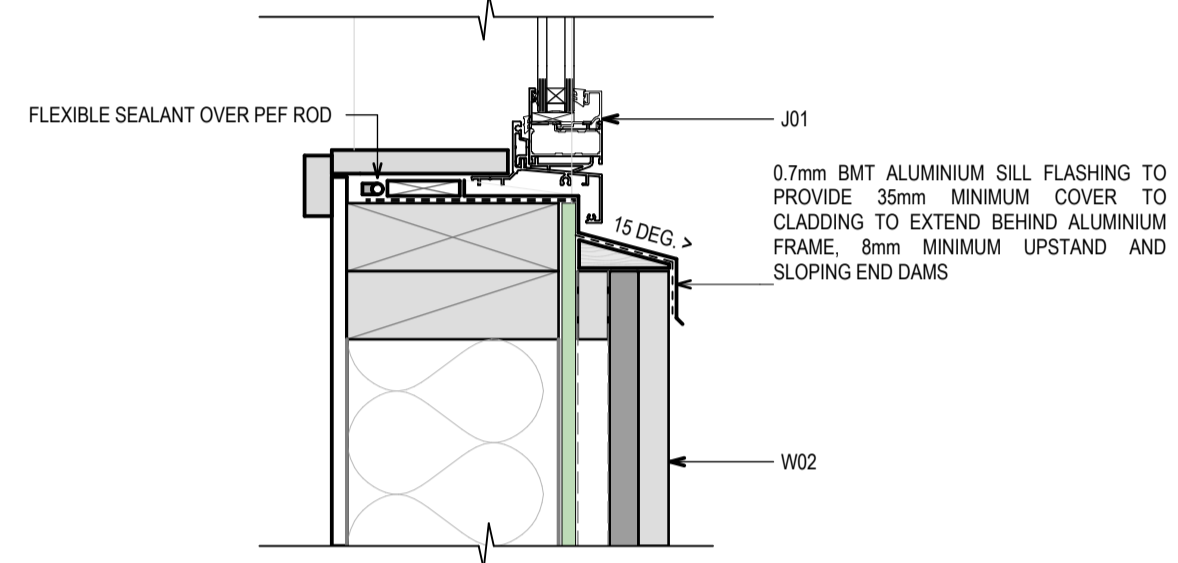
4 TRICLAD - GARAGE HEAD 1:5

**NOTES**

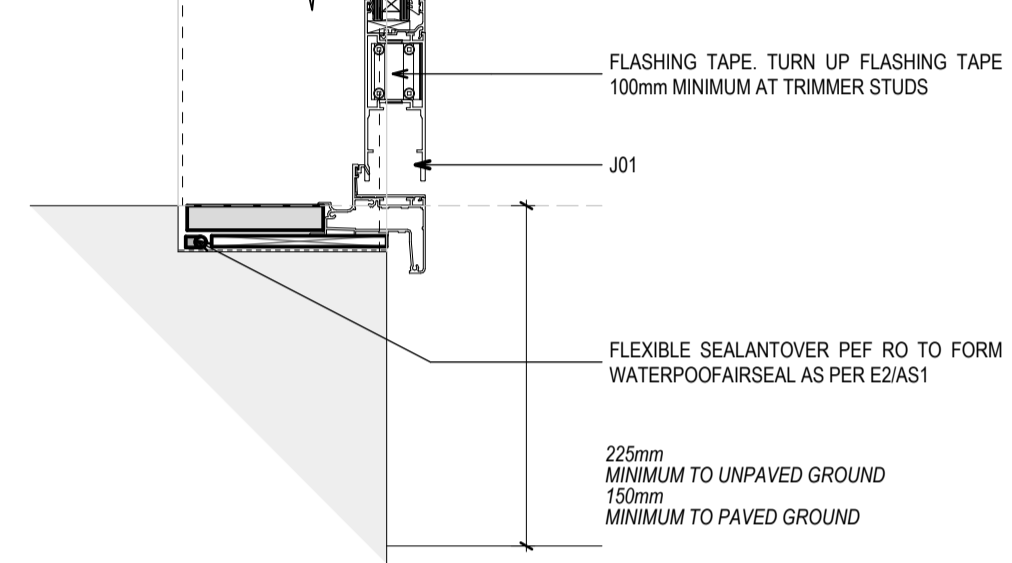
**J01** JOINERY  
DOUBLE GLAZED POWDER COATED ALUMINIUM  
JOINERY RECESSED 50mm INTO TIMBER FRAMING

**J02** GARAGE DOOR  
POWDER COATED ALUMINIUM FRAME WITH TIMBER  
INSERT. RECESSED 50mm INTO TIMBER FRAMING

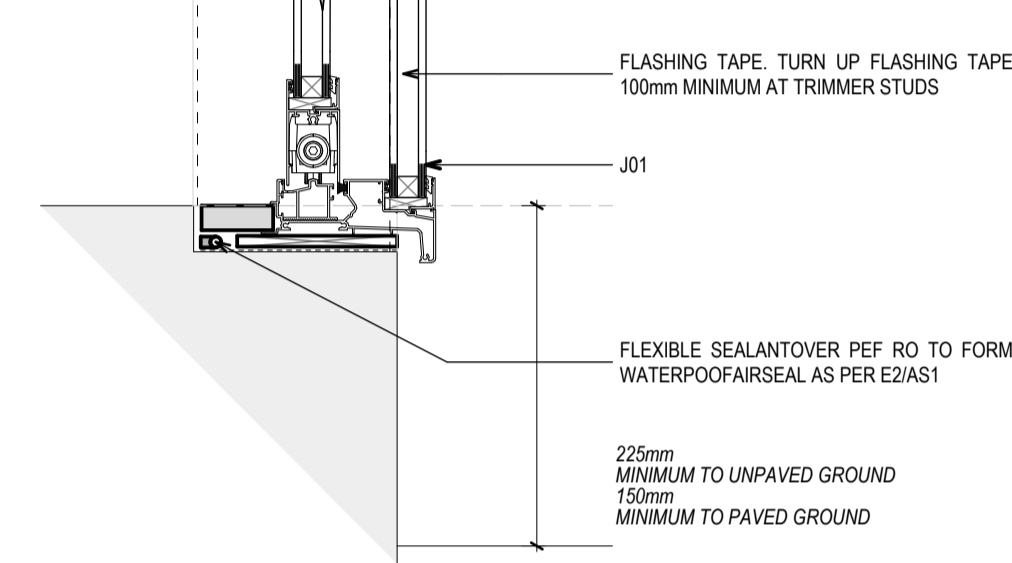
**W02** TRICLAD BOARD AND BATTEN  
ON H3.1 40x20mm SG8 TIMBER CAVITY BATTENS OVER  
JAMES HARDIE 9mm RAB BOARD ON H1.2 140x45mm  
SG8 TIMBER STUD FRAMING AT 600mm MAXIMUM  
CENTRES AND NOGS AT 800mm CENTRES MAXIMUM  
WITH R3.2 INSULATION INFILL ON 10mm GIB  
PLASTERBOARD LEVEL 4 PAINT FINISH



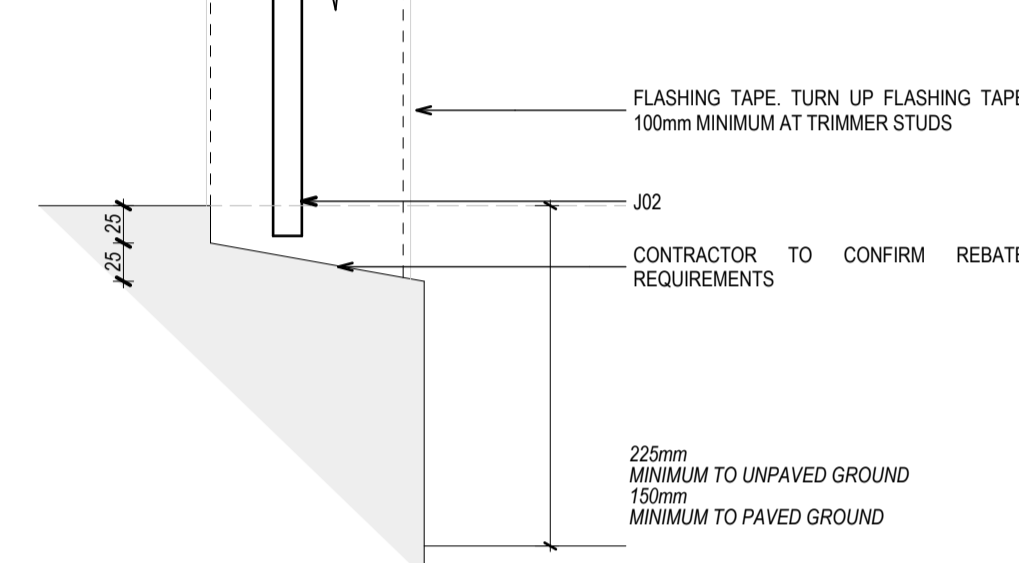
5 TRICLAD - WINDOW JAMB 1:5



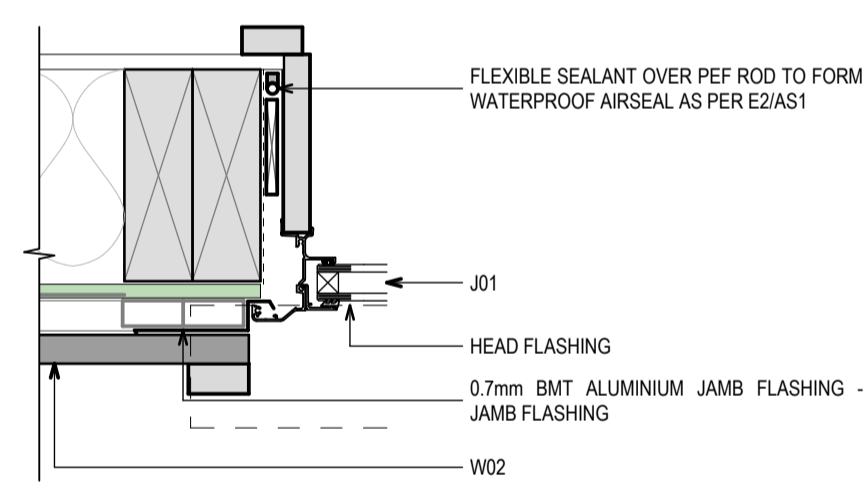
6 STANDARD - DOOR REBATE 1:5



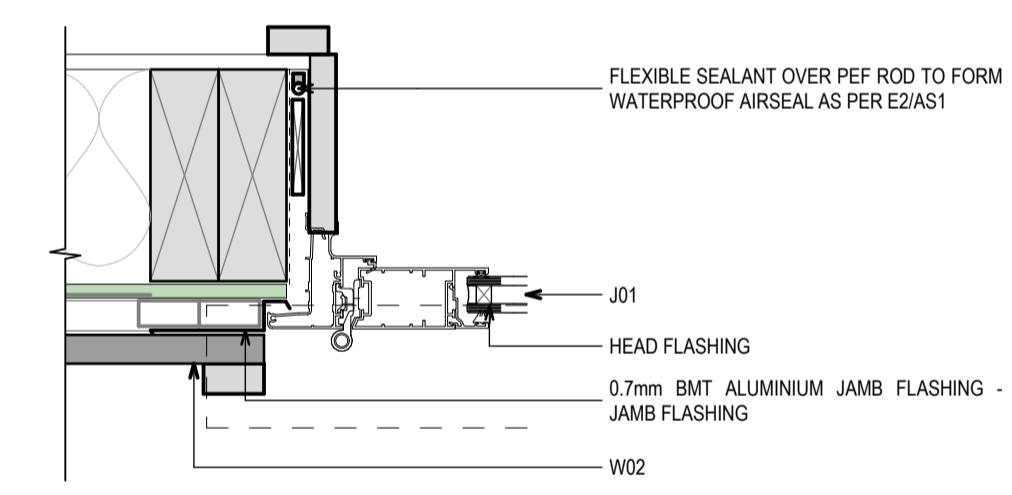
7 STANDARD - SLIDING DOOR REBATE 1:5



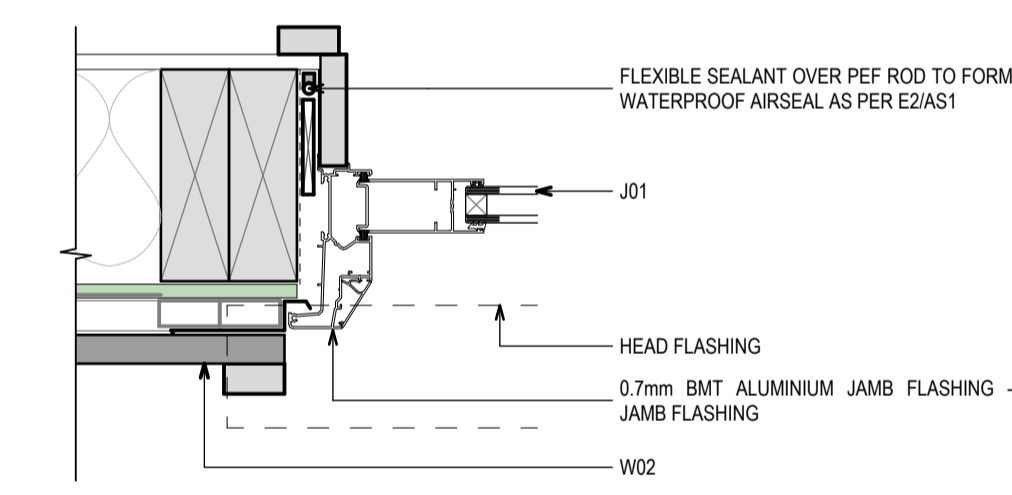
8 STANDARD - GARAGE REBATE 1:5



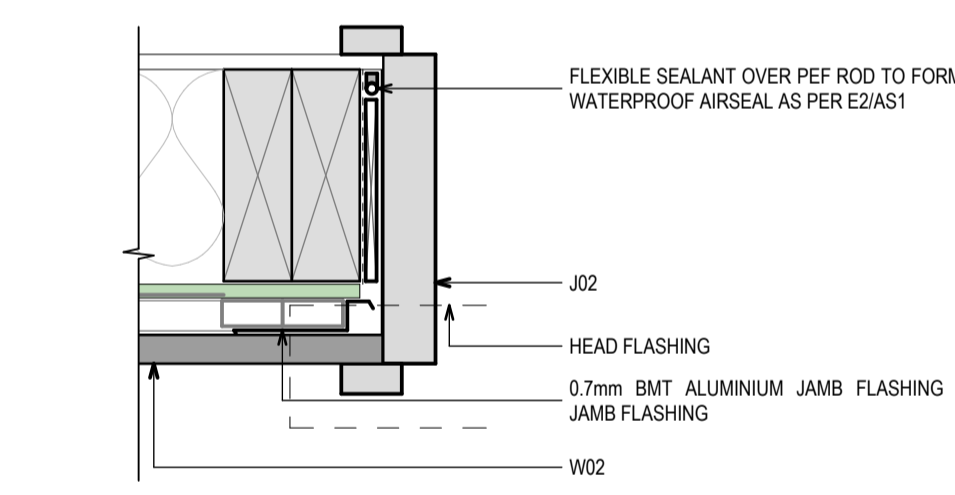
9 TRICLAD - WINDOW JAMB 1:5



10 TRICLAD - DOOR JAMB 1:5



11 TRICLAD - SLIDING DOOR JAMB 1:5



12 TRICLAD - GARAGE DOOR JAMB 1:5

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Date	Change Name	ChID	RevID
29/03/2019			A
29/08/2019			B

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SURVEY:

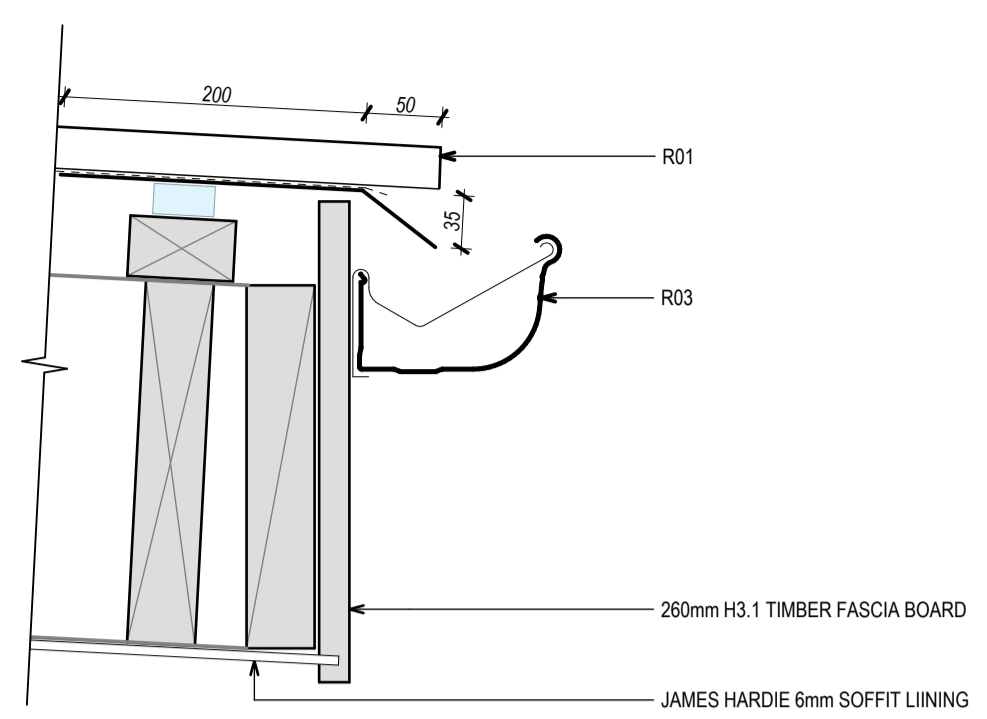
PROJECT:  
**BLYTHE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
CONCEPT

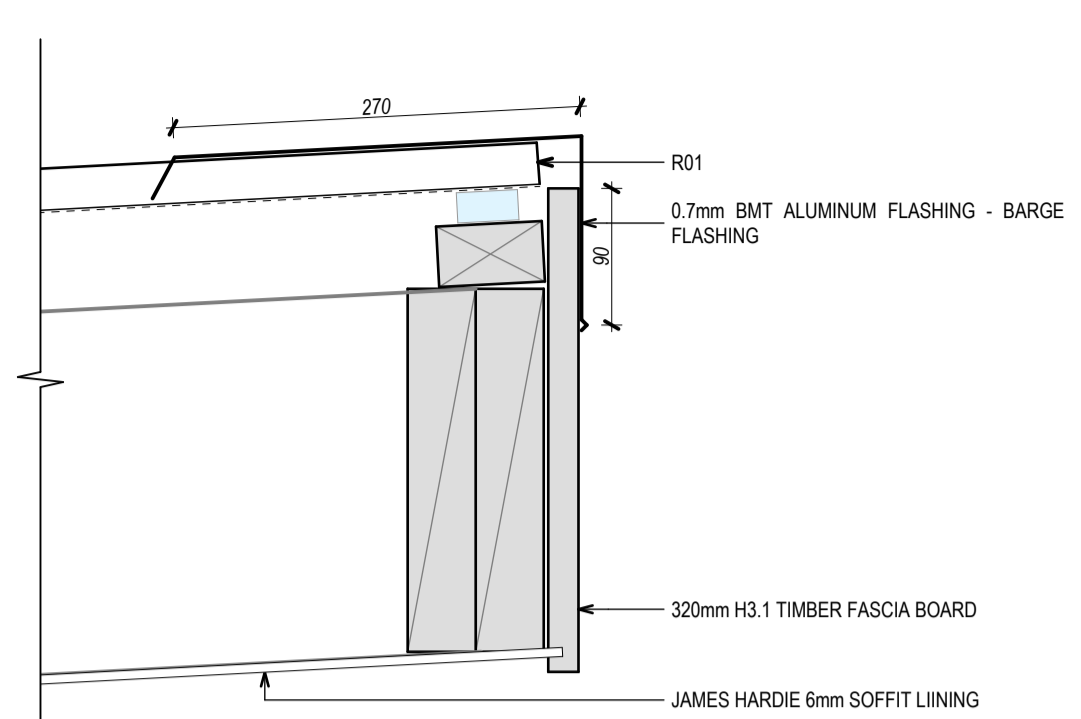
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REVISION: B  
ISSUED: 20/08/2019  
SCALE: 1:5 @ A1  
SHEET NUMBER: **A403**

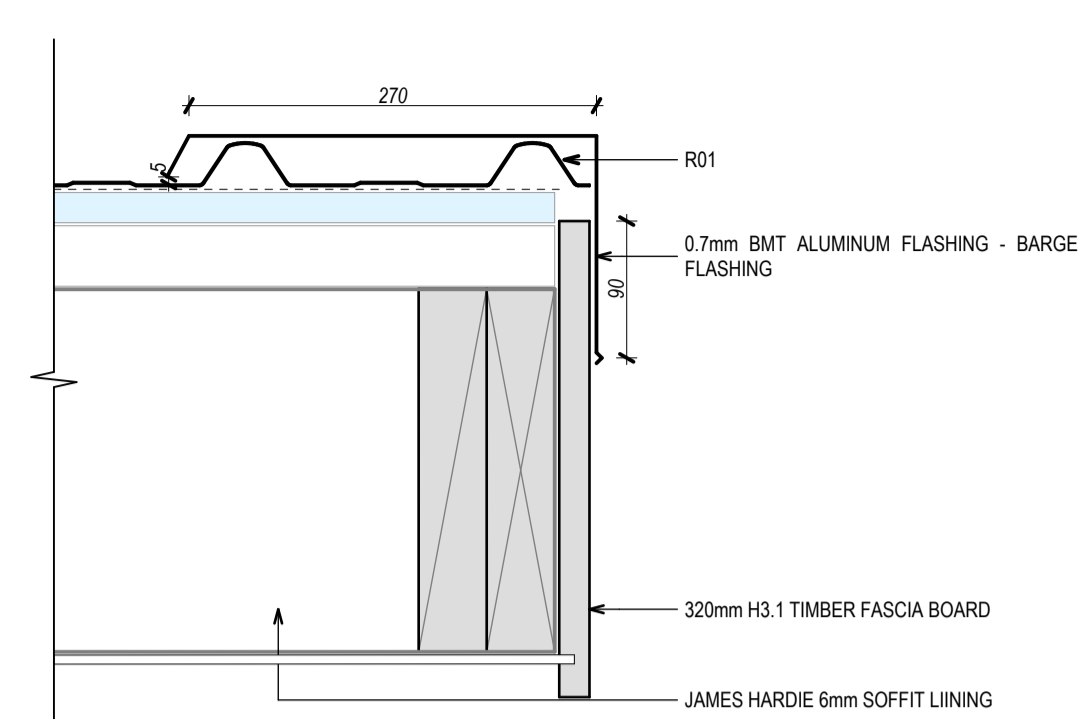
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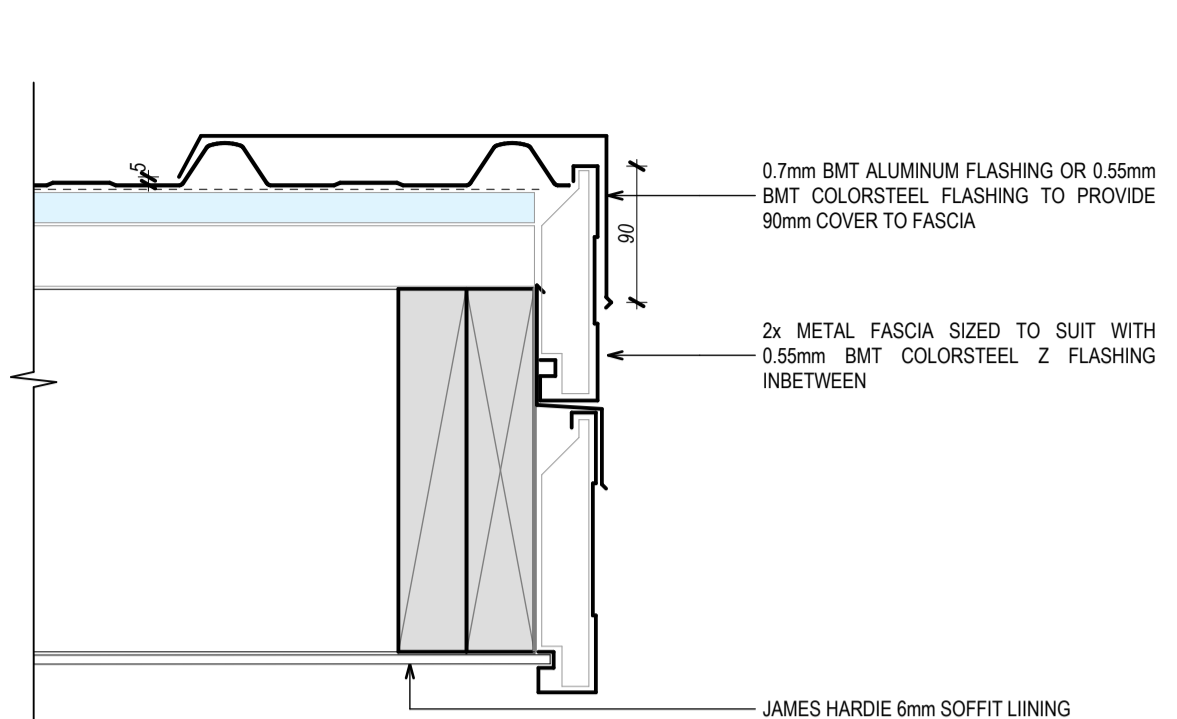
1 EAVE 1:5



2 SAWTOOTH BARGE 1:5



3 BARGE 1:5



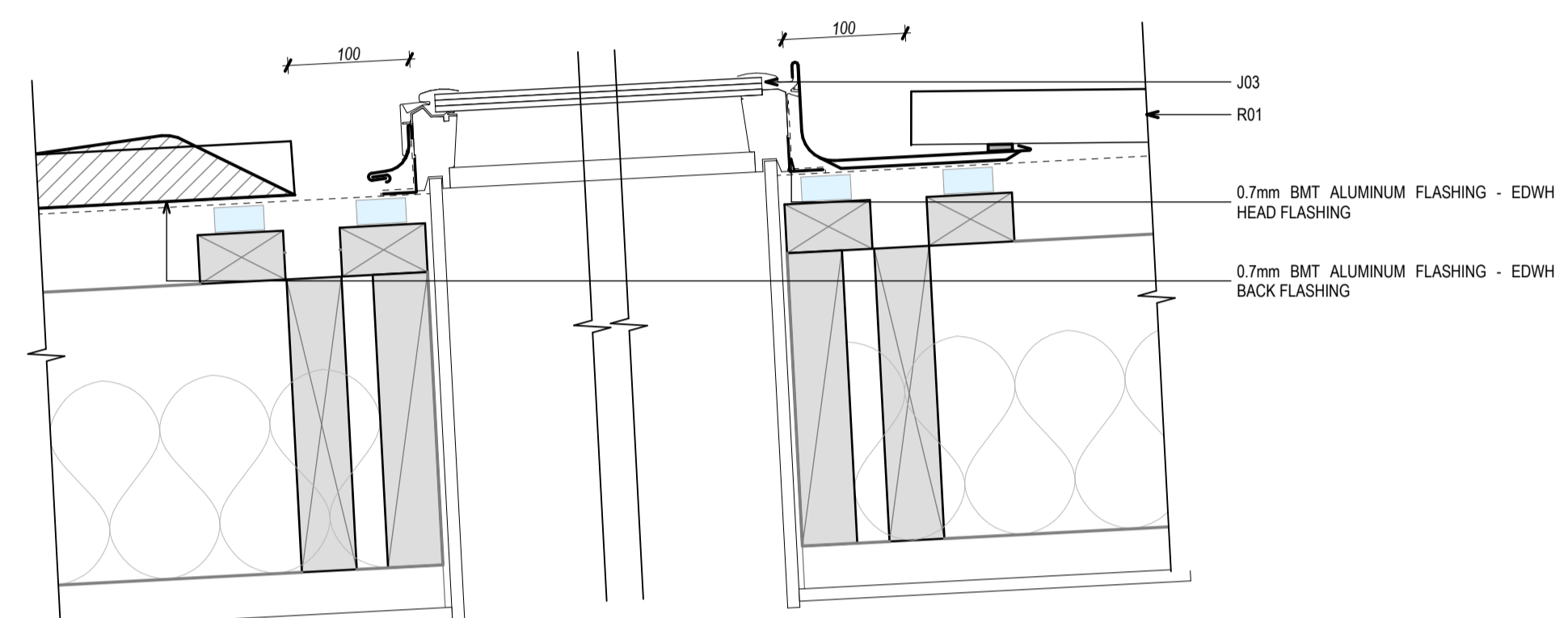
11 ALTERNATIVE BARGE DETAIL 1:5

**NOTES**

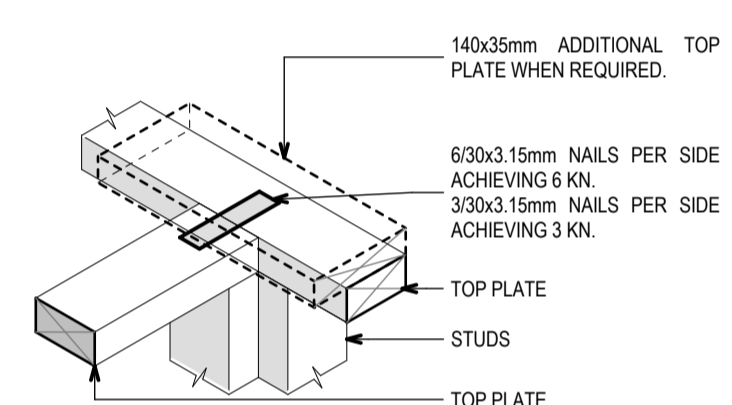
**J03 SKYLIGHTS**  
POWDER COATED ALUMINIUM FRAME

**R01 COLORSTEEL 5-RIB**  
OVER COVERTEK 407 ROOFING UNDERLAY OVER VB20 VENTILATED BATTEN FIXED WITH 1/10G x80mm SELF DRILLING SCREWS ON H1.2 70x45mm SGB TIMBER PURLINS AT 900mm CENTRES OVER H1.2 HYPSPAN 240x45mm LVL TIMBER RAFTERS AT 600mm CENTRES WITH R3.6 INSULATION INFILL.

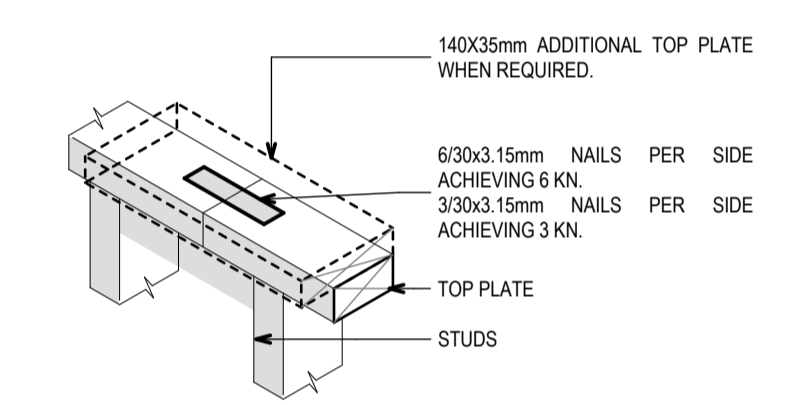
**R03 GUTTERS**  
PVC HALF ROUND GUTTER WITH BRACKETS AT 800mm CENTRES FIXED TO FASCIA. COLOUR TO MATCH ROOF AND CLADDING



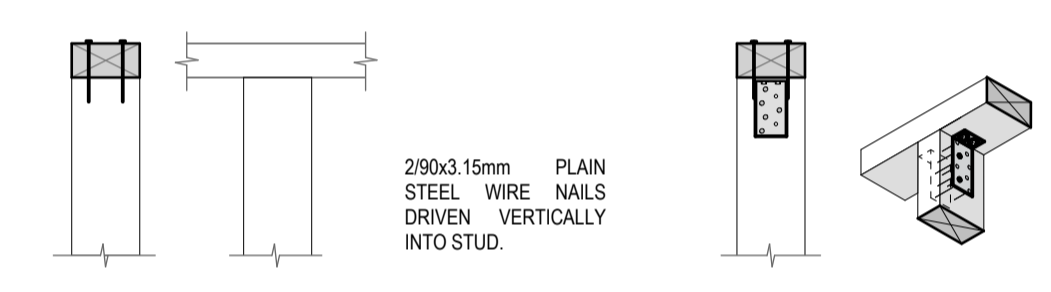
4 SKYLIGHT 1:5



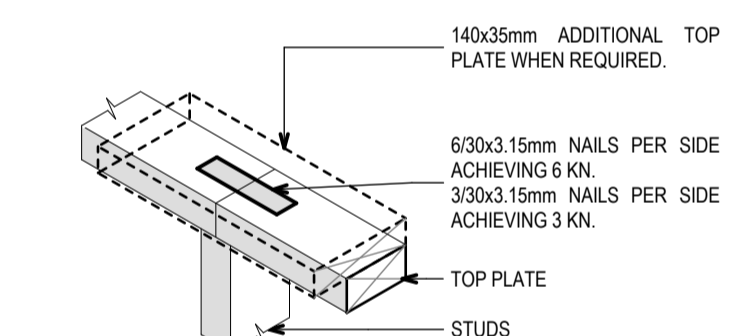
5 BRACING WALLS TOP PLATE CONNECTIONS 1:10



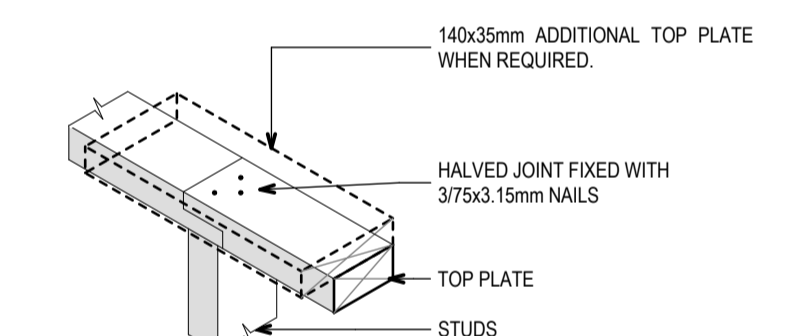
NON-BRACING WALLS TOP PLATE CONNECTIONS 1:10



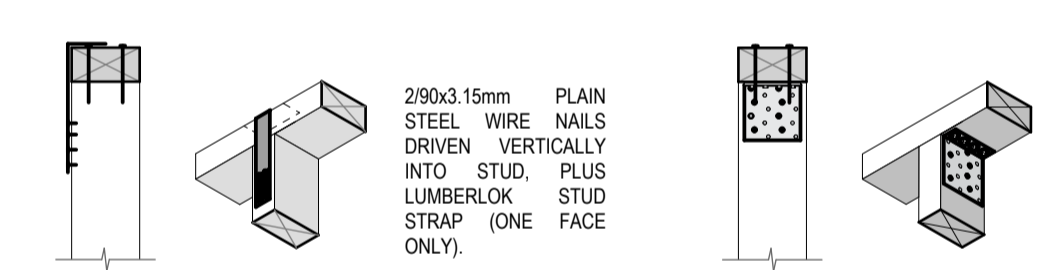
TOP PLATE FIXING TYPE A - 0.7kN TOP PLATE FIXING TYPE B - 0.7kN



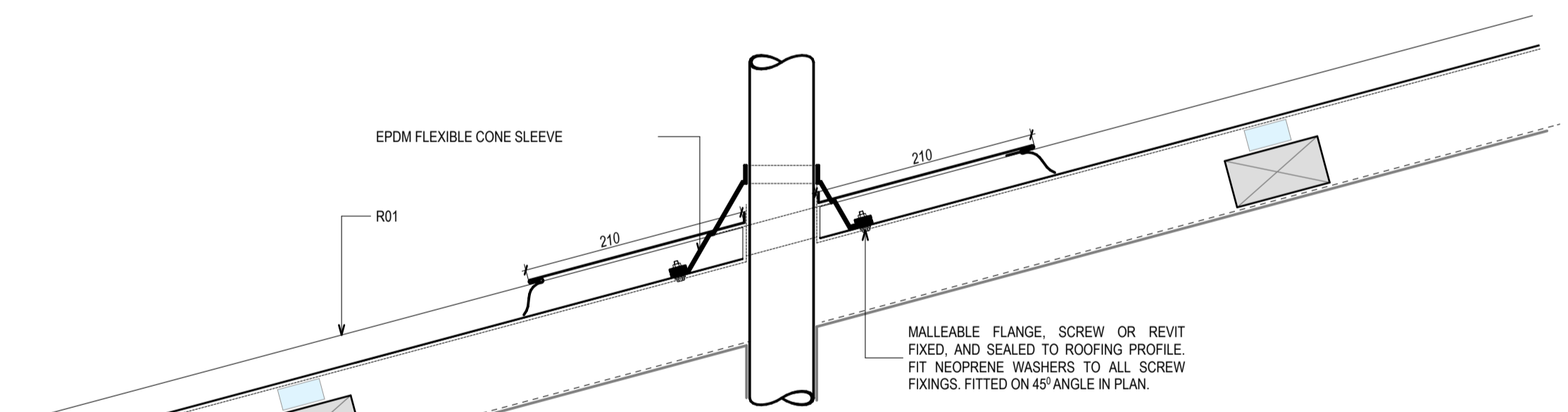
5 BRACING WALLS TOP PLATE CONNECTIONS 1:10



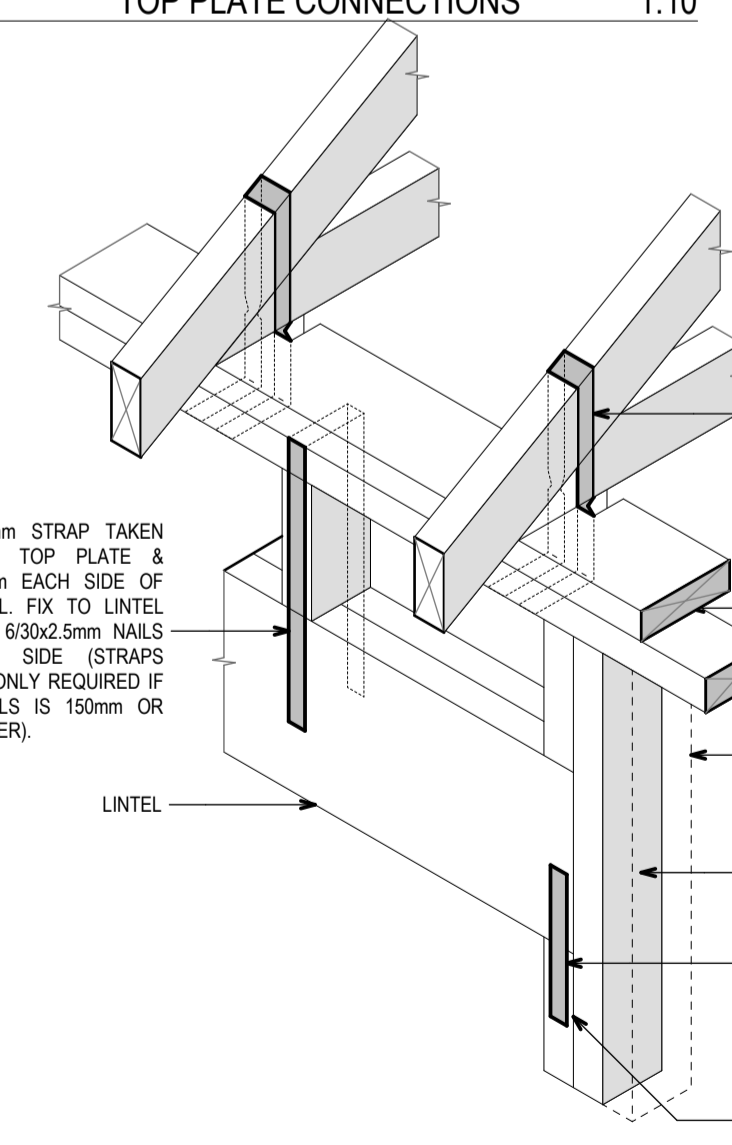
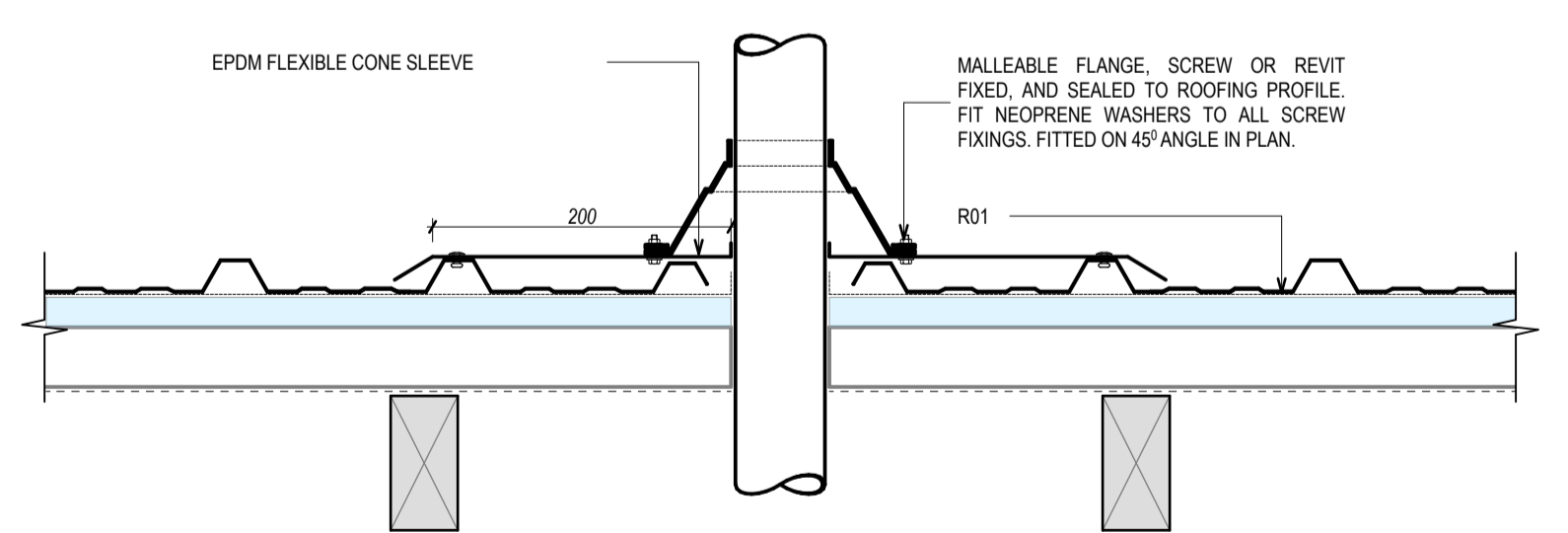
NON-BRACING WALLS TOP PLATE CONNECTIONS 1:10



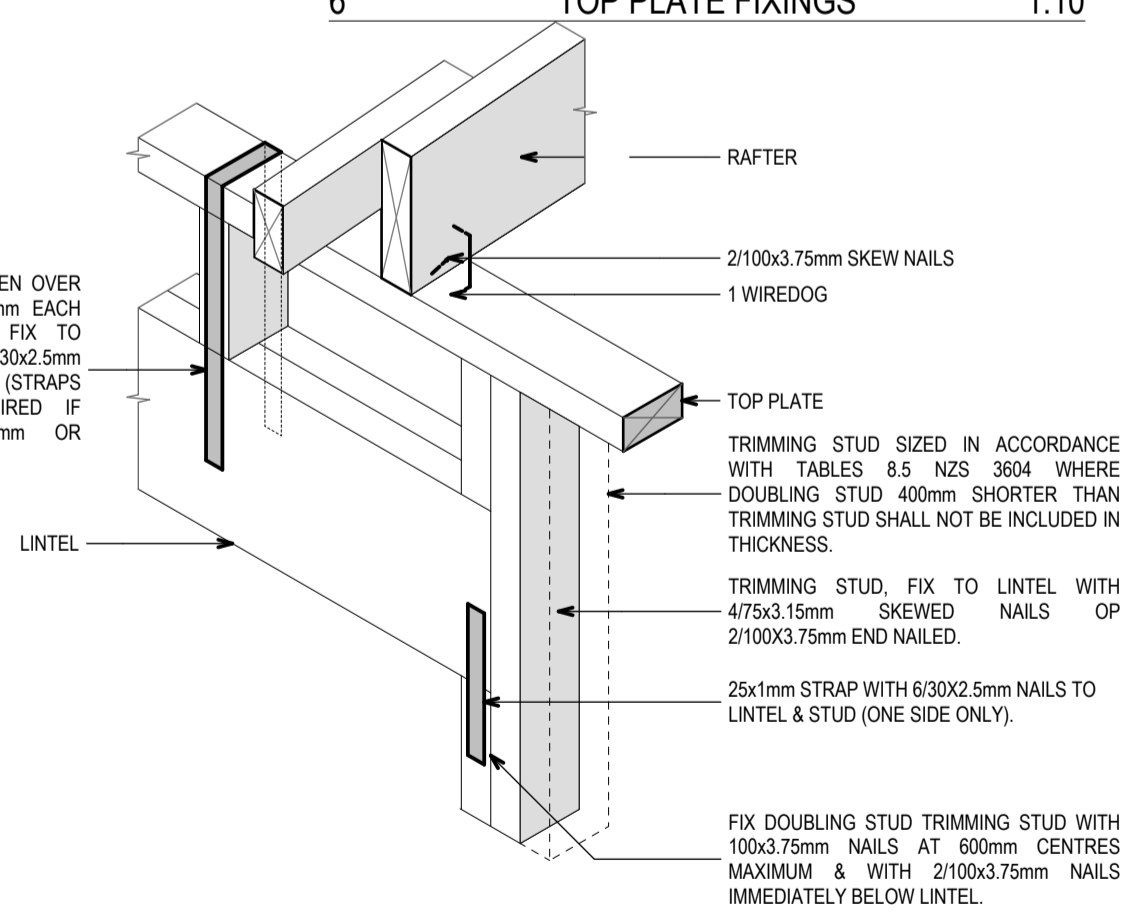
TOP PLATE FIXING TYPE A - 4.7kN TOP PLATE FIXING TYPE B - 4.7kN



10 PIPE PENETRATION 1:5



7 TRUSS AND LINTEL UPLIFT FIXING 1:10



8 RAFTER AND LINTEL UPLIFT FIXING 1:10

Date	Change Name	Chd	RevId
29/08/2019			A
29/08/2019			B

ENGINEER:  
NZS3604:2011  
SURVEY:

PROJECT:  
**BLYTHE HOUSE**  
ADDRESS:  
LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

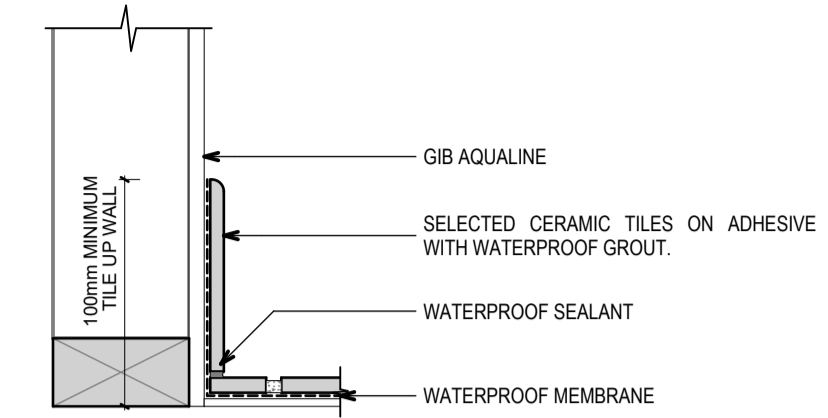
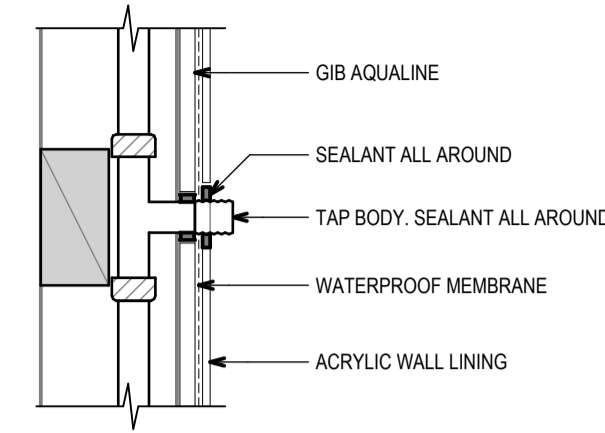
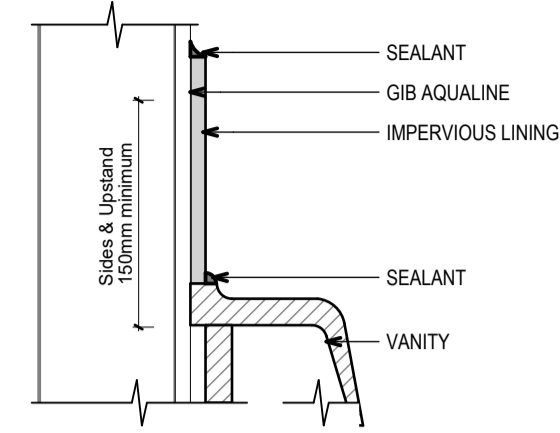
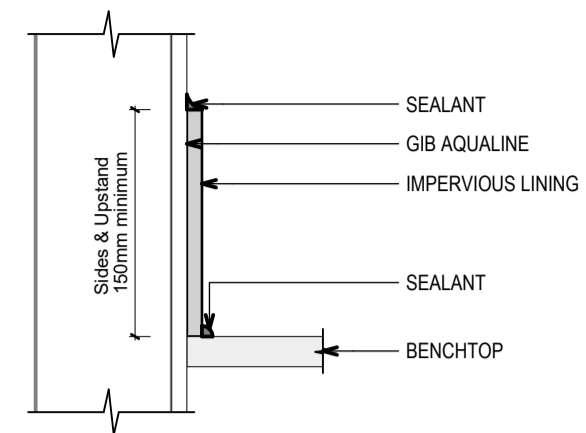
STATUS:  
CONCEPT

TITLE:  
**ROOF AND FRAMING DETAILS**

REVISION: B  
ISSUED: 20/08/2019  
SCALE: 1:5, 1:10 @ A1  
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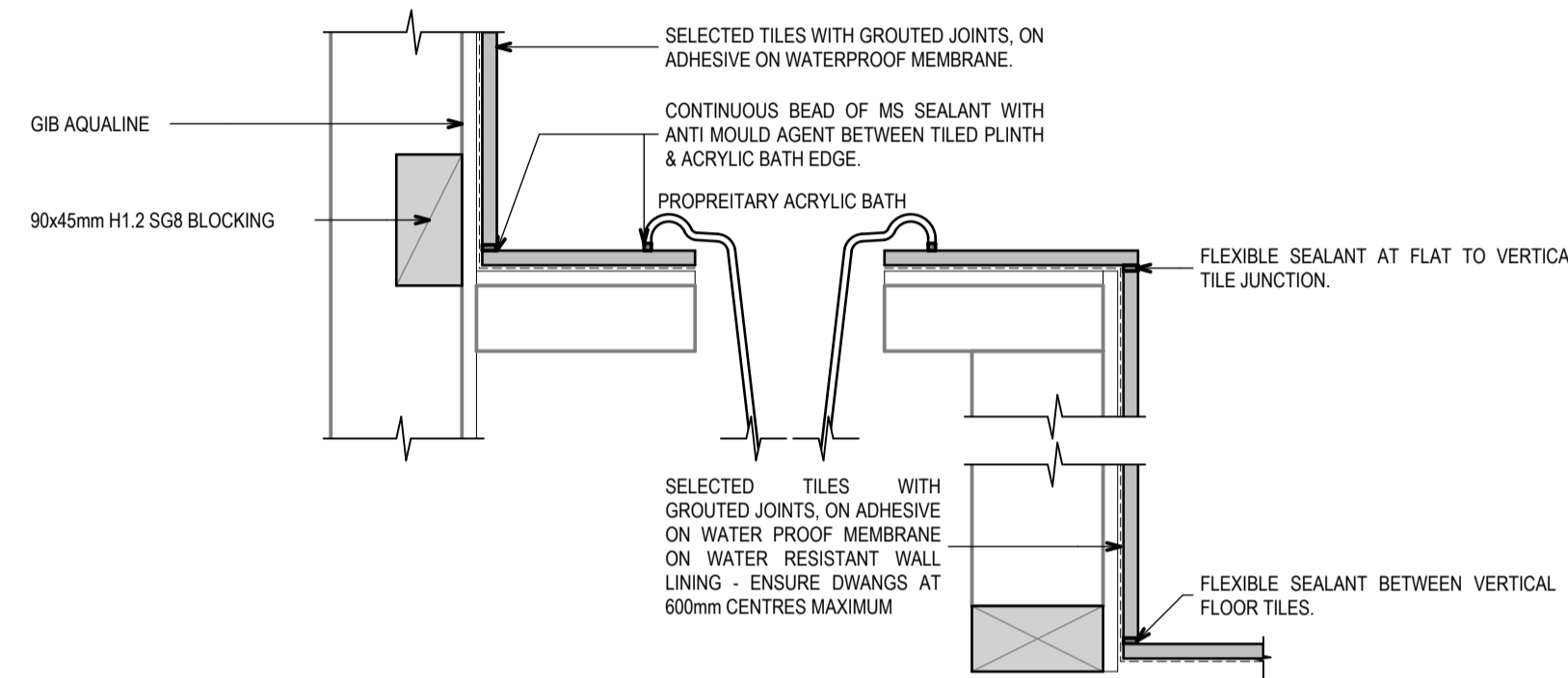
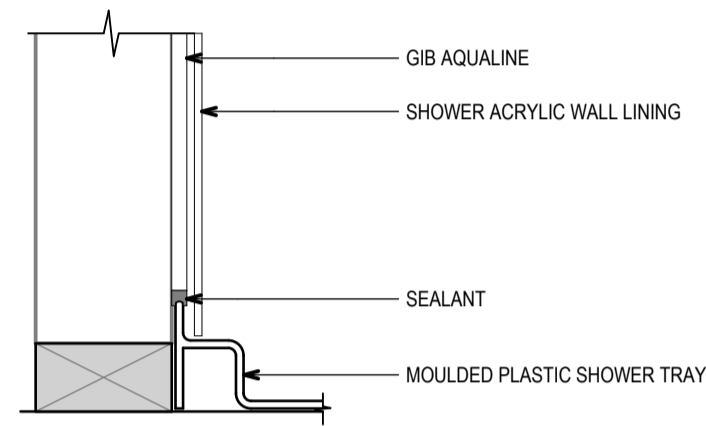


1 BENCH TOP TO WALL 1:5

2 VANITY TO WALL 1:5

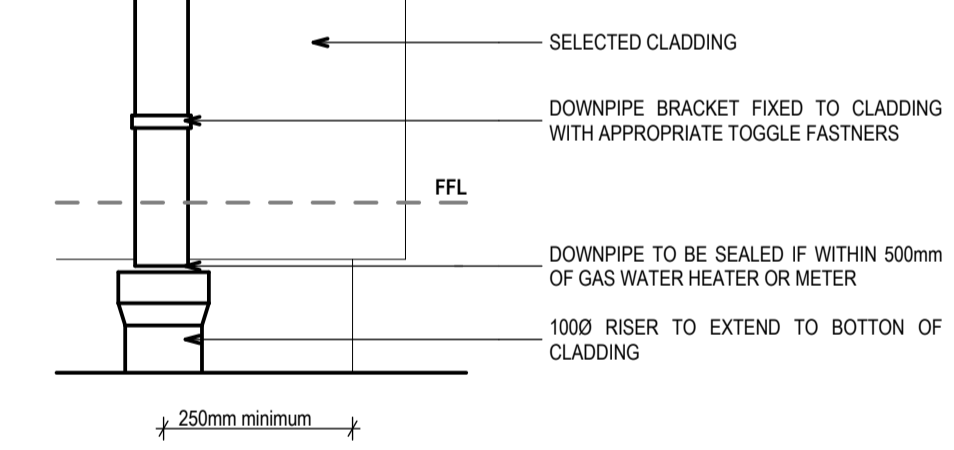
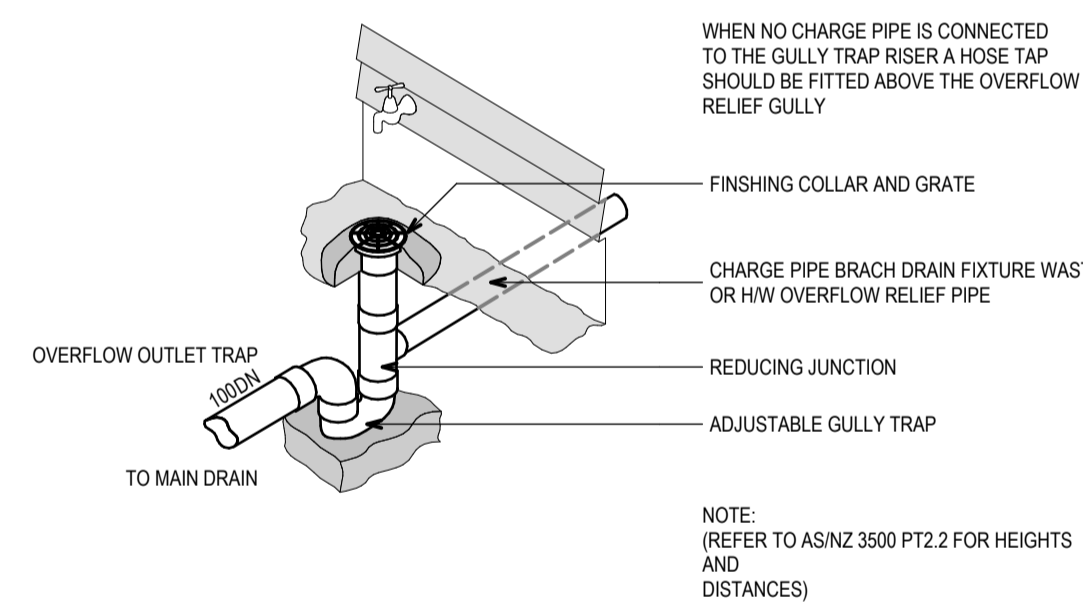
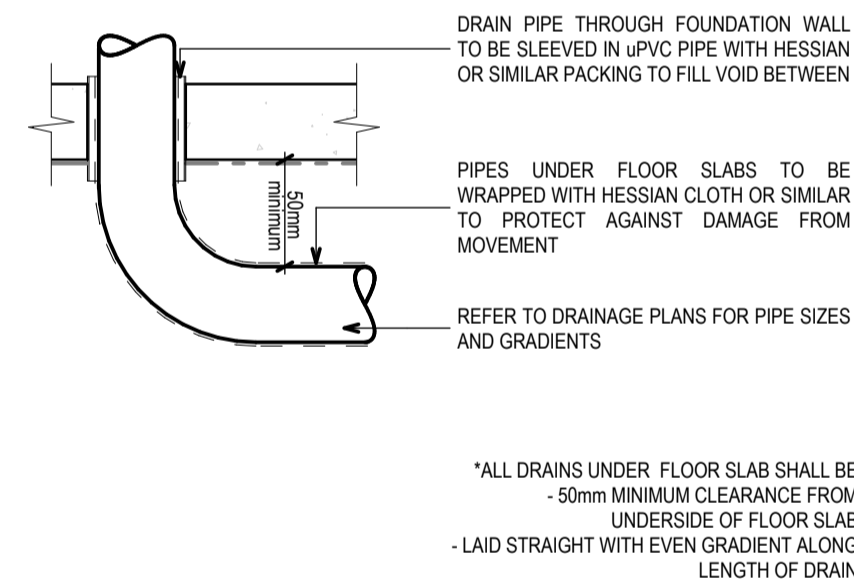
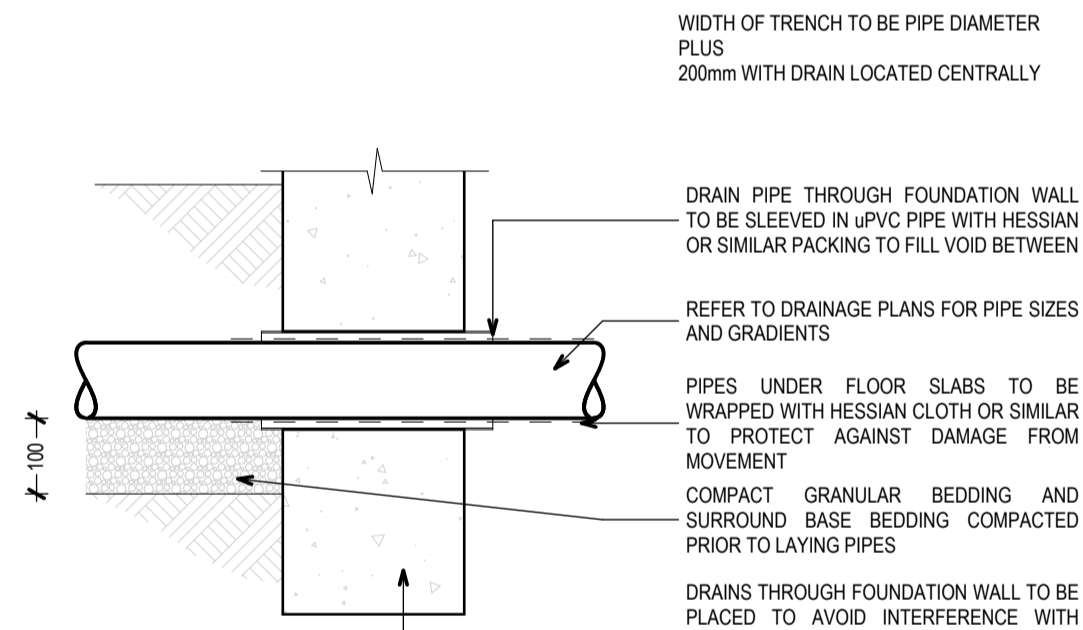
3 PIPE PENETRATION (ACRYLIC) 1:5

4 TILE FLOOR TO WALL 1:5



5 ACRYLIC SHOWER TO WALL 1:5

6 BATH (TILED FLOOR) 1:5

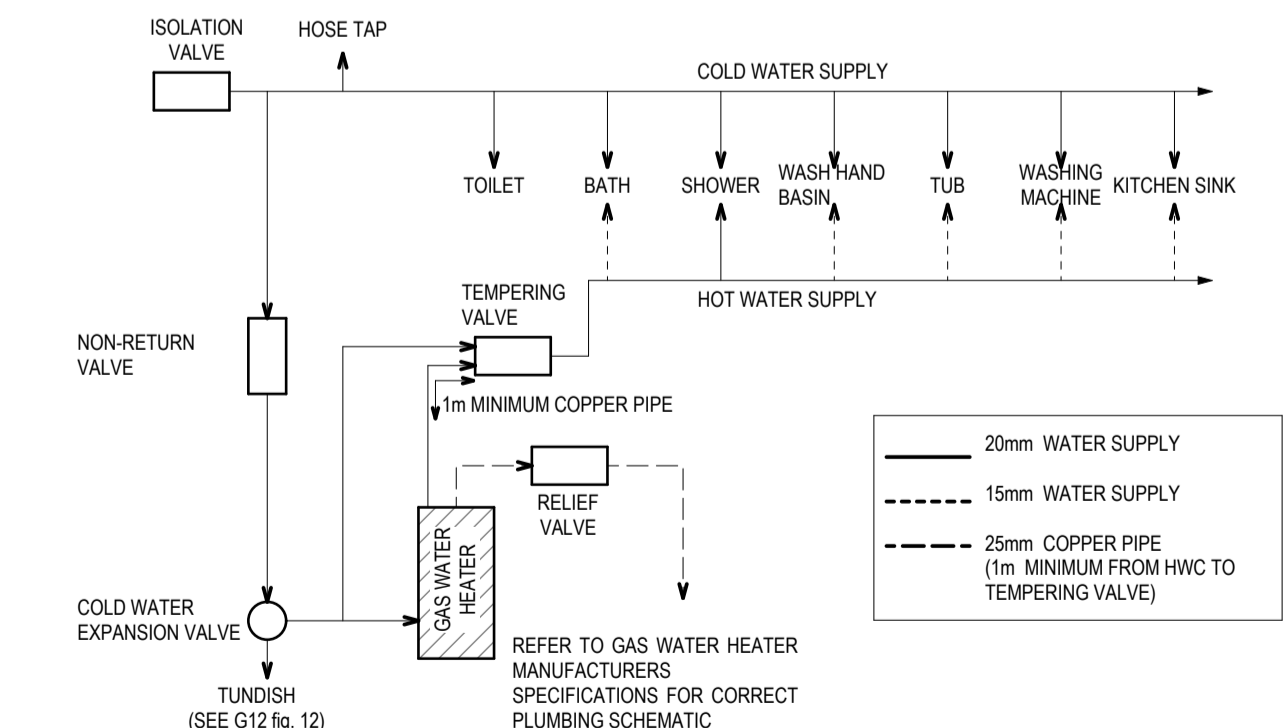
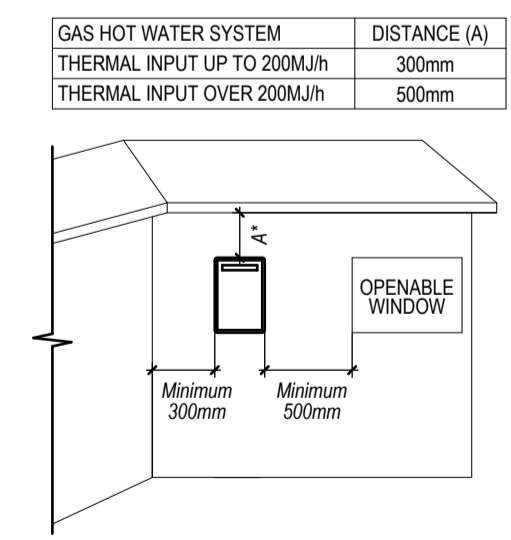
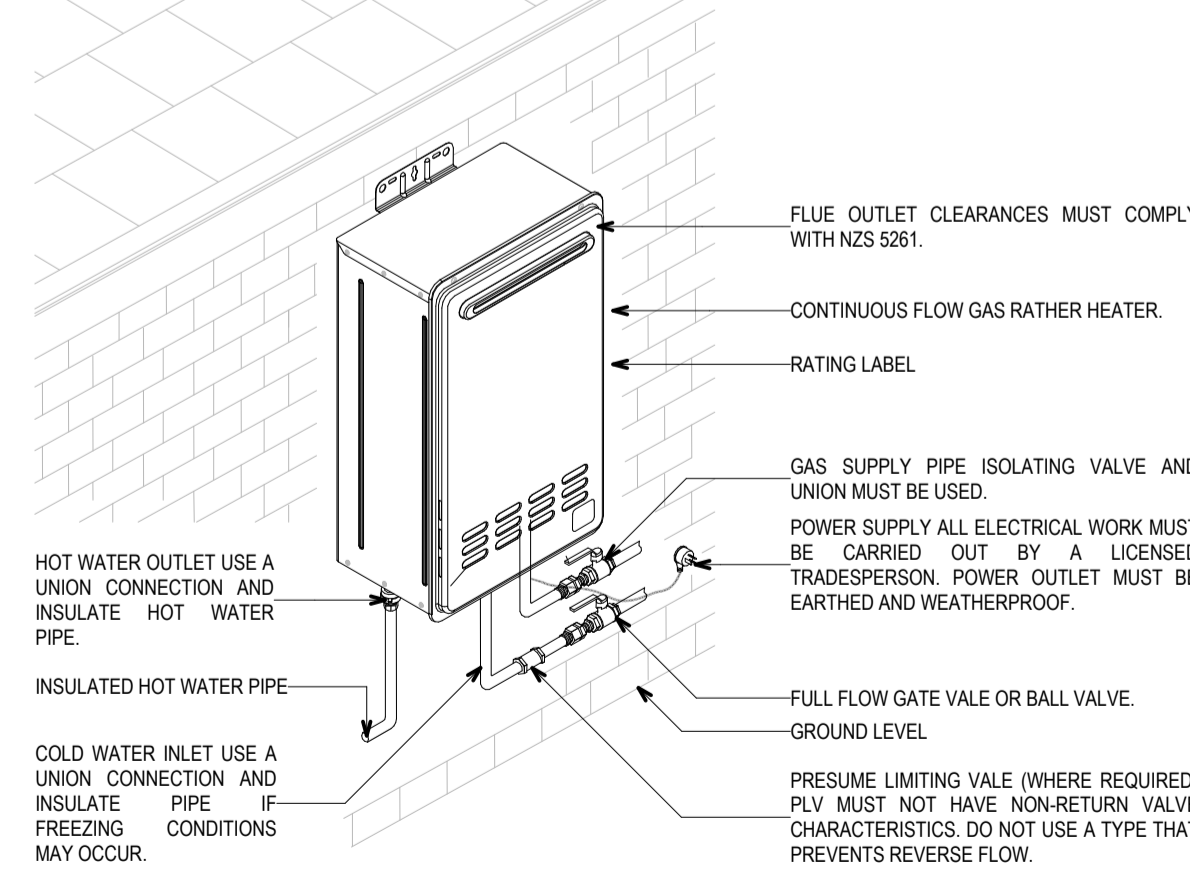
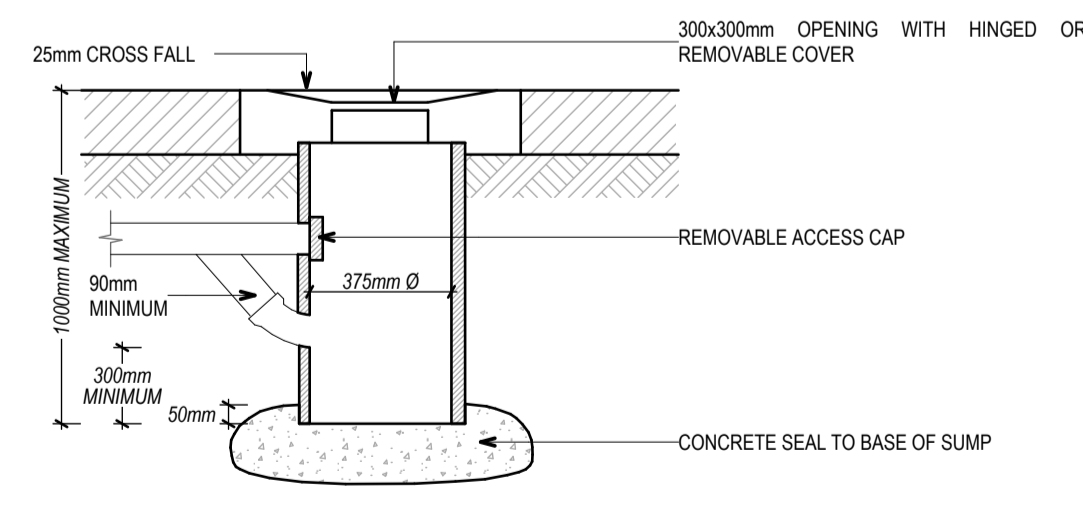


7 PIPE PENETRATION 1:5

8 SLAB PENETRATION 1:5

9 ORG 1:5

10 DOWNPIPE CORNER OFFSET 1:5



11 TYPE 1 SUMP 1:20

12 GAS WATER HEATER 1:100

13 GAS WATER SCHEMATIC 1:100

RECEIVED 20/08/2019

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29/08/2019		B	

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NZS3604:2011  
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PROJECT:  
**BLYTHE HOUSE**  
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LOT: 116 DP: 2086  
5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
CONCEPT  
TITLE:  
**WET AREA AND PLUMBING DETAILS**

REVISION:  
ISSUED: 20/08/2019  
SCALE: 1:5, 1:20, 1:100 @ A1  
SHEET NUMBER: **A405**

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\* ALL CONSTRUCTION IS TO COMPLY WITH NEW ZEALAND BUILDING CODE AND ALL RELEVANT DOCUMENTS, AND WITH THE LOCAL TERRITORIAL AUTHORITY REGULATIONS.

**All Openings Schedule**

Full Element ID	D01	D02	D03	D04	D05	D06	IN	IN	IN	IN	IN
Quantity	1	1	1	1	1	1	1	1	1	2	4
W x H Size	3,600x2,200	860x2,200	3,600x2,200	2,600x2,200	1,585x2,050	910x2,200	1,000x2,200	1,270x2,200	810x2,200	860x2,200	910x2,200
Wallhole Dimensions	3,600x2,200	860x2,200	3,600x2,200	---	1,585x2,050	910x2,200	1,000x2,200	1,270x2,200	1,545x2,200	860x2,200	1,745x2,200
Sill height	0	10	0	0	0	0	0	0	0	0	0
Head height	2,200	2,210	2,200	2,200	2,050	2,200	2,200	2,200	2,200	2,200	2,200
2D Symbol											
View from Side Opposite to Opening Side											

**JOINERY NOTES:**  
 JOINERY MANUFACTURER TO CHECK AND VERIFY THE FOLLOWING PRIOR TO COMMENCING MANUFACTURE OF JOINERY UNITS.  
 ALL DIMENSIONS SHOWN ARE ROUGH OPENINGS.  
 ANY STRUCTURAL SUPPORTS WHERE REQUIRED.  
 REFER TO ENGINEERS DESIGNS WHERE REQUIRED.

**GLAZING TO COMPLY WITH THE FOLLOWING STANDARDS**  
 NZS3504: SPECIFICATION FOR ALUMINIUM WINDOWS  
 NZS4223: CODE OF PRACTICE FOR GLAZING IN BUILDINGS  
 NZS4211: SPECIFICATION FOR THE PERFORMANCE OF WINDOWS

ALL FIXINGS AND FLASHINGS TO MANUFACTURERS DETAILS AND SPECIFICATIONS.  
 REFER FLOOR PLANS/ELEVATIONS FOR HANGING ORIENTATIONS.

**LEGEND:**  
 -SAFETY GLAZING (SG)  
 -OBSCURE GLAZING (OB)

1 Door Schedule 2:1

**All Openings Schedule**

Full Element ID	W01	W02	W03	W04	W05	W05A	W06	W07	W08	W09
Quantity	1	1	1	1	1	1	1	1	1	1
W x H Size	1,200x2,200	1,200x800	800x800	800x800	800x800	1,800x400	1,400x1,450	1,200x1,450	2,400x800	2,400x800
Sill height	0	1,400	1,400	1,400	1,400	1,800	750	750	1,400	1,400
Head height	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200
2D Symbol										
View from Side Opposite to Opening Side										

W10	W11	W12
1	1	1
2,400x800	1,200x650	1,200x800
1,400	1,550	1,400
2,200	2,200	2,200

3 Window Schedule 2:1

Date	Change Name	ChID	RevID
29/03/2019			A
29/08/2019			B

ENGINEER:  
 NZS3604:2011  
 SURVEY:

PROJECT:  
**BLYTHE HOUSE**  
 ADDRESS:  
 LOT: 116 DP: 2086  
 5A TOI STREET, TAWHERO, WHANGANUI

STATUS:  
 RFI RESPONSE

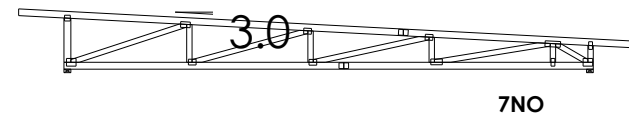
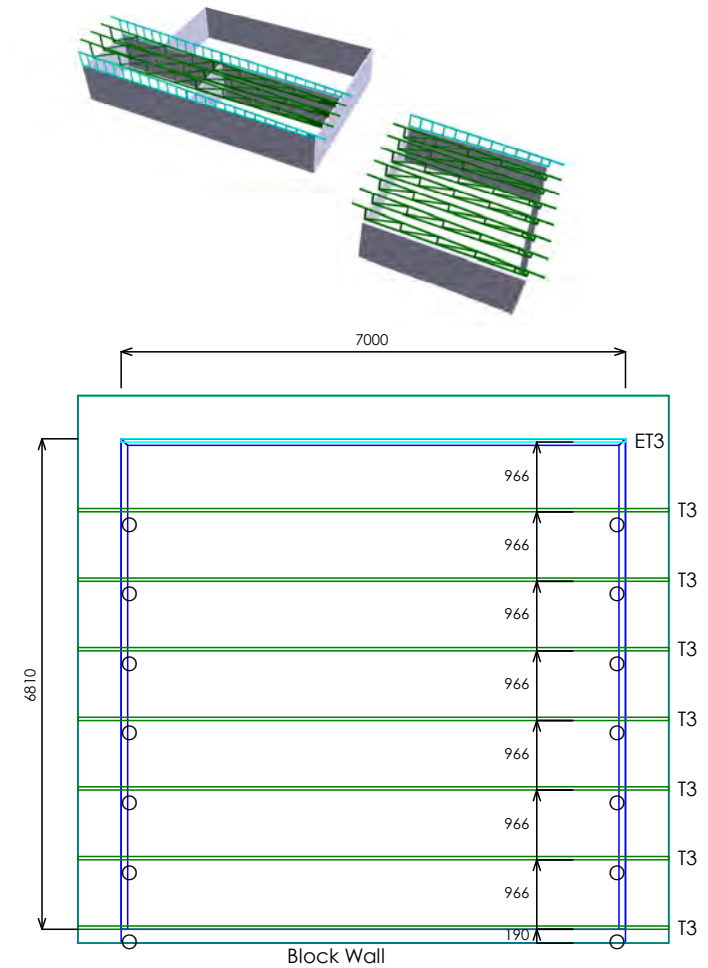
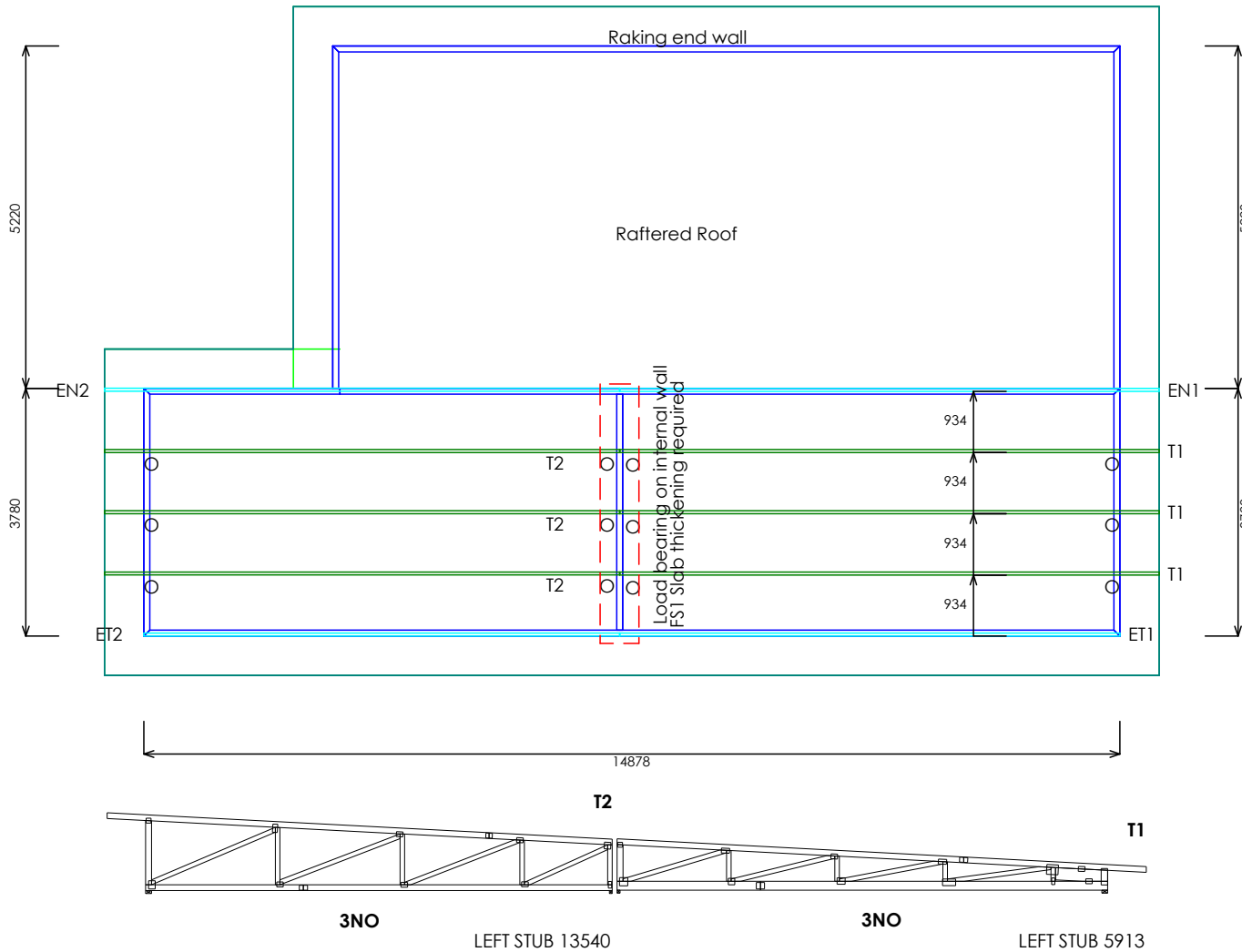
TITLE:  
**DOOR AND WINDOW SCHEDULE**

REVISION:  
 ISSUED: 20/08/2019  
 SCALE: 2:1 @ A1

SHEET NUMBER: **A501**

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Nib 12913

LEFT STUB 5913

PrimeCad v4.7.301

Prepared By:

**WANGANUI**  
FRAMES & TRUSSES LTD  
200 Taupo Quay, Ph: 06 349 1037  
Email: framesandtrusses@icloud.com

Site Address :  
Blythe  
5A Toi St, Tawhero  
Wanganui

Sheet Title :  
**For Building Consent  
Buildable Truss Layout**

Date : 22 Mar,2019    Drawn : Mark McCormick  
Scale : 1: 100    System : MiTek 20/20

Job Details:

Roof Pitch : 3. Deg  
Roof Material : Light  
Ceiling Material : Standard  
Wind Zone : High  
Roof Snow Load : 0.000 kPa

Truss Centres : 900 mm  
Roof Live Load : 0.250kPa  
Floor Live Load : kPa  
Wind Speed : 44.0 m/s



Job Title :  
**12327**

Sheet :  
**1**

Revision Number :

RECEIVED 23/05/2019

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

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

www.mitek.nz.co.nz

MiTek 20/20 Engineering 4.7.301.0

Printed: 13:07:25 22 Mar 2019

## PRODUCER STATEMENT for MiTek 20/20<sup>®</sup> TRUSS DESIGN - Version 4.7

ISSUED BY: **MiTek New Zealand Limited**  
TO: **Wanganui Frames and Trusses**  
IN RESPECT OF: **MiTek<sup>®</sup> Truss Designs**

This producer statement covers the MiTek 20/20<sup>®</sup> truss design and the structural performance of the GANG-NAIL<sup>®</sup> connector plate for the job reference **12327** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

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

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

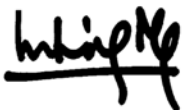
- i) All proprietary products meeting their performance specification requirements
- ii) The provision of adequate roof bracing and overall building stability
- iii) Correct selection and placement of GANG-NAIL connector plates
- iv) Correct input of Truss Design Data as shown in the Fabricator Design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

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

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

**On behalf of MiTek New Zealand Limited,**

**Date: Friday, 22 March 2019**



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

RECEIVED 23/05/2019

Job: 12327

Client: Wanganui Frames &amp; Trusses

Site: Blythe

Phone:

5A Tol St, Tawhero

Wanganui

Description:

Building Consent No.:

MiTek 20/20 Engineering 4.7.301.0

MiTek New Zealand Limited

Phone:

Printed: 13:07:25 22 Mar 2019

**MITEK FABRICATOR DESIGN STATEMENT**

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

**MiTek 20/20® TRUSS DESIGN DATA**

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

**Job Details**

Importance Level : 2

Design Working Life : 50 years

**Roof Truss**

Timber Group: MSG8 10 H1.2

Pitch: 3.000 deg

Nominal Overhang: 600 mm

**Roof****Ceiling****Wind**

Material: Light  
 Dead Load: 0.250 kPa  
 Restraints: 1200 mm centres  
 Live Load: Qur = 0.250 kPa  
 Qc = 1.100 kN

Material: Standard  
 Dead Load: 0.200 kPa  
 Restraints: 400 mm centres  
 Live Load: Qc = 1.400 kN

Area: High (44.0 m/s )  
 Pressure Coeff: Cpe = varies; Cpi = -0.30, 0.20

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

**MiTek® Truss List**

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
T1	3	7627	3.000	934
T2	3	7251	3.000	900
T3	7	7000	3.000	966
EN1	1	7627	3.000	934
EN2	1	7251	3.000	900
ET1	1	7627	3.000	934
ET2	1	7251	3.000	900
ET3	1	7000	3.000	966

Total quantity : 18

RECEIVED 23/05/2019

The computer design input has been carried out by:

Signed: 

Date: ...Friday, 22 March 2019....

Name of Detailer: Mark McCormick

Qualifications and Title: MiTek Detailer

On behalf of: Wanganui Frames and Trusses

## Demand Calculation Sheet

### Job Details

Name: BLYTHE HOUSE  
 Street and Number: 5A TOI STREET  
 Lot and DP Number: LOT 201 DP  
 City/Town/District: WHANGANUI  
 Designer:  
 Company: BB  
 Date: 06/03/2019

### Building Specification

Number of Storeys 1  
 Floor Loading 2 kPa  
 Foundation Type Subfloor  
 Subfloor Cladding Weight Light  
 Cladding Weight **Single** Light  
 Roof Weight Light  
 Room in Roof Space No  
 Roof Pitch (degrees) 3  
 Roof Height above Eaves (m) 1  
 Building Height to Apex (m) 5.3  
 Ground to Lower Floor (m) 1.4  
 Average Stud Height (m) 2.4  
 Building Length (m) 14.878  
 Building Width (m) 9  
 Building Plan Area (m<sup>2</sup>) 118.88

### Building Location

Wind Zone = High

Earthquake Zone 2

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

### Bracing Units required for Wind

	Along	Across
Single Level	392	548
Subfloor Level	856	1063

### Bracing Units required for Earthquake

	Along & Across
Single Level	833
Subfloor Level	1247



# Single Level Along Resistance Sheet

Job Name: BLYTHE HOUSE

Timber Floor Limit of 120 BUs/m Applied

Wind	EQ
Demand	
392	833
Achieved	

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1118	1144
A	1	1.00		2.4	JHD 0.6	HomeRAB	99	107	285%	137%
	2	1.00		2.4	JHD 0.6	HomeRAB	99	107		
	3	0.50		2.4	JHD 0.4	HomeRAB	42	54		
	4	0.60		2.4	JHD 0.6	HomeRAB	59	64		
	5	1.00		2.4	JHD 0.6	HomeRAB	99	107		
	6	0.80		2.4	JHD 0.6	HomeRAB	79	86		
									477 OK	524 OK
B	1	1.20		2.4	GS1-N	GIB®	83	72		
	2	1.90		2.4	GS1-N	GIB®	131	114		
									214 OK	186 OK
C	1	1.50		2.4	JHD 1.2	HomeRAB	180	180		
	2	1.40		2.4	JHD 1.2	HomeRAB	168	168		
	3	0.80		2.4	JHD 0.6	HomeRAB	79	86		
									427 OK	434 OK



## Single Level Across Resistance Sheet

Job Name: **BLYTHE HOUSE**

Timber Floor Limit of 120 BUs/m Applied

Wind	EQ
Demand	
548	833
Achieved	

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1063 194%	1059 127%
1	1	1.10		2.4	JHD 0.6	HomeRAB	109	118		
	2	1.00		2.4	JHD 0.6	HomeRAB	99	107		
									208 OK	225 OK
2	1	0.80		2.4	JHD 0.6	HomeRAB	79	86		
	2	0.70		2.4	JHD 0.6	HomeRAB	69	75		
									149 OK	161 OK
3	1	1.10		2.4	GS1-N	GIB®	74	66		
	2	0.60		2.4	GS1-N	GIB®	34	35		
									108 OK	101 OK
4	1	3.50		2.4	GS1-N	GIB®	242	210		
									242 OK	210 OK
5	1	1.20		2.4	JHD 1.2	HomeRAB	144	144		
	2	1.20		2.4	JHD 1.2	HomeRAB	144	144		
	3	0.70		2.4	JHD 0.6	HomeRAB	69	75		
									357 OK	363 OK



## Subfloor Level Along Resistance Sheet

Job Name: BLYTHE HOUSE

									Wind	EQ
									Demand	
									856	1247
									Achieved	
Line	Element	Length (m)	Angle (degrees)		Type	Supplier	Wind (BUs)	EQ (BUs)	1920 224%	1440 115%
A	1	1.00			Braced Piles	NZS3604	160	120		
	2	4.00			Anchor Pile	NZS3604	640	480		
									800 OK	600 OK
B	1	2.00			Braced Piles	NZS3604	320	240		
	2	1.00			Anchor Pile	NZS3604	160	120		
									480 OK	360 OK
C	1	1.00			Braced Piles	NZS3604	160	120		
	2	3.00			Anchor Pile	NZS3604	480	360		
									640 OK	480 OK



## Subfloor Level Across Resistance Sheet

Job Name: BLYTHE HOUSE

									Wind	EQ
									Demand	
									1063	1247
									Achieved	
Line	Element	Length (m)	Angle (degrees)		Type	Supplier	Wind (BUs)	EQ (BUs)	1920	1440
1	1	2.00			Braced Piles	NZS3604	320	240	181%	115%
										320 OK
2	1	1.00			Braced Piles	NZS3604	160	120		
	2	2.00			Anchor Pile	NZS3604	320	240		
									480 OK	360 OK
3	1	2.00			Anchor Pile	NZS3604	320	240		
										320 OK
4	1	2.00			Anchor Pile	NZS3604	320	240		
										320 OK
5	1	3.00			Anchor Pile	NZS3604	480	360		
										480 OK



## Demand Calculation Sheet

### Job Details

Name: BLYTHE HOUSE - GARAGE  
 Street and Number: 5A TOI STREET  
 Lot and DP Number: LOT 201 DP  
 City/Town/District: WHANGANUI  
 Designer:  
 Company: BB  
 Date: 06/03/2019

### Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	<b>Single</b>
Cladding Weight	Light
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	3
Roof Height above Eaves (m)	1
Building Height to Apex (m)	3.6
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	7
Building Width (m)	7
Building Plan Area (m <sup>2</sup> )	49

### Building Location

Wind Zone = High

Earthquake Zone 2

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

### Bracing Units required for Wind

	Along	Across
Single Level	266	219

### Bracing Units required for Earthquake

	Along & Across
Single Level	184



# Single Level Along Resistance Sheet

Job Name: BLYTHE HOUSE - GARAGE

									Wind	EQ
									Demand	
									266	184
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	641 241%	596 324%
D	1	1.10		2.4	GS1-N	GIB®	74	66		
	2	1.10		2.4	GS1-N	GIB®	74	66		
									147 OK	131 OK
E	1	1.20		2.4	BL1-H	GIB®	154	125		
										154 OK
F	1	3.40		2.4	BLK	ConcreteBlock	340	340		
										340 OK



## Single Level Across Resistance Sheet

Job Name: BLYTHE HOUSE - GARAGE

									Wind	EQ
									Demand	
									219	184
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	660	586
									301%	318%
6	1	0.90		2.4	GS1-N	GIB®	57	53		
	2	1.00		2.4	GS1-N	GIB®	65	60		
									122 OK	113 OK
7	1	3.60		2.4	GS1-N	GIB®	248	216		
										248 OK
8	1	0.70		2.4	GS1-N	GIB®	41	41		
	2	3.60		2.4	GS1-N	GIB®	248	216		
									290 OK	257 OK

## Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
Ecoply	EP1 0.4	0.4	80	95
Ecoply	EP1 0.6	0.6	95	105
Ecoply	EP1 1.2	1.2	120	135
Ecoply	EPG 0.4	0.4	100	115
Ecoply	EPG 1.2	1.2	150	150
HomeRAB	HP 0.4	0.4	85	91
HomeRAB	HP 0.6	0.6	99	103
HomeRAB	HP 1.2	1.2	133	104
HomeRAB	HP 2.4	2.4	141	67
HomeRAB	HPg 0.4	0.4	90	98
HomeRAB	HPg 0.6	0.6	127	136
HomeRAB	HPg 1.2	1.2	164	138
ConcreteBlock	BLK	1	100	100
200PFC	200PFC	0.4	83.33	83.33
230PFC	230PFC	0.4	88.1	88.1

BRANZ NZS 4218:2009 CALCULATION METHOD TOOL

PROJECT SUMMARY

Project name	BLYTHE HOSUE
Address	5A TOI STREET
Designer	BUILDBIM
Address	
Phone	
Date	28/01/2019
Reference number	OTC 032

Climate zone	3: South Island, Taupo and Ruapehu Districts, northern part of Rangitikei District, Stewart Island, Chatham Islands						
Wall construction type	1: Any wall type						
If mixed wall types	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; height: 20px;"></td> <td>0 Percentage of wall area solid timber construction</td> </tr> <tr> <td style="height: 20px;"></td> <td>0 Percentage of wall area high thermal mass construction</td> </tr> <tr> <td style="text-align: right;">100</td> <td>Percentage of wall area "Any wall type"</td> </tr> </table>		0 Percentage of wall area solid timber construction		0 Percentage of wall area high thermal mass construction	100	Percentage of wall area "Any wall type"
	0 Percentage of wall area solid timber construction						
	0 Percentage of wall area high thermal mass construction						
100	Percentage of wall area "Any wall type"						
If solid timber wall	1: External 75 mm thick solid timber and timber framed internal walls						

**Is there just one wall construction R-value ( $R_{Wall}$ ) and one door ( $R_{Door}$ ) construction R-value (but different to the walls) for the building?** no

Summary of calculation method heat loss

Element	Area (m <sup>2</sup> )	Proposed building heat loss (W/°C)	Reference building heat loss (W/°C)
Roofs/ceilings	155.1	46.0	47.4
Walls	110.9	27.9	56.4
Floors	118.0	42.0	90.8
Vertical glazing	32.8	126.1	168.1
Skylights	1.2	8.3	-
Doors (Attributable)	2.0	0.0	-
<b>Total</b>		<b>250.2</b>	<b>362.6</b> W/°C

Glazing percentage: 23%

Glazing <50%: Yes

Minimum R-values OK: Yes

Issues to check: Some R-values appear to be very high. Check highlighted values.

PASS/FAIL

PASS

CEDAR

**Bcon19/0212 - WDC Approved Plans - 29/08/2019**

3.98 m<sup>2</sup>C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail](#)

external surface 0.03

Cladding : Rusticated or shiplap weatherboard  
R-value: 0.16

Air Barrier : 9mm fibre cement RAB board  
R-value: 0.05

Timber Frame & Cavity : no framing (for example SIP Panels)  
Wall Frame Area: 0.0% Cavity Area: 100.0%

15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08 15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08

Framing :  
R-value: 0.00

Insulation : 3.6

still Airgap: none  
R-value: 0.00

Wall Lining : Gypsum plasterboard 10mm  
R-value: 0.04

internal surface 0.09

Element Name (optional)

**Bcon19/0212 - WDC Approved Plans - 29/08/2019**

3.37 m<sup>2</sup>C/W

Type: Roof: Timber framed Roof, direct fixed or battened flat Ceiling

Timber framed Roof, direct fixed or battened flat Ceiling [view detail](#)

external surface 0.03

Roofing : Corrugate iron with building paper

R-value: 0.01

Insulation :

Timber Frame & Cavity : 90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%

Cavity Area: 95.0%

Roof space (still air) 0.11

Roof space (still air) 0.11

Framing :

R-value: 0.75

Pink@Batts@ R3.6 Ceiling

Roof Lining : Gypsum plasterboard 13mm

R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m<sup>2</sup>]:  Number of downlights:  Clearance from lamp holder side [m]:  [i](#)

Type: Floor: Suspended Floor (no Lining) ▼

Suspended Floor (no Lining) [view detail](#)

internal surface 0.09

Flooring : Plywood 21mm ▼

R-value: 0.15

Timber Frame &amp; Cavity : 190+ mm joists @ 400mm ▼

Floor Frame Area: 11.3%

Cavity Area: 88.7%

Framing :

R-value: 1.56

Expol Underfloor R-2.8 Wooden Floor

(Dbl Layer) 2.8

Insulation value of the subfloor space

Suspended floor area [m<sup>2</sup>]: 118.25

Perimeter length [m]: 8.9

Perimeter height [m]: 4

Perimeter type: Exposed floor (pole house) ▼

Type: Wall: Timber Frame with vented Cavity ▼

Timber Frame with vented Cavity [view detail](#)

external surface 0.03

Cladding : Rusticated or shiplap weatherboard ▼

*R-value: 0.16*

Air Barrier : 9mm fibre cement RAB board ▼

*R-value: 0.05*

Timber Frame &amp; Cavity : no framing (for example SIP Panels) ▼

*Wall Frame Area: 0.0%**Cavity Area: 100.0%*

15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08

Framing :  
*R-value: 0.00*

Insulation : 3.6

still Airgap: none ▼

*R-value: 0.00*

Wall Lining : Gypsum plasterboard 10mm ▼

*R-value: 0.04*

internal surface 0.09

BRANZ NZS 4218:2009 CALCULATION METHOD TOOL

PROJECT SUMMARY

Project name	BLYTHE HOSUE
Address	5A TOI STREET
Designer	BUILDBIM
Address	
Phone	
Date	28/01/2019
Reference number	OTC 032

Climate zone	3: South Island, Taupo and Ruapehu Districts, northern part of Rangitikei District, Stewart Island, Chatham Islands						
Wall construction type	1: Any wall type						
If mixed wall types	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><input type="text" value="0"/></td> <td>Percentage of wall area solid timber construction</td> </tr> <tr> <td><input type="text" value="0"/></td> <td>Percentage of wall area high thermal mass construction</td> </tr> <tr> <td><input type="text" value="100"/></td> <td>Percentage of wall area "Any wall type"</td> </tr> </table>	<input type="text" value="0"/>	Percentage of wall area solid timber construction	<input type="text" value="0"/>	Percentage of wall area high thermal mass construction	<input type="text" value="100"/>	Percentage of wall area "Any wall type"
<input type="text" value="0"/>	Percentage of wall area solid timber construction						
<input type="text" value="0"/>	Percentage of wall area high thermal mass construction						
<input type="text" value="100"/>	Percentage of wall area "Any wall type"						
If solid timber wall	1: External 75 mm thick solid timber and timber framed internal walls						

**Is there just one wall construction R-value ( $R_{Wall}$ ) and one door ( $R_{Door}$ ) construction R-value (but different to the walls) for the building?** no

Summary of calculation method heat loss

Element	Area (m <sup>2</sup> )	Proposed building heat loss (W/°C)	Reference building heat loss (W/°C)
Roofs/ceilings	33.4	9.9	10.1
Walls	49.5	15.6	25.7
Floors	24.5	16.2	18.8
Vertical glazing	7.2	27.7	67.7
Skylights	0.0	0.0	-
Doors (Attributable)	2.0	0.0	-
<b>Total</b>		<b>69.4</b>	<b>122.3</b> W/°C

Glazing percentage: 12%

Glazing <50%: Yes

Minimum R-values OK: Yes

Issues to check: Some R-values appear to be very high. Check highlighted values.

PASS/FAIL

PASS

Element Name (optional)

**Bcon19/0212 - WDC Approved Plans - 29/08/2019**

1.51 m<sup>2</sup>C/W

Type: Floor: Slab Floor

Slab Floor [view detail](#)

internal surface 0.09

Flooring : 50-100mm Concrete Topping Screed

*R-value: 0.04*

Slab Insulation

Slab floor area [m<sup>2</sup>]: 207.8

Perimeter length [m]: 77.14

External wall thickness [mm]: 90 [i](#)

Soil conductivity [W/m °C]: 1.2 [i](#)

Underslab insulation: none [v](#) Insulation :  [i](#)

Piles Footings: Number:  Penetration Diameter:

Slab edge insulation: none [v](#) Insulation :  [i](#)

Element Name (optional)

**Bcon19/0212 - WDC Approved Plans - 29/08/2019**

3.37 m<sup>2</sup>C/W

Type: Roof: Timber framed Roof, direct fixed or battened flat Ceiling

Timber framed Roof, direct fixed or battened flat Ceiling [view detail](#)

external surface 0.03

Roofing : Corrugate iron with building paper

R-value: 0.01

Insulation :

Timber Frame & Cavity : 90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%

Cavity Area: 95.0%

Roof space (still air) 0.11

Roof space (still air) 0.11

Framing :

R-value: 0.75

Pink@Batts@ R3.6 Ceiling

3.6

Roof Lining : Gypsum plasterboard 13mm

R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m<sup>2</sup>]:  Number of downlights:  Clearance from lamp holder side [m]:  [i](#)

Element Name (optional)

**Bcon19/0212 - WDC Approved Plans - 29/08/2019**

2.27 m<sup>2</sup>C/W

Type:

Timber Frame (direct fixed Cladding)

external surface 0.03

Cladding :

*R-value: 0.10*

Air Barrier :

*R-value: 0.00*

Timber Frame & Cavity :

Wall Frame Area: 14.4%

Cavity Area: 85.6%

Framing :  
*R-value: 0.75*

still Airgap:

*R-value: 0.00*

Wall Lining :

*R-value: 0.04*

internal surface 0.09

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail](#)

external surface 0.03

Cladding : Rusticated or shiplap weatherboard

*R-value: 0.16*

Air Barrier : 9mm fibre cement RAB board

*R-value: 0.05*

Timber Frame &amp; Cavity : no framing (for example SIP Panels)

*Wall Frame Area: 0.0%**Cavity Area: 100.0%*

15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08

Framing :  
*R-value: 0.00*

Insulation : 3.6

still Airgap: none

*R-value: 0.00*

Wall Lining : Gypsum plasterboard 10mm

*R-value: 0.04*

internal surface 0.09



**buildBIM Ltd**

# **PROJECT SPECIFICATION**

## **OTC 032**

5A TOI STREET  
TAWHERO  
WHANGANUI

**Issued for Tender/Consent**

OTC 032

## PROJECT OVERVIEW

### Scope

New 2 bedroom dwelling with detached garage. Constructed from light timber framing, roof clad in 5RIB trapezoidal over truss or rafter framed roof. dwelling constructed on a 3604 pile foundation

### Address

<b>Site Address</b>	5A TOI STREET
<b>Suburb</b>	TAWHERO
<b>City</b>	WHANGANUI
<b>Lot #</b>	116
<b>DP #</b>	2086

### Site Conditions

<b>Wind Zone</b>	H - High Wind Speed
<b>Earthquake Zone</b>	Zone 2
<b>Exposure Zone</b>	Zone C - Medium
<b>Snow Loading Zone</b>	Zone N1

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# **1 PRELIMINARIES & GENERAL**

## **1.1 Project Overview**

### **1.1.1 Contract Documents**

The Contract Documents are complementary and comprise this Specification, the accompanying drawings, the Contract together with Schedules as specified below, any written documentation clarifications issued during tendering/estimating, any manufacturer/supplier information issued with this Specification, any list of agreed Subcontractors, the contract establishment letter and any other relevant correspondence, and any Site Instructions or additional details or instructions issued as Variations.

If the Architect/Designer has not been engaged to administer the Contract or observe the works, then the term Architect/Designer, where referred to in this specification, means Contract Administrator.

These Project Specific Conditions supersede the Standard Conditions where they are in conflict. Refer any ambiguity or apparent discrepancy within or between any Contract Documents to the Architect/Designer, whose interpretation shall be binding on all parties.

Ensure that all Trades are aware of all Conditions and that subcontract prices are accepted on this basis, and in a form acceptable to the Registered Master Builders Federation or the Certified Builders Association. Ensure that all persons engaged on the works are aware of all items in this specification and on the drawings that may in any way affect their section of the works.

### **1.1.2 Site**

Relevant site conditions are believed to be correctly represented in the Contract Documents, however the Contractor (and Subcontractors where appropriate) are requested to inspect the site to ascertain for themselves the nature and extent of the works and the rights and interests that may be interfered with in the execution of the works, as no claims for additional payment will be recognised on the grounds of insufficient description.

### **1.1.3 Adjacent Owners**

Carry out whatever actions or precautions are required to avoid or to absolutely minimise noise, dirt, dust, access, etc. inconvenience or disruption of any nature to the adjacent owners or tenants. Indemnify the Principal against any claims arising from this source.

### **1.1.4 Protection**

Take all appropriate precautions to protect all third party property, services, etc., and indemnify the Principal against any claims arising from the construction operations. Any damage to third party property caused by construction activities or failure to protect shall be rectified as soon as possible by the person causing the damage, or by appropriately qualified trades-persons employed by the person responsible for the damage if necessary.

Suspend operations during weather which would affect the quality of work in progress. Secure the works as soon as possible against adverse weather, dust and vandals. Avoid structural damage that is

caused by overloading.

Adequately protect all finished work and maintain until the date of Practical Completion. Each trade shall protect the work of all other trades, and each trade is responsible for making good any damage they cause to finished works. Arrange special protection as required for windows and doors, finished timber work, plumbing fittings and hardware, cabinets and other joinery, and similar items.

#### **1.1.5 Responsibility**

The Contractor will be held responsible for the full period of his legal responsibility in connection with this Contract for ensuring that all work execution, materials, and fittings, are completely in accordance with Contract requirements.

The Contractor is responsible to the Principal for the appropriateness and fitness, in relation to a reasonable expectation or requirement, of all of the materials and workmanship incorporated into the works by himself or his subcontractors; for this reason few specific guarantees are required in these contract documents. The terms and conditions of any warranty or guarantee required or provided shall not in any way negate the minimum remedies available under common law as if no warranty or guarantee had been furnished.

No apparent expression of the Architect's/Designer's reasonable satisfaction shall be deemed to be acceptance of defective materials or workmanship within the terms of the Contract or to be an authority for any Variation except where such Variation is authorised as provided for in the Contract. Instructions that are given verbally are deemed to be instructions for proper execution of the works and do not involve extra charges.

Workmanship in all trades is required to be equal to or better than recognised good trade practice. The Contractor shall provide all necessary setting out information and component dimensions for subcontractors and shall check and be responsible for the accuracy of their work.

Should any tradesperson consider that the surface finish or general conditions of previous work are unsatisfactory to ensure a proper finish for their own work thereon, that tradesperson shall give immediate notice to the Contractor or Architect/Designer as appropriate and shall not proceed until all necessary improvements have been made. Failing such notice the trade concerned will not be relieved of responsibility for a poor finish due to such unsatisfactory condition.

Specialist Finishes Subcontractors are responsible for ensuring that substrates are completely appropriate for them to achieve first class results, and to this end shall, in sufficient time, instruct the Contractor with regard any fixings, primings, sealings or whatever for the substrate that vary in any way from the substrate manufacturer's standard recommendations. The Contractor shall advise the Architect/Designer with regard these variances, and not proceed until the Architect/Designer has agreed to them.

The Contractor and all Subcontractors affected shall be jointly and severally responsible for completion of the whole of the works in a completely watertight condition and shall therefore examine all details to be satisfied that this condition can be achieved. If any detail is considered unsatisfactory the Architect/Designer shall be notified immediately and he/she will then either interpret the detail to the Contractor's satisfaction, or accept responsibility for watertightness at the points in question, always assuming reasonable workmanship.

Ensure that all materials or items incorporated into any particular construction or finish are compatible and that their individual use is approved by the manufacturers and/or suppliers of the other parts of the system.

For all electronic/electrical/mechanical operating systems all work and all necessary materials and items incidental to the primary item specified, that are incorporated into the works, shall be such as to leave a neat, efficient, easily maintained and robust installation, completely in accordance with all of the recommendations of the primary items' manufacturers. Where appropriate, source all parts of a system from a single supplier or manufacturer.

The Contractor shall make provision for all temporary works and services required for the satisfactory completion of the contract works. The Contractor shall pay all associated costs and fees; carry out all necessary maintenance, alterations and servicing requirements; and remove temporary works and services on completion of the contract works. Temporary works and services shall comply with the requirements New Zealand Building Code.

#### **1.1.6 Specification**

This Specification covers contract administration, standards, materials quality, workmanship and the scope of works only: the exact nature of the works and all specialist items, descriptions, etc., are contained on the drawings, which also take full precedence.

All clauses in all specification sections apply to their full extent and meaning to the entire Contract. Trade sections and paragraphs have been introduced into this specification for reference only and it shall not be construed that each trade section is a complete segregation of the materials and labour of that trade. The onus is on all trades to be conversant with any and all clauses which in any way affect their work.

(Be aware that the 'scope' noted in the 'Project Overview', and scope and general extent clauses within this specification, are included to provide a general indication only and must NOT be interpreted as schedules of quantities - the exact nature and extent of all aspects of the works are shown on the drawings).

#### **1.1.7 Standards**

New Zealand Standards (NZS), Australian Standards (AS), Joint Standards (AS/NZS), British Standards (BS), Acts of Parliament, Regulations made thereunder, Codes of Practice, and any specific Manufacturer's Instructions or Manufacturer's Recommendations that are referred to in these Contract Documents shall all be deemed to be the latest published edition thereof at the time of drawings issue, and shall be followed by the Contractor and all Subcontractors to the full extent applicable consistent with the intent of this Contract. Documents cited within other cited publications are deemed to form part of this specification.

Where Standards have a number of Divisions, e.g. AS/NZS 3500.1, AS/NZS 3500.2, etc., each of the Divisions relevant to this project is deemed to form part of this specification.

Retain current copies of significant cited documents and manufacturer's technical literature on the site.

#### **1.1.8 Authorities and Charges**

Comply with all relevant provisions of the NZ Building Code, and with all relevant territorial or statutory authority regulations, by-laws, obligations, etc. Give all required notices.

The Principal has obtained a Land Use Consent. The Principal has applied for and paid for the Project Information Memoranda, the Building Consent and other approvals required for the works to start. The PIM and Building Consent will be forwarded to the Contractor as quickly as possible after they are issued by the Territorial Authority. Note: It is an offence under the Building Act to carry out work not in accordance with a Building Consent.

Should the Building Consent be subject to any conditions which modify the requirements of the Contract Documents in any way, the Architect/Designer reserves the right to negotiate any or all of these modifying conditions with the Building Consent Authority. If after these negotiations additional work is required, it will be handled as a Variation to the Contract.

#### **1.1.9 Code Compliance Certificate**

The Principal will apply for the Code Compliance Certificate (CCC) and any other licenses or approvals for the building to be used. However, Practical Completion will NOT be certified until the CCC inspection has occurred and any additional works required by the local Building Consent Authority have been completed. To this end it is recommended that the Contractor obtains all required certificates, guarantees, Producer Statements, as-built drawings, etc., required for the CCC application as work proceeds, to facilitate application for the CCC as soon as the works are completed. For his part, the Principal hereby undertakes to apply for the CCC within one day of all required material being in hand. Likewise, the Contractor should have capacity available to attend as quickly as possible to any items identified by the Building Consent Authority as being required prior to the issue of the CCC.

#### **1.1.10 Coordination of the Works**

Coordinate the works of all trades to ensure efficient progress of the works. Ensure that all holes, sleeves, penetrations, supports, etc., that are required for services are correctly incorporated as work proceeds. Identify and sufficiently forward-notify the appropriate persons of all deadlines for the supply of fittings, components, information, etc.

#### **1.1.11 Documents Interpretation**

Except where they are clearly to the contrary, all dimensions are deemed to be to the bare surface of concrete, masonry, timber framing or other basic construction material. All figured dimensions take precedence over scaled sizes. Where any detail is included in more than one drawing the larger scale detail takes precedence. Where any ambiguity exists refer to the Architect/Designer for interpretation.

The word 'provide' and the word 'fix' used separately in the Documents shall be taken to mean 'provide and fix' unless otherwise stated.

When the term 'allow' occurs in the Documents, except with reference to Monetary Allowances, the cost of the item shall be at the risk of the Contractor.

The terms 'approved', 'directed', and 'selected' when used in the Documents refers to the approval, direction or selection of or by the Architect/Designer. Please give adequate notice of when these decisions are required. 'Architect/Designer' shall mean the Architect or Designer, their representative or any Consulting Engineer engaged by the Architect/Designer.

**1.1.12 Work Shown and Mentioned**

The Contract Documents show the extent and nature of the works but there is no warranty expressed or implied that they show each and every minor detail or item required to be included by the Contractor. Should any material, structural member, fixing, or item or work appear to be inadequately described, yet obviously necessary for the neat, strong and satisfactory completion of the work, it shall be incorporated into the Contract Works.

**1.1.13 Site Safety**

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance. Comply with the relevant provisions of the New Zealand Building Code, in particular Clause F5.

So far as is reasonably practicable and according to a PCBU's (person conducting a business or undertaking) primary duty of care, take all necessary steps required to make the site and the contract works safe, and to provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the site safety rules and are not unnecessarily exposed to hazards.

Each PCBU, so far as is reasonably practicable, must ensure the health and safety of workers, and that other people are not put at risk by its work. If more than one PCBU has a duty in relation to the same matter, each PCBU with the duty must, so far as is reasonably practicable, consult, co-operate with, and co-ordinate activities with all other PCBUs who have a duty in relation to the same matter. PCBUs can enter reasonable agreements with other PCBUs to meet their duties, but cannot contract out of their duties.

Notify WorkSafe as soon as possible when a notifiable event occurs. Take all reasonable steps to preserve the site of the notifiable event in accordance with WorkSafe requirements. Ensure that the site of the event is not disturbed until authorised otherwise by WorkSafe. Keep records of all notifiable events.

Scaffolding shall comply with all Statutory and Local Authority Regulations, with the WorkSafe 'Best Practice Guidelines for Scaffolding', AS/NZS 1576 (Scaffolding equipment), AS/NZS 4576 (Guidelines for Scaffolding), and AS/NZS 4994 (Roof edge scaffolding), and shall be maintained for the duration and removed on completion.

The use of ballistic fixings must absolutely comply with all relevant safety recommendations at all times. No rubbish fires are allowed on site. Portable/personal disc/tape players, radios and iPods must not be used anywhere on the site. No smoking on site, except in the designated location in accordance with the Smoke Free Environments Act 1990, the location of which will be determined by the Contractor, with the approval of the Principal.

A PCBU's primary duty of care includes, but is not limited to, so far as is reasonably practicable:

- providing and maintaining a work environment that is without risks to health and safety;
- providing and maintaining safe plant and structures;
- providing and maintaining safe systems of work;

- ensuring the safe use, handling and storage of plant, structures and substances;
- providing adequate facilities for the welfare at work of workers in carrying out work for the business or undertaking, including ensuring access to those facilities;
- providing any information, training, instruction, or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking;
- monitoring the health of workers and the conditions at the workplace for the purpose of preventing injury or illness of workers arising from the conduct of the business or undertaking.

Before commencing work on the site, the Contractor shall prepare and submit to the contract administrator a health and safety plan. The health and safety plan shall include, but not be limited to:

- the health and safety of all people on the site and on other properties, and the general public;
- identification of existing and potential construction hazards and risks;
- safety procedures to eliminate, isolate or minimise construction hazards;
- the equipment to be used to minimise the hazards;
- the maintenance of a register of hazards for the site;
- the name and qualifications of the site safety person;
- emergency procedures;
- first aid facilities and safety equipment;
- the methodology for notifying, recording and investigating accidents and injuries.

Carry out all construction operations in accordance with the submitted health and safety plan.

#### **1.1.14 Variations**

The Architect/Designer will issue Site Instructions (SI) to amend or clarify the works. Upon receipt of a SI the Contractor shall immediately notify the Architect/Designer if he believes there are price or timing adjustment implications. The Architect/Designer will then issue a Variation Price Request (VPR) for pricing of the possible Variation by the Contractor, within the time stipulated, or within 10 days if no time is stipulated. If the Contractor does not return the VPR within the time stipulated the Architect/Designer will assess it at reasonable rates. Once agreement is reached on price and/or timing a Variation Order (VO) for the item will be issued. Note that works covered by a SI or a VPR must NOT be actioned until the VO is issued.

When a Variation is contemplated and timing does not allow SI and VPR action the Contractor is to advise, and record in the site diary, an estimate of price and timing implications. If accepted by the Architect/Designer, a VO will be issued immediately. The Contractor shall then co-operate with the Architect/Designer to establish agreed pricing.

Claims for Variations neither priced nor estimated prior to being put in hand (but considered valid) will be incorporated into Progress Payment Certificates or the Draft Final Accounts as claimed and accepted but with a proviso allowing 5 (five) days for written objections by either the Principal or the Contractor, to any aspect of them, for further consideration.

The Main Contractor's Variations Margin agreed pre-contract will be the maximum accepted for any trade unless higher rates are nominated pre-contract and are accepted. The Main Contractor's agreed Variations Margin shown shall be deemed to include all preliminary and general costs, overheads, variation processing costs, and profit. If no margin is given, a 5% overall margin will be

applied.

Note that 'loss of anticipated profit' claims consequent upon reduction of works extent will NOT be recognised, and that the cost of processing Variations is deemed to be included in the P & G Allowance.

Also note that for Variations pricing all materials shall be charged at the actual net invoiced cost plus margin; i.e. recognised 'Trade Price', volume discounted where appropriate.

#### **1.1.15 Progress Claims**

Progress Claims shall be in writing, shall be in accordance with the requirements of the Construction Contracts Act 2002, and shall include all of the following:

- The overall amount claimed.
- The percentage completion and amount claimed for each Subcontractor. For accurate claim verification please ensure that this breakdown exactly matches the trades costs breakdown agreed-to pre-contract.
- The total Contract Sum Adjustment for any/all Variations authorised prior to the claim.
- Items covered by Monetary Allowances listed separately.
- And, if specifically requested, confirmation that amounts previously claimed on behalf of Subcontractors, certified by the Architect/Designer, and paid by the Principal, have actually been paid to the Subcontractor (apart from normal retentions).

Note that retentions will be held exactly in accordance with the Conditions of Contract.

#### **1.1.16 Cleaning and Completion**

Clear construction debris and rubbish from the works at regular intervals, and additionally if so instructed by the Architect/Designer. Clean each space thoroughly before commencing any finishing works.

In preparation for the Practical Completion inspection carry out the following:

- Clean the works thoroughly, removing all debris, surplus materials, splashes, marks, temporary markings, etc. (All cleaning methods and materials shall be as recommended by the manufacturer of the item being cleaned).
  - Remove protective wrappings and coverings unless otherwise directed.
  - Touch up minor painting faults, carefully matching colour, and brushing out edges. Repaint any badly marked surfaces back to suitable break-lines.
  - Adjust, ease and/or lubricate as required all doors, drawers, controls and other moving parts to ensure their efficient operation.
  - Any other works required to leave all spaces ready for immediate occupation and all electronic/electrical/mechanical systems fully operational.
  - Clean out all spoutings, gutters, downpipes, and gullies and flush out all drains.
  - Clean all sanitary appliances and check all aspects of the water services.
  - Thoroughly re-inspect all aspects of the works (and have any defects fully rectified) to be certain that the works are completely ready for the Practical Completion inspection - if an unreasonable number of items are noted by the Architect/Designer during the inspection it will be terminated and then rescheduled for at least a week forward to allow proper completion to be achieved.
- (Note that a Code Compliance Certificate must be obtained before Practical Completion will be

certified. Obtain all required certificates, guarantees, as-built drawings, etc., as work proceeds to enable the CCC application to be submitted as soon as construction is completed).

## **2 SITEWORKS**

### **2.1 Preliminary**

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### **2.2 Compliance**

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

### **2.3 Site & Scope**

#### **2.3.1 Site**

Note that no claims will be recognised on the grounds of insufficient description of existing site conditions in the Contract Documents.

Take great care to excavate exactly for the wall foundations to avoid any damage to adjacent property.

#### **2.3.2 Scope**

This section covers:

Rabbits control  
Demolition work  
Boulders salvage

Removal of vegetation  
Excavation of topsoil and stockpiling and final distribution  
Excavation of topsoil and stockpiling and final distribution (and new topsoil)

Excavation as required for foundations and slabs  
Excavation as required for foundations, slabs, and drive  
Excavation as required for foundations, slabs, and carpark  
Excavation as required for foundations, slabs, carpark and drive

Supply, placing and compaction of hardfill basecourse and sand blinding  
Supply and placing of any site concrete required

Supply and installation of retaining walls waterproofing systems and field drains  
Backfilling behind retaining walls

Preparation for, and installation of asphalt driveway paving  
Supply and installation of asphaltic concrete

Preparation for paving works, and sandstone and asphalt paving  
Preparation for sandstone and schist paving  
Preparation for and installation of paving  
Preparation for, and installation of exposed aggregate paving  
Supply and installation of flagstone paving

Preparation for, and installation of topsoil to planter areas  
Instant lawn supply and installation  
Grass for disturbed areas around the works areas

Polythene groundcover under the timber floor  
Preparation for and installations of Gobi blocks  
Supply and installation of the trampoline

### **2.3.3 Waahi Tapu**

During excavation, should a waahi tapu or other cultural site be unearthed, cease excavation operations immediately, and inform the Contract Administrator. Inform the local Iwi, and inform Heritage New Zealand Pouhere Taonga and apply for an appropriate authority if required. Take appropriate action, following discussions with Heritage NZ Pouhere Taonga and Territorial Authority, and runanga/runaka/iwi if Maori, to remedy any damage and/or to restore the site.

*Note; in accordance with the Heritage New Zealand Pouhere Taonga Act 2014, where an archaeological site is present (or uncovered), an authority from Heritage New Zealand is required if the site is to be modified in any way. An archaeological site is defined in the Heritage New Zealand Pouhere Taonga Act 2014 as any place in New Zealand (including buildings, structures or shipwrecks) that was associated with pre-1900 human activity, where there is evidence relating to the history of New Zealand that can be investigated using archaeological methods.*

## **2.4 Drives, Paths & Paving**

## **2.5 Excavation & Siteworks**

### **2.5.1 Excavation**

Excavation work shall be carried out in accordance with the WorkSafe NZ Excavation Code of Practice. Co-ordinate with other trades as to set-out and timing to ensure that all cut faces are covered or finished etc. as soon as possible after the excavation is complete.

Plan the excavation carefully to ensure that stockpiles will not interfere with concrete construction, to stockpile just sufficient material for the filling, backfilling and reshaping required later, and to avoid overlying areas outside the works area with material.

As the bulk scope of excavations works will have been carried out prior to commencing work on site, advise and co-ordinate with the separate contractor to ensure that the main building platform is consistent with what is expected. If any concerns are raised please immediately advise the Architect for direction.

Cease machine excavation above final levels and trim to the finish profiles by hand where appropriate. Any over excavation in critical foundation, etc. areas made up with 10MPa concrete unless otherwise approved. Trim slab benches exactly to the required level to allow for hardfill and blinding.

Noisy excavation equipment shall be used only during hours which will avoid undue nuisance to the occupants of adjacent properties.

Excavate accurately in position and true to line and minimum sizes and to levels and grades required for all slabs, footings and foundations, and over the rest of the areas shown for levels adjustment.

Excavations down to firm undisturbed ground, and footings and foundations 200mm minimum into solid, except where shown otherwise.

Below slabs on ground the general intent is to excavate to a stable undisturbed subgrade (of 300 kPa ultimate bearing capacity).

Trim slab benches as required to allow for hardfill and blinding.

Batter all excavation cuts at a stable slope.

From the excavated material select the most appropriate material for compacted filling and stockpile it in appropriate positions sufficient for filling and backfilling (but NOT for hardfilling).

Remove all surplus material from the site as soon as it is excavated, taking care to avoid damaging the footpath or streets or spilling material on to them.

Remove individual boulders from the excavated material and stockpile them where noted for future landscaping use by others.

Keep excavations free of water - remove foundation trench material which becomes water-softened.

Ensure that rainwater runoff from excavated surfaces does not carry material onto adjacent properties.

Report for instruction when any unexpected voids, made-up ground or similar are encountered.

Report the finding of antiquities or other items of value, and leave them undisturbed until approval (and instruction) is given for their removal - they remain the property of the Principal.

As soon as excavation and filling is complete foundation material will be inspected by the Architect, and any changes to foundation widths/details will be directed.

**2.5.2 Excavation Completion**

As soon as excavation and filling is complete and before any concrete is placed or other work proceeded with the foundation material will be inspected by the Engineer, and any necessary changes to foundation widths or details will be directed.

**2.5.3 Filling**

Filling with salvaged material (of appropriate moisture content) shall be compacted in 150mm layers with mechanical rammers, to 95% relative compaction. All work generally in accordance with the provisions of NZS 4431.

On completion clean up the stockpile areas and the site.

**2.5.4 Sealing Retaining Walls**

The exterior of concrete blockwork walls shall be waterproofed with all aspects of the surface preparation and application exactly in accordance with the manufacturers recommendations.

(manufacturer & product info here)

## 3 WATERPROOFING

### 3.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 3.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3740:2010(AS)	Waterproofing of domestic wet areas
4858:2004(AS/NZS)	Wet area membranes
NZBC E2/AS1	External Moisture
NZBC E3/AS1	Internal Moisture

### 3.3 ARDEX Liquid-Applied Waterproofing Membranes

#### 3.3.1 Scope

Supply and install the specified ARDEX Liquid-Applied Waterproofing Membranes to the locations indicated on the drawings, complete with all system components and accessories required for proper installation and performance. All aspects of this work shall be in complete accordance with the manufacturer's requirements and technical literature (check [www.ardex.co.nz](http://www.ardex.co.nz), or call 0800 227 339 for the latest editions), other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for any specified ARDEX Liquid-Applied Waterproofing Membranes, or ARDEX products, or ARDEX system components or accessories.

This specification should be read in conjunction with other relevant specification sections as they may be interrelated.

The following is a list and general description of the extent of ARDEX Liquid-Applied Waterproofing Membranes works, which are more specifically defined in the contract documents, required for the completion of the contract works:

#### 3.3.2 Requirements

##### *Safety*

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

*Warranty*

ARDEX NZ Ltd warrant this work under normal use and environmental conditions, against failure of materials and application, according to the warranty conditions.

- 15 Years' Warranty Materials and Workmanship - for all ARDEX Liquid-Applied Waterproofing Membranes.
- Provide the ARDEX Warranty on the manufacturer's standard warranty form.
- Commence the warranty from the date of practical completion.

*Substitutions*

ARDEX Liquid-Applied Waterproofing Membranes shall be as specified herein and as indicated on the approved drawings. The substitution of ARDEX branded products for alternative brands is not permitted under any circumstances.

The substitution of a specified ARDEX waterproofing product for an alternative ARDEX branded product by the Applicator shall only be permitted with the Contract Administrator's authorisation, and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate alternative ARDEX branded products to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Applicator.

*Quality Assurance*

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of ARDEX Liquid-Applied Waterproofing Membranes work are carried out to the highest standard.

*Inspection & Reporting of ARDEX Waterproofing Membranes*

BCA inspections of ARDEX Liquid-Applied Waterproofing Membranes works shall take place at each of the stages as scheduled in the Building Consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

Carry out all necessary pre-installation/application and installation/application inspections for each area of waterproofing work in accordance with the requirements of industry best practice recommendations and guidelines.

Complete all necessary Pre-Installation Checklists prior to installation/application, and all relevant Installation Checklists.

Complete all necessary Installation Sign-Off Certificates before undertaking subsequent work or before handing over completed work.

*Defective Materials & Work*

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected ARDEX Liquid-Applied Waterproofing Membranes materials and work shall be repaired and/or replaced to the satisfaction of the Contract Administrator, without delay and at no additional cost to the Principal.

Should a problem be encountered with any ARDEX waterproofing product during use or delivery, immediately contact the ARDEX Technical Hotline on 0800 227 339. Do not continue to use the product that is not performing to specification or expectation. Keep the product in question and where possible, the document batch numbers and/or manufacturing dates.

#### *Flood Testing*

Make all necessary provisions for, and carry out all necessary flood testing of ARDEX waterproofing membranes in accordance with the requirements of the ARDEX Warranty. Carry out any additional works required as a result of the flood testing.

### **3.3.3 Performance**

#### *Durability*

The durability requirements of ARDEX Liquid-Applied Waterproofing Membranes shall meet the requirements of NZBC B2/AS1: Table 1, according to Building Element, Component, Situation/Function, and Duration.

#### *Interior Wet-Area Waterproofing Membranes*

Interior Wet-Area Waterproofing Membranes. The performance of interior wet-area waterproofing membranes shall comply with the requirements of NZBC E3/AS1, in accordance with the 'Code of Practice for Internal Wet Area Membranes' prepared by the Waterproofing Association (NZ) Inc.

### **3.3.4 Interior Undertile Membrane**

#### *ARDEX WPM 001*

Interior Undertile Waterproofing Membrane - [ARDEX WPM 001](#). A 1-part, read-to-use, fast drying, polymer-based, fibre-reinforced waterproofing membrane designed for use under tiles. Suitable for use on interior and exterior walls and floors, in wet areas, and on decks, balconies, and other areas that will be tiled or otherwise protected from regular foot traffic.

#### Features:

- BRANZ Appraised - [BRANZ Appraisal No.472 \(2017\)](#).
- Conforms to the requirements of AS/NZS 4858 - meets class 3 classification (high extensibility).
- Designed for tiling applications - fully compatible with ARDEX tiling adhesive systems.
- Fibre reinforced - excellent strength, eliminates the need for a reinforcing mat.
- Low VOC.

#### Where to Use:

- On concrete structures; on new and existing concrete.
- On cement/sand screeds and renders.
- On fibre cement sheet - wet-area grade only; and compressed fibre cement sheet.
- On plasterboard wall lining - wet-area grade only - interior use only.
- On plywood - wet-area grade only - interior use only.
- On particleboard - wet-area grade only - interior use only.

#### Limitations:

- Do NOT use ARDEX WPM 001 for continuously immersed waterproofing applications.

- Do NOT use ARDEX WPM 001 on substrates subject to negative hydrostatic pressure or rising damp, unless treated with Ardex WPM 300.
- Do NOT allow ARDEX WPM 001 waterproofing membrane to be left exposed and subject to regular foot traffic.
- All floor areas must have adequate built-in drainage falls prior to the application of ARDEX WPM 001 waterproofing membrane.

**Primer & Sealer:**

- Seal damp substrates and set concrete less than 28 days' old using [ARDEX WPM 300](#) in accordance with ARDEX requirements.
- Seal set renders and screeds less than 7 days' old using [ARDEX WPM 300](#) in accordance with ARDEX requirements.
- Prime all substrates receiving ARDEX WPM 001 waterproofing membrane using [ARDEX WPM 265](#) in accordance with ARDEX requirements.

**Application:**

- Seal corner junctions and junctions where movement will occur with a neutral cure silicone sealant in accordance with ARDEX requirements.
- Treat movement control joints, waste outlets and penetrations in accordance with ARDEX requirements.
- Apply a minimum of two coats of ARDEX WPM 001 to achieve the required total dry film thickness - Floors, 1.0mm; Walls, 0.5mm - in accordance with ARDEX requirements.
- Reinforce ARDEX WPM 001 membrane between coats as necessary using ARDEX Deckweb fabric in accordance with ARDEX requirements.

**Application Data (at +23° and 50% RH):**

- Application Temperature Range: from +10°C to +35°C (surface temperature).
- Recoat Time: 1-2 hours.
- Complete Dry Time: 48-72 hours after application, depending on humidity, surface temperature and porosity of substrate.
- Fully Cured: 3 days after application.
- Flood Test Time: at least 72 hours after application, and before tiling commences.
- Colour: Blue.

Apply ARDEX WPM 001 undertile waterproofing membrane to properly prepared substrates in strict accordance with the manufacturer's requirements.

**Installed Location:****3.3.5 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install ARDEX Liquid-Applied Waterproofing Membrane systems and products as required.

### **3.3.6 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All preparation and installation work shall be carried out by ARDEX Approved Applicators, familiar with the specified products and installation techniques, to fully comply with all ARDEX NZ Ltd warranty requirements and in accordance with the manufacturer's installation requirements, relevant ARDEX BRANZ Appraisals, and as noted and detailed on the drawings.

All work shall be such as to leave a neat, efficient, robust and waterproof installation.

Use only ARDEX-approved primers compatible with the specified membranes and substrates, and according to the membrane's application/use.

Do not install membranes in wet weather conditions, or when temperatures and humidity are outside the manufacturer's permissible range.

Make all necessary provisions to protect adjacent finished work and surfaces from damage and contamination during installation.

As necessary, protect installed membranes from damage and contamination during subsequent construction activities until permanently covered/enclosed.

### **3.3.7 Delivery & Handling**

Store ARDEX waterproofing products inside, in a weatherproof environment, clear of the floor, on a flat, even and level surface. Keep stored products dry, out of direct sunlight and protected from damage, moisture and contamination.

Do not use damaged, defective or contaminated products, or products that are beyond their designated shelf life.

Should a problem be encountered with any ARDEX product, immediately contact the ARDEX Technical Hotline on 0800 227 339. Do not continue to use the product that is not performing to specification or expectation. Keep samples of the product in question and where possible, document batch numbers and/or manufacturing dates.

Handle ARDEX waterproofing products in accordance with the manufacturer's requirements as set out in the relevant Technical Data Sheet(s), and in a manner that prevents contamination or deterioration of the material and does not reduce its performance.

Installers shall be familiar with and comply with the manufacturer's Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

Conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - including the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#).

### **3.3.8 Preparation**

#### *General*

Substrates shall be structurally sound and dimensionally stable, even and smooth, clean, dry, and free from dirt, dust, grease, oil, wax, paint residue, loose plaster and laitance, curing compounds and other materials and contaminants likely to cause damage to the waterproofing membrane or affect its bonding and performance.

Carry out all necessary inspections and preparatory work to all substrates in accordance with the manufacturer's product Technical Data Sheet prior to application of ARDEX surface primers and waterproofing membranes.

Check that the substrate is free of voids and depressions, and is in correct alignment - true to line, level and/or plumb and to the falls indicated on the drawings.

Check that all embedded items are correctly installed, and that all substrate edges are completed as detailed.

Confirm the location of all movement control joints prior to commencement of the works, and ensure that they are appropriately treated. Do not cover or bridge control joints without the use of the manufacturer's recommended bond breaker tapes, flexible waterproofing bands, corners, sleeves, sealants etc, appropriate for the application and the ARDEX waterproofing membrane.

Allow floor levelling compounds and mortar screeds to properly cure in accordance with the manufacturer's recommendations before commencing waterproofing.

The commencement of work on each section of waterproofing shall be deemed to indicate full acceptance by the ARDEX Approved Applicator that all preparatory works by other trades are appropriate to achieve the required finished results.

Carry out all necessary substrate priming in accordance with ARDEX requirements.

### **3.3.9 Completion**

Check that ARDEX liquid-applied waterproofing membranes have been applied and installed correctly, with all edges, penetrations, outlets, movement control joints and other detailing correctly finished.

Check waterproofing membranes for defects, surface damage and punctures - carry out any repairs in strict accordance with the manufacturer's instructions before permanently covering. Replace damaged membranes when beyond repair.

As necessary, flood test waterproofing membranes in accordance the manufacturer's requirements and time frames - carry out any additional works necessary as a result of the testing.

Ensure waterproofing membranes are adequately protected from damage and contamination until permanently covered or enclosed.

Leave this work complete, watertight and leak-free, and to the required standard in accordance with ARDEX NZ Ltd requirements.

Clean up thoroughly, and leave adjacent surfaces and finished work clean and free of damage and contamination. Remove all associated rubbish from site.

Issue to the Owner a copy of the manufacturer's maintenance requirements (if applicable), and a copy of the ARDEX NZ Ltd Warranty.

## 4 CARPENTRY

### 4.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 4.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1080.1:2012(AS/NZS)	Timber - Methods of test - Method 1: Moisture content
1170.2:2011(AS/NZS)	Structural design actions - Wind actions
1170.5:2004(NZS)	Structural design actions - Earthquake actions - New Zealand
1604.3:2012(AS/NZS)	Specification for preservative treatment - Part 3: Plywood
2269.0:2012(AS/NZS)	Plywood - Structural - Part 0: Specifications
2295:2006(NZS)	Pliable, permeable building underlays
2588:1998(AS/NZS)	Gypsum plasterboard
2589:2017(AS/NZS)	Gypsum linings - Application and finishing
2785:2000(AS/NZS)	Suspended ceilings - Design and installation
2904:1995(AS/NZS)	Damp-proof courses and flashings
2908.2:2000(AS/NZS)	Cellulose-cement products - Flat sheets
3601:1973(NZS)	Metric dimensions for timber
3602:2003(NZS)	Timber and wood-based products for use in building
3603:1993(NZS)	Timber Structures Standard
3604:2011(NZS)	Timber-framed buildings
3617:1979(NZS)	Specification for profiles of weatherboards, fascia boards, and flooring
3618:1984(NZS)	Mechanical stress grading of timber
3622:2004(NZS)	Verification of timber properties
3631:1988(NZS)	New Zealand timber grading rules
3640:2003(NZS)	Chemical preservation of round and sawn timber
4200.1:2017(AS NZS)	Pliable building membranes and underlays - Part 1: Materials
4200.2:1994(AS/NZS)	Pliable building membranes and underlays - Installation requirements
4219:2009(NZS)	Seismic performance of engineering systems in buildings
4389:2015(AS/NZS)	Roof safety mesh
4859.1:2002(AS/NZS)	Materials for the thermal insulation of buildings - General criteria and technical provisions

AWCI Code of Practice	For Design, Installation and Seismic Restraint of Suspended Ceilings
NZBC B2	Durability
NZBC E2	External moisture
NZBC E2/AS1	External Moisture

### **4.3 General**

This section includes the receiving, stacking and storage of all Carpenter's materials and the fabrication, erection and fixing of all framing, sheathings and finishing timbers, including all work incidental to neatly finishing in other trades and all temporary work and temporary bracing.

The Carpenter shall attend upon all trades, and shall supply and fix all obviously necessary but not specifically mentioned fixings and materials.

### **4.4 Timber Framing**

#### **4.4.1 Scope**

Supply and install timber framing to the floors, walls, roofs, and other timber framed elements, as identified and detailed on the drawings. All aspects of this work shall be in accordance with NZS 3604, product manufacturers' recommendations, and as shown on the drawings and the specification.

#### **4.4.2 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All work shall be carried out to current best trade practise by experienced and competent tradesmen, familiar with the materials and installation techniques, in accordance with NZS 3604 and as shown on the drawings.

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings prior to installing timber framing.

Co-ordinate with other trades to install timber framing as required.

#### **4.4.3 Timber Framing**

##### *Timber Grade and Quality*

Unless otherwise noted or specified on the drawings or specification, all framing timber shall be minimum structural grade SG 8 Radiata pine in accordance with NZS 3622.

Framing timber shall be seasoned or kiln dried, and be straight and true and free from wind, warp and distortion, and in lengths suitable for the members required, and shall have a moisture content of between 12% and 18% before installation.

Do not use damaged, faulty or defective materials.

##### *Timber Treatment*

All non-durable timber framing shall be appropriately treated against moisture and/or insect decay by treatment plants with recognised quality assurance systems that are administered by the Timber

Preservation Council (NZTPC). Treatment of timber and wood-based building products shall be to the requirements of NZS 3602 as an absolute minimum, and all treated timber shall be identified and marked as required.

Carefully manage treated framing during installation to avoid accidental use of timber with a lower performance or durability treatment than that required or specified.

#### *Storage & Handling*

Check timber framing upon delivery and reject sub-standard or damaged material.

Store timber framing dry under cover, fillet stacked and well clear of the ground, and protect from damage, moisture, and contamination.

Ensure all appropriate personal protection equipment is worn at all times when handling and cutting treated framing.

#### *Framing Installation*

All timber framing members, including all dwaning, strutting, blocking, bracing etc, shall be sized, setout, fitted and fixed to the requirements of NZS 3604 and as shown on the drawings to accommodate structural loadings, cladding and lining setout and support, and the installation of other building components, fixtures and fittings.

All framing shall be erected without deviation, true to line, level, angle and plumb, and evenly aligned and square, and within the tolerances allowed in NZS 3604 Table 2.1. Framing members accurately cut, lapped, housed, joined, and seated so as to provide full contact over the bearing surfaces.

Temporarily prop, brace, tie, and secure framing members and elements as required until the framing is complete and self supporting. Leave in place for safety purposes as long as required.

Protect timber framing as required during installation against damage and moisture, and against significant variation of moisture content until ready for lining. Avoid ponding of water around floor plates.

#### *Concrete Separation*

Separate timber framing with an approved continuous damp proof course when in direct contact with concrete or masonry. Ensure that the DPC material is compatible with the timber treatment.

Free draining separations to external vertical faces shall be 12mm minimum and as noted on the drawings.

#### *Timber Re-treatment*

All cut or drilled surfaces of H4 and H5 treated timber framing shall be flood coat re-treated, with a suitable product recommended by the original treatment plant, before installation.

#### *Edge Notching and Centre Holes*

The notching, checking, and boring of framing members shall be in strict accordance with the requirements of NZS 3604.

Avoided checking and cutting where possible and keep to such dimensions so as not to prejudice the purpose for which the member is used. Keep edge notching to a minimum and where possible use centrally bored holes instead.

Concealed services pipes and wiring shall not project beyond the framing face and where possible shall be beyond the lining's fixing reach.

#### *Framing Protection*

Protect timber framing as required during installation against damage and moisture, and against significant variation of moisture content until ready for lining. Avoid ponding of water around floor plates.

#### *Built-up Framing Members*

Except for jack studs, bottom plates and top plates, framing members may be substituted with built-up members in accordance with the limitations of NZS 3604 2.4.4.7 with the prior approval of the Architect/Designer only.

### **4.4.4 Steel Fixings**

#### *Fastenings and Connectors*

Unless otherwise noted or specified, timber framing fastenings and connectors shall be as specified in the relevant fixing schedules of NZS 3604 or have an equivalent capacity as specified therein. Timber framing connectors and fixings shall comply with the product information as required in NZS 3604 2.4.6, and shall be used and installed in accordance with the manufacturer's recommendations. Pre-drill nail holes in split-prone framing as necessary.

#### *Durability of Fixings & Fastenings*

Unless otherwise noted or specified, the minimum durability of timber framing fixings and fastenings, excluding nails and screws, shall comply with the durability requirements of NZS 3604 Table 4.1. Galvanised steel fixing components, excluding nails and screws, shall have galvanised coating masses in accordance with NZS 3604 Table 4.2.

Unless noted or specified otherwise, the materials for nails and screws shall be as given in NZS 3604 Table 4.3.

Steel fixings and fastenings in contact with timber treated with copper based timber preservatives (H3.2 or higher) shall be in accordance with NZS 3604 4.4.4.

Stainless steel nails shall be minimum Grade 304 unless otherwise specified or noted.

#### *Bolts and Coachscrews*

Unless specified or shown otherwise, all bolted and coach screwed connections shall be M12 or M16 in accordance with the relevant fixing requirements given in NZS 3604.

Bolted and coach screwed connections shall have either a 50mm x 3mm square, or a 55mm x 3mm round, washer to each head and nut for M12 and M16 fixings. Washers shall be of the same material and durability as the bolt or coach screw.

### **4.4.5 Floor Framing**

Unless specified or shown otherwise, timber floor joists shall be to the dimensions and spacings given in NZS 3604 Table 7.1.

Floor joists shall be laid on edge true to line and level, have a minimum support bearing of 32mm (except when cantilevered), and so that any crook will straighten under load.

Floor joists shall be jointed over supports (except when cantilevered beyond the support) in accordance with NZS 3604 7.1.1.7.

#### **4.4.6 Wall Framing**

##### *Plates*

Top and bottom plates shall be to the dimensions and layout shown on the drawings. Unless specified or shown otherwise, top and bottom plates shall be fixed in accordance with NZS 3604 7.5.12 and Tables 8.18 and 8.19, true to line and level or angle.

Joints in top plates shall be made over a stud or over blocking between studs, and all top plate connections shall be in accordance with NZS 3604 8.7.3. Form all holes and edge notches in top and bottom plates in accordance with NZS 3604 8.7.5.

##### *Studs*

Studs shall be to the dimensions and spacings shown on the drawings, and installed true to line and plumb in both directions between top and bottom plates.

Unless noted otherwise, non-load bearing wall studs shall be to the spacings given in NZS 3604 Table 8.4, stud width as shown on the drawings.

Form all holes and edge notches in studs in accordance with NZS 3604 8.5.1.5. Do not notch, check, cut, or bore holes in the middle third of any trimming stud.

Should the need arise, studs shall be straightened in accordance with NZS 3604 8.5.3 with prior approval from the Architect/Designer only.

Unless noted otherwise, studs in loadbearing walls for 3 kPa floor loads shall be in accordance with NZS 3604 Table 14.10.

##### *Lintels*

Lintels shall be to the dimensions and locations shown on the drawings, and installed true to line and level, and shall be supported by a 45mm thick doubling stud or jack stud fixed to a trimming stud, and secured against uplift in accordance with NZS 3604 8.6.1.8 as required.

The thickness of a lintel may be made from two or more members, where each member is the length of the lintel, in accordance with NZS 3604 2.4.4.7.

##### *Sill & Head Trimmers*

Unless specified or shown otherwise, sill and head trimmers to openings shall be the same width as the wall stud and to the thickness given in NZS 3604 Table 8.15, and installed at the required opening height true to line and level, and supported by a 45mm thick doubling stud or jack stud fixed to a trimming stud.

##### *Dwangs*

Dwangs shall be the same width and thickness as the wall stud, and installed at the centres noted on the drawings, and accurately cut and fixed in place true to line and level and flush with stud edges.

Dwangs fixed in accordance with NZS 3604 Table 8.19.

### *Ribbon Boards*

Ribbon boards shall be as dimensioned and located on the drawings, and installed on edge and checked 25mm into studs at the required height, true to line and level, and fixed in place in accordance with NZS 3604 Table 8.19.

## **4.4.7 Roof Framing**

### *Rafters*

All rafters (including hip, valley and jack rafters) shall be to the dimensions, spacings, pitch, and layout shown on the drawings.

Rafters shall be aligned and paired at the required spacings to ridge boards, ridge beams, hip rafters and valley rafters, and as shown on the drawings, and installed parallel, true to line, pitch and plane, and fixed in accordance with NZS 3604 Table 10.1.

Any required jointing of rafters shall be made over supports shown on the drawings only.

Unless shown otherwise, rafter seating to top plates, beams, and lintels shall have a minimum bearing of 32mm without reducing the rafter depth to less than 65mm, or 80%, at the birds mouth.

Extend rafter ends to form eaves as detailed on the drawings and in accordance with NZS 3604

10.2.1.14.

Fly rafters and outriggers installed to form gable verges as detailed on the drawings and in accordance with NZS 10.2.1.15.3

### *Purlins*

Purlins shall be to the dimensions and spacings shown on the drawings and as required by the cladding material, and fixed to rafters and/or trusses in accordance with NZS 3604 Table 10.10 (purlins on their flat) and/or Table 10.11 (purlins on their edge).

Purlins on their flat shall be continuous over a minimum of two spans.

Provide all necessary blocking and lateral support to purlins laid on edge in accordance with NZS 3604 10.2.1.16.6, and as detailed.

Extend purlins to form gable verges as detailed and in accordance with NZS 3604 10.2.1.15.

### *Roof Trusses*

Roof trusses shall be Specific Engineering Design (SED) in accordance with NZBC B1/VM1 and manufactured by an accredited fabricator, and shall comply with all aspects of NZS 3604 10.2.2. Roof trusses shall be fabricated to meet the specific design requirements of the roof including, but not limited to; roof layout, pitch, and details, in accordance with the drawings and specification.

Roof trusses shall be supported and fixed to the truss fabricator's specifications but shall be no less than that required by NZS 3604 Tables 10.14 and 10.15. Roof trusses shall be braced as shown on the drawings and in accordance with NZS 3604 10.3.

### *Roof Bracing*

Roof bracing shall be as shown on the drawings and in accordance with NZS 3604 10.3 and 10.4 as necessary.

## **4.4.8 Ceiling Framing**

Unless specified or shown otherwise, timber ceiling battens shall be to the dimensions and spacings shown on the drawings and in accordance with NZS 3604: Table 13.1, and shall be installed true to

line, level and plane, and fixed to the underside of floor joists, rafters, ceiling joists or truss chords in accordance with NZS 3604: Table 13.3.

Ceiling battens shall be of Merchantable grade or better timber complying with NZS 3631.

## **4.5 GIB® Plasterboard Sheets**

### **4.5.1 Scope**

Supply and install the selected GIB® Plasterboard sheets, complete with all accessories, as sheet lining material to the walls, ceilings and other elements identified on the drawings. All aspects of this work shall be in complete accordance with Winstone Wallboards Ltd technical literature and installation guidelines (call Winstone Helpline on 0800 100 442 or check [www.gib.co.nz](http://www.gib.co.nz) for the latest editions) and other relevant product manufacturers' recommendations.

Substitution of any specified GIB® system, GIB® System component or GIB® plasterboard is not permitted.

### **4.5.2 GIB Plasterboard**

GIB® Standard plasterboard, 10mm thick.

Location:

GIB® Standard plasterboard, 13mm thick.

Location:

GIB Aqualine® plasterboard, 10mm thick.

Location:

### **4.5.3 Fixings**

Fix sheets with adhesive and GIB® Grabber® drywall screws in accordance with Winstone Wallboards Ltd requirements.

Fix sheets with GIBFix® adhesive and GIB® Nails in accordance with Winstone Wallboards Ltd requirements.

GIBFix® All-Bond adhesive. Use to adhere the sheets and accessories to the framing in accordance with Winstone Wallboards Ltd requirements.

GIBFix® One. Use to adhere the sheets to the timber framing and battens in accordance with Winstone Wallboards Ltd requirements.

**4.5.4 Level of Plasterboard Finish**

To the areas noted as a specific Level of Finish (3-5) on the drawings, additionally comply with all relevant aspects of Winstone Wallboards Ltd literature and AS/NZS 2589, complete with all system accessories, and other relevant product manufacturers' recommendations.

NOTE: Unless stated otherwise, Level 4 is the default Level of Finish.

**4.5.5 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to ensure that appropriate clearances are allowed from adjacent internal linings, fixtures, products, and associated services, etc, that the sheets correctly allow for door and window installation, and that services penetrations are correctly handled to maintain sheet integrity.

**4.5.6 Workmanship**

All installation work shall be carried out by experienced tradesmen familiar with the techniques and materials specified and in accordance with the current requirements of Winstone Wallboards Ltd.

**4.5.7 Delivery & Handling**

Store GIB® plasterboard sheets undercover inside a watertight building and keep sheets dry at all times. Stack sheets flat on a dry level surface in accordance with Winstone Wallboards Ltd recommendations. Avoid damage to sheet edges, ends, and surfaces. Carry all sheets on edge. Do not use damaged or faulty sheets.

**4.5.8 Preparation**

Check that the timber framing elements are in accordance with NZS 3604, or in accordance with NZS 3603 and AS/NZS 1170 for specific design, and otherwise in accordance with the specified Level of Finish and Winstone Wallboards Ltd requirements. Framing shall be plumb and in true alignment, complete and suitable for the sheets, and maximum moisture content 18% or as recommended by Winstone Wallboards Ltd. Ensure that the framing is true to line and plane and with no projections due to structural and bracing bracketry etc. Ensure that all framing brackets, plates, braces and hold-downs etc. are correctly installed.

Check that the building has been completely finished to all penetrations including doors, windows, services, etc so that the sheets can be installed without being affected by any weather conditions. Check junctions to all other building elements and ensure that all necessary works have been completed eg. flooring, setout of services, etc. that will enable the sheets and accessories to be installed. Clear building debris and rubbish from framing voids and keep clean until GIB sheet linings are installed.

#### **4.5.9 Installation**

Install the sheets, complete with all accessories, to the framing in accordance with the relevant Winstone Wallboards Ltd recommendations and literature, and as noted and detailed on the drawings.

#### **4.5.10 Completion**

Ensure that the sheets have been cut, fitted and joined, and fixed correctly. Check for damage and replace as necessary.

Clean up thoroughly on completion and remove all waste and rubbish from site.

Provide a copy of the Winstone Wallboards Ltd maintenance requirements to the owner.

### **4.6 GIB® Rondo® Metal Batten Systems**

#### **4.6.1 Scope**

Supply and install the specified GIB® Rondo® Metal Batten Systems to the locations identified on the drawings, incorporating all system components and accessories required for proper installation and performance. All aspects of this work shall be in complete accordance with the [GIB® Rondo® Metal Batten Systems - System and Installation Manual](#) publication and the [GIB® Site Guide](#) (check [www.gib.co.nz](http://www.gib.co.nz), or call 0800 100 442 for the latest editions), other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for GIB® Rondo® Metal Batten Systems.

This specification section should be read in conjunction with the GIB® Plasterboard Linings specification and relevant GIB® Systems specifications, and other specification sections, as they are interrelated.

For the purpose of this specification, the GIB® Rondo® Metal Batten Systems - System and Installation Manual publication is referred to as the 'GIB® Rondo® Metal Batten Systems Manual'.

#### **4.6.2 Requirements**

##### *Safety*

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

##### *Warranty*

##### GIB® Product & System Warranty:

- 10 Years Warranty - for all GIB® Products and Systems installed, according to warranty conditions.
- Provide the GIB® Product & System Warranty on the manufacturer's standard warranty form.
- Commence the warranty from the date of practical completion of the contract works.

*Producer Statement PS1 - GIB® Rondo® 308 Ceiling Suspension System*

Producer Statement PS1 - GIB® Rondo® 308 Ceiling Suspension System. Furnish a fully completed Producer Statement PS1 (Design) as confirmation that the GIB® Rondo® 308 Ceiling Suspension System as designed and documented complies with the relevant clauses of the New Zealand Building Code. The PS1 Producer Statement shall not serve as a product warranty or guarantee of compliance.

**4.6.3 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to ensure that the GIB® Rondo® Metal Batten System correctly allows for ceiling lining installation, and for the locations of recessed lights and other fittings installed by others, and to install GIB® Rondo® Metal Batten Systems as required.

**4.6.4 Workmanship**

Where required by the NZ Building Act 2004, it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

Installation of GIB® Rondo® Metal Batten Systems shall be carried out by experienced and competent tradespersons, who are familiar with the specified systems and installation techniques, in accordance with the GIB® Rondo® Metal Batten Systems - System and Installation Manual, to fully comply with all warranty requirements, and relevant requirements of AS/NZS 2785 (suspended systems). Submit evidence of experience on request, e.g. National Certificate of Interior Systems, or Certified Business Member of AWCINZ.

All cutting, jointing, fixing and supporting techniques shall be exactly as recommended by the manufacturer. All work shall be such as to leave a neat, efficient and robust installation, to the required standard, free from damage and defects.

**4.6.5 Delivery & Handling**

Store all materials and accessories indoors, off the floor, on a flat, level surface in accordance with the manufacturer's requirements. Keep materials and accessories dry and protected from damage, distortion, moisture and contamination at all times.

Do not use damaged or defective materials and products.

Handle all materials in accordance with the manufacturer's requirements and Product Data Sheets, and in a manner that prevents damage and distortion to the component.

Installers shall be familiar with and comply with the manufacturer's Material Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

Installers shall conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - including the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#).

#### **4.6.6 Preparation**

##### *General*

The building must be fully enclosed, weathertight and suitably dry before installation commences.

Check that all preliminary and preparatory building works have been completed to specification and as shown on the drawings.

Check that any required building services installations, including electrical, plumbing, mechanical, fire, or other service located behind the ceiling line and/or wall line, have been completed.

Supporting timber framing shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content 18% at the time of installation.

Supporting light structural steel framing shall comply with the requirements of AS/NZS 4600 or the NASH Standard for Residential and Low-rise Steel Framing, Part 1: Design Criteria. All light structural steel framing members shall satisfy the requirements of AS/NZS 1170.

Supporting steel stud partitioning shall comply with AS 1397 and as specified and shown on the drawings.

Supporting steel structures shall comply with NZS 3404.

Supporting concrete structures shall comply with the CCANZ CP 01:2011 or with NZS 3109. New concrete must have aged for a minimum of 28 days.

Supporting concrete masonry structures shall comply with NZS 4229, or with NZS 4230 and AS/NZS 1170 for specific design.

Carry out all necessary substrate inspections and preparatory work in accordance with the GIB® Rondo® Metal Batten System Manual and the GIB® Site Guide prior to installation.

Confirm the location and details of movement control joints, as indicated on the drawings, prior to installation.

The commencement of work on each section/area shall be deemed to indicate full acceptance by the installer that all preparatory works by other trades is complete.

#### **4.6.7 Completion**

Carry out a final inspection immediately after installation. Check that the GIB Rondo Metal Batten System has been installed correctly in accordance with the GIB® Rondo® Metal Batten Systems Manual and installation tolerances, to the correct set-out and details shown on the drawings, and that the installations are accurately aligned true to line, level (and/or plumb) and plane.

Check that the installed layout allows for the correct positioning and installation of all penetrations and services fixtures and fittings as indicated on the drawings.

Check for any damage and defective work - repair or replace as necessary to the required standard.

Leave all of this work complete and to the required standard in accordance with the manufacturer's warranty requirements, as shown on the drawings.

Leave completed works and surrounding surfaces clean and free of rubbish and debris. Remove all rubbish and excess material from the site.

Issue to the Owner a copy of the a copy of the GIB® Product and System Warranty.

Provide all necessary Producer Statements.

## **4.7 Thermakraft Underlay, DPM & DPC**

### **4.7.1 Scope**

Supply and install Thermakraft Underlays and Membranes, as specified herein, to the locations identified on the drawings, complete with all accessories required for proper installation and performance. All aspects of this work shall be in complete accordance with Thermakraft Ltd technical information and installation requirements (check [www.thermakraft.co.nz](http://www.thermakraft.co.nz), or call 0800 806 595 for the latest editions), other relevant product manufacturers' recommendations, and as shown on the design drawings.

No substitutions are permitted for the specified products from Thermakraft Ltd.

The following is a list and a general description of the extent of the Thermakraft Underlays and Membranes works, which are more specifically defined in the contract documents, required for the completion of the contract works:

### **4.7.2 Requirements**

#### *Substitutions*

Thermakraft Ltd products shall be as specified herein and as indicated on the approved drawings. The substitution of Thermakraft branded products for alternative brands is not permitted under any circumstances.

The substitution of a specified Thermakraft product for an alternative Thermakraft branded product by the Contractor shall only be permitted with the Contract Administrator's written authorisation, and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate alternative Thermakraft branded products to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

#### *Safety*

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

*Warranty*Thermakraft Ltd Product Warranty:

- 15 Years Warranty - for all Thermakraft warranted products installed, according to the warranty conditions.
- Provide the Thermakraft Ltd Product Warranty on the manufacturer's standard warranty form.
- Commence the warranty from the date of permanent installation.

**4.7.3 Roof Underlay**

Covertex 407. A self-supporting, fire-retardant, absorbent, breathable, synthetic non-woven polyolefin underlay. Nominal weight 220g/m<sup>2</sup>.

Covertex 407 is CodeMark assured with the NZ Building Code: [CodeMark Certificate of Conformity No:GM-CM30028-Rev C](#), issued by Global-Mark Pty Ltd.

Installed as a roof underlay over timber or steel roof framing in accordance with the manufacturer's requirements and [BRANZ Appraisal No.651 \(2009\)](#).

Covertex 407 roof underlay can be used directly under direct-fixed roof claddings, or directly under roof cavity battens or tile battens in accordance with Thermakraft requirements.

Covertex 407 roof underlay must be installed in a manner that prevents ponding of water. Provide additional support at no more than 300mm centres when Covertex 407 is installed on roofs with slopes less than 10°.

Do not leave Covertex 407 exposed on roofs for more than a total of 7 days before covering.

Installed Location:

**4.7.4 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install Thermakraft Underlays, DPMs, and DPCs as required.

**4.7.5 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All installation work shall be carried out by experienced and competent tradespersons, familiar with the specified products and installation techniques, in accordance with the manufacturer's requirements, and to fully comply with all warranty requirements.

All cutting, joining, and fixing techniques shall be exactly as recommended by the manufacturer, and carried out with the use of suitable tools and equipment appropriate for the application. All work shall be such as to leave a neat, efficient, and weathertight installation.

#### **4.7.6 Delivery & Handling**

Store underlay rolls on end, undercover, on a flat, clean and dry surface. Keep stored materials dry, out of direct sunlight, and protected from damage and contamination at all times.

Handle materials in accordance with the manufacturer's requirements and in a manner that prevents damage to or deterioration of the product.

Do not use damaged or defective materials, or products that are beyond their designated shelf life.

Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear when handling materials.

Installers shall conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - including the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#), as well as the [Best practice guidelines for working on roofs](#) for roofing installations.

#### **4.7.7 Preparation**

##### *General*

Prior to installation, carry out all necessary inspections and preparatory work required, and ensure that all preliminary works by other trades has been completed to specification and as shown on the approved drawings.

Do not commence installation until all necessary preliminary works by others is complete and to the required standard. The commencement of work shall be deemed to indicate full acceptance by the installer that all preliminary works by other trades is complete.

Supporting timber framing shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content of 20% at the time of cladding installation. Allow LOSP treated timber to sufficiently flash-off before installing Sisalation® building underlays and foils.

Supporting light structural steel framing shall comply with the requirements of AS/NZS 4600 or the NASH Standard for Residential and Low-rise Steel Framing, Part 1: Design Criteria. Comply with the light structural steel framing fabricator's specifications and requirements for fixing cladding and roofing components.

Supporting heavy steel structures shall comply with NZS 3404.

#### **4.7.8 Completion**

Check that all underlays have been installed correctly and are properly supported, and that all underlay edges, joins and ends are correctly finished prior to closing off with claddings - all in accordance with Thermakraft installation requirements.

Check installed membranes and underlays for defective work and damage - replace and/or repair as necessary to the required standard.

Leave all of this work complete, and free of defects, and to the required standard in accordance with the manufacturer's warranty requirements.

Issue to the Owner a copy of the Thermakraft maintenance requirements and the Thermakraft product warranties for the installed products.

## **4.8 James Hardie Pre-Cladding**

### **4.8.1 Scope**

Supply and install RAB Board 9mm fibre-cement sheet as a rigid air barrier to the walls identified on the drawings, complete with all accessories. RAB Board 9mm is suitable for bracing or specific engineering design shear wall for use in residential or commercial applications where the structural design requires strong/stiffer walls. It also provides superior acoustic performance in external walls as compared to RAB Board 6mm or plywood rigid air barriers. All aspects of this work shall be in complete accordance with the [James Hardie Rigid Air Barriers Installation Manual](#) (check [www.jameshardie.co.nz](http://www.jameshardie.co.nz), or call 0800 808 868 for the latest edition), [BRANZ Appraisal No.611 \(2011\)](#), and other relevant product manufacturers' recommendations. Use the James Hardie RAB Board Installation Checklist at all relevant stages of the work.

### **4.8.2 Co-operation**

Co-ordinate with other trades to ensure that appropriate clearances are allowed from roofing products and associated flashings etc, that the panels correctly allow for door and window installation, and that services penetrations are correctly handled to maintain full weathertightness and panel integrity.

Ensure that other trades are aware of the James Hardie Safe Working Practices.

### **4.8.3 Preparation**

Check that the timber framing elements are in accordance with NZS 3604, or in accordance with NZS 3603 and AS/NZS 1170 for specific design, and in accordance with James Hardie requirements. Framing shall be plumb and in true alignment, complete and suitable for the panels, and maximum moisture content as per NZS 3602. Ensure that the framing is true in line with no projections due to structural and bracing bracketry etc. Ensure that the bottom plate hold-downs are correctly installed.

Check that the ground levels are sloping away from the building in accordance with E1/AS1, with no ponding water against the building, and that the ground will remain clear of the sheet by at least 100mm at all times.

### **4.8.4 Workmanship**

All installation work shall be carried out by an LBP, or supervised by an LBP, in accordance with James Hardie Rigid Air Barriers Installation Manual and other relevant product manufacturers' recommendations.

#### **4.8.5 Delivery & Handling**

Carry all sheets on edge. Stack sheets flat on a level platform off the ground eg., use the supplied delivery pallet on level ground, or minimum 4 evenly spaced bearers on level ground. Keep sheets and accessories dry at all times. Avoid damage to sheet edges, ends, and surfaces. Keep uPVC flashings and jointers out of direct sunlight, and store all accessories on flat and avoid damage to any. All installers to be familiar with and comply with the James Hardie Safe Working Practices in the Installation Manual, to use appropriate safety gear, and in particular to be aware to avoid breathing silica dust. Do not use any damaged or blemished sheets or accessories.

#### **4.8.6 Installation**

Fix sheets vertically directly to framing in accordance with the Installation Manual.

Vertical joints on framing to be sealed with a joint sealing tape, for both non-bracing and bracing applications.

Ensure that all cut edges of sheets where exposed are primed prior to installation with Dulux 1 Step Prep, Resene Quick Dry, or similar. Ensure that the bottom edge of the sheet overhangs below the bottom plate by 15mm, and is clear of the ground surface by at least 100mm; the finished ground clearance shall be in accordance with E2/AS1. Install flexible flashing tape to all junctions and penetrations (including cables etc), with the addition of a pipe bandage for pipes to maintain weathertightness and air pressure resistance. Do not use sealant.

#### **4.8.7 Horizontal Joints**

Horizontal joints to be formed at floor joist level with a uPVC flashing. Ensure that the sheets are not fixed to the floor joists.

#### **4.8.8 Fixings**

Fix sheets with stainless steel nails in accordance with James Hardie requirements.

#### **4.8.9 Completion**

Ensure that the sheets have been fixed correctly, that all vertical joints and horizontal joints have been completed correctly, and that all penetrations have been taped correctly. Check that no damage has occurred to any installed sheet element or associated component, replace as necessary. Check that no dirt has been mounded up within 100mm of the sheet, and maintain the clearance. Ensure that the cladding is installed within 90 days of the sheet installation. Hand over a copy of the latest edition of the James Hardie Rigid Air Barriers Product Warranty to the client.

### **4.9 Abodo Weatherboard Cladding**

#### **4.9.1 Scope**

Supply and install Abodo Weatherboard Cladding, as specified herein, to the locations identified on the drawings, complete with all system components and accessories required for proper installation and performance. All aspects of this work shall be in complete accordance with the [Abodo CodeMark Weatherboard Cladding System Manual \(2016\)](#) and Abodo product literature (check [abodo.co.nz](http://abodo.co.nz), or email [info@abodo.co.nz](mailto:info@abodo.co.nz), or call 09 249 0100 for the latest editions), and other relevant product

manufacturers' recommendations, within the conditions and limitations of the Abodo Weatherboard Cladding CodeMark Certificate of Conformity.

Abodo Weatherboard Cladding is CodeMark assured to comply with the New Zealand Building Code: [CodeMark Certificate of Conformity No.CMA-CM40070-R02](#), issued by CertMark New Zealand.

No substitutions are permitted for Abodo Weatherboard Cladding.

For the purpose of this specification, the Abodo CodeMark Weatherboard Cladding System Manual (2016) publication is referred to as the 'Abodo Cladding Manual'.

The following is a list and a general description of the extent of the Abodo Weatherboard Cladding works, which are more specifically defined in the contract documents, required for the completion of the contract works:

#### **4.9.2 Requirements**

##### *Safety*

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

##### *Warranty*

Abodo Wood Ltd 'Built-to-Last Warranty':

- 15 Year Warranty - for all Abodo Weatherboard Cladding materials installed, according to the warranty conditions.
- Provide the Abodo Wood Ltd 'Built-to-Last Warranty' on the manufacturer's standard warranty form.
- Commence the warranty from the date of permanent installation.

##### *Substitutions*

Abodo Weatherboard Cladding shall be as specified herein and as indicated on the approved drawings. The substitution of Abodo Wood branded products for alternative brands is not permitted under any circumstances.

The substitution of a specified Abodo Wood product for an alternative Abodo Wood branded product by the Contractor shall only be permitted with the Architect's/Designer's written authorisation, and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate alternative Abodo Wood branded products to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

##### *Defective Materials & Work*

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected Abodo Weatherboard Cladding materials and work shall be repaired and/or replaced to the satisfaction of the Architect/Designer, without delay and at no additional cost to the Principal.

Should a problem be encountered with any Abodo Wood product during use or delivery, immediately contact the Abodo Wood on 09 2490 100. Do not continue to use the product that is not performing to specification or expectation. Keep the product in question, and where possible, the document batch numbers and/or manufacturing details.

#### **4.9.3 Cladding Material**

##### *Vulcan Primed Cladding*

Abodo Weatherboard Cladding, including weatherboards and timber mouldings, shall be manufactured from [Vulcan Primed Cladding](#) - thermally modified Radiata pine (*Pinus radiata*).

##### Quality:

- Select Grade: Front face and edges virtually free of any defects but with one edge knot and one small face defect allowed per piece in 20% of boards only. Back side with some defects allowed according to Feature Grade.

##### Substrate Colour:

- Chocolate brown timber with light blue or white coloured factory primer coating.

##### Face Finish:

- Smooth dressed face.

##### Durability:

- Thermally modified to TM230 schedule. No chemical preservatives used.
- Tested by SCION, and approved for uses described in NZS 3602:2003 Table 2A. Equivalent to H3.1 (NZS 3640). Durability Class 2 (EN 350-1).
- Available optionally H3 treated with Protim preservation system - Durability class 1 (EN 113), H3 (AS 1604), H3.1 (NZS 3640).
- Thermally modified timber is resistant to most wood-boring insects but is not always resistant to termites.

##### Moisture Content:

- Approximately 7% MC (+/-2%) at time of despatch.

##### Construction:

- Solid timber, or finger-jointed with Type 1 polyurethane adhesive (VOC and formaldehyde free).

##### Coating:

- Vulcan Primed Cladding is supplied with two factory coats of Resene True-Prime waterborne primer/undercoat.
- Vulcan Primed Cladding must have two coats of quality acrylic exterior house paint applied within 60 days of installation.
- Where dark colours are to be used it is recommended to use Resene CoolColour™ systems.
- Refer to Coating clause.

Vulcan Primed Weatherboard Profile: Refer to Weatherboard Profile clause.

#### **4.9.4 Weatherboard Profile & Orientation**

*Vertical - Hector WB10P 135x18 (115mm cover) - Vulcan Primed Cladding*

Vulcan Primed Cladding Profile - Hector Secret Fix WB10P 135x18 (115mm cover). A 135mm wide x 18mm thick, secret-fixed, interlocking weatherboard. Installed vertically to the locations and details shown on the approved drawings in accordance with the Abodo Cladding Manual.

Installed Location:

#### **4.9.5 Cavity Battens**

*Timber Cavity Battens, 20mm Cavity - Vertical Weatherboards*

Timber Cavity Battens (non-structural) - to form a nominal 20mm deep drained cavity for vertical weatherboards - Abodo CB-H-20x45 Castellated Cavity Battens. 45 wide x 20mm thick, H3.1 treated Radiata pine, bevelled and castellated cavity battens, incorporating 25mm wide x 6mm deep rebates alternating at 100mm centres either side of the batten.

Fixing to Timber Framing:

- Fix castellated cavity battens to timber framing using 40 x 2.5mm hot-dip galvanised flat head nails.

Fixing to Lightweight Steel Framing (painted weatherboards only):

- Fix castellated cavity battens to lightweight steel framing using Class 3, 6g x 30mm, countersunk, self-drilling screws, spaced at maximum 800mm centres.

Installed horizontally, with batten edges sloping down and away from the framing, at maximum 480mm vertical centres, to the layout and details shown on the drawings and in accordance with the Abodo Cladding Manual.

#### **4.9.6 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works, including membranes, flexible underlays, rigid air barriers, and trims and any other related works are completed in accordance with the Abodo Weatherboard Cladding Manual.

Coordinate with trades the locations of pipes, outlets, cables, meter boards and other fittings installed by others, and to install Abodo Weatherboard Cladding as required.

#### **4.9.7 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner (LBP). On completion of the installation, the installing LBP shall complete and sign a Restricted Building Work (RBW) memorandum, and shall issue a copy to the Building Consent Authority and to the Main Contractor (as applicable).

Installation work shall be carried out by suitably qualified and experienced tradespersons, familiar with the specified products and the required construction and installation techniques, in accordance with Abodo Weatherboard Cladding Manual and to fully comply with all warranty requirements.

All work shall be such as to leave a neat, efficient, robust and weathertight installation, to the required standard, free from damage and defects, including surface marking.

Make all necessary provisions to protect adjacent finished work and surfaces from damage during installation.

#### **4.9.8 Delivery & Handling**

Take delivery of materials undamaged. Reject any item found to be defective or damaged and contact the supplier for replacement.

Store Abodo weatherboards and accessories undercover, flat and true, clear of the ground by at least 100mm and supported on dry and clean timber bearers spaced at maximum 900mm centres in accordance with Abodo recommendations. Keep stored weatherboards and accessories dry and protected from damage and contamination.

Do not use damaged or defective weatherboards or accessories. Should a problem be encountered with any Abodo product, immediately contact Abodo on 09 249 0100. Do not continue to use the product that is not performing to specification or expectation. Keep samples of the product in question and where possible, document batch numbers and/or manufacturing details.

Handle weatherboards in accordance with the manufacturer's recommendations and in a manner that prevents damage and surface marking.

Installers shall be familiar with, and comply with, the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear when handling materials.

Installers shall conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - including the [Best practice guidelines for working at height in NZ](#), and the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#).

#### **4.9.9 Preparation**

##### *Vertical Cladding - Timber Frame, Rigid Wall Underlay*

Vertical Weatherboard Cladding - installed over a drained cavity, on timber framed walls with a rigid wall underlay; check all aspects of preparatory works, including but not limited to:

- Check that the timber wall framing complies with NZS 3604, or is in accordance with NZS 3603 and AS/NZS 1170 for specific design, and in accordance with the requirements of the Abodo Cladding Manual.
- Check that the framing has studs at maximum 600mm centres, nogs/dwangs at maximum 480mm centres, is plumb and in true alignment, includes all blocking required for cavity battens and fixing at openings, joints, corners and soffits etc., and has a maximum moisture content of 20% at the time of cladding installation.
- Check that the rigid wall underlay has been installed in accordance with the manufacturer's requirements, and is over-fixed with a flexible wall underlay.
- Check that flexible wall underlay (if required by RAB manufacturer) has been installed over the rigid wall underlay in accordance with NZBC requirements and the manufacturer's recommendations, and

with all finishing tapes, flashings, etc., at windows, doors, corners and penetrations all correctly incorporated to provide a continuous seal.

- Check that all preparatory materials are lapped such that any water will run down to the exterior.
- Check that any rigid air barrier to unlined gables and external garage walls is overlaid with an absorbent flexible wall underlay in accordance with E2/AS1 Table 23, and the manufacturer's recommendations.
- Check that the ground levels are sloping away from the building so that there will be no ponding water against the building, and that the ground will remain clear of the cladding by at least 100mm at all times in accordance with E2/AS1.

#### **4.9.10 Installation**

##### *Cladding General*

Install Abodo Weatherboard Cladding, complete with all system components and accessories required for proper installation and performance, in accordance with the Abodo Cladding Manual and as shown on the approved construction drawings.

Confirm the layout and location of movement control joints, the layout of cavity battens, and any specific cladding detailing requirements prior to installation.

Ensure that all associated preliminary and preparatory works are completed to the required standard and specification, and as shown on the drawings.

Ensure that the current, up-to-date Abodo technical literature is readily available on site for reference during installation. Where there is any doubt, contact Abodo Wood on 09 249 0100 or email [info@abodo.co.nz](mailto:info@abodo.co.nz).

Abodo weatherboards and timber mouldings must be sealed with at least one coat all four sides prior to fixing. Ensure that all site-cuts to weatherboards and timber mouldings are properly sealed with an approved coating in accordance with Abodo requirements.

Refer to Fixing clause for fixing type and placement etc.

All internal and external weatherboard corner junctions, inter-storey junctions, and weatherboard trim and accessories, shall be constructed and installed to the details shown on the drawings.

Always keep weatherboard cladding lines consistent and true along walls and around corners.

All flashings around windows, doors and other openings, at corner junctions, inter-storey junctions, soffit junctions, and pipe penetrations, shall be carefully constructed, fixed and finished to the details shown on the drawings.

##### *Hector WB10/WB10P Weatherboard - Vertical*

General installation of vertical Abodo Hector WB10/WB10P Weatherboard Cladding:

Over the flexible wall underlay, install and fix the specified cavity battens and cavity closure to wall framing according to the layout and details shown on the drawings.

Back-flash all internal and external corners with corner flashings as detailed on the drawings and in accordance with the Abodo Cladding Manual.

Carefully set-out and secret-fix Hector WB10/WB10P weatherboards to the wall framing through the cavity battens, vertically to straight plumb lines, with side-laps directed away from prevailing weather, and with ends level along the baseline, minimum 50mm, or as detailed, below the bottom plate or floor structure.

From each leading corner, interlock and fix vertical Hector WB10/WB10P weatherboards in accordance with the Abodo Cladding Manual and as detailed on the drawings, keeping cladding lines plumb, straight and true.

Always use full length weatherboards where possible. Where joints are unavoidable, joints shall be formed over a nog/dwang line and cavity batten, and with 50mm wide PVC flashing tape applied to the back face of the boards along the joint. Weatherboard joints shall be scarfed at 35°, centred over the double dwangs/nogs, and fixed with a single fixing located minimum 12mm from the end (front edge) of each board. The scarf joint shall have adhesive sealant applied before fixing. Only if specified and shown on the drawings, the joint shall be covered with a flat soaker - as specified. Joints shall be located so as to avoid clustering, and shall be offset by at least 480mm from joints in boards either side of the joint. The use of end-matched joints made off nog/dwang fixing lines is subject to the Architect's/Designer's express approval only.

Internal and external corners, eaves junctions, windows, doors and other openings in the weatherboard cladding shall be constructed and made weathertight as detailed on the drawings in accordance with the Abodo Cladding Manual.

#### **4.9.11 Completion**

Check that the Abodo Weatherboard Cladding system has been correctly installed and fixed to the layout and details shown on the drawings and in accordance with the requirements of the Abodo Cladding Manual.

Check that all joints, associated trim and accessories are correct, that junctions with other materials and elements are sealed, and the weatherboard cladding system is weathertight.

Check for damage and defects - replace or repair as necessary to the required standard.

Ensure that the work of other trades does not negatively impact on or reduce the minimum clearances required by the NZ Building Code, between the cladding and ground, roof and/or deck junctures.

Leave all of this work complete and weathertight and to the required standard in accordance with the Abodo Wood Ltd 'Built-to-Last Warranty'.

Leave the completed works and surrounding surfaces clean and free of debris and rubbish. Remove all rubbish and excess material from the site.

Complete and sign the Restricted Building Work (RBW) memorandum, and the Abodo Wood Weatherboard Cladding System Quality Assurance Checklist. Issue a copy of the RBW document to the Building Consent Authority and to the Main Contractor (as applicable).

Issue to the Owner a copy of the Abodo Weatherboard Cladding maintenance requirements, and a copy of Abodo Wood Ltd 'Built-to-Last Warranty'.

## **4.10 Plywood Cladding**

### **4.10.1 Scope**

Supply and install the specified Plywood Claddings to the locations identified on the drawings, complete with all accessories. All aspects of this work shall be in complete accordance with the manufacturer's technical literature and installation guidelines, other relevant product manufacturers' recommendations, and as shown on the drawings.

Refer to Painting for all weather protective coating requirements applied to Plywood Claddings.

The following is a list and a general description of the extent of Plywood Cladding work, which are more specifically defined in the contract documents, required for the completion of the contract works:

### **4.10.2 Plywood Sheet Cladding**

12mm Plywood Cladding. 12mm thick, B/D Grade structural plywood sheet with a dressed (sanded) face veneer and square edges. Manufactured from softwood veneers, with a minimum of 5 ply, and complying with AS/NZS 2269 requirements. Preservative treatment, as specified, in accordance with AS/NZS 1604:3 and complying with NZS 3602.

Installed to timber framed buildings as direct-fixed or cavity-fixed wall cladding in accordance with the manufacturer's requirements, NZBC E2/AS1 and as shown on the drawings. Cavity-fixed cladding shall be over a 20mm drained cavity.

Manufacturer & brand name:

Location:

### **4.10.3 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Co-ordinate with other trades to ensure that plywood claddings correctly allow for door and window installation, and that services penetrations are correctly handled to maintain full weathertightness and material integrity, and to install plywood cladding as required.

All installation work shall be carried out by an experienced tradespersons, familiar with the specified products and installation techniques, in accordance with the manufacturer's installation requirements and as noted and detailed on the drawings.

All cut edges of plywood sheets shall be sealed prior to installation with a brush-on, clear, timber preservative.

Seal the bottom edge and back of the sheet 150mm high where plywood sheets are installed clear ground/paving level and above apron flashings on roofs - with a primer, stain or timber preservative, as appropriate for the required finish.

All cutting, drilling and notching of plywood materials shall be carried out using suitable tools and equipment to ensure accurate installation. All work shall be such as to leave a neat, efficient and robust installation.

Take all reasonable measures during installation to protect the surface of the plywood cladding from scratching and marking likely to affect the finish and appearance of the cladding.

At installation completion:

Check that the installed plywood cladding has been installed correctly, that all joints and accessories have been completed correctly, and that all penetrations have been correctly flashed and sealed.

Check for damaged and defective work - repair or replace as necessary.

Leave this work complete and weathertight.

Ensure that the work of other trades does not reduce the cladding to ground, deck or roof clearances that are required by the NZ Building Code.

Leave the work area clean, and remove rubbish and excess material from site.

#### **4.10.4 Delivery & Handling**

Store plywood sheets flat, off the ground on level bearers evenly spaced at 600mm centres, and without bending or excessive compression - if available, store sheets on the supplied delivery pallet. Keep sheets and accessories clean and dry and protected from damage and contamination at all times.

Plywood materials must be dry prior to fixing, jointing or finishing.

Do not use damaged or defective plywood sheets or accessories, or products that are beyond the designated shelf life.

Handle plywood sheets and accessories in accordance with the manufacturer's recommendations and in a manner that prevents damage and surface marking.

Installers should be familiar with and comply with the manufacturer's Material Safety Data Sheet precautions for use.

#### **4.10.5 Preparation**

*Cavity Fix - Timber Frame, Rigid Air Barrier*

Timber Framing for Plywood Sheet Cladding; check all aspects of preparatory works, including but not limited to:

Check that the timber wall framing complies with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and is in accordance with the plywood sheet manufacturer's requirements.

Check that the framing has studs at maximum 600mm centres and nogs/dwangs at maximum 800mm centres, is plumb and in true alignment, includes all blocking required for cavity battens and fixing at openings, joints, corners and soffits etc., and has a maximum moisture content of 18% at the time of

plywood cladding installation.

Check that the rigid air barrier, as specified, has been installed in accordance with NZBC requirements and the manufacturer's recommendations, with all finishing tapes, flashings, etc., at windows, doors, corners and penetrations correctly incorporated to provide a continuous seal.

Check junctions to all other building elements and ensure that all necessary works have been completed that will enable the plywood sheets and accessories to be installed.

Check that all preparatory materials are lapped such that any water will run down to the exterior.

Check that the ground levels are sloping away from the building so that there will be no ponding water against the building, and that the work of other trades does not negatively impact on or reduce the minimum clearances required by the NZ Building Code, between the cladding and ground, roof and/or deck junctures.

#### **4.10.6 Cavity Battens**

Ex 50 x 25mm H3.1 treated Radiata cavity battens (non-structural). Installed over the building underlay at the required layout, and fixed to the timber framing with 40 x 2.5mm hot-dipped galvanised flat head nails at maximum 400mm centres.

#### **4.10.7 Installation - Plywood Cladding**

As shown on the drawings; confirm the layout and location of all control joints and any specific cavity-fixed plywood cladding detailing requirements. Ensure that all cut edges of plywood sheets are sealed prior to installation.

Fix the specified cavity closure strip to the framing level along the base line minimum 35mm, or as detailed, below the bottom plate or floor structure. Ensure that the openings in the cavity closure strip are kept clear and unobstructed at all times. Install cavity closure strip above window and door joinery as detailed.

Install the H3.1 timber cavity battens over the building underlay to the required layout and fix to the framing as specified.

Install the plywood cladding sheets full size, to the required set-out pattern, fixed through the cavity battens to the framing as specified, complete with all necessary accessories, including under-flashings, battens, mouldings, sealant, etc. All sheet joints located over cavity battens and solid framing.

Ensure that the bottom edge of the sheet overhangs below the bottom plate or floor structure by minimum 50mm or as detailed, and is clear of the ground surface by at least 100mm; the finished ground clearance shall be in accordance with E2/AS1.

Finish sheets at window and door openings as detailed on the drawings.

Neatly form any necessary pipe, conduit or other penetration through the sheet with an even margin all round and seal flush with the specified flexible sealant. Ensure that a pipe bandage is fitted to all pipes etc. to maintain weathertightness and air pressure resistance prior to installing the sheet.

Plywood cladding vertical sheet joints shall be gapped 2mm apart and covered with minimum ex.75mm x 25mm, H3.1, weather-grooved and pre-primed timber battens. Weathergrooves shall measure 6mm x 6mm.

Install the vertical cover battens centred over the gapped sheet joint and fix with one nail in the centre of the batten at 300mm centres vertically - ensure the nail is clear of the sheet edges behind. External corner battens (weathergrooved) shall be sized to provide minimum 50mm cover over the plywood cladding.

Fix timber cover battens as specified.

#### **4.10.8 Cover Battens & Boards**

Timber cover battens and other plywood cladding timber boards and mouldings shall be dressed, H3.1 treated, dressing grade Radiata pine.

## 5 ROOFING

### 5.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 5.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1170.2:2011(AS/NZS)	Structural design actions - Wind actions
1397:2001(AS)	Steel sheet and strip - Hot-dip zinc-coated or aluminium/zinc-coated
1562.3:1996(AS/NZS)	Design and installation of sheet roof and wall cladding - Plastic
2295:2006(NZS)	Pliable, permeable building underlays
2728:2013(AS/NZS)	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
2904:1995(AS/NZS)	Damp-proof courses and flashings
3604:2011(NZS)	Timber-framed buildings
4020:2005(AS/NZS)	Testing of products for use in contact with drinking water
4200.1:1994(AS/NZS)	Pliable building membranes and underlays - Materials
4200.1:2017(AS NZS)	Pliable building membranes and underlays - Part 1: Materials
4200.2:1994(AS/NZS)	Pliable building membranes and underlays - Installation requirements
4389:2015(AS/NZS)	Roof safety mesh
4534:2006(AS/NZS)	Zinc and zinc/aluminium-alloy coatings on steel wire
4859.1:2002(AS/NZS)	Materials for the thermal insulation of buildings - General criteria and technical provisions
NZBC B2	Durability
NZBC E2	External moisture
NZBC E2/AS1	External Moisture
NZMRM Code of Practice	NZ Metal Roof and Wall Cladding Code of Practice - Version 3.0

### 5.3 Thermakraft Underlay, DPM & DPC

#### 5.3.1 Scope

Supply and install Thermakraft Underlays and Membranes, as specified herein, to the locations identified on the drawings, complete with all accessories required for proper installation and performance. All aspects of this work shall be in complete accordance with Thermakraft Ltd technical information and installation requirements (check [www.thermakraft.co.nz](http://www.thermakraft.co.nz), or call 0800 806 595 for the

latest editions), other relevant product manufacturers' recommendations, and as shown on the design drawings.

No substitutions are permitted for the specified products from Thermakraft Ltd.

The following is a list and a general description of the extent of the Thermakraft Underlays and Membranes works, which are more specifically defined in the contract documents, required for the completion of the contract works:

### 5.3.2 Requirements

#### *Safety*

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

#### *Warranty*

##### Thermakraft Ltd Product Warranty:

- 15 Years Warranty - for all Thermakraft warranted products installed, according to the warranty conditions.
- Provide the Thermakraft Ltd Product Warranty on the manufacturer's standard warranty form.
- Commence the warranty from the date of permanent installation.

#### *Substitutions*

Thermakraft Ltd products shall be as specified herein and as indicated on the approved drawings. The substitution of Thermakraft branded products for alternative brands is not permitted under any circumstances.

The substitution of a specified Thermakraft product for an alternative Thermakraft branded product by the Contractor shall only be permitted with the Contract Administrator's written authorisation, and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate alternative Thermakraft branded products to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

### 5.3.3 Wall Underlay

Covertex 403 Plus. A fire-retardant, absorbent, breathable, synthetic non-woven polyolefin underlay. High strength, nominal weight 105g/m<sup>2</sup>.

Installed as a standalone flexible wall underlay over timber or steel wall framing in accordance with the manufacturer's requirements and [BRANZ Appraisal No.918 \(2016\)](#), in NZS 3604 Wind Zones up to and including 'Very High'.

Installed as a flexible wall underlay over a rigid air barrier in accordance with NZBC E2/AS1 9.1.7.2 to the manufacturer's requirements and [BRANZ Appraisal No.918 \(2016\)](#), in NZS 3604 Wind Zones up to and including 'Extra High'.

Covertex 403 Plus can be used with absorbent and non-absorbent direct-fixed wall claddings, or absorbent and non-absorbent wall claddings over a 20mm drained cavity, and masonry veneer cladding over a drained cavity in accordance with NZBC E2/AS1 and [BRANZ Appraisal No.918 \(2016\)](#).

Do not leave Covertex 403 Plus exposed on walls for more than a total of 42 days before covering.

Installed Location:

#### **5.3.4 Roof Underlay**

[Covertex 407](#). A self-supporting, fire-retardant, absorbent, breathable, synthetic non-woven polyolefin underlay. Nominal weight 220g/m<sup>2</sup>.

Covertex 407 is CodeMark assured with the NZ Building Code: [CodeMark Certificate of Conformity No:GM-CM30028-Rev C](#), issued by Global-Mark Pty Ltd.

Installed as a roof underlay over timber or steel roof framing in accordance with the manufacturer's requirements and [BRANZ Appraisal No.651 \(2009\)](#).

Covertex 407 roof underlay can be used directly under direct-fixed roof claddings, or directly under roof cavity battens or tile battens in accordance with Thermakraft requirements.

Covertex 407 roof underlay must be installed in a manner that prevents ponding of water. Provide additional support at no more than 300mm centres when Covertex 407 is installed on roofs with slopes less than 10°.

Do not leave Covertex 407 exposed on roofs for more than a total of 7 days before covering.

Installed Location:

#### **5.3.5 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install Thermakraft Underlays, DPMs, and DPCs as required.

#### **5.3.6 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All installation work shall be carried out by experienced and competent tradespersons, familiar with the specified products and installation techniques, in accordance with the manufacturer's requirements, and to fully comply with all warranty requirements.

All cutting, joining, and fixing techniques shall be exactly as recommended by the manufacturer, and carried out with the use of suitable tools and equipment appropriate for the application. All work shall be such as to leave a neat, efficient, and weathertight installation.

### **5.3.7 Delivery & Handling**

Store underlay rolls on end, undercover, on a flat, clean and dry surface. Keep stored materials dry, out of direct sunlight, and protected from damage and contamination at all times.

Handle materials in accordance with the manufacturer's requirements and in a manner that prevents damage to or deterioration of the product.

Do not use damaged or defective materials, or products that are beyond their designated shelf life.

Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear when handling materials.

Installers shall conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - including the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#), as well as the [Best practice guidelines for working on roofs](#) for roofing installations.

### **5.3.8 Completion**

Check that all underlays have been installed correctly and are properly supported, and that all underlay edges, joins and ends are correctly finished prior to closing off with claddings - all in accordance with Thermakraft installation requirements.

Check installed membranes and underlays for defective work and damage - replace and/or repair as necessary to the required standard.

Leave all of this work complete, and free of defects, and to the required standard in accordance with the manufacturer's warranty requirements.

Issue to the Owner a copy of the Thermakraft maintenance requirements and the Thermakraft product warranties for the installed products.

## **5.4 Profiled Metal Roofing**

### **5.4.1 Scope**

*ISO 9223 Category C3 Medium (Coastal Moderate)*

Supply and install profiled metal rigid-sheet roofing, as specified herein, to the locations identified on the drawings, complete with all accessories required for proper installation. All aspects of this work shall be in complete accordance with the roofing manufacturer's technical literature and installation requirements, the [NZ Metal Roof and Wall Cladding Code of Practice](#), other relevant product manufacturers' recommendations, and as shown on the drawings.

### **5.4.2 Requirements**

*Safety*

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes

of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

#### *Warranty - Roofing Material*

Roofing Material Product Warranty. Warrant this work against failure of materials under normal use and environmental conditions:

- 15 Years for Perforation: according to the roofing material manufacturer/supplier warranty conditions.
- 15 Years for Coatings: according to the roofing material manufacturer's warranty conditions.
- Provide the Product Warranty on the roofing manufacturer's Standard Warranty Form.
- Commence the warranty from the date of practical completion of the contract works.

#### *Warranty - Installation*

Installation Warranty. Warrant this work under normal environmental conditions and use against waterproofing failure:

- 15 Years for Workmanship.
- Provide the Installation Warranty on the roofing installer's Standard Warranty Form.
- Commence the warranty from the date of practical completion of the contract works.

Include a copy of the roofing manufacturer's maintenance requirements with the Installation Warranty.

### **5.4.3 Roofing Profile**

Corrugated Profiled Metal Roofing. Standard corrugated profile; 18mm nominal crest height; 76mm nominal crest pitch. Manufactured from the material type, thickness and finish specified.

Minimum roof pitch: 8° (1:7).

Corrugated metal roofing shall be fixed with self-drilling screws through the profile crest in accordance with the requirements of the NZMRM Code of practice.

Sheets shall be continuous from ridge to gutter, or where a step is designed into the roof, sheets shall be continuous from ridge to step and step to gutter. Sheet ends must be stop-ended under flashings.

Installed in accordance with the requirements of the roofing manufacturer's technical literature and the NZMRM Code of Practice, to the locations and details shown on the drawings.

Installed Location:

Trapezoidal Profiled Metal Roofing. Symmetrical or asymmetrical trapezoidal profile, with a minimum crest height of 19mm. Asymmetrical profiles shall have a flat or lightly profiled pan width of 210mm maximum between crests. Profile depth, crest pitch, crest width and pan width as specified below or as shown on the drawings. Manufactured from the material type, thickness and finish specified.

Minimum roof pitch: 4° (1:14) where the crest height is less than 27mm, or 3° (1:20) where the crest height is 27mm or higher.

Trapezoidal metal roofing shall be fixed with self-drilling screws through the profile crest in accordance with the requirements of the NZMRM Code of practice.

Sheets shall be continuous from ridge to gutter, or where a step is designed into the roof, sheets shall be continuous from ridge to step and step to gutter. Sheet ends must be stop-ended under flashings.

Installed in accordance with the requirements of the roofing manufacturer and the NZMRM Code of Practice, to the locations and details shown on the drawings.

Profile Dimensions:

Installed Location:

#### **5.4.4 Roofing Material**

*Galvanised Steel - 0.55mm - Corrugated Profile*

Corrugated Profile Roofing. Manufactured from Galvanised Steel - 0.55mm BMT. Hot-dipped galvanised zinc-coated steel coil complying with AS 1397. G500 steel - 550 MPa minimum yield strength. 450gms/m<sup>2</sup> coating weight.

#### **5.4.5 Components & Accessories**

*Roof Underlay*

Roof Underlay. Refer to separate specification section.

#### **5.4.6 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate to ensure that all roof members required for ridges, hips, valleys, barges, penetrations, junctions with vertical faces, etc. are correctly installed.

Coordinate with the roof drainage system, and generally with other trades as required, to install the specified profiled metal roofing.

Ensure that each section of roof is waterproofed as soon as possible after preparatory work is complete; allow to carry out the works in several operations if necessary to comply with this condition.

#### **5.4.7 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All installation work shall be carried out by experienced and competent tradespersons, familiar with the specified products and installation techniques, in accordance with the requirements of the NZMRM Code of Practice, and to fully comply with all warranty requirements. All work shall be such as to leave a neat, efficient, robust and weathertight installation.

All cutting, fixing and installation techniques, fasteners and sealants shall be exactly as recommended by the roofing manufacturer in accordance with the NZMRM Code of Practice, and with the use of suitable tools and equipment appropriate for the application.

Always maintain isolation of dissimilar materials in accordance with the NZMRM Code of Practice. Isolate dissimilar materials (metal and nonmetal) in close proximity as necessary by painting the surfaces or fitting separator strips. Place isolators between metals and treated timber or cement-based materials. Do not use unpainted lead-sheet or copper materials to come in contact, or allow runoff from these, with galvanised or Zinalume® materials.

#### **5.4.8 Delivery & Handling**

Upon delivery to site, inspect roofing materials and reject those items that are found to be damaged, defective or contaminated. Contact the manufacturer/supplier for replacement of rejected items at time of delivery to site.

Store profiled metal roofing, flashings and accessories undercover, clear of level ground, on bearers at evenly spaced centres as recommended by the roofing manufacturer. Keep stored materials and accessories dry and protected from damage and contamination at all times.

Handle materials in accordance with the manufacturer's requirements and in a manner that prevents damage to or deterioration of the material, including surface marking. Do not use damaged or defective materials or products, or products that are beyond their designated shelf life.

Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear when handling materials.

Installers shall conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - in particular the [Best practice guidelines for working on roofs](#) and the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#).

For all work undertaken on the roof, installers shall always wear soft, clean footwear with a light-coloured sole. Do not walk on translucent/natural lighting sheet.

#### **5.4.9 Preparation**

##### *General*

Prior to installation, carry out all necessary inspections and preparatory work required, and ensure that all preliminary works by other trades has been completed to specification and as shown on the approved drawings.

Do not commence installation until all necessary preliminary works by others is complete and to the required standard. The commencement of work shall be deemed to indicate full acceptance by the installer that all preliminary works by other trades is complete.

Supporting timber structures shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content in accordance with the requirements of NZS 3603 at the time of installation.

Supporting lightweight steel framed structures shall meet the requirements of AS/NZS 4600 or the NASH Standard for Residential and Low-rise Steel Framing, Part 1: Design Criteria.

Supporting steel structures shall comply with NZS 3404.

#### **5.4.10 Installation**

##### *Roof Underlay*

Install roof underlay in accordance with the underlay manufacturer's requirements with minimum 150mm side and end laps, and lapped such that any water will be shed to the outside of the underlay.

Non self-supporting underlay must be supported by hexagonal galvanised wire mesh, safety mesh or alternative support, as specified and/or shown on the drawings, in accordance with the underlay manufacturer's recommendations.

Underlay shall be installed in a manner so that it is sufficiently tensioned without sagging, overhangs fascia boards 20mm - 25mm, and finished along roof edges, ridges, valley gutters, roof/wall junctions and at penetrations to the details shown on the drawings.

Underlayment for fully-supported roofing shall be in accordance with NZMRM Code of Practice - Sections 4.3.11 Separation, 11.4.2 Substrate, and 11.5.1 Ventilation.

##### *Roofing - Corrugated/Trapezoidal Profile*

Install profiled metal roofing in accordance with the NZMRM Code of Practice and as shown on the drawings, and to fully comply with all warranty requirements. As shown on the drawings, confirm any specific roofing detailing requirements prior to installation.

Accurately set-out roofing sheets exactly square to the building axis and with sheets lapped away from the prevailing wind; maintain this accurate set-out throughout installation. Check for and eliminate any creep and/or spread of sheets during installation.

Cut metal roofing and flashings by shear only – do not use abrasive cutting tools on or near the roof. Do not use black lead pencils for marking pre-finished roofing and flashings.

Prevent contact with, or run-off from, incompatible materials in accordance with the recommendations in the NZMRM Code of Practice. Observe the roofing material manufacturer's recommendations where flues discharge above roofs, and for the installation of solar heating panels. Protect roofing surfaces from damage at all times; replace the whole sheet where a significant depth of the material or coating has been damaged (including flashings).

Screw-fixed sheets shall be fixed with fasteners appropriate for the roofing profile and material, substrate/structure and the environment in accordance with the Roofing Industries Profile Technical Summary and the NZMRM Code of Practice recommendations (minimum Class 4).

Screw fastening placement and spacings shall be strictly in accordance with the roofing manufacturer's requirements and the NZMRM Code of Practice, to fully comply with the Wind Zone requirements, purlins spacings, etc.

Use fixing systems that will accommodate thermal expansion for long lengths and/or dark colours.

All roofing jointing techniques and sealants shall be in accordance with the roofing manufacturer's recommendations and the NZMRM Code of Practice, and shall be compatible with the roofing material and finish. Joints shall be sealed with an approved neutral-cure sealant or approved closed-cell lap tape.

Ridges, hips, barges and flashings generally, shall be in accordance with the NZMRM Code of Practice and the roofing manufacturer's requirements.

#### *Flashings*

Install flashings to roof edges, ridges, roof/wall junctions, parapets and roof penetrations as detailed on the drawings and in accordance with the NZMRM Code of Practice and the roofing manufacturer's requirements.

All flashings shall be neatly formed and finished, securely fastened to the structure, weatherproof and have falls set to avoid water ponding.

For highly visible flashings, plan each flashing joint and/or junction with specific regard to aesthetic requirements.

#### *Penetrations*

Penetrations greater than 150mm in any direction must have support framing installed around the perimeter of the penetration. Penetration flashings shall not rely solely on silicone sealant to achieve weathertightness of the flashing.

Flash pipes penetrating the roofing with a proprietary pipe collar flashing.

#### *Cleaning*

Completely clean off all drill and other swarf and pop-rivet shanks as the work proceeds (at least daily), and keep them and other rubbish out of the spoutings.

Remove associated trade debris from the roof and from the site progressively, and on completion leave the roof and rainwater system completely clean.

### **5.4.11 Fixing**

#### *Corrugated Profile - Steel material, fixed to Timber*

Corrugated Profile Roofing - manufactured from steel-based material: Crest-fix roofing to timber framing using minimum AS 3566 Corrosion Class 4, 12g-11, Type 17, Hex. Head-with-Seal, Self-drilling Screws, in accordance with the NZMRM Code of Practice and the roofing manufacturer's requirements.

Primary screw fastener embedment into timber framing shall be a minimum of 35mm and greater than 6 times the screw thread diameter.

Where battens, sarking or insulation is installed over the structure being fixed to, increase the screw length by the thickness of such material.

#### **5.4.12 Completion**

Check that the profiled metal roofing and associated components and flashings have been installed and finished correctly.

Check for defective work and materials - replace and/or repair as necessary.

Sweep down the completed roof and clean out spouting, gutters and rainwater pipes.

Leave all of this work complete and weathertight in accordance with the roofing manufacturer's requirements and the NZMRM Code of Practice, and to fully comply with all warranty requirements.

Leave the completed works and surrounding surfaces clean and free of debris and rubbish. Remove all rubbish and excess material from the site.

Issue to the Owner a copy of the roofing manufacturer's maintenance requirements on completion.

Issue to the Owner the roofing material manufacturer/supplier 'Product Warranty', and a copy of the installer's 'Installation Warranty'

## 6 ALUMINIUM JOINERY

### 6.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 6.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1734:1997(AS/NZS)	Aluminium and aluminium alloys - Flat sheets, coiled sheet and plate
1866:1997(AS/NZS)	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
2208:1996(AS/NZS)	Safety glazing materials in buildings
4211:2008(NZS)	Specification for performance of windows
4223.1:2008(NZS)	Code of practice for glazing in buildings - Glass selection and glazing
4223.2:2016(NZS)	Glazing in buildings - Part 2: Insulating glass units
4223.3:2016(NZS)	Glazing in buildings - Part 3: Human impact safety requirements
4223.4:2008(NZS)	Glazing in buildings - Part 4: Wind, dead, snow, and live actions
4666:2012(AS/NZS)	Insulating glass units
4667:2000(AS/NZS)	Quality requirements for cut-to-size and processed glass
4668:2000 (AS/NZS)	Glossary of terms used in the glass and glazing industry

### 6.3 Aluminium Windows & Doors

#### 6.3.1 Alternatives

The materials and elements specified indicate the required standards for these works. Alternatives which are equal to or superior to these materials and elements may be tendered for approval.

Thermal performance (NZBC H1/AS1) must be as required to meet the Designer's Thermal Evaluation.

#### 6.3.2 Installation Type

##### *Timber Frame Installation - Cavity Construction*

All windows (and aluminium frame external doors) installation work shall be exactly in accordance with NZBC E2/AS1, the Windows Association's Windows Installation System (WANZ:WIS), and details on the drawings or supplied by the windows manufacturer.

Check framing alignment, and that window openings are square and the correct size for fitting tolerances.

Prepare framing openings by neatly cutting the building wrap at 45° into the corners, turning wrap through the frame depth and fixing to the inside face, flashing the bottom corners with moulded

plastic and over-flashing the full sill and 200mm up the jambs with the specified flexible flashing tape, stapled to hold the stretched external corners. At head corners install flashing tape 200mm each way from the corners.

Install the WANZ extruded aluminium support bar with built in drainage and ventilation to NZBC E2, to provide continuous support to the window unit. Install the head cavity closer, positioned to provide a 15mm drip edge to the cladding.

Set shims or pack as necessary and install the frames exactly true and square, blocked-up off the support bar as required. Use appropriate separators between aluminium and other materials, and fix securely with due regard for any anticipated movements and for linings, trim etc.

Install the head flashing, extending 35mm up behind the cladding (and in turn over-flashed with an additional piece of wrap cover extended up under the wrap or flashing or eaves above), sloping at 15° down to the exterior, and turning down to cover the top of the aluminium frame by at least 10mm, before finishing with a 5mm 45° 'kick out'. Upstand the head flashing ends as detailed. Install jamb flashings/ sealant or scribes as detailed.

After frames installation install closed cell backing rods as required and expanding foam air-seal the gap between framing and liners.

### **6.3.3 Interior Finish**

GIB Groove.

### **6.3.4 Finish**

*Powder Coated Aluminium - Matt*

Polyester powder coating in accordance with WANZ Powder Coating Quality Assurance System and AAMA 2603-98 performance is required.

### **6.3.5 Hardware**

Hardware colour matched to Aluminium Joinery.

Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Key alike all lockable window hardware able to be keyed alike.

Account for all keys and deliver separately to the site manager. Factory fit all required and scheduled hardware.

### **6.3.6 Workmanship**

These windows will be manufactured in workshops containing all mechanical equipment appropriate for the work, and by experienced and competent tradesmen who are familiar with the techniques and materials specified.

The manufacturer will co-ordinate with other trades to establish the exact sizes for all frames before fabrication. Frames and sashes will be fabricated true, square, rigid, and 'out of wind', with all joints strongly mechanically fixed, and with mitres tight and fully sealed. Potential thermal, wind and seismic movements will be accommodated within the construction. All cavities will drain to the exterior, and all drilling swarf etc. will be removed during fabrication.

Stays, hinges, running gear and glazing will be installed as scheduled (the Designer will be notified if any scheduled hardware of fixing position appears to be inappropriate for this project).

Hardware will be fixed true to line and position, and adjusted and oiled as required for correct operation.

Glass will be cut true and square, sized to provide correct edge clearances, blocked into place as required, and all units will be delivered either pressure fit, pocket glaze, or beaded/wedged, unless site glazing is required. Glazing gaskets will be compatible with all adjacent materials, and cut 1% over-length to absolutely avoid stretching during installation. Frames will be braced etc. as necessary for transportation to the site.

Flashings as detailed will be supplied. Flashing materials will be compatible with the windows.

### **6.3.7 Delivery and Installation**

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and the construction principles that are embodied in the Acceptable Solutions.

Arrange for delivery of windows to the site only when a suitable storage situation is available for them, handle the windows in accordance with the manufacturers requirements, avoid any frame distortion, avoid rubbing damage, avoid contact with concrete, plaster, mud etc. and keep them dry. Retain protective coverings for as long as possible, and remove them at completion.

Experienced and competent tradesmen who are familiar with the techniques and materials specified shall carry out all installation work. Fix in accordance with the manufacturer's instructions. Take utmost care to avoid damage to anodized or powder coated surfaces - correction of any such disfigurement requires written authority - replace any badly damaged items.

Use fixings compatible with the materials involved, as recommended by the windows manufacturer and to comply with the DWP requirements, basically aluminium or Type 316 stainless steel where exposed externally; galvanized to AS/NZS 4680, 610g/m<sup>2</sup>, may be used where not exposed.

Thoroughly check all preparatory work to openings prior to installation, including underlay, corner seal tapes, adjacent cladding, pre-installed flashings, waterproofing systems etc. as appropriate. Use inert barriers or coatings to prevent contact between dissimilar metals or between aluminium and concrete.

Install flashings as detailed and supplied by the windows manufacturer, installed tightly and neatly with absolute minimum tolerances, with head weathering jamb, jamb weathering sill, and sill open

(draining) to exterior. Except where the window is recessed all head flashings shall extend 30mm minimum beyond the frame.

Air-seal all frame perimeters to adjacent structure to a depth of 15 - 20mm with expanding foam or appropriate sealant including a PEF rod at head, sill and jambs to retard the spread of sealant.

Weather-seal frame jambs etc. to adjacent surfaces (or to each other) as detailed or as required by the windows manufacturer, to achieve a fully watertight installation. In preparation for sealant the joints shall be clean, dry, and primed if necessary. Insert closed cell polyethylene backer rods or a polyethylene tape slip layer if required. Mask adjacent surfaces if appropriate, install the sealant fully in accordance with the sealant manufacturer's recommendations, and finish to even smooth surfaces.

Remove trade debris progressively, appropriately clean any affected adjacent surfaces, thoroughly clean the windows, check that all hardware is in full working order, and provide safety indication of the glass for the balance of adjacent works.

## 7 INSULATION

### 7.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 7.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3604:2011(NZS)	Timber-framed buildings
4220:1982(NZS)	Code of practice for energy conservation in non-residential buildings
4243.1:2007(NZS)	Energy efficiency - Large buildings - Building thermal envelope
4246:2016(NZS)	Energy efficiency - Installing bulk thermal insulation in residential buildings
4859.1:2002(AS/NZS)	Materials for the thermal insulation of buildings - General criteria and technical provisions

### 7.3 Thermal Insulation

#### 7.3.1 Scope

Supply and install the selected products as thermal insulation to the specified R-values, complete with all accessories, to the floors, walls, ceilings, roofs, and other thermally insulated building elements, as noted and shown on the drawings. All aspects of this work shall be in accordance with the product manufacturer's technical literature and installation requirements, other relevant product manufacturers' recommendations, and as shown on the drawings.

#### 7.3.2 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Co-ordinate with other trades to install all thermal insulation as required.

#### 7.3.3 Workmanship

All installation work shall be carried out by experienced and competent tradesmen, familiar with the specified products and installation techniques, in accordance with the manufacturer's installation requirements, and as noted and detailed on the drawings.

Store and handle products in accordance with the manufacturer's recommendations, keep dry and protect from damage. Do not compress fibre insulation bales. Do not use damaged or defective insulation products and accessories.

The building must be completely enclosed and water tight before installation commences with the exception of roof insulation when installed with roofing. Ensure the moisture content of timber

framing is no greater than 18% prior to installing insulation to timber framed elements. Always maintain the full insulation thickness to ensure the required thermal values are achieved. Do not install insulation pads or blankets into closed cavities that are less than the stated insulation nominal thickness.

#### **7.3.4 Product**

##### *Glass Fibre Pads*

Glass fibre thermal insulating pads.

Manufacturer, brand name & type:

Thickness & R-Value:

Location:

##### *Glass Fibre Blanket*

Glass fibre thermal insulating blanket.

Manufacturer, brand name & type:

Thickness & R-Value:

Location:

#### **7.3.5 Installation**

##### *Wall Insulation - Glass Fibre Pads*

Install glass fibre insulation pads, complete with accessories, friction fitted between wall studs and dwangs etc. and held in place in accordance with the manufacturer's installation recommendations. Completely fill the framing voids, leave no gaps at the edges or at penetrations etc, and maintain full insulation pad thickness. Support external wall insulation with vertical strapping tape at 400mm centres to the outside face, stainless steel stapled to the framing.

##### *Ceiling Insulation, Truss/Framed Roof - Glass Fibre Pad*

Install glass fibre insulation pads, complete with accessories, friction fitted between the ceiling joists, over the ceiling lining in accordance with the manufacturer's installation recommendations. Leave no gaps along the insulation pad edges and joints, and at the ceiling perimeter/wall junction. Separate ceiling insulation 200mm from recessed light fittings and other recessed electrical fittings; refer to the drawings for containment requirements around recessed electrical fittings.

#### **7.3.6 Completion**

Check that all insulation has been installed correctly and is correctly supported and that all edges, joints and ends are fully closed without gaps. Check for damage and faults and repair or replace as necessary. Collect and remove from site all rubbish and waste material.

Issue to the Owner a copy of any product maintenance requirements and a copy of the Thermal Insulation Product and Installation Warranties for the completed works.

## 8 JOINERY

### 8.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 8.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1491:1996(AS/NZS)	Finger jointed structural timber
1859.1:2004(AS/NZS)	Reconstituted wood-based panels - Specifications - Particleboard
2208:1996(AS/NZS)	Safety glazing materials in buildings
2924.1:1998(AS/NZS)	High pressure decorative laminates - Sheets made from thermosetting resins - Classification and specifications
3601:1987(NZS/BS)	Specification for carbon steel pipes and tubes with specified room temperature properties for pressure purposes
3602:2003(NZS)	Timber and wood-based products for use in building
3610:1979(NZS)	Specification for profiles of mouldings and joinery
3619:1979(NZS)	Specification for timber windows
3631:1988(NZS)	New Zealand timber grading rules

### 8.3 Workmanship

#### 8.3.1 Workmanship

All work shall be carried out by or under the direct supervision of competent and experienced joiners in accordance with recognised good trade practice, and shall be carried out in a properly established workshop complete with all mechanical equipment appropriate for the work. All work shall be in strict accordance with the drawings.

Confer with the Main Contractor to check openings sizes, fittings limiting dimensions and available access dimensions (and make provision for site assembly if appropriate). Additional dimensions will be supplied by the Architect/Designer if required.

All items assembled by appropriate joints customarily employed in good quality work. Joints shall be accurately cut, fitted and full surface glued and shall be tongued, mortice and tenon, doweled or housed in preference to scarfed or mitred. Use screws in preference to nails or brads. Install glue blocks in appropriate locations. Unavoidable screw pockets matching buttoned in clear finished work.

Fine machine sand all visible surfaces and handsand finish to a clean, even surface all clear finished cabinets. Lightly sand arris all projecting edges.

All veneers shall be A grade, completely free of bark pockets, checks, gum streaks, resin pockets, stains, knots (of any size), or pith. Adjacent veneers and boards in clear finished work shall be carefully selected to provide good continuity of colour and grain pattern; this particularly applies to clashing strips on veneered MDF which shall be 2mm thickness solids.

The following are unacceptable defects and will most likely result in rejection of cabinets specified for clear finishing:

- a) Scratches, bruises, machine or hammer marks on exposed surfaces;
- b) Glue stains on clear finish specified work;
- c) Iron-on veneers;
- d) Corrugated fasteners and machine staples;
- e) Baseboard showing through veneers through excessive sanding (to remove marks presumably).

### **8.3.2 Delivery**

Brace and / or crate all items as required to prevent distortion or disfigurement during transit. Arrange for delivery to site, not during inclement weather. Attend upon the carpenter to identify items and instruct in assembly procedures.

## **8.4 Elements**

### **8.4.1 Windows / Exterior Doors**

Timber sections for windows/exterior doors shall be to exact sizes, with profiles rebated, throated, grooved, sunk etc. as drawn or as required to suit weatherproofing, linings, trim etc. (all sash or door frame rebates 8mm wide x 5mm deep weathergrooved as a minimum). Fabricate frames with housed and checked joints, exterior doors with mortice and tenon, and sashes with mortice and tenon aluminium pinned.

Fixed glazed panes beaded directly (no sub-sash). Beads square profile to heads and jambs and weathered to sills.

Glass as scheduled. Glass cut true and square, sized to give correct edge clearances, blocked in place as required, bedded fully, and securely beaded or sprigged and puttied. Bed large fixed panes in BR606.

## **8.5 Materials**

## 9 PAINTING & DECORATING

### 9.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 9.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2310:2002(AS/NZS)	Glossary of paint and painting terms
2311:2017(AS/NZS)	Guide to the painting of buildings
3750.0:2008(AS/NZS)	Paints for steel structures - Introduction and list of Standards
BRANZ IB 257	Wood primers

### 9.3 General

#### 9.3.1 Alternatives

The materials specified in this section or on the drawings indicate the required standards for these works. Alternatives which are considered equal to or superior to these may be tendered for approval (in writing, and they must NOT be used unless they are approved in writing).

#### 9.3.2 Co-operation

Co-operate with all trades and attend upon Concretor, Joiner, Carpenter, etc. to ensure that the surfaces provided by these trades are completely suitable for the Painter works that are required.

#### 9.3.3 Preparation

No painting or varnishing or other surface coating work shall be undertaken unless the surfaces to be coated are in a correct and proper condition to ensure first class results.

Inspect the works of other trades on which Painter work is scheduled and report to the Main Contractor and the Architect/Designer any defects or irregularities that would affect the permanency or finish of the painting work, and do not proceed until the defects or irregularities have been completely rectified. Failure to examine and report will be construed as an acceptance that all preparatory works are completely satisfactory.

This clause does not relieve the Painter of any of the usual preparatory work to surfaces customarily performed by this trade.

Clean down all surfaces with sugar soap, strippers, mould killers, etching agents, etc. as required. Sand or rub all sharp edges off exterior timbers and other materials as appropriate before painting.

Finish rub down ALL surfaces. Ensure that the moisture content of all substrates is appropriate. Remove locks, fastenings, and similar hardware before painting and refix on completion. Remove all electrical switch and power plates before painting and refix them on completion. Mask adjacent surfaces as required to a true line and remove the masking on completion. Dust and wipe down all surfaces for Painter work and completely remove all dust, rubbish, dirt etc. from areas involved immediately prior to commencement. To each area of the works complete all surface preparation before applying paint to any surface.

#### **9.3.4 Protection**

Take adequate precautions to prevent paint spots falling on prefinished or similar surfaces, and extreme care to keep absorbent materials (e.g. cedar, sawn framing, decking, paving) completely clean during all adjacent painting work. Correction of any such disfigurement shall be to the Architect/Designer's approval.

#### **9.3.5 Workmanship**

Strictly adhere to all Manufacturers' instructions.

Strictly observe Manufacturers' requirements with regard to surface and air temperatures for painting. No work shall be carried out on surfaces that are not completely dry, and no external work shall be carried out during damp or wet conditions.

In all finishes any irregularities or brushmarks or dust etc. in each preceding coat shall be rubbed down to provide a smooth clean surface for the following coat. Each coat shall be finished over all surfaces before a further coat is applied, and each coat shall be completely dry before subsequent coats. Finish broad areas before painting trim, paint ceilings before walls and walls before joinery, trim and other items.

Each coat and the full completed system shall be of uniform finish, colour, texture and sheen, shall have proper covering of thin edges, corners, end grain etc. and shall be free of blemishes such as runs, sags, fat edges, entrained hairs, brush marks, starved patches etc.

#### **9.3.6 Wallpapers & Lining Papers**

Wallpapers and lining papers, where scheduled, shall be hung plumb, true and square, and with precise butts. Patterns shall be accurately matched at each join. All rolls used in any one area shall be from the same batch. Use a fungicide incorporated adhesive that is recommended by the supplier. Edges neatly and precisely cut to the adjacent element. Finish free of air bubbles, wrinkles, gaps or stains.

#### **9.3.7 General**

The schedules indicate the general extent of the works to be carried out but are in no way exhaustive in their description of the actual items for painter work. Complete all work necessary for the proper and entire completion of the works. All items and portions of items reasonably inferable but not specifically mentioned are deemed included, i.e. cupboard interiors, the top and bottom of doors, unseen cabinetry tops, etc. All doors shall have equal painter work on ALL surfaces.

Where timber work is specified for priming before fixing the priming shall be thoroughly brushed in to all surfaces, and all exterior timber work for paint finishing shall be fully primed within one week of fixing. Should more than one month elapse between priming and undercoating the timber shall be fully reprimed.

Stopping up work shall be carried out immediately the priming or sealing coat is dry, and shall be solidly placed to finish clean and dry. Stopping tinted to match the timber for clear finished work.

Paint putties within one month of glazing timber frames; paint to impinge on glass to assist sealing.

### **9.3.8 Materials**

All Painter materials shall be ready mixed and delivered in unopened containers. Materials shall be used only for the purpose and in the manner intended by the manufacturer; any apparent scheduled discrepancy in this respect shall be referred to the Architect/Designer immediately for clarification.

Where surfaces are specified to be finished in a particular manner or material, all preparatory work, priming, or undercoating, that is necessary to ensure a proper finish shall be provided, irrespective of any apparent omission herein.

Thinning shall only be to manufacturer's specification. Thoroughly stir as required to lift any settled pigment and ensure the paint is homogeneous. Paints shall be factory or shop tinted to the colour required. Undercoats shall be fully tinted to match the final colour scheduled. All paints shall have the finished film thickness that is specified by the manufacturer (checked by monitoring the coverage per litre).

### **9.3.9 Completion**

Allow to touch up to approval any Painter work which is damaged during the finishing works of other trades. Replace all hardware, remove all masking, covers, containers etc., thoroughly clean all affected surfaces, and leave all spaces ready for immediate occupation. Avoid scratching or abrading glass or hardware during any cleaning.

## 10 FLOOR COVERINGS

### 10.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 10.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1884:2013(NZS AS)	Floor coverings - Resilient sheet and tiles - Installation practices
2358:1990(AS)	Adhesives - For fixing ceramic tiles
2455.1:2007(AS/NZS) A1	Textile floor coverings - Installation practice - General
2455.2:2007(AS/NZS)	Textile floor coverings - Installation practice - Carpet tiles
3103:1991(NZS)	Specification for sands for mortars and plasters
3122:2009(NZS)	Specification for Portland and blended cements (General and special purpose)
3661.2:1994(AS/NZS)	Slip resistance of pedestrian surfaces - Part 2: Guide to the reduction of slip hazards
3740:2010(AS)	Waterproofing of domestic wet areas
3958.1:2007(AS)	Guide to the installation of ceramic tiles
4586:2004(AS/NZS)	Slip resistance classification of new pedestrian surface materials
4858:2004(AS/NZS)	Wet area membranes
BRANZ Good Practice Guide	Tiling
NZBC B2/AS1	Durability
NZBC D1	Access Routes
NZBC D1/AS1	Access Routes
NZBC E3/AS1	Internal Moisture

### 10.3 Tiling

#### 10.3.1 Scope

Supply, install and finish all Tiling works, complete with all necessary components and accessories required for proper installation and performance, as specified herein and to the locations, layouts and details shown on the approved drawings. All aspects of this work shall be carried out to comply with the New Zealand Building Code and relevant standards, and in accordance with the approved project design documentation, and with any relevant product manufacturers' technical literature.

The following is a list and a general description of the extent of Tiling work, which are more specifically defined in the contract documents, required for the completion of the contract works:

**10.3.2 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install tiling as required, and to ensure that:

- appropriate tolerances and clearances allow for adjacent finishes, fixtures and fittings, etc; and
- penetrations for piped and cabled services are correctly located to maintain tile integrity and tiling performance.

**10.3.3 Workmanship**

Where required by the NZ Building Act 2004, it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All Tiling work shall be carried out to best trade practice by qualified and experienced tradespersons, familiar with the specified materials and installation and finishing techniques, in accordance with AS 3958.1 and relevant product manufacturers' technical literature, to the layout and details shown on the approved drawings, and to fully comply with all warranty requirements.

Submit evidence of experience on request, e.g. National Certificate in Floor and Wall Tiling, or certified member of Master Plasterers and Tilers Association.

All substrate preparation, tile laying and tiling accessories application and finishing techniques shall be exactly as recommended by the specified product manufacturer. All work shall be such as to leave a neat, efficient and robust installation.

Interior wet-area tiling shall be waterproof and installed over a waterproof membrane as shown on the drawings.

Exterior floor tiling shall be waterproof and weathertight, and where necessary installed over a waterproof membrane as shown on the drawings.

As recommended by the tile manufacturer, use only an approved adhesive that is compatible with the specified tile, its substrate and its application/use.

Where necessary, delay tiling to allow maximum curing and settling and initial creep of the substrates, particularly to load bearing structural elements.

Do not cover or bridge movement control joints with tiles and tile underlay.

Tiling shall not be undertaken when the ambient and surface temperatures are outside the specified product manufacturer's permissible temperature range.

Where necessary, mask off and protect from contamination adjacent surfaces, joinery, fixtures and finished work before commencing.

Exterior tiling shall not be undertaken during inclement weather. As necessary and in accordance with the manufacturer's requirements, protect exterior tiling from rain, hot dry winds and direct sunlight to aid proper drying and curing.

Leave all tiled surfaces clean, sound, and free from blemishes of any kind.

#### **10.3.4 Delivery & Handling**

Upon delivery to site, inspect the tile packs and reject those items that are found to be damaged, defective or contaminated. Contact the supplier for replacement of rejected items at time of delivery to site.

Do not use damaged, defective or contaminated materials, or products that are beyond their designated shelf life.

Store all tiling materials undercover, in a weatherproof environment, off the floor, on a flat, even and level surface in accordance with the manufacturer's requirements. Keep products and materials dry, out of direct sunlight and protected from damage, moisture and contamination at all times.

Handle tiling materials in accordance with the manufacturer's requirements and in a manner that prevents damage to and contamination of the materials and works.

Installers shall be familiar with and comply with all associated product Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

Installers shall conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - including the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#).

#### **10.3.5 Completion**

Check that all Tiling work has been correctly installed to the required layout, and that all tile joints, edge-trimming and other detailing is correctly finished, grouted and sealed.

Check all Tiling installations for damage, marks and defects - repair or replace as necessary. Carry out any repairs to the required standard.

Thoroughly clean tiled surfaces in accordance with the manufacturer's recommended procedures and techniques. Lightly buff where appropriate.

Leave this work complete and to the required standard, and in accordance with the associated warranty requirements.

Clean up thoroughly, and leave adjacent surfaces and finished work clean and free of damage and contamination. Remove all associated rubbish from site.

Protect the completed installation from damage, trafficable dirt and grime, and stains as necessary until hand-over as scheduled or directed.

Issue to the Owner a copy of all relevant product manufacturers' maintenance requirements, and a copy of relevant manufacturer Product Warranties and the installer/applicator Installation Warranty for the installed products and completed works.

## **10.4 Carpet & Resilient Floor Coverings**

### **10.4.1 Scope**

Supply and install the specified Floor Coverings and flooring products to the areas and surfaces, layouts and details shown on the drawings, complete with all accessories. All aspects of this work shall be in accordance with the specified floor covering manufacturers' technical literature and installation requirements, relevant Standards and Code requirements, other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for the specified Floor Coverings and flooring products.

### **10.4.2 Floor Coverings**

#### *Carpet*

Carpet flooring; to the specified product, pile style and content, and colour and pattern. Installed in accordance with the manufacturer's requirements and AS/NZS 2455.1 to the locations and layout shown on the drawings.

Manufacturer, brand name & range:

Pile style:

Pile content/fibre:

Pile thickness:

Construction:

Colour/Pattern code:

Grading:

Location:

### **10.4.3 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Co-ordinate with other trades as required to install the specified floor coverings and accessories.

### **10.4.4 Workmanship**

All installation work shall be carried out by experienced and competent floor layers, familiar with the products specified and installation techniques, under the direct supervision of a Registered National Flooring Association (NFA) Member, in accordance with the manufacturer's installation requirements, NZS/AS 1884, AS/NZS 2455.1, AS/NZS 2455.2 and AS/NZS 4586 as relevant, and as noted and detailed on the drawings.

Use only approved adhesives that are compatible with the specified floor covering product and the substrate as recommended by the floor covering manufacturer.

The building must be fully enclosed and weathertight with all doors and necessary fittings and trim installed prior to laying floor coverings.

#### **10.4.5 Delivery & Handling**

Store and handle all floor covering products and accessories in accordance with the manufacturer's recommendations. Store products and accessories under cover and out of direct sunlight on a flat and level surface; keep dry and protect from damage and contamination at all times.

Do not use damaged or defective flooring products or accessories, or products that are beyond their designated shelf life. Do not damage or mark or distort flooring products and accessories during handling.

Allow floor coverings and accessories to properly condition for a minimum of 24 hours, or as recommended by the manufacturer, prior to laying in accordance with the manufacturer's requirements. Unless recommended otherwise by the manufacturer, do not lay floor coverings below 15°C room temperature.

#### **10.4.6 Substrate Preparation**

##### *General*

Ensure the substrate surface is free of oil, grease and other contaminants, then sweep or vacuum as required to ensure it is absolutely clean. Ensure that any expansion or crack control joints are appropriately trimmed - do not install floor coverings over them.

The commencement of work on each section of floor shall be deemed to indicate a full acceptance by the relevant Flooring Subcontractor that all preparatory works by other trades are appropriate to achieve the required finished results.

##### *New Concrete Floors*

New concrete substrates must be compliant with NZS 3114 'U3 Surface Finish' and with the floor covering manufacturer's requirements and must have aged for a minimum of 28 days prior to laying the floor coverings. Check for moisture content by hygrometer reading to BRANZ BU330 - do not commence laying floor coverings until the substrate is surface-dry and the moisture readings are less than 75% relative humidity over the entire surface.

Grind off any high spots on the concrete slab, and using the specified proprietary levelling compound repair flush with feathered edges any low spots or damaged areas then grind smooth.

Lightly grind or shot blast any surface that is glazed to the extent that may compromise the adhesive bond. Leave the surface clean and free of dust and contaminants etc.

Location:

#### **10.4.7 Installation**

##### *Carpet Floor Coverings - Direct Stick*

Install by direct stick method carpet floor coverings and accessories, including all jointing, in accordance with the manufacturers' recommendations, procedures and techniques, AS/NZS 2455.1, and as shown on the drawings.

Allow carpet floor coverings to properly condition in accordance with the manufacturer's recommendations prior to laying. Turn underfloor heating systems off 48 hours prior to installation and leave off during installation and for a minimum of 48 hours after completion. Thoroughly clean

each area before commencing work. Seal or prime as necessary any porous surface receiving floor covering adhesive, and apply adhesive exactly to the manufacturer's recommendations.

Confirm the location of all carpet joints and seams prior to laying. Install carpet rolls in consecutive sequence and in the same direction. Do not install carpet floor coverings over expansion joints - use only the specified expansion joint cover strip and neatly finish carpet flooring in accordance with the cover strip manufacturer's requirements.

Carpet flooring accurately laid, fitted and jointed and fully bonded to the substrate. All seams and cross joints to be close-fitting and fused together with a low profile heat bond tape. Cut and properly prepare cross joints to ensure accurate pattern alignment. Roll carpet flooring with a suitably weighted roller as recommended by the manufacturer to ensure maximum adhesion.

Accurately install stair tread nosings and lay pre-cut carpet pieces to each stair tread and riser and finish neatly into or under the nosing edge as necessary.

Install any required carpet skirting, capping and edge trim, transition strips and naplock bars, as noted and detailed on the drawings; all finished straight and level and true to line.

Keep the working area cordoned off and protected during installation and protect completed installation work from damage and contamination until hand over of the works as programmed/scheduled.

#### **10.4.8 Completion**

Ensure that the specified floor coverings have been installed correctly, and that all seams, joints and accessories have been and completed correctly. Check for damage and defects and repair or replace as necessary.

Thoroughly clean the installed floor coverings in accordance with the manufacturers' recommended techniques and procedures.

Carry out any product specific finishing/polishing applications as recommended only by the floor covering manufacturer.

Leave the works area clean and remove all rubbish and waste material from the site.

Protect the completed works from damage, trafficable dirt and grime, and stains as necessary while other works are in progress.

Issue to the Owner a copy of the Manufacturers' maintenance requirements and a copy of the Manufacturers' Materials Warranties and the Applicators' Installation Warranties for all of the installed floor coverings.

## 11 PLUMBING

### 11.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 11.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1221:1997(AS/NZS)	Fire hose reels
1254:2010(AS/NZS)	PVC-U pipes and fittings for stormwater and surface water applications
1260:2009(AS/NZS)	PVC-U pipes and fittings for drain, waste and vent application
1477:2006(AS/NZS)	PVC pipes and fittings for pressure applications
1546.1:2008(AS/NZS)	On-site domestic wastewater treatment units - Septic tanks
1596:2014(AS/NZS)	The storage and handling of LP Gas
2032:2006(AS/NZS)	Installation of PVC pipe systems
2033:2008(AS/NZS)	Installation of polyethylene pipe systems
2492:2007(AS/NZS)	Cross-linked polyethylene (PE-X) pipes for pressure applications
2537.1:2011(AS/NZS)	Mechanical jointing fittings for use with crosslinked polyethylene (PE-X) for pressure applications - Part 1: Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - General
2642.2:2008(AS/NZS)	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
2712:2007(AS/NZS)	Solar and heat pump water heaters - Design and construction
3500.1:2015(AS/NZS)	Plumbing and drainage - Part 1: Water services
3500.2:2015(AS/NZS)	Plumbing and drainage - Part 2: Sanitary plumbing and drainage
3500.3:2015(AS/NZS)	Plumbing and drainage - Part 3: Stormwater drainage
3500.4:2003(AS/NZS)	Plumbing and drainage - Part 4: Heated water services
3500.5:2012(AS/NZS)	Plumbing and drainage - Part 5: Housing installations
3501:1976(NZS)	Specification for copper tubes for water, gas, and sanitation
4121:2001(NZS)	Design for access and mobility: Buildings and associated facilities
4517:2010(NZS)	Fire sprinkler systems for houses
4602:1988(NZS)	Low pressure copper thermal storage electric water heaters
4603:1985(NZS)	Installation of low pressure thermal storage electric water heaters with copper cylinders (open-vented systems)
4606.1:1989(NZS)	Storage water heaters - General requirements

4607:1989(NZS)	Installation of thermal storage electric water heaters: valve-vented systems
4613:1986(NZS)	Domestic solar water heaters
4614:1986(NZS)	Installation of domestic solar water heating systems
4617:1989(NZS)	Tempering (3-port mixing) valves
4692.1:2005(AS/NZS)	Electric water heaters - Energy consumption, performance and general requirements
4766:2006(AS/NZS)	Polyethylene storage tanks for water and chemicals
5601.1:2013(AS NZS)	Gas installations - Part 1: General installations
7602:1977(NZS)	Specification for polyethylene pipe (Type 5) for cold water services
7643:1979(NZS)	Code of practice for the installation of unplasticized PVC pipe systems
7646:1978(NZS)	Specification for polyethylene pipes and fittings for gas reticulation
AS/NZS 3500.5:2012	Plumbing and drainage - Part 5: Housing installations
NZBC G11	Gas as an Energy Source
NZBC G12	Water Supplies
NZBC G13	Foul Water

### 11.3 General

Carry out all works necessary to leave the water, waste, vent and soil systems serving the sanitary fittings and the plumbing hardware shown on the drawings or specified below in correct working order complete with all ancillary systems (safetrays, floor drains, overflows, relief valves, etc.) required, and with all normal incidentals customarily installed by this trade.

Comply with the Building Code, Territorial Authority By-laws and statutory authority Regulations as appropriate. Obtain all necessary permits and consents, serve all necessary notices, arrange for all tests and pay all fees and customary charges in connection with the required works.

### 11.4 Workmanship

#### 11.4.1 Co-operation

Co-operate with all other trades. Attend upon Concretor, Drainlayer and Carpenter to set out the exact positions of pipe runs before adjacent work is put in hand, and to ensure that all pipes, sleeves, fixings, flashings etc. are correctly incorporated into the structure as construction proceeds.

#### 11.4.2 Workmanship

All plumbing work shall be carried out by, or under the direct control of, properly qualified tradesmen, and shall be to recognised high standards.

Observe best local trade practice to avoid problems which arise from freezing winter conditions.

The cutting away and checking of timbers shall be limited to such dimensions as will not prejudice the purpose for which the timber is used; observe NZS 3604 restrictions on the holing and checking of

joists and beams. Chasing and checking of other materials only to approval. Install seismic restraints to storage tanks and HWCs.

Weatherseal wherever pipes, screws, bolts or other fastenings penetrate an external surface, and particularly roofing; seal with gaskets, flashings (and overflashings if necessary) or mastic as appropriate - any damage that results from failure of such seals will be made good at the Plumber's expense.

Adequately protect all surfaces. Any damage to fittings or surfaces made good by the appropriate trade at the Plumber's expense.

#### **11.4.3 Pipework**

Joints between pipes of different materials shall always be to the approval of the TA Plumbing Inspector.

Pipework set-out neatly with a minimum number of bends, and more or less parallel to and at right angles to structural elements - avoid diagonal piping.

All internal pipework shall be concealed except where otherwise is either shown or approved. Exposed pipework shall be accurately and neatly run. Arrange all pipework (and particularly traps) in a manner which will allow maximum future accessibility for repairs or maintenance. Arrange for access panels to any primary maintenance positions, and install conveniently located isolating valves for each group of fittings. Wingbacks securely and squarely fixed. Crox unions usually acceptable only at the final connection to fittings. Install white plastic flanges where pipes penetrate linings in visible locations.

Where pipes are covered with nail fixed linings and trim ensure that their positions are marked on the linings to minimise the risk of subsequent nailings penetrating the pipe. Any such damage shall be rectified immediately, with all consequential damage made good.

Set pipework out in straight runs to even gradients. Fix all pipes to the structure sufficiently to fully support and to prevent sagging or vibration. Clips and saddles shall be the same material as the pipe. Exterior pipes on stand-off brackets. Fixings to the exterior or damp locations shall all be hot dip galvanized unless otherwise noted. Sleeves for pipes or drains penetrating concrete or masonry shall be uPVC, 20mm minimum larger internal diameter than the external diameter of the pipe, finished flush with concrete or masonry, and packed and mastic sealed.

Close open ends of the systems during construction to prevent the entry of foreign matter.

#### **11.4.4 Temperature Movement**

All work shall respect in full all probable thermal movements - layouts, fixings and jointings shall be arranged to allow thermal movement without risk of prejudice to watertight conditions, or risk of damage from straining of the pipes which will generate failures.

In particular, observe best local trade practice to avoid problems arising from freezing conditions.

**11.4.5 Excavation**

Allow to carry out all excavation that is required to suit the services installed by this trade. Check for other services before excavation. Trenches true to line and level, base of trenches clear of loose material, and shore trenches as required to suit the ground conditions. Backfilling shall be carried out by this trade, and be to the requirements specified in Siteworks.

**11.4.6 Fire Wall/Ceiling Penetrations**

Ensure that where drainage pipe work penetrate through fire rated floor or wall areas that these penetrations are stopped with intumescent foaming sealant for joints up to 10mm, and with intumescent stopping putty where the gap exceeds 10mm. Where required fit approved intumescent type fire collars to pipes located such that the fire rating of the wall or ceiling is maintained.

**11.4.7 Testing**

All plumbing services shall be completed in stages which will allow for proper testing under normal working pressures prior to the application of insulation, concealment or other enclosure. Testing of piped water services shall be by hydrostatic testing in accordance with AS/NZS 3500.1 and shall not show any leakage when subjected to a hydrostatic pressure of 1500kPa for a period of not less than 30 minutes. All leaks remedied and retested. On completion the whole of the plumbing services to be subjected to full operational tests in the presence of the plumbing inspector, with any defects revealed in these tests properly remedied.

**11.4.8 Warranties**

Warranty cards and manufacturer's guarantees for all items supplied and installed by this trade shall be correctly filled in and handed over at Practical Completion.

**11.5 Materials****11.5.1 Materials**

Materials shall be delivered with packaging and labeling intact. Incidentals (jointing compounds, PTFE tape, seals, washers, silfos, solvent cements, etc.) shall be completely appropriate for the application involved. The use of imperfect items or items damaged in any way is always subject to approval.

**11.5.2 Alternatives**

The materials and elements specified indicate the required standards for these works. Alternatives which are equal to or superior to these materials and elements may be tendered for approval.

**11.5.3 Materials Separation**

Separate dissimilar metals in any circumstances which could produce contact or electrolytic action by a water film, with thick plastic tape, bituminous felt or other inert material. Pipes in contact with or built into concrete or masonry shall be fully spiral wrapped in Denso tape or equal.

## **11.6 Elements**

### **11.6.1 Sanitary Fittings**

Supply and fix all of the sanitary fittings as scheduled on the drawings. All fittings checked on delivery for 'perfect' condition, and all fittings plain white. Supply and fix all normal accessories that are not usually supplied with the fitting.

The Plumber is responsible for fittings from delivery until Practical Completion of the contract.

### **11.6.2 Plumbing Hardware**

There is no prime cost sum allowance. All plumbing finishing hardware is specified on the drawings.

### **11.6.3 Flashings**

Ridges, hips, barges, valleys, aprons etc. flashings all supplied and installed by the Roofer. Metal windows flashings (those installed during windows installation ONLY) will be supplied by the windows subcontractor and installed by the Carpenter. All other flashings including wall penetration flashings, soakers, etc. that are required to leave the building completely water and weathertight are the Plumber's responsibility.

All flashings shall be machine folded to profiles as shown or required, incorporating capillary breaks where appropriate, shall be formed in one piece where possible, and lead or other soft edged where required. Stop ends, external angles, junctions etc. soldered or sealed and blind riveted as appropriate.

## **11.7 Systems**

### **11.7.1 Wastes & Vents**

All traps sized to AS 3500.2. Wastes and vents all uPVC. Wastes shall be to AS 3500.2 falls as a minimum. Vents shall be generally as indicated, but avoid where permissible in compliance with AS 3500.2, or shall be combined above the flood level of the fittings.

Fit bird proof domes to all vents.

### **11.7.2 Hot Water System**

*Electric Storage, High Pressure Hot Water Cylinder*

Supply the electric storage high pressure hot water cylinder noted on the drawings and install it where shown. Where appropriate install the cylinder on a safetray, with its drain discharging in a visible location.

Install temperature and pressure relief valves, cold water expansion valves, flow control valves, line strainers, pressure limit valves, and non-return/isolating valves as required to leave the hot water system in full design operational order. Install a tempering valve for each cylinder to control the hot water temperature at any sanitary fixture used for personal hygiene at not more than 55°C.

Check that the water pressure is suitable for the cylinders operation, and install PRV's if excessive.

Pressure relief discharges shall be copper and to the exterior in approved positions.

Flush all pipework before making the final connections. Lag the main distribution pipes full length

with wall pipe insulation.

Showers shall have priority feeds, without 'tees', and the pipework layout shall ensure that the showers temperature and pressure remain as even as possible.

Irrespective of whether a mixing device is installed, the storage water heater control thermostat shall be set at a temperature of not less than 60°C to prevent the growth of Legionella bacteria.

## 12 DRAINLAYING

### 12.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 12.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1254:2010(AS/NZS)	PVC-U pipes and fittings for stormwater and surface water applications
1260:2009(AS/NZS)	PVC-U pipes and fittings for drain, waste and vent application
1546.1:2008(AS/NZS)	On-site domestic wastewater treatment units - Septic tanks
2032:2006(AS/NZS)	Installation of PVC pipe systems
3500.2:2015(AS/NZS)	Plumbing and drainage - Part 2: Sanitary plumbing and drainage
3500.3:2015(AS/NZS)	Plumbing and drainage - Part 3: Stormwater drainage
7643:1979(NZS)	Code of practice for the installation of unplasticized PVC pipe systems
AS/NZS 1547:2012	On-site domestic wastewater management
BS 5572	Code of practice for sanitary pipework
NZBC G13	Foul Water

### 12.3 General

Carry out all required works to leave the sewer and stormwater systems shown on the drawings in correct working order complete with all normal incidentals.

Comply with Local Authority By-laws and Health Department Regulations as appropriate. Obtain all necessary permits and consents, serve all necessary notices, arrange all tests and pay all fees and customary charges in connection with the works.

### 12.4 Workmanship

#### 12.4.1 General

Carry out all required works to leave the sewer and stormwater systems shown on the drawings in correct working order complete with all normal incidentals. Comply with Local Authority By-laws and Health Department Regulations as appropriate. Obtain all necessary permits and consents, serve all necessary notices, arrange all tests and pay all fees and customary charges in connection with the works.

**12.4.2 Co-operation**

Cooperate with all trades and attend upon the Concretor and Plumber to set out exact pipe runs before any adjacent work is put in hand and ensure that all sleeves etc. are correctly incorporated as work proceeds.

**12.4.3 Materials**

All pipes and other materials shall comply with the appropriate Standards, and shall be protected from damage of any kind until installation is complete. All incidentals appropriate for the applications involved. Concrete shall be 17.5MPa and as specified under Concretor, Mortar shall be as specified in Blocklayer.

**12.4.4 Workmanship**

All drainlaying shall be carried out by, or under direct control of, properly qualified tradesmen, and shall be to recognised high standards. Ensure cast-in items are installed when required so that no delay is caused by this trade. Adequately protect all adjacent surfaces - clean down to remove dirt etc., and any damage shall be made good by the appropriate trade at the Drainlayer's expense.

On completion of drainlaying clean up full area affected by this trade to the condition it was in before drainlaying commenced.

Site is to be returned as close as possible to its present condition on completion of the contract.

**12.4.5 Excavation**

As required for sewer and stormwater. Check for other service lines before excavation - the Drainlayer is responsible for making good any damage. Trenches true to line and with even gradients between gullies, soil stack terminations or downpipes, etc.

Keep the bottom of trenches clear of loose material. All pipes shall be laid in appropriate bedding material, compacted as required. Shore trenches if required to suit ground conditions. Backfilling shall be by this trade, to the standards required in Siteworks.

**12.5 Elements****12.5.1 Drainlaying**

Commence drainlaying at the low end of even fall sections of drains and proceed in a continuous sequence to the fittings connections.

Sumps, gullies, etc. solidly bedded. Lay 110mm uPVC drains to connect gullies, sumps, stacks, and downpipes through to the street edge connections.

Every junction and bend shall be an inspection position. Temporarily seal the open ends of incomplete drains to prevent entry of foreign matter. Make appropriate provision for any anticipated differential settlement. Place signal strip above all drains.

Ensure that stormwater drains are very accurately positioned so that downpipes can drop directly into them, without offsets.

**12.5.2 Testing**

The sewer and stormwater systems shall both be fully tested to the approval of the Territorial Authority Inspector before being covered in. If any defects show rectify and then fully retest.

**12.5.3 As Built Drawings**

During drainlaying plot the location of all bends and changes in direction and all cleaning access positions. Locate each item by two diagonal measures from structure corners, etc. and record on a blank plan copy (supplied by Architect/Designer when requested).

Note that Practical Completion of the contract will not be certified until this as-built drawing has been produced (made available to the Contractor in time for the Code Compliance Certificate application).

## 13 ELECTRICAL

### 13.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 13.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2201.1:2007(AS/NZS)	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
2293.2:1995(AS/NZS)	Emergency evacuation lighting for buildings - Inspection and maintenance
3000:2007(AS/NZS)	Electrical installations (known as the Australia/New Zealand Wiring Rules)
3012:2010(AS/NZS)	Electrical installations - Construction and demolition sites
3085.1:2004(AS/NZS)	Telecommunications installations - Basic requirements
3100:2009(AS/NZS)	Approval and test specification - General requirements for electrical equipment
3112:2011(AS/NZS)	Approval and test specification - Plugs and socket-outlets
3191:2008(AS/NZS)	Electrical flexible cords
5000.1:2005(AS/NZS)	Electric cables - Polymeric insulated - For working voltages up to and including 0.6/1 (1.2) kV
60227.5:2003(AS/NZS)	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Flexible cables (cords)
60335.2.30:2009(AS/NZS)	Household and similar electrical appliances - Safety - Particular requirements for room heaters
60335.2.35:2004(AS/NZS)	Household and similar electrical appliances - Safety - Particular requirements for instantaneous water heaters
60598.2.2:2001(AS/NZS)	Luminaires - Particular requirements - Recessed luminaires
60598.2.22:2005(AS/NZS)	Luminaires - Particular requirements - Luminaires for emergency lighting
60898.1:2004(AS/NZS)	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Circuit-breakers for a.c. operation
61009.1:2015(AS/NZS)	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules
6104:1981(NZS)	Specification for emergency electricity supply in buildings
AS/NZS 2053	Specification for unplasticized PVC conduit and fittings for electrical wiring
AS/NZS 3439	Electrical switchgear and controlgear

NZECP 54

Recessed luminaires

### **13.3 Workmanship**

#### **13.3.1 General**

Supply and install all materials, including all necessary minor and incidental items, for proper completion of all of the electrical services specified or shown on the drawings. The contract will not be deemed to be complete until the Electrician has provided an Electrical Certificate of Compliance in accordance with NZECP 11 (made available to the Contractor in time for the Code Compliance Certificate application).

Obtain all necessary permits and consents, serve all notices and pay all fees in and customary charges connection with the works.

The position of switches, light and power outlets and other fittings, although shown specifically in some instances, are in general only shown diagrammatically. The exact location of each of these items will be as directed on site by the Architect/Designer; the Electrician shall give reasonable notice of when this information is required. Items positioned in contravention of this shall be repositioned if directed, including rewiring if necessary, all at the Electrician's expense.

Unless drawn (on 1:20 wall elevations) or specified otherwise the mounting height to the centreline of the following items above the floor shall be:

- 1000mm for lighting switches;
- 2000mm for wall mounted lights;
- 2100mm for the bayonet of pendant lights;
- 300mm for power points, except at benches.

(Notify the Architect/Designer if either the actual fitting or mounting position seem to make the mounting height noted above inappropriate).

Warranty cards and manufacturers guarantees for items supplied and installed by this trade shall be filled in correctly and handed over at Practical Completion. Arrange all circuits to obtain an optimum balance of the system, and check and reconnect where necessary to achieve this on completion. Leave the works clean and tidy and in full operational order.

#### **13.3.2 Co-operation**

Co-operate with all other trades and attend upon the Concretor and Carpenter to set out all required penetrations and to ensure that all wiring and fittings are correctly incorporated as work proceeds. The Carpenter will provide and fix all necessary dwangs and timber supports in locations determined by the Electrician.

### **13.3.3 Workmanship**

The cutting away and checking of timbers shall be limited to such dimensions as will not prejudice the purpose for which the timber is used; observe NZS 3604: 2011 restrictions on the holing and checking of joists and beams. Chasing and checking of other materials shall be only to approval.

Adequately protect all surfaces. Any damage to fittings or surfaces made good by the appropriate trade at the Electrician's expense.

### **13.3.4 Wiring**

Joints within cable runs will not normally be accepted. TPS cable shall be adequately supported, and clipped at regular intervals. At terminations all strands of conductors shall be fully secured in a terminal block or clamped under a screw head washer; do not cut away any strands. Wiring which terminates in enclosed fittings and/or where subject to heat liable to cause deterioration, shall be high temperature type, with the tails made off with heat resisting sleeves, to protect the permanent wiring.

Wire lights in 1.5mm 3 core - 7.5 amps loading max per circuit (allow for 100w to all light fittings unless identified otherwise).

Wire power outlets in 2.5mm 3 core - 7 maximum GPO singles or doubles per circuit. Assess power outlets for specific equipment and allow accordingly.

Conceal all wiring except as noted on drawings or below. All wiring cast into concrete shall be run in conduit pipes. All cables shall be stranded (single core is unacceptable).

Wire more or less parallel to and at right angles to the structural elements - avoid any diagonal wiring. Layout of the principal distribution wiring shall be to approval. Position all wires to minimise the risk of damage from subsequent nailing of linings etc.

Generally, do not run TPS horizontally within timber walls except in the area up to 300mm above floor. Wire in the ceiling framing and drop vertically to outlets and switches.

Do not run TPS horizontally within partitions except in the area up to 300mm above floor. Wire in the ceiling void and drop vertically to outlets and switches. Principal wiring in the ceiling void shall be supported on adequate catenaries.

Wire exterior lighting in screened cable.

Low voltage 2 core wire in parallel from the vacuum system outlets back to the vacuum unit position. (Vacuum unit has transformer).

## **13.4 Systems**

### **13.4.1 Earth**

Provide a driven main earth suitable for the full installation, close to the meterboard, complying fully with all appropriate regulations and to the complete approval of a certified inspector. Bond all

exposed metals, including light fittings and piped services and provide earth conductors for the entire system. Sheathing to any neutral screened cables may be used for earthing.

#### **13.4.2 Mains**

Install a neutral screened 16mm main cable underground (depth, cover/protection, backfilling, signal strip etc. to comply with all relevant regulations) from the grid connection position noted on the Site Plan along the route indicated to the meterboard, positioned where shown on the Floor Plan, and make appropriate arrangements for the grid connection. Install pilot as required. The meterboard shall be metalclad with a meter reading window, recessed maximum depth into the wall and at 2m to the top of the board, with the meters and water heater controllers by the supply company nominated by the Principal. Install all switches and fuses that are necessary. From the meterboard run (route to approval) a neutral screened 16mm main plus controllers etc. to the switchboard.

### **13.5 Materials & Control**

#### **13.5.1 Materials**

All materials delivered with packaging and labeling intact. All required incidentals (insulating tape, seals, fixings, etc.) shall be completely appropriate for the application involved. The use of items damaged in any way is subject to approval in each instance.

#### **13.5.2 Switchboard**

The switchboard shall be an appropriate size standard PDL DBF series board installed fully recessed where shown and at 2m to the top of the board. Install appropriate sized MCB's for all circuits, including a minimum of two power and one lighting RCDs as required to cover all outlets.

### **13.6 Elements**

#### **13.6.1 Light Fittings**

All light fittings are identified as to type on the drawing, and will be supplied by the Principal. Take delivery, install in accordance with any directions supplied and protect until Practical Completion.

#### **13.6.2 Tele Communications**

Workmanship shall be recognised best trade practice, and in accordance with the manufacturers' recommendations. All work shall be by competent and experienced operatives.

#### **13.6.3 Other Wired Services**

Co-operate with all other trades to ensure that the following services are installed complete and in accordance with their manufacturer's recommendations with all normal or necessary incidentals and with all wiring concealed.

-SKY TV.

-Stereo Unit.

-Central Vacuum System.

-Garage door operating mechanisms.

-Gas hot water supply unit installed complete by the Plumber - supply electrical feed and connect.

- Wall mounted fan heaters.
- Front door bell as noted - supply and install.
- Kitchen, laundry and wet areas air exhaust fans and ducting as noted - supply and install.
- Cupboard heaters - supply and install.
- Infrared / movement / daylight sensor switches as noted.
- Under-tile electric heating to the bathroom and shower room complete with thermostat control installed where shown. Supply and install (immediately prior to tiles installation) exactly to the suppliers recommendations.
- Heated towel rails to bathroom and shower room.
- Spa pool equipment will be installed complete by the Plumber. Supply power through weather proof connection, with an isolating switch.
- Hot water cylinders installed complete by the Plumber. Supply and connect.
- The lap pool electrical equipment will be installed complete and wired from the splitter box (by a Registered Electrician) by the Pool Installer. Main contract Electrician shall verify that all aspects of this work comply with all relevant main contract requirements.
- Septic tank pumps feed in conduit from an isolating switch.
- Heat pump
- Supply a Heavy Duty TV Aerial (suitable for TV1, 2, and 3, Sky, and all local and community TV stations) and install on the roof ridges where directed, stayed against wind, and with all connections compatible with the roofing and waterproof. Feed to the outlets shown with the complete system exactly to aerial suppliers recommendations.
- Heating.
- Install ceiling fans with variable speed controllers supplied by owner.

1. BRANZ Appraisal No.918 (2016) - Thermakraft Covertex 403 Plus Wall Underlay
2. CodeMark Certificate of Conformity - Thermakraft Covertex 407
3. BRANZ Appraisal No.651 (2009) - Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay
4. CodeMark Certificate of Conformity - Thermakraft Covertex 407
5. BRANZ Appraisal No.651 (2009) - Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay
6. BRANZ Appraisal No.472 (2017) - ARDEX Undertile Internal Liquid Waterproofing Membranes
7. BRANZ Appraisal No.611 (2011) - James Hardie Rigid Air Barriers
8. CodeMark Certificate of Conformity - Abodo Weatherboard Cladding
9. [CARTER HOLT HARVEY](#)
10. [5-RIB TRAPEZOIDAL](#)



**BRANZ Appraised**  
Appraisal No. 918 [2016]

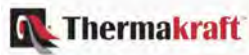
**THERMAKRAFT  
COVERTEK 403 PLUS  
WALL UNDERLAY**

**Appraisal No. 918 [2016]**  
Amended 23 February 2017



**BRANZ Appraisals**

Technical Assessments of products for building and construction.



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**Product**

- 1.1 Thermakraft Covertek 403 Plus Wall Underlay is a fire retardant flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel framed buildings. The product consists of a micro-porous water resistant film ultrasonically bonded between two layers of non-woven spun-bonded polyolefin, and is coloured white.

**Scope**

**Flexible Wall Underlay**

- 2.1 Thermakraft Covertek 403 Plus Wall Underlay has been appraised for use as a flexible wall underlay for 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 direct fixed absorbent and non-absorbent wall claddings; or,
  - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or to a specific design for steel framed buildings; and,
  - situated in NZS 3604 Wind Zones up to and including Very High.

**Use over Rigid Wall Underlay**

- 2.2 Thermakraft Covertek 403 Plus Wall Underlay 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 to a specific design for steel framed buildings; and,
  - situated in NZS 3604 Wind Zones up to and including Extra High.

**Specific Design**

- 2.3 Thermakraft Covertek 403 Plus Wall Underlay 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 Thermakraft Covertek 403 Plus Wall Underlay into their design in accordance with the declared properties and the instructions of Thermakraft Limited.



## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Thermakraft Covertex 403 Plus Wall Underlay, 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. Thermakraft Covertex 403 Plus Wall Underlay meets these requirements. See Paragraphs 9.1 and 9.2.

**Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:** Performance C3.4 [c]. Thermakraft Covertex 403 Plus Wall Underlay meets this requirement. See Paragraph 10.1.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the cladding system, Thermakraft Covertex 403 Plus Wall Underlay will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Thermakraft Covertex 403 Plus Wall Underlay meets this requirement and will not present a health hazard to people.

## Technical Specification

4.1 Thermakraft Covertex 403 Plus Wall Underlay is a synthetic building underlay for use under wall claddings. The product consists of a micro-porous water resistant film laminated between two layers of non-woven spun-bonded polyolefin. Thermakraft Covertex 403 Plus Wall Underlay is coloured white on the top and bottom faces.

4.2 The product is supplied in rolls 1.350 m wide x 18.6 m, 37.0 m and 55.0 m long. The product is printed with the Thermakraft Covertex 403 Plus logo repeated along the length of the roll. The rolls are wrapped in clear polythene film.

### Accessories

4.3 Accessories used with Thermakraft Covertex 403 Plus Wall Underlay which are supplied by the installer are:

- **Fixings** - staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the wall underlay to the framing.
- **Wall underlay support** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

## Handling and Storage

5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Thermakraft Covertex 403 Plus Wall Underlay. 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 Thermakraft Covertek 403 Plus Wall Underlay is intended for use as an alternative to conventional building papers which are fixed over timber or steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 1 for material properties.
- 7.2 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.
- 7.3 Thermakraft Covertek 403 Plus Wall Underlay must not be exposed to the weather or ultra violet light for a total of more than 42 days before being covered by the wall cladding.
- 7.4 Thermakraft Covertek 403 Plus Wall Underlay is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 [c].
- 7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5. Wall underlay support options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens.

**Table 1: NZBC E2/AS1 Table 23 (NZS 2295) Requirements**

NZBC E2/AS1 Table 23 (NZS 2295) Wall Underlay Properties	Property Performance Requirement	Actual Property Performance
Absorbency	$\geq 100 \text{ g/m}^2$	Pass
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 20 \text{ mm}$	Pass
pH of Extract	$\geq 5.5$ and $\leq 8$	Pass
Shrinkage	$\leq 0.5\%$	Pass
Mechanical	Edge tear and tensile strength	<b>Edge tear [Average]:</b> Machine direction = 217 N Cross direction = 104 N  <b>Tensile strength [Average]:</b> Machine direction = 4.57 kN/m Cross direction = 2.63 kN/m
Air Barrier	Air resistance: $\geq 0.1 \text{ MN s/m}^3$	Pass. Thermakraft Covertek 403 Plus Wall Underlay can be used as an air barrier.

### Claddings

- 7.6 Thermakraft Covertek 403 Plus Wall Underlay is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations. Thermakraft Covertek 403 Plus Wall Underlay is suitable for use under cavity based wall claddings as an absorbent synthetic wall underlay as called up in NZS 2295, Table 2.4 on steel framed buildings.

### Stucco Plaster

- 7.7 Thermakraft Covertek 403 Plus Wall Underlay is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.
- 7.8 Thermakraft Covertek 403 Plus Wall Underlay may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 [b].

### Structure

- 8.1 Thermakraft Covertek 403 Plus Wall Underlay is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

### Durability

- 9.1 Thermakraft Covertek 403 Plus Wall Underlay meets code compliance with NZBC Clause B2.3.1 [a], not less than 50 years for wall underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 [b], 15 years for wall underlays used where the cladding durability requirement is 15 years.

### Serviceable Life

- 9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 42 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Thermakraft Covertek 403 Plus Wall Underlay is expected to have a serviceable life equal to that of the cladding.

### Control of Internal Fire and Smoke Spread

- 10.1 Thermakraft Covertek 403 Plus Wall Underlay has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b], for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Thermakraft Covertek 403 Plus Wall Underlay from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### External Moisture

- 12.1 Thermakraft Covertek 403 Plus Wall Underlay must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.
- 12.2 Thermakraft Covertek 403 Plus Wall Underlay, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

## Installation Information

### Installation Skill Level Requirements

- 13.1 Installation must always be carried out in accordance with the Thermakraft Covertex 403 Plus Wall Underlay Technical Literature and this Appraisal by, or under the supervision of a Licensed Building Practitioner with the relevant Licence Class.

### Underlay Installation

- 14.1 Thermakraft Covertex 403 Plus Wall Underlay must be fixed to all framing members at maximum 300 mm centres with large-head clouts 20 mm long, 6-8 mm staples, self-drilling screws or proprietary underlay fixings. The underlay must be pulled taut over the framing before fixing.
- 14.2 Thermakraft Covertex 403 Plus Wall Underlay must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.
- 14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.
- 14.4 Thermakraft Covertex 403 Plus Wall Underlay 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.
- 14.6 Any damaged areas of Thermakraft Covertex 403 Plus Wall Underlay, 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 Thermakraft Covertex 403 Plus Wall Underlay 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 Thermakraft Covertex 403 Wall Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. The following tests have been carried out on Thermakraft Covertex 403 Plus Wall Underlay: resistance to dry delamination in accordance with AS/NZS 4201.1, surface water absorbency in accordance with AS/NZS 4201.6 and air resistance to BS 6538.3. A range of these tests were completed before and after the underlays were exposed to ultra-violet light.
- 15.2 The Flammability Index of Thermakraft Covertex 403 Plus Wall Underlay has been evaluated in accordance with AS 1530.2.



### Other Investigations

- 16.1 A durability opinion has been given by BRANZ technical experts.
- 16.2 An evaluation of the expected performance of Thermakraft Covertek 403 Plus Wall Underlay in direct contact with metal wall cladding has been completed by BRANZ.
- 16.3 The practicability of installation of Thermakraft Covertek 403 Plus Wall Underlay has been assessed by BRANZ and found to be satisfactory.
- 16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

### Quality

- 17.1 The manufacture of Thermakraft Covertek 403 Plus Wall Underlay 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.
- 17.2 The quality of supply to the market is the responsibility of Thermakraft Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Thermakraft Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

### Sources of Information

- AS 1530.2 - 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp - cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays - materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays - Methods of test - Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays - Methods of test - Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays - Methods of test - Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays - Methods of test - Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays - Methods of test - Surface water absorbency.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, permeable building underlays.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 7, 01 January 2017].
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

### Amendments

#### Amendment No. 1, dated 23 February 2017.

This Appraisal has been amended to update the Appraisal Holder.



BRANZ Appraised  
Appraisal No. 918 [2016]

BRANZ Appraisal  
Appraisal No. 918 [2016]  
14 June 2016

THERMAKRAFT COVERTEK 403  
PLUS WALL UNDERLAY



In the opinion of BRANZ, **Thermakraft Covertek 403 Plus Wall Underlay** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Thermakraft 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. **Thermakraft 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 **Thermakraft 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 **Thermakraft Limited** or any third party.

For BRANZ

A handwritten signature in blue ink, appearing to read 'Chelydra Percy'.

**Chelydra Percy**

Chief Executive

Date of Issue:

14 June 2016

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertex 407



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### Product Description

Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay (Covertex 407) is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water resistant film laminated to two layers of non woven spun-bonded polyolefin. Covertex 407 is coloured white on the top bottom faces.

### Product purpose and use

Covertex 407 has been assessed for use as a self-supporting roof underlay on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1 (Amendment 7, 1 January 2017), Paragraph 1.1 with regards to building height and floor plan area; and,
- with masonry tile roof cladding; and,
- with metal tile and profiled metal roof cladding; and,
- situated in NZS 3604-2011 Wind Zones up to, and including Extra High.

Covertex 407 is supplied in rolls 1.250 m wide x 20 m and 40 m long or 2.550 m wide x 29.5 m long. The product is printed with the Covertex 407 logo repeated along the length of the roll as well as lap lines. A customer specific version without the Covertex 407 print is also available. The rolls are wrapped in clear polythene film.

Accessories used with Covertex 407 which are supplied by the installer are:

- Fixings - stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the roof underlay to the framing.

For use as an alternative to kraft paper roofing underlays: fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity and to assist in the moisture management of the cladding system.

### Certificate holder

**Thermakraft Limited**  
 11 Turin Place, East Tamaki Auckland, New Zealand  
 Tel: +64 9 2733727  
[www.thermakraft.co.nz](http://www.thermakraft.co.nz)

<b>CodeMark Certification Body</b>		11/3/2013	1/8/2018	9/6/2019	GM-CM30028-RevE
Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia Tel: +61 (0)2 9886 0222 <a href="http://www.Global-Mark.com.au">www.Global-Mark.com.au</a>	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 OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertex 407



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### Compliance with the New Zealand Building Code (NZBC):

- **Clause B2 DURABILITY:** Performance B2.3.1(a), not less than 50 years, B2.3.1(b), 15 years and B2.3.2. Covertex 407 meets these requirements.
- **Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:** Performance C3.4 (c) Covertex 407 meets this requirement.
- **Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the roof cladding system, Covertex 407 will contribute to meeting this requirement.
- **Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Covertex 407 meets this requirement and will not present a health hazard to people.

### Subject to the following conditions and limitations:

- Certificate holder will notify Global-Mark Pty Ltd in accordance with Regulation 15 of the Building (Product Certification) Regulations 2008
- Maintaining the validity of BRANZ Appraisal No. 651 (2009) Amended 25 May 2018 Thermakraft Covertex 407 Fire Retardant Self Supporting Roof Underlay. (The Appraisal) (refer to [www.branz.co.nz](http://www.branz.co.nz))

### Design and Installation Conditions:

- **Timber and Steel Framing**  
Timber and steel roof framing must be provided in accordance with the requirements of the NZBC and the roof cladding manufacturer.
- **General**

**Table 1: NZBC E2/AS1 (Amendment 7, 1 January 2017) Table 23 Requirements**

Roof Underlay Properties	Property Performance Requirement	Results
Absorbency	≥ 150 g/m <sup>2</sup>	Pass > 150 g/m <sup>2</sup>
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 100 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear (Average): <ul style="list-style-type: none"> <li>• Machine direction = 320 N</li> <li>• Cross direction = 289 N</li> </ul> Tensile strength (Average): <ul style="list-style-type: none"> <li>• Machine direction = 6.0 kN/m</li> <li>• Cross direction = 5.8 kN/m</li> </ul>

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertek 407



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Covertek 407 is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.

The material also provides a degree of temporary weather protection during early construction. However, the product will not make the roof weathertight and some wetting of the underlying structure is always possible before the roof cladding is installed. Hence, the entire building must be closed-in and made weatherproof before moisture sensitive materials such as ceiling linings and insulation materials are installed.

Covertek 407 is suitable for use under roof claddings on buildings as a roof underlay as called up in NZBC Acceptable Solution E2/AS1 (Amendment 7, 1 January 2017), Table 23. Refer to Table 1 for the material properties of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay.

Covertek 407 is suitable for use in residential and commercial roofs with roof pitches of minimum 3°. The product must not span unsupported more than 1200 mm in one direction. Spans greater than 1200 mm require additional support such as galvanised wire mesh or safety mesh.

- At roof pitches of 10° or more, Covertek 407 may be run horizontally or vertically.
- At roof pitches less than 10° (minimum 3°), Covertek 407 may be run
  - horizontally, or
  - vertically if installed over a roof underlay support.

Refer to Table 2 for a summary of the roof underlay support requirements.

Table 2: Roof Underlay Support Requirements

Roof Pitch	Span	Roof Underlay Support Required?	
		Horizontally Installed	Vertically Installed
10° or more	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	No
Less than 10° (minimum 3°)	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	Yes

• **Structure**

Covertek 407 is suitable for use in all Wind Zones of NZS 3604-2011 up to, and including, Extra High.

• **Durability**

Covertek 407 meets code compliance with NZBC Clause B2.3.1 (a) (Amendment 7, April 2011), not less than 50 years for roof underlays used where the roof cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding, and code compliance with NZBC Clause B2.3.1 (b), 15 years for roof underlays used where the roof cladding durability requirement is 15 years.

• **Serviceable Life**

Provided it is not exposed to the weather or ultra-violet light for a total of more than 7 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, Covertek 407 is expected to have a serviceable life equal to that of the roof cladding.

• **Control of Internal Fire and Smoke Spread**

Covertek 407 has an AS 1530 Part 2 – 1993 (including Amendment 1) flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6 (July 2014), Paragraph 4.17.8 (b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

• **Prevention of Fire Occurring**

Separation or protection must be provided to Covertek 407 from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 (July 2014), and NZBC Verification Method C/VM1 (July 2014)

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertek 407

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provide methods for separation and protection of combustible materials from heat sources).

- **External Moisture**

Covertek 407 must only be used under roof claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 (Amendment 7, 1 January 2017).

Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay, when installed in accordance with Thermakraft Covertek 407 Synthetic Roof Underlay (J2902-05/17), will assist in the total cladding system's compliance with NZBC Clause E2 (Amendment 7, 1 January 2017).

- **Underlay Installation**

Covertek 407 must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.

Covertek 407 may be run vertically or horizontally. Refer to Table 2 for a summary of roof underlay support requirements. The roof underlay must extend from the ridge and overhang the fascia board by 20-25 mm.

Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide. To assist with achieving the correct lap dimension, Covertek 407 has a 150 mm lap line printed continuously along the top face.

When fixing the product in windy conditions, care must be taken due to the large sail area created.

Any damaged areas of Covertek 407, 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.

- **Installation Conditions**

Shall be carried out by:

- A Licensed Building Practitioner with experience in roof cladding installation; or,
- By competent tradespersons with an understanding of roof underlay installation.

The installer shall also:

Comply with all relevant technical information relating to the products use, including information contained within the Thermakraft Covertek 407 Synthetic Roof Underlay (J2902-05/17) and the Appraisal.

**End of record**



## BRANZ Appraised

Appraisal No. 651 [2019]

## THERMAKRAFT COVERTEK 407 FIRE RETARDANT SELF- SUPPORTING ROOF UNDERLAY

Appraisal No. 651 [2019]

This Appraisal replaces BRANZ  
Appraisal No. 651 [2009].



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



### ThermoKraft Limited

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### BRANZ

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## Product

- 1.1 ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water resistant film laminated to two layers of non woven spun-bonded polyolefin.

## Scope

- 2.1 ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay has been appraised for use as a self-supporting roof underlay on 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 masonry tile roof cladding; and,
  - with metal tile and profiled metal roof cladding; and,
  - situated in NZS 3604 Wind Zones up to, and including Extra High.

## Building Regulations

### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay, 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. ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay meets these requirements. See Paragraphs 9.1 and 9.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the roof cladding system, ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay meets this requirement and will not present a health hazard to people.



## Technical Specification

- 4.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water resistant film laminated to two layers of non woven spun-bonded polyolefin. Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is coloured white on the top bottom faces.
- 4.2 The product is supplied in rolls 1.250 m wide x 20 m and 40 m long and 2.55 m wide x 29.4 m long. The product is printed with the Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay logo repeated along the length of the roll. The rolls are wrapped in clear polythene film.

### Accessories

- 4.3 Accessories used with Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay which are supplied by the installer are:
- Fixings - stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the roof underlay to the framing.

## 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 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay. 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 Timber and steel roof framing must be provided in accordance with the requirements of the NZBC and the roof cladding manufacturer.

### General

- 7.2 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.
- 7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the roof weathertight and some wetting of the underlying structure is always possible before the roof cladding is installed. Hence, the entire building must be closed-in and made weatherproof before moisture sensitive materials such as ceiling linings and insulation materials are installed.
- 7.4 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is suitable for use under roof claddings on buildings as a roof underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23. Refer to Table 1 for the material properties of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay.

**Table 1: NZBC E2/AS1 Table 23 Requirements**

NZBC E2/AS1 Table 23 Roof Underlay Properties	Property Performance Requirement	Results
Absorbency	≥ 100 g/m <sup>2</sup>	Pass > 150 g/m <sup>2</sup>
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 100 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear [Average]: Machine direction = 320 N Cross direction = 289 N Tensile strength [Average]: Machine direction = 6.0 kN/m Cross direction = 5.8 kN/m

- 7.5 Thermakraft Covertek 407 is suitable for use in residential and commercial roofs with roof pitches of minimum 3°. The product must not span unsupported more than 1200 mm in one direction. Spans greater than 1200 mm require additional support such as galvanised wire mesh or safety mesh.
- 7.6 At roof pitches of 10° or more, Thermakraft Covertek 407 may be run horizontally or vertically.
- 7.7 At roof pitches less than 10° [minimum 3°], Thermakraft Covertek 407 may be run horizontally, or vertically if installed over a roof underlay support.
- 7.8 Refer to Table 2 for a summary of the roof underlay support requirements.

**Table 2: Roof Underlay Support Requirements**

Roof Pitch	Span	Roof Underlay Support Required?	
		Horizontally Installed	Vertically Installed
10° or more	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	No
Less than 10° [Minimum 3°]	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	Yes



### Structure

- 8.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High.

### Durability

- 9.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for roof underlays used where the roof cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding, and code compliance with NZBC Clause B2.3.1 (b), 15 years for roof underlays used where the roof 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 7 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is expected to have a serviceable life equal to that of the roof cladding.

### Control of Internal Fire and Smoke Spread

- 10.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay 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 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay must only be used under roof claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1, or roof claddings covered by a valid BRANZ Appraisal.
- 12.2 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

## Installation Information

### Installation Skill Level Requirements

- 13.1 Installation must always be carried out in accordance with the Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay Technical Literature and this Appraisal, by competent tradespersons with an understanding of roof underlay installation.

### Underlay Installation

- 14.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.
- 14.2 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay may be run horizontally or vertically. Refer to Table 2 for a summary of roof underlay support requirements. The roof underlay must extend from the ridge and overhang the fascia board by 20-25 mm.



- 14.3 Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide. To assist with achieving the correct lap dimension, Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay has a 150 mm lap line printed continuously along the top face.
- 14.4 When fixing the product in windy conditions, care must be taken due to the large sail area created.
- 14.5 Any damaged areas of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay, 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

- 14.6 The Technical Literature must be referred to during the inspection of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay 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 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6 and pH of extract in accordance with AS/NZS 1301.421s. A range of these tests were completed before and after Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay was exposed to ultra-violet light.
- 15.2 The Flammability Index of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay has been evaluated in accordance with AS 1530.2.

### Other Investigations

- 16.1 A durability opinion has been given by BRANZ technical experts.
- 16.2 An evaluation of the expected performance of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay in direct contact with metal roof cladding has been completed by BRANZ.
- 16.3 The practicability of installation of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay has been assessed by BRANZ and found to be satisfactory.
- 16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

### Quality

- 17.1 The manufacture of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay 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.
- 17.2 The quality of supply to the market is the responsibility of Thermakraft Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the roof underlay into their design in accordance with the instructions of Thermakraft Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft 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 4201.3: 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.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 8, 30 November 2018].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ Appraised  
Appraisal No. 651 [2019]

BRANZ Appraisal  
Appraisal No. 651 [2019]  
20 March 2019

THERMAKRAFT COVERTEK  
407 FIRE RETARDANT SELF-  
SUPPORTING ROOF UNDERLAY



In the opinion of BRANZ, **Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Thermakraft 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. **Thermakraft 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 **Thermakraft 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 **Thermakraft Limited** or any third party.

For BRANZ

A handwritten signature in blue ink, appearing to read 'Chelydra Percy'.

**Chelydra Percy**

Chief Executive

Date of Issue:

20 March 2019

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertex 407



Page 1 of 4



Product Description
<p>Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay (Covertex 407) is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water resistant film laminated to two layers of non woven spun-bonded polyolefin. Covertex 407 is coloured white on the top bottom faces.</p>
Product purpose and use
<p>Covertex 407 has been assessed for use as a self-supporting roof underlay on buildings within the following scope:</p> <ul style="list-style-type: none"> <li>the scope limitations of NZBC Acceptable Solution E2/AS1 (Amendment 7, 1 January 2017), Paragraph 1.1 with regards to building height and floor plan area; and,</li> <li>with masonry tile roof cladding; and,</li> <li>with metal tile and profiled metal roof cladding; and,</li> <li>situated in NZS 3604-2011 Wind Zones up to, and including Extra High.</li> </ul> <p>Covertex 407 is supplied in rolls 1.250 m wide x 20 m and 40 m long or 2.550 m wide x 29.5 m long. The product is printed with the Covertex 407 logo repeated along the length of the roll as well as lap lines. A customer specific version without the Covertex 407 print is also available. The rolls are wrapped in clear polythene film.</p> <p>Accessories used with Covertex 407 which are supplied by the installer are:</p> <ul style="list-style-type: none"> <li>Fixings - stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the roof underlay to the framing.</li> </ul> <p>For use as an alternative to kraft paper roofing underlays: fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity and to assist in the moisture management of the cladding system.</p>
Certificate holder
<p><b>Thermakraft Limited</b>                  11 Turin Place, East Tamaki Auckland, New Zealand                  Tel: +64 9 2733727  <a href="http://www.thermakraft.co.nz">www.thermakraft.co.nz</a></p>

<b>CodeMark Certification Body</b>		11/3/2013	1/8/2018	9/6/2019	GM-CM30028-RevE
Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia Tel: +61 (0)2 9886 0222 <a href="http://www.Global-Mark.com.au">www.Global-Mark.com.au</a>	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 OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertex 407



Page 2 of 4



### Compliance with the New Zealand Building Code (NZBC):

- **Clause B2 DURABILITY:** Performance B2.3.1(a), not less than 50 years, B2.3.1(b), 15 years and B2.3.2. Covertex 407 meets these requirements.
- **Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:** Performance C3.4 (c) Covertex 407 meets this requirement.
- **Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the roof cladding system, Covertex 407 will contribute to meeting this requirement.
- **Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Covertex 407 meets this requirement and will not present a health hazard to people.

### Subject to the following conditions and limitations:

- Certificate holder will notify Global-Mark Pty Ltd in accordance with Regulation 15 of the Building (Product Certification) Regulations 2008
- Maintaining the validity of BRANZ Appraisal No. 651 (2009) Amended 25 May 2018 Thermakraft Covertex 407 Fire Retardant Self Supporting Roof Underlay. (The Appraisal) (refer to [www.branz.co.nz](http://www.branz.co.nz))

### Design and Installation Conditions:

- **Timber and Steel Framing**  
Timber and steel roof framing must be provided in accordance with the requirements of the NZBC and the roof cladding manufacturer.
- **General**

**Table 1: NZBC E2/AS1 (Amendment 7, 1 January 2017) Table 23 Requirements**

Roof Underlay Properties	Property Performance Requirement	Results
Absorbency	≥ 150 g/m <sup>2</sup>	Pass > 150 g/m <sup>2</sup>
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 100 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear (Average): <ul style="list-style-type: none"> <li>• Machine direction = 320 N</li> <li>• Cross direction = 289 N</li> </ul> Tensile strength (Average): <ul style="list-style-type: none"> <li>• Machine direction = 6.0 kN/m</li> <li>• Cross direction = 5.8 kN/m</li> </ul>

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertek 407



Page 3 of 4



Covertek 407 is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.

The material also provides a degree of temporary weather protection during early construction. However, the product will not make the roof weathertight and some wetting of the underlying structure is always possible before the roof cladding is installed. Hence, the entire building must be closed-in and made weatherproof before moisture sensitive materials such as ceiling linings and insulation materials are installed.

Covertek 407 is suitable for use under roof claddings on buildings as a roof underlay as called up in NZBC Acceptable Solution E2/AS1 (Amendment 7, 1 January 2017), Table 23. Refer to Table 1 for the material properties of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay.

Covertek 407 is suitable for use in residential and commercial roofs with roof pitches of minimum 3°. The product must not span unsupported more than 1200 mm in one direction. Spans greater than 1200 mm require additional support such as galvanised wire mesh or safety mesh.

- At roof pitches of 10° or more, Covertek 407 may be run horizontally or vertically.
- At roof pitches less than 10° (minimum 3°), Covertek 407 may be run
  - horizontally, or
  - vertically if installed over a roof underlay support.

Refer to Table 2 for a summary of the roof underlay support requirements.

Table 2: Roof Underlay Support Requirements

Roof Pitch	Span	Roof Underlay Support Required?	
		Horizontally Installed	Vertically Installed
10° or more	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	No
Less than 10° (minimum 3°)	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	Yes

• **Structure**

Covertek 407 is suitable for use in all Wind Zones of NZS 3604-2011 up to, and including, Extra High.

• **Durability**

Covertek 407 meets code compliance with NZBC Clause B2.3.1 (a) (Amendment 7, April 2011), not less than 50 years for roof underlays used where the roof cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding, and code compliance with NZBC Clause B2.3.1 (b), 15 years for roof underlays used where the roof cladding durability requirement is 15 years.

• **Serviceable Life**

Provided it is not exposed to the weather or ultra-violet light for a total of more than 7 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, Covertek 407 is expected to have a serviceable life equal to that of the roof cladding.

• **Control of Internal Fire and Smoke Spread**

Covertek 407 has an AS 1530 Part 2 – 1993 (including Amendment 1) flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6 (July 2014), Paragraph 4.17.8 (b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

• **Prevention of Fire Occurring**

Separation or protection must be provided to Covertek 407 from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 (July 2014), and NZBC Verification Method C/VM1 (July 2014)

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertek 407

Page 4 of 4



provide methods for separation and protection of combustible materials from heat sources).

- **External Moisture**

Covertek 407 must only be used under roof claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 (Amendment 7, 1 January 2017).

Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay, when installed in accordance with Thermakraft Covertek 407 Synthetic Roof Underlay (J2902-05/17), will assist in the total cladding system's compliance with NZBC Clause E2 (Amendment 7, 1 January 2017).

- **Underlay Installation**

Covertek 407 must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.

Covertek 407 may be run vertically or horizontally. Refer to Table 2 for a summary of roof underlay support requirements. The roof underlay must extend from the ridge and overhang the fascia board by 20-25 mm.

Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide. To assist with achieving the correct lap dimension, Covertek 407 has a 150 mm lap line printed continuously along the top face.

When fixing the product in windy conditions, care must be taken due to the large sail area created.

Any damaged areas of Covertek 407, 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.

- **Installation Conditions**

Shall be carried out by:

- A Licensed Building Practitioner with experience in roof cladding installation; or,
- By competent tradespersons with an understanding of roof underlay installation.

The installer shall also:

Comply with all relevant technical information relating to the products use, including information contained within the Thermakraft Covertek 407 Synthetic Roof Underlay (J2902-05/17) and the Appraisal.

**End of record**



## BRANZ Appraised

Appraisal No. 651 [2019]

## THERMAKRAFT COVERTEK 407 FIRE RETARDANT SELF- SUPPORTING ROOF UNDERLAY

Appraisal No. 651 [2019]

This Appraisal replaces BRANZ  
Appraisal No. 651 [2009].



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.

**Thermakraft** TRUSTED IN NEW ZEALAND

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### Product

- 1.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water resistant film laminated to two layers of non woven spun-bonded polyolefin.

### Scope

- 2.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay has been appraised for use as a self-supporting roof underlay on 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 masonry tile roof cladding; and,
  - with metal tile and profiled metal roof cladding; and,
  - situated in NZS 3604 Wind Zones up to, and including Extra High.

### Building Regulations

#### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay, 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. ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay meets these requirements. See Paragraphs 9.1 and 9.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the roof cladding system, ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. ThermoKraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay meets this requirement and will not present a health hazard to people.



## Technical Specification

- 4.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water resistant film laminated to two layers of non woven spun-bonded polyolefin. Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is coloured white on the top bottom faces.
- 4.2 The product is supplied in rolls 1.250 m wide x 20 m and 40 m long and 2.55 m wide x 29.4 m long. The product is printed with the Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay logo repeated along the length of the roll. The rolls are wrapped in clear polythene film.

### Accessories

- 4.3 Accessories used with Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay which are supplied by the installer are:
- Fixings - stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the roof underlay to the framing.

## 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 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay. 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 Timber and steel roof framing must be provided in accordance with the requirements of the NZBC and the roof cladding manufacturer.

### General

- 7.2 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.
- 7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the roof weathertight and some wetting of the underlying structure is always possible before the roof cladding is installed. Hence, the entire building must be closed-in and made weatherproof before moisture sensitive materials such as ceiling linings and insulation materials are installed.
- 7.4 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is suitable for use under roof claddings on buildings as a roof underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23. Refer to Table 1 for the material properties of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay.

**Table 1: NZBC E2/AS1 Table 23 Requirements**

<b>NZBC E2/AS1 Table 23 Roof Underlay Properties</b>	<b>Property Performance Requirement</b>	<b>Results</b>
Absorbency	≥ 100 g/m <sup>2</sup>	Pass > 150 g/m <sup>2</sup>
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 100 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear [Average]: Machine direction = 320 N Cross direction = 289 N Tensile strength [Average]: Machine direction = 6.0 kN/m Cross direction = 5.8 kN/m

- 7.5 Thermakraft Covertek 407 is suitable for use in residential and commercial roofs with roof pitches of minimum 3°. The product must not span unsupported more than 1200 mm in one direction. Spans greater than 1200 mm require additional support such as galvanised wire mesh or safety mesh.
- 7.6 At roof pitches of 10° or more, Thermakraft Covertek 407 may be run horizontally or vertically.
- 7.7 At roof pitches less than 10° [minimum 3°], Thermakraft Covertek 407 may be run horizontally, or vertically if installed over a roof underlay support.
- 7.8 Refer to Table 2 for a summary of the roof underlay support requirements.

**Table 2: Roof Underlay Support Requirements**

<b>Roof Pitch</b>	<b>Span</b>	<b>Roof Underlay Support Required?</b>	
		<b>Horizontally Installed</b>	<b>Vertically Installed</b>
10° or more	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	No
Less than 10° [Minimum 3°]	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	Yes

### Structure

- 8.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High.

### Durability

- 9.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for roof underlays used where the roof cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding, and code compliance with NZBC Clause B2.3.1 (b), 15 years for roof underlays used where the roof 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 7 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay is expected to have a serviceable life equal to that of the roof cladding.

### Control of Internal Fire and Smoke Spread

- 10.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay 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 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay must only be used under roof claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1, or roof claddings covered by a valid BRANZ Appraisal.
- 12.2 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

## Installation Information

### Installation Skill Level Requirements

- 13.1 Installation must always be carried out in accordance with the Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay Technical Literature and this Appraisal, by competent tradespersons with an understanding of roof underlay installation.

### Underlay Installation

- 14.1 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.
- 14.2 Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay may be run horizontally or vertically. Refer to Table 2 for a summary of roof underlay support requirements. The roof underlay must extend from the ridge and overhang the fascia board by 20-25 mm.



- 14.3 Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide. To assist with achieving the correct lap dimension, Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay has a 150 mm lap line printed continuously along the top face.
- 14.4 When fixing the product in windy conditions, care must be taken due to the large sail area created.
- 14.5 Any damaged areas of Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay, 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

- 14.6 The Technical Literature must be referred to during the inspection of Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay 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 Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6 and pH of extract in accordance with AS/NZS 1301.421s. A range of these tests were completed before and after Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay was exposed to ultra-violet light.
- 15.2 The Flammability Index of Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay has been evaluated in accordance with AS 1530.2.

### Other Investigations

- 16.1 A durability opinion has been given by BRANZ technical experts.
- 16.2 An evaluation of the expected performance of Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay in direct contact with metal roof cladding has been completed by BRANZ.
- 16.3 The practicability of installation of Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay has been assessed by BRANZ and found to be satisfactory.
- 16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

### Quality

- 17.1 The manufacture of Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay 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.
- 17.2 The quality of supply to the market is the responsibility of Thermakraft Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the roof underlay into their design in accordance with the instructions of Thermakraft Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft 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 4201.3: 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.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 8, 30 November 2018].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ Appraised  
Appraisal No. 651 [2019]

BRANZ Appraisal  
Appraisal No. 651 [2019]  
20 March 2019

THERMAKRAFT COVERTEK  
407 FIRE RETARDANT SELF-  
SUPPORTING ROOF UNDERLAY



In the opinion of BRANZ, **Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Thermakraft 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. **Thermakraft 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 **Thermakraft 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 **Thermakraft Limited** or any third party.

For BRANZ

A handwritten signature in blue ink, appearing to read 'Chelydra Percy'.

**Chelydra Percy**

Chief Executive

Date of Issue:

20 March 2019



**BRANZ Appraised**  
Appraisal No. 472 [2017]

## ARDEX UNDERTILE INTERNAL LIQUID WATERPROOFING MEMBRANES

**Appraisal No. 472 [2017]**

This Appraisal replaces BRANZ  
Appraisal No. 472 [2011]



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



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## 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 1/360<sup>th</sup> 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.



## 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  $1/360^{\text{th}}$  of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.



## Substrates

### Plywood

- 8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with 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.

### 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.

### 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.

## 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.



### 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 Appraised**  
Appraisal No. 472 [2017]

**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



**BRANZ Appraised**  
Appraisal No. 611 [2011]

**JAMES HARDIE RIGID  
AIR BARRIERS**

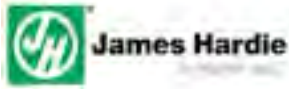
**Appraisal No. 611 (2011)**

Amended 13 March 2019.



**BRANZ Appraisals**

Technical Assessments of products  
for building and construction.



**James Hardie New Zealand  
Limited**

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**Product**

1.1 James Hardie Rigid Air Barriers are a range of rigid wall underlay materials including RAB™ Board and HomeRAB™ Pre-Cladding. They are sealed fibre cement sheets designed for use as rigid wall underlay behind wall cladding systems. HomeRAB™ Pre-Cladding and RAB™ Board are manufactured using a medium density fibre cement formulation.

**Scope**

- 2.1 HomeRAB™ Pre-Cladding has been appraised for use as a rigid wall underlay and temporary weather-protecting sheathing 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 non-absorbent wall claddings directly fixed to framing with a flexible wall underlay over the HomeRAB™ Pre-Cladding; 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 RAB™ Board has been appraised for use as a rigid wall underlay and temporary weather-protecting sheathing 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,
  - Importance level I to V buildings as defined in AS/NZS 1170; and,
  - constructed with timber framing, or timber frame infill complying with the NZBC; and,
  - with absorbent wall claddings directly fixed to framing; and,
  - with non-absorbent wall claddings directly fixed to framing with a flexible wall underlay over the RAB™ Board; 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,
  - when used in conjunction with wall cladding systems subjected to maximum wind pressures for structural and weathertightness design of 1.0 kPa Serviceability Limit State (SLS) and 1.5 kPa Ultimate Limit State (ULS) where studs are at maximum 600mm centres, and 3.0 kPa SLS and 4.5 kPa ULS where studs are at maximum 400 mm centres.



[Note: James Hardie Rigid Air Barriers can be used to provide structural bracing. RAB™ Board can also be used in fire resistance rated construction. These aspects have not been assessed by this Appraisal and are outside its scope.]

## Building Regulations

### New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, James Hardie Rigid Air Barriers, 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:
- 3.2 **Clause B1 STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.4. James Hardie Rigid Air Barriers meet the requirements for loads arising from earthquake and wind [i.e. B1.3.3 (f) and (h)]. See Paragraphs 8.1 - 8.7.
- 3.3 **Clause B2 DURABILITY:** Performance B2.3.1[a], not less than 50 years, B2.3.1[b], 15 years and B2.3.2. James Hardie Rigid Air Barriers meet these requirements. See Paragraphs 9.1 - 9.3.
- 3.4 **Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the cladding system, James Hardie Rigid Air Barriers will contribute to meeting this requirement. See Paragraphs 12.1 and 12.3.
- 3.2 **Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. James Hardie Rigid Air Barriers meet this requirement and will not present a health hazard to people.

## Technical Specification

- 4.1 System components and accessories for James Hardie Rigid Air Barriers, which are supplied by James Hardie New Zealand Limited are:

### HomeRAB™ Pre-Cladding

- HomeRAB™ Pre-Cladding is a 4.5 mm thick fibre cement sheet, manufactured from a cellulose fibre cement formulation. It is produced in sheet material form with 'HomeRAB' printed on the front face. The sheets are formed, cut to length, and then cured by high pressure autoclaving. The sheet is coated on the front face and four edges with a green tinted water repellent sealer.
- HomeRAB™ Pre-Cladding is available in sizes of 1200 mm wide and 2450, 2750 and 3000 mm long. It is manufactured to conform to the requirements of AS/NZS 2908.2.

### RAB™ Board

- RAB™ Board are 6.0 mm or 9.0 mm thick fibre cement sheets, manufactured from a cellulose fibre cement formulation. It is produced in sheet material form. The sheets are formed, cut to length, and then cured by high pressure autoclaving. The sheet is coated on the front face and four edges with a green tinted water repellent sealer.
- RAB™ Board is available in sizes of 1200 mm wide and 2450 and 3000 mm long for 6.0 mm sheets, or 1200 mm wide and 2750 and 3000 mm long for 9.0 mm sheets. It is manufactured to conform to the requirements of AS/NZS 2908.2.

### Accessories

- HomeRAB™ Pre-Cladding and RAB™ Board horizontal flashings - uPVC, available in 3000 mm lengths.
- 4.2 System components and accessories for James Hardie Rigid Air Barriers, which are supplied by the building contractor are:
- Joint sealing tape and flexible sill and jamb flashing tape system - 3M™ All Weather Flashing Tape 8067 [3M New Zealand Ltd] and SUPER-STICK Flexible Flashing Tape [Marshall Innovations Ltd].
  - HomeRAB™ Pre-Cladding and RAB™ Board sheet fixing - gun driven 40 mm or 50 x 2.8 mm hot-dip galvanised or ring shank stainless steel round head nails, or hand driven 40 x 2.8 mm hot-dip galvanised or ring shank stainless steel HardieFlex™ nails. [Note: Hot-dip galvanising must comply with AS/NZS 4680 and stainless steel must be Grade 304 or 316.]

## Handling and Storage

- 5.1 Handling and storage of all materials supplied by James Hardie New Zealand Limited or the building contractor, whether on site or off site, is under the control of the building contractor. James Hardie Rigid Air Barriers must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. The sheathing must always be carried on edge. uPVC flashings and jointers must be protected from direct sunlight and physical damage, and should be stored flat and under cover.
- 5.2 Other accessories must be stored so they are kept clean, dry and undamaged.

## Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Installation Manual for James Hardie Rigid Air Barriers. The Installation Manual must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Installation Manual and within the scope of this Appraisal must be followed.

## Design Information

### Framing

#### Timber Treatment

- 7.1 Timber wall framing behind James Hardie Rigid Air Barriers must be treated as required by NZBC Acceptable Solution B2/AS1.

#### Timber Framing

- 7.2 For HomeRAB™ Pre-Cladding installations, 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. In all cases studs must be at maximum 600 mm centres. Dwargs must be fitted flush between the studs at maximum 1200 mm centres. [Note: The timber framing must also be suitable for the selected wall cladding. Refer to the selected cladding system's Technical Literature for specific framing requirements.]
- 7.3 For RAB™ Board installations, 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 considering local factors. In all cases studs must be at maximum 600 mm centres for buildings situated in wind pressures up to 1.5 kPa ULS, and at maximum 400 mm centres for buildings situated in wind pressures greater than 1.5 kPa ULS up to 4.5 kPa ULS. Dwargs must be fitted flush between the studs at maximum 1200 mm centres. [Note: The timber framing must also be suitable for the selected wall cladding. Refer to the selected cladding system's Technical Literature for specific framing requirements.]
- 7.4 Timber wall framing where James Hardie Rigid Air Barriers are joined must be 45 mm minimum finished width.

### James Hardie Rigid Air Barrier Set Out

- 7.5 James Hardie Rigid Air Barriers must be installed vertically. At the base of the wall, the sheet must hang below the bottom plate a minimum of 15 mm, up to a maximum of 40 mm, for concrete floors. Sheet overhang where used with timber floors must hang below timber subfloor members a minimum of 15 mm, up to a maximum of 40 mm.
- 7.6 In all cases, HomeRAB™ Pre-Cladding and RAB™ Board sheet edges must be supported and fixed to the wall framing.

### General

7.7 James Hardie Rigid Air Barriers are intended for use as rigid wall underlays fixed over timber framed walls in order to support wind pressures, and to act as a secondary barrier to wind-driven rain.

### Temporary Weather Protection

7.8 Commencing from installation, James Hardie Rigid Air Barriers must not be exposed to the weather for more than 180 days.

7.9 James Hardie Rigid Air Barriers may be used as a temporary weather protecting sheathing to allow the insulation and internal lining of the building to proceed before the wall cladding is installed. To achieve temporary weathertightness, all joints, internal and external corners of the James Hardie Rigid Air Barriers must be sealed, the roof cladding and soffit linings must be installed, the flexible sill and jamb flashing tape system must be installed around the window and door openings, and the window and door joinery must be installed complete with head flashings and airseals. The timber wall framing moisture content must not exceed that specified by the internal lining system supplier at the time of the insulation installation and internal lining application.

7.10 James Hardie Rigid Air Barriers are suitable for use under wall claddings as a rigid wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23, except that non-absorbent claddings must not be installed directly over the James Hardie Rigid Air Barriers.

**Table 1: NZBC E2/AS1 Table 23 Requirements**

<b>NZBC E2/AS1 Table 23 Rigid Wall Underlay Properties</b>	<b>Property Performance Requirement</b>	<b>James Hardie Rigid Air Barriers Actual Property Performance</b>
Vapour Resistance	< 7 MN s/g	0.6 MN s/g
Water Resistance	> 20 mm	Pass

### Structure

#### Mass

8.1 The mass of HomeRAB™ Pre-Cladding is approximately 6.5 kg/m<sup>2</sup> at equilibrium moisture content. The mass of 6.0 mm RAB™ Board is approximately 8.6 kg/m<sup>2</sup> at equilibrium moisture content. The mass of 9.0 mm RAB™ Board is approximately 13 kg/m<sup>2</sup> at equilibrium moisture content. This mass must be added to the selected wall cladding system mass when determining the overall wall cladding mass in terms of NZS 3604.

#### Wind Zones

8.2 HomeRAB™ Pre-Cladding is suitable for use in all Wind Zones of NZS 3604, up to, and including, Very High. The sheets must be fixed at centres as specified in Table 2. The fixings must be positioned a minimum of 12 mm from all sheet edges, and a minimum of 50 mm horizontally and 75 mm vertically from sheet corners. The fastener heads must finish flush with the sheet surface.

**Table 2: HomeRAB™**

<b>NZS 3604 Wind Zone</b>	<b>Framing Set Out</b>	<b>HomeRAB™ Pre-Cladding Nailing Centres to Studs, Plates and Dwargs</b>
Low, Medium, High and Very High	Studs at 600 mm centres maximum and dwargs at 1200 mm centres	200 mm

8.3 RAB™ Board is suitable for use in design wind pressures up to and including 4.5 kPa ULS when used in conjunction with wall cladding systems able to resist the same face load pressures. The sheets must be fixed at centres as specified in Table 3. The fixings must be positioned a minimum of 12 mm from all sheet edges, and a minimum of 50 mm horizontally and 75 mm vertically from sheet corners. The fastener heads must finish flush with the sheet surface. Basis of Appraisal

**Table 3: RAB™ Board Fixing Centres**

Wind Pressure	Framing Set Out	RAB™ Board Nailing Centres to Studs, Plates and Dwargs
≤ 1.5 kPa ULS [NZS 3604 Wind Zone Very High]	Studs at 600 mm centres and dwargs at 1200 mm	200 mm
> 1.5 kPa ULS and ≤ 4.5 kPa ULS [NZS 3604 Wind Zone Extra High and above]	Studs at 400 mm centres and dwargs at 1200 mm	200 mm

### Top Plate Hold Down Connections

8.4 James Hardie Rigid Air Barriers can be used as an alternative to wire dog connectors to achieve a top plate connection capacity of 4.7 kN in accordance with Fixing Type B of NZS 3604 Table 8.18. To achieve the connection strength, the HomeRAB™ Pre-Cladding and RAB™ Board sheets must be fixed along the top edge into the top plate with 50 x 2.8 mm hot-dip galvanised or ring shank stainless steel round head nails, or hand driven 40 x 2.8 mm hot-dip galvanised or ring shank stainless steel HardieFlex™ nails at 75 mm centres. The fixings must be positioned a minimum of 20 mm from the sheet edge. The fastener heads must finish flush with the sheet surface. The remainder of the sheet is fixed in accordance with Table 2 or Table 3.

### Wall Cladding Fixing

8.5 The length of the selected wall cladding fixing must be increased by a minimum of the thickness of the James Hardie Rigid Air Barrier to maintain the face load strength of the wall cladding system.

### Bracing

8.6 HomeRAB™ Pre-Cladding and RAB™ Board can be used to provide structural bracing. This has not been assessed by this Appraisal and is outside its scope.

### Inter-storey Deflection

8.7 RAB™ Board is suitable to accommodate inter-storey deflections. When installed in accordance with the detail contained in the technical literature, RAB™ Board is capable to withstanding Serviceability Limit State [SLS] deflections up to height/180. For structures where greater inter-storey deflections are expected, a deflection head should be incorporated into design as detailed in the technical literature in conjunction with specific engineering design.

### Durability

9.1 James Hardie Rigid Air Barriers meet code compliance with NZBC Clause B2.3.1 (a), not less than 50 years when used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years where the cladding durability requirement is 15 years.



### Serviceable Life

- 9.2 Provided they are not exposed to the weather or ultraviolet light for a total of more than 180 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, James Hardie Rigid Air Barriers are expected to have a serviceable life of at least 50 years.
- 9.3 Areas of geothermal activity and coastal locations can be very corrosive to fasteners, especially coastal locations within distances of up to 500 metres of the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets in some instances. These coastal locations are defined in NZS 3604: 2011 as Zone D. For the James Hardie Rigid Air Barriers when used as a rigid sheathing in Zone D they must be fixed with stainless steel fasteners. Fasteners outside Zone D may be hot dipped galvanised steel.

### Maintenance

- 10.1 James Hardie Rigid Air Barriers will not normally require maintenance. However, if damage occurs to the cladding or lining protecting the sheathing or to the sheathing itself, the repairs or replacement must be carried out to ensure the integrity of the rigid wall underlay.

### Prevention of Fire Occurring

- 11.1 James Hardie Rigid Air Barriers are considered a non-combustible material and need not 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 – C/AS6 and NZBC Verification Method C/VM1.

### External Moisture

- 12.1 James Hardie Rigid Air Barriers must be used behind claddings that meet the performance requirements of NZBC Clause E2.
- 12.2 James Hardie Rigid Air Barriers meet the performance requirements for a rigid wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23, except that non-absorbent claddings must not be installed directly over the James Hardie Rigid Air Barriers.
- 12.2 James Hardie Rigid Air Barriers, when installed in accordance with the Installation Manual and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

### Installation Information

#### Installation Skill Level Requirements

- 13.1 Installation must always be carried out in accordance with the James Hardie Rigid Air Barriers Installation Manual and this Appraisal, by or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

### System Installation

- 14.1 James Hardie Rigid Air Barriers may be cut by scoring and snapping, hand guillotine, hand or power saw. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.
- 14.2 Sheets must be dry prior to installation. Cut edges that are left exposed must be sealed prior to installation.
- 14.3 Prior to fixing James Hardie Rigid Air Barriers, a check must be made to ensure all sheet edges will be supported by framing. At the base of the wall, the sheet must hang below the bottom plate by a minimum of 15 mm.

- 14.4 James Hardie Rigid Air Barriers must be fixed to the timber framing with 40 mm or 50 x 2.8 mm hot-dip galvanised or ring shank stainless steel round head nails, or hand driven 40 x 2.8 mm hot-dip galvanised or ring shank stainless steel HardieFlex™ nails. Refer to Table 2, Table 3 and Paragraph 8.4 for fixing centres and Paragraph 9.3 for material selection.
- 14.5 At vertical joints, James Hardie Rigid Air Barriers must be installed with a 2-3 mm gap between the sheet edges and must be supported over vertical framing. At horizontal joints between floor levels, James Hardie Rigid Air Barriers must be installed with a minimum 6 mm gap between the sheet edges and must be supported over horizontal framing. At inter-storey floor levels, James Hardie Rigid Air Barriers must not be fixed to inter-storey joists or blocking and must have a minimum 15 mm gap between the sheet edges at this point to allow for shrinkage of the framing. All horizontal joints must be flashed with a uPVC flashing.
- 14.6 Any damaged areas, such as holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with joint sealing tape.

**Joint Sealing Tape Installation**

- 14.7 All vertical sheet joints, internal and external corners must be covered with 3M™ All Weather Flashing Tape 8067 or SUPER-STICK flexible flashing tape. The manufacturer's instructions regarding the application temperatures for the joint sealing tapes, and the requirements for the use of adhesive primer must be followed.
- 14.8 James Hardie Rigid Air Barriers must be cleaned of dust and other surface contaminants prior the application of the joint sealing tape to ensure adequate adhesion is achieved.

**Flexible Sill and Jamb Tape Installation**

- 14.9 The selected flexible sill and jamb tape flashing system must be installed in accordance with the tape manufacturer's instructions, except where varied by the James Hardie Rigid Air Barriers Installation Manual. Particular attention must be paid to the installation of the sill and jamb tapes around window and door joinery openings to ensure all exposed timber wall framing in the opening is protected.

**Inspections**

- 14.10 The Installation Manual must be referred to during the inspection of James Hardie Rigid Air Barriers installations. When the construction sequence is followed in accordance with Paragraph 7.10 and the Installation Manual, the BCA inspections for pre-cladding and pre-lining may be combined.

**Health and Safety**

- 15.1 Cutting of James Hardie Rigid Air Barriers must be carried out in well ventilated areas, and a dust mask and eye protection must be worn.
- 15.2 When power tools are used for cutting, grinding or forming holes, health and safety measures as set out in the Installation Manual must be undertaken because of the amount of dust generated.
- 15.3 Safe use and handling procedures for James Hardie Rigid Air Barriers and the components that make up the cladding system are provided in the relevant manufacturer's Installation Manual.

**Basis of Appraisal**

The following is a summary of the technical investigations carried out:

**Tests**

- 16.1 Testing has been carried out by James Hardie Building Products to determine the face load pressure resistance of HomeRAB™ Pre-Cladding. Testing has also been carried out by James Hardie Building Products to determine the face load pressure resistance of RAB™ Board in conjunction with Titan Facade Panels. The testing was completed in a NATA Accredited laboratory and was observed by BRANZ. The test method and results have been reviewed by BRANZ and found to be satisfactory.

16.2 The resistance of James Hardie Rigid Air Barriers to water vapour transmission in accordance with AS/NZS 4200.1 and resistance to water penetration in accordance with AS/NZS 4201.4 has been completed by BRANZ.

## Other Investigations

- 17.1 Structural and durability opinions were given by BRANZ technical experts.
- 17.2 BRANZ expert opinion on NZBC E2 code compliance for James Hardie Rigid Air Barriers was based on evaluation of all details within the scope and as stated within this Appraisal. The details contained within the Installation Manual 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 rigid wall underlays.
- 17.3 The non-combustibility of James Hardie Rigid Air Barriers have been assessed by BRANZ technical experts.
- 17.4 The Installation Manual for James Hardie Rigid Air Barriers has been examined by BRANZ and found to be satisfactory.
- 17.5 The Installation Manual for James Hardie Rigid Air Barriers has been examined by BRANZ and found to be satisfactory.

## Quality

- 18.1 The manufacture of James Hardie Rigid Air Barriers has been examined by BRANZ, including methods adopted for quality control. Details regarding the composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 18.2 The quality of materials, components and accessories supplied by James Hardie New Zealand Limited is the responsibility of James Hardie New Zealand Limited. The quality control system of James Hardie New Zealand Limited has been assessed and registered as meeting the requirements of ISO 9001: 2008 by Telarc SAI Limited.
- 18.3 Quality of installation on site of components and accessories supplied by James Hardie New Zealand Limited and the building contractor is the responsibility of the installer.
- 18.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing systems, uPVC flashings, joint seal tapes and flexible sill and jamb tape systems in accordance with the instructions of James Hardie New Zealand Limited.

## Sources of Information

- Sources of Information
- AS/NZS 1170: 2002 Structural design action - General principles.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheet.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays - materials.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays - Methods of test - Resistance to water penetration.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for the 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.



## Amendments

### Amendment No. 1, 3 September 2013

This Appraisal has been amended to update clause changes as required by the introduction of NZBC Fire Clauses C1-C6 Protection from Fire and A3 Building Importance Levels.

### Amendment No. 2, 15 December 2014

This Appraisal has been amended to replace 3.5 mm thick HomeRAB® Preclad™ Lining with 4.5 mm thick HomeRAB® Pre-Cladding. The use of James Hardie Rigid Air Barriers as an alternative to the NZS 3604 top plate hold down connections has also been included.

### Amendment No. 3, 13 March 2019

This Appraisal has been amended to add 9.0 mm RAB Board sheets and to increase the construction exposure time to 180 days and inter-storey deflections, clarify non-combustibility of James Hardie Rigid Air Barriers.



**BRANZ Appraised**  
Appraisal No. 611 [2011]

**BRANZ Appraisal**  
Appraisal No. 611 [2011]  
26 August 2011

JAMES HARDIE RIGID AIR  
BARRIERS



In the opinion of BRANZ, **James Hardie Rigid Air Barriers** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **James Hardie New Zealand**, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the Technical Literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. **James Hardie New Zealand:**
  - a) continues to have the product reviewed by BRANZ;
  - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
  - c) abides by the BRANZ Appraisals Services Terms and Conditions;
  - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
  - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
  - c) any guarantee or warranty offered by **James Hardie New Zealand**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **James Hardie New Zealand** or any third party.

For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

26 August 2011



# CERTIFICATE OF CONFORMITY

This is to certify that

**ABODO Wood Ltd**

**ABODO Weatherboard Cladding**



**Complies with the New Zealand Building Code:**

1. B1.3.1, B1.3.2
2. B2.3.1 (b)
3. E2.3.2, E2.3.3, E2.3.5
4. F2.3.1

## Product Description

Timber weatherboard for cladding of residential and commercial buildings

Profile Options	Substrate Options
Bevel Backed	Sand
Vertical Shiplap	Vulcan
Rusticated	Stratos
Secret Fix	Tundra

## Product Purpose or Use

Used as partial or complete cladding system.

## Subject to the following Conditions & Limitations:

- a. Must be installed according to ABODO CodeMark Weatherboard Cladding Manual CWB-M-130925 Jun 2016.
- b. Only to be installed using fastenings, adhesives, coatings and other associated hardware as detailed in ABODO CodeMark Weatherboard Cladding Manual CWB-M-130925 Jun 2016.
- c. No substitution of any component, fastening, adhesive, coating or other associated hardware is permitted without written approval of the certificate holder.
- d. Design of wall and roof claddings, including specifications for building wraps and underlays, are outside the scope of this certification however such elements of the building must comply with the requirements of NZBC Clause E2 External Moisture and NZBC Clause E3 Internal Moisture.
- e. It is only suitable for buildings with a 'Risk Score' of 20 or below as per the 'Risk Matrix' outlined in E2/AS1.
- f. All joinery used in conjunction with the ABODO Weatherboard Cladding must meet the requirements of NZS 4211:2008.
- g. The certificate holder must maintain compliance with the conditions set out in Section 15 of the Building (Product Certification) Regulations 2008.

## Certificate Holder



**Abodo Wood Ltd**

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## Certification Body

**CertMark International Pty Ltd**

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[www.CertMark.org](http://www.CertMark.org)

**John Thorpe**

CertMark International Pty Ltd

30/09/2013

**Date of Issue**

CMA-CM40070-I01-R02

**Certificate Number**

Revised September 2016

• This certificate is issued by an independent certification body accredited by the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation & Employment (MBIE) under the Building Act 2004. MBIE does not in any way warrant, guarantee, or represent that the building method or product the subject of this certificate conforms to the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. MBIE disclaims, to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate

• 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 MBIE website, [www.mbie.govt.nz](http://www.mbie.govt.nz)

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- FUTUREBUILD® STRUCTURAL LVL  
hy ONE®
- FUTUREBUILD® STRUCTURAL LVL  
hy SPAN®
- FUTUREBUILD® LVL TRUSS CHORDS  
hy CHORD®
- FUTUREBUILD® STRUCTURAL LVL BEAMS  
hy 90°
- FUTUREBUILD® LVL ENGINEERED P-JOISTS  
hy JOIST®
- FUTUREBUILD® LVL SCAFFOLD PLANKS  
hy PLANK®
- FUTUREBUILD® LVL FORMWORK BEAMS  
tru FORM®
- FUTUREBUILD® LVL FORMWORK EDGE BOARDS  
edge FORM®



# FUTUREBUILD® LVL RESIDENTIAL DESIGN GUIDE

JULY 2014



Information contained within is specific to the Futurebuild® range of LVL products and cannot be used with any other LVL products no matter how similar they may appear.



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## 1.0 LAMINATED VENEER LUMBER

Laminated Veneer Lumber (LVL) is the engineered solution for residential housing design and construction. Futurebuild® LVL is an engineered wood product with high structural reliability and performance, and consistent dimensional accuracy. It allows architects and designers to specify Futurebuild LVL with confidence and is readily available in a range of thicknesses, depths and lengths.

- Futurebuild LVL has been tried and trusted in Australasia for over 30 years
- Made in New Zealand
- Available FSC “Chain of Custody” certified on request
- Fully supported by Carter Holt Harvey® Woodproducts design and technical expertise
- Easy to work with using traditional building tools
- Clearly branded for easy identification on-site
- Engineered to precise tolerances

This guide is intended for use by professionals and good building practice must be followed at all times.

### 1.1 FUTUREBUILD® LVL

Manufactured by Carter Holt Harvey Woodproducts New Zealand, the Futurebuild LVL range is New Zealand's leading brand of LVL. The Futurebuild LVL range of products features specific material property 'recipes'. As such the information contained within this guide is specific to the Futurebuild LVL range and cannot be used with any other LVL product no matter how similar they may appear.

For more information about the Futurebuild LVL range including technical notes and limit state design information visit [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz)

*The information contained in this manual relates specifically to Futurebuild® LVL products manufactured by Carter Holt Harvey® Woodproducts and cannot be used with any other manufacturers LVL product no matter how similar they may appear.*

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

## 1.2 APPLICATION

---

The span tables and technical information in this guide are intended to be used by designers or builders to select the appropriate Futurebuild® LVL products for use in the framing of houses and similar buildings within the scope of NZS 3604.

The tabulated data given applies for Futurebuild LVL members installed in accordance with traditionally recognised framing practice as described in NZS 3604 Timber Framed Buildings, the installation specifications contained in this guide and the Futurebuild LVL Residential Installation Guide.

The software specification program designIT® for houses provides the ability to review reaction information for the determination of support and tie-down information where required. For more information or to download CHH design software free of charge, visit [www.chhsoftware.com](http://www.chhsoftware.com) or contact CHH Woodproducts on 0800 808 131.

## 1.3 SUSTAINABILITY

---

Futurebuild LVL is manufactured from radiata pine, a plantation grown medium density softwood. It is grown on tree farms which are tended and harvested to provide wood for LVL manufacture and other applications. The crop is managed on a sustainable basis to yield millable trees. New Zealand plantations are managed in compliance with the New Zealand Forest Accord, a voluntary agreement signed in 1991 between

New Zealand forest managers and environmental non-government organisations. Futurebuild LVL is manufactured in New Zealand, at the CHH Woodproducts Marsden Point Laminated Veneer Mill. Futurebuild LVL is available Forestry Stewardship Council (FSC) (SCS-COC-001316) certified upon request.

## 1.4 DISCLAIMER

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The information contained in this document is current as of July 2014 and is based on data available to CHH Woodproducts at the time of going to print. This publication replaces all previous CHH Woodproducts Futurebuild LVL residential design literature. CHH Woodproducts reserves the right to change the information contained in this literature without prior notice. It is important that you call 0800 808 131 to confirm that you have the most up to date information available or refer to [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz)

CHH Woodproducts has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. This information does not replace professional advice and we recommend that professional advice should be obtained specific to your circumstances. To the extent permitted by law, CHH Woodproducts will not be liable for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

## 2.0 PRODUCT RANGE

### Structural Products

FUTUREBUILD®  
STRUCTURAL LVL

hy  
SPAN®

hySPAN® has high structural properties and is available in a large range of sizes and lengths. hySPAN is typically specified for structural beams and is also used for lintels, rafters and floor joists in residential structures.

FUTUREBUILD®  
LVL TRUSS CHORDS

hy  
CHORD®

hyCHORD® is available in smaller section sizes to match SG Structural Timber such as Laserframe®. hyCHORD is primarily specified as roof truss chords, but can also be used for lintels, rafters, purlins, floor joists, wall studs or other members where smaller section sizes are required.

FUTUREBUILD®  
STRUCTURAL LVL  
BEAMS

hy  
90®

hy90® is a 90 mm thick LVL product manufactured primarily for lintels or beams to match 90 mm light timber framing. It has lower structural properties than hySPAN but its thickness offers better member stability when used as long span structural beams or columns.

FUTUREBUILD®  
LVL ENGINEERED  
I-JOISTS

hy  
JOIST®

hyJOIST® is an engineered 'I-beam' utilising LVL flanges and a plywood web. It is ideally suited to floor joist and rafter applications due to its light weight, straightness and the ability to cut large holes through the web (e.g. for services or ventilation)

FUTUREBUILD®  
STRUCTURAL LVL

hy  
ONE®

hyONE® is a 90 mm thick, high stiffness and strength LVL product manufactured primarily for lintels or floor beams where large spans or depth restrictions apply.

FUTUREBUILD®  
LVL JOIST

hy  
BOUND

hyBOUND® is a treated boundary joist for enhanced weather protection and to aid in the transfer of upper storey loads.

### Formwork Products

FUTUREBUILD®  
LVL FORMWORK  
BEAMS

tru  
FORM®

truFORM® is manufactured for use in concrete formwork and is suitable for joists, bearers, walers and soldiers.

FUTUREBUILD®  
LVL FORMWORK  
EDGE BOARDS

edge  
FORM®

edgeFORM® is manufactured for use in concrete formwork as edge boards.

### Access Products

FUTUREBUILD®  
LVL SCAFFOLD  
PLANKS

hy  
PLANK®

hyPLANK® is a strong, lightweight LVL scaffold plank with significantly higher structural reliability than sawn timber.

### Building Systems

FUTUREBUILD®  
LVL BUILDING  
SYSTEMS

hy  
FRAME®

hyFRAME® is a CHH Woodproducts building system designed for the agricultural market.

Formwork and Access products are outside the scope of this guide. For more information on these products visit [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz) or contact CHH Woodproducts.

## 2.1 PRODUCT AVAILABILITY

TABLE 1: FUTUREBUILD® LVL STANDARD PRODUCT RANGE

Product	Depth (mm)	Thickness (mm)				Length (0.6 m increments where indicated)
		28	45	63	90	
hySPAN®	150		✓	✓		2.4 – 13.2 m
	170		✓			
	200		✓	✓		
	240		✓	✓		
	300		✓	✓		
	360		✓	✓		
	400		✓	✓		
	450			✓		
hy90°	150				✓	4.8 – 7.2 m
	200				✓	
	240				✓	
	300				✓	
	360				✓	
	400				✓	
hyONE®	240				✓	4.8 – 6.0, 7.2 m
	300				✓	4.8 – 6.0, 7.2 m
	360				✓	5.4, 6.0, 7.2 m
	400				✓	5.4, 7.2 m
hyCHORD®	90		✓			4.8*, 6.0*, 7.2 m*
	140		✓			4.8*, 6.0*, 7.2 m*
	190		✓			4.8*, 6.0*, 7.2 m*
hyJOIST®	200		✓			2.4 – 13.2 m
	240			✓	✓	
	300			✓	✓	
	360			✓	✓	
	400				✓	
hyBOUND®	200	✓				4.8, 6.0 m
	240	✓				
	300	✓				
	360	✓				
	400	✓				

- \* Indicates untreated product available on a make to order basis. Additional lead times may apply
- Non standard products and lengths may be available subject to production availability. Additional lead times may apply
- A comprehensive range of accessories including joist hangers, blocking and web stiffeners are available. Contact CHH Woodproducts or refer to "designIT for houses" software for more information

Available treated only

Available either untreated or treated

### 3.0 GENERAL DESIGN CONSIDERATIONS

The design methodology used in the preparation of this guide complies with the requirements of the following design standards:

- AS/NZS 1170:2002/3 Structural Design Actions
- NZS 3603:1993 Timber Structures Standard, an Acceptable Solution to NZBC Clause 1 Structure.

Guidance has been taken from AS 1684.1:1999, Residential timber-framed construction, Part 1: Design criteria, and reviewed to ensure agreement with NZS 3604:2011 Timber Framed Buildings. When selected and installed in accordance with the specifications, details and limitations in this guide and the Residential Installation Guide, Futurebuild® LVL will comply with the requirements of the New Zealand Building Code.

The spans given in these tables have been developed by experienced timber design engineers in accordance with NZS3603:1993 and include the most up-to-date loading combinations from AS/NZS 1170.

Floor loading applied includes an allowance for:

- Floor mass not exceeding 40 kg/m<sup>2</sup>, unless otherwise notified
- Live load of up to 1.5 kPa/1.8 kN, for use in domestic houses

For other situations, such as decks, balconies, tiled areas and apartment floors, designIT® for houses software should be used for specification where alternate loading conditions may be applied. For commercial, industrial and other heavily loaded floors use designIT for Commercial Floors or contact CHH Woodproducts.

#### Wind Loading

Unless noted otherwise, the tables given in this guide are suitable for applications in building wind zones up to very high (VH) exposure.

#### Snow Loading

All tables are suitable for ground snow loads up to 1.0 kPa. For snow loads over 1.0 kPa refer to designIT for houses software.

#### Member Specification

In selecting an appropriate beam size, specifiers should also consider the applicability of design deflection limits for the beams intended use. Deflection limits applied in this guide may not be suitable for some designs and further advice should be obtained.

#### Reaction/Support Considerations

For tie down, support and reaction information refer to designIT for houses software.

#### Deflection Limits

The deflection limits used in these span tables have been determined on the basis of experience with the known serviceability performance of individual member types in typical applications. Where reduced deflections or higher levels of performance are required consult designIT for houses software or select members that have an increased spanning capability as required.

DL – Dead Load, sometimes referred to as permanent load, considers load that is deemed to apply for periods of more than 6 months.

LL – Live Load, sometimes referred to as transient load, is load that is considered to be temporary in its nature.

Dynamic – Dynamic serviceability limits are applied to floor joists and relate to the dynamic response of a floor joist to load. The 1 kN for 2 mm deflection is provided to reflect a dynamic performance level of the floor corresponding 8 Hz.

### 3.1 CHH SOFTWARE SOLUTIONS

CHH Software Solutions include specification software for both residential and non-residential structural systems. They enable designers and engineers, even those unfamiliar with the specifics of timber engineering to produce high quality, reliable specifications using engineered wood products.

#### Residential Software

**design<sup>it</sup> HOUSES** **designIT<sup>®</sup> for houses** is a software tool for all building practitioners for designing with the Futurebuild<sup>®</sup> LVL range of engineered wood products and other selected materials for houses and similar structures.

designIT for houses enables a wide range of applications to be considered, including floor layouts, wind and other loads, which are not included in this publication without the need for engineering knowledge or the exercise of professional engineering judgment.

**it** **designIT site** The **designIT Site** app has been developed as a handy reference tool for the specifier or tradesman on the go. It is a trimmed down version of designIT for houses.

**it** **floorIT site** **floorIT site** is a smartphone app to aid specifiers in the specification, selection and estimation of quantities for a range of flooring applications.

**lay<sup>it</sup> out FLOORS** **layITout<sup>®</sup>** is an integrated design and layout tool that allows users to enter a house plan, propose and then design a floor joist layout for a fully integrated engineered floor system.

#### Non Residential Software

**design<sup>it</sup> COMMERCIAL FLOORS** **designIT** for Commercial Floors is a software tool for all building practitioners for designing with the Futurebuild LVL range of engineered wood products and other selected materials in commercial, industrial and other heavily loaded floors.

The computeIT<sup>®</sup> software suite is designed to aid in the specification of heavy structural members and non residential structural systems. It includes three software packages; computeIT for beams, computeIT toolkit and computeIT for portal frames.

**compute<sup>it</sup> BEAMS** **computeIT for beams** is an all purpose beam analysis package that enables engineers to develop design solutions for a range of engineered wood products.

**compute<sup>it</sup> TOOLKIT** **computeIT toolkit** is a series of design tools allowing quick and easy design of beams, columns, rigid moment connections, purlins and girts.

**compute<sup>it</sup> PORTAL FRAMES** **computeIT for portal frames** is a fully integrated portal frame design, analysis and specification package for the development of optimised timber design solutions.

**it** **slabIT site** is an app for the design of truFORM and gripFORM members for use as joists and bearers for forming slab soffits.

For more information or to download CHH software free of charge, visit [www.chhsoftware.com](http://www.chhsoftware.com) or contact CHH Woodproducts.

### 3.2 MANUFACTURE

Futurebuild LVL is manufactured by using phenolic adhesive to laminate radiata pine veneer, in a continuous assembly in which the grain direction of all veneers is orientated in the longitudinal direction. It is pressed as a 1.2 m nominal width continuous billet in various standard thicknesses, docked to any specified

length and then ripped into standard widths for use as structural beams etc.

For product range and size information refer to section 2.1 Product Availability.

### 3.3 STRUCTURAL PROPERTIES

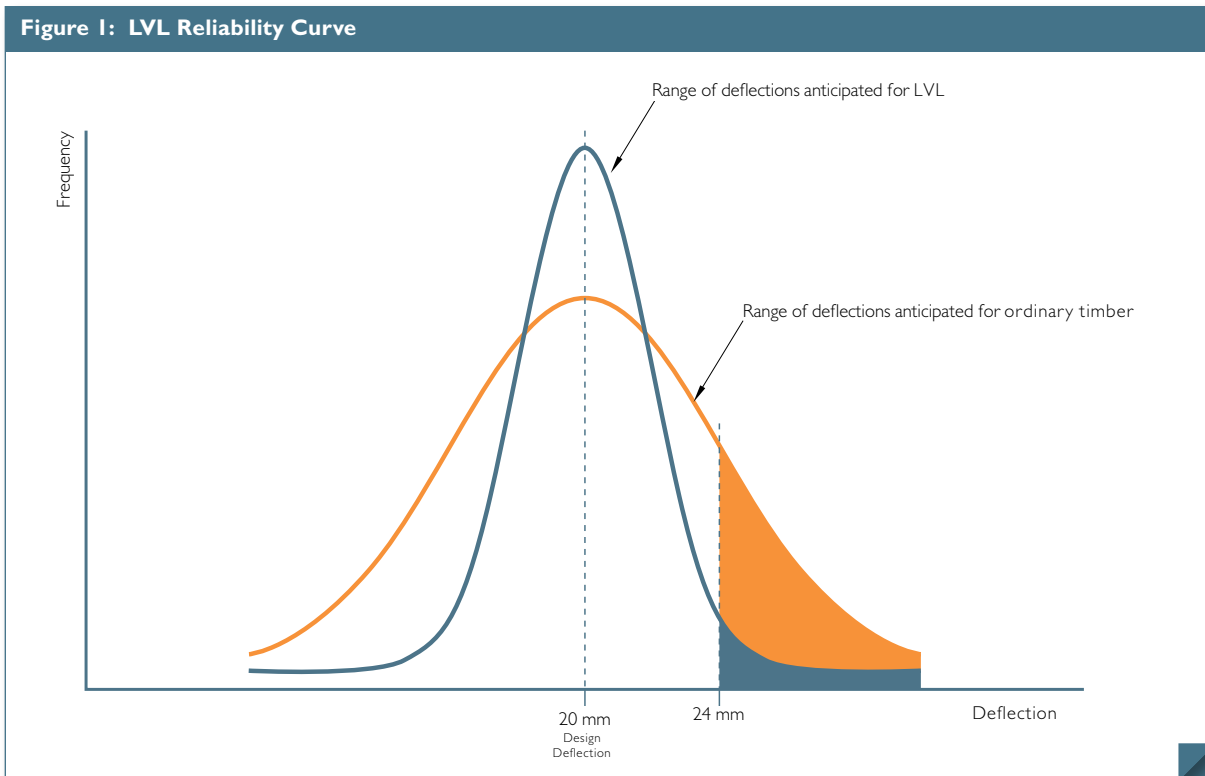
The structural properties for Futurebuild LVL have been determined by testing in accordance with the requirements of AS/NZS 4357 and section 4 of AS/NZS 4063.2:2010 and so comply with the provisions of the NZ Building Code through clause C2.3 in NZS3603.

Refer to the Futurebuild LVL Specific Engineering Design Guide for engineering design information.

### 3.4 STRUCTURAL RELIABILITY

Futurebuild LVL is manufactured by laminating various grades of veneer in a predetermined pattern to impart predictable and reliable structural properties. The uniformity of LVL is the key to its high strength and stiffness properties and its reputation for reliable and predictable performance. It is the reliability of LVL that makes it a genuine engineering material suitable for high load, high risk applications such as large span portal frames.

For ordinary applications the reliability of LVL, illustrated graphically in Figure 1, rewards specifiers and builders with the confidence of meeting customer expectations and reduction in the incidence of expensive and disruptive call backs.



### 3.5 STRUCTURAL CERTIFICATION

The span tables and details in this guide for Futurebuild® LVL have been designed in accordance with sound and widely accepted engineering principles.

The design properties of Futurebuild LVL in this guide were determined in accordance with clauses 2.3 and C2.3 of NZS 3603: "Timber Structures Standard." Futurebuild LVL is Product Certified by the Engineered Wood Products Association of Australasia (EWPAA) as being manufactured in accordance with the joint New Zealand / Australian Standard AS/NZS 4357: "Structural Laminated Veneer Lumber." The EWPAA is accredited for product certification by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

Structural design is in accordance with NZS 3603 (verification method BI/MM1, 6.1) with loads and deflection criteria as indicated on the tables. Serviceability and other criteria were selected using guidelines available from joint Australian / New Zealand standards technical committees and correspond to those used in NZS 3604, (Acceptable Solution BI / AS1, 4.1).

When installed in accordance with the specifications, details and limitations in this guide and the Residential Installation Guide, Futurebuild LVL members will comply with the requirements of the New Zealand Building Code.

### 3.6 QUALITY ASSURANCE

Futurebuild LVL is manufactured in a fully quality controlled process, independently third party audited by the Engineered Wood Products Association of Australia (EWPAA). The EWPAA certifies Futurebuild LVL manufactured by CHH Woodproducts at its Marsden Point (New Zealand) mill.

Participation and compliance with the requirements of the EWPAA's process based quality control scheme includes product testing and monitoring of properties. It provides the basis for the EWPAA's Product Certification of Futurebuild LVL as conforming to the requirements of AS/NZS 4357 (Structural Laminated Veneer Lumber). Conformance with AS/NZS 4357

ensures that Futurebuild LVL is suitable for structural applications in accordance with NZS 3603 Timber Structures Standard and NZS 3604 Timber Framed Buildings.

The EWPAA's product certification scheme is accredited under the government Joint Accreditation System of Australia and New Zealand (JAS-ANZ).



### 3.7 DURABILITY

Futurebuild LVL is manufactured to meet the requirements of the New Zealand Building Code Clause B2 Durability. As such, if the product is used in accordance with CHH Woodproducts specifications and good building practices, and treated to the levels prescribed in NZS 3602, Timber and Wood-based Products for Use in Building, it will comply with the requirements of the NZ Building Code.

The recent changes to the New Zealand Building Code Clause B2 Durability (Amendment 8) have provided clarification around Acceptable Solutions for various treatment levels of LVL, these include the use of untreated LVL, H1.2 glueline and surface spray treated LVL, and H3.1 Azole LOSP treated LVL options.

There is no change to how LVL can be applied untreated in situations where it is protected from weather (with no risk of moisture penetration conducive to decay) i.e. mid floors, sub floors, etc. This is identified in Sections C and E of Table 1 of NZS 3602.

With regard to treated LVL, citing of NZS 3604:2011 in Clause B2/AS1 dictates that if LVL is not specifically referred to in NZS3602 the LVL can be preservative treated to the same level as that required in Clause B2/AS1 of the New Zealand Building Code for kiln dried Radiata Pine. Clause B2/AS1 allows for treatment to be to either a H1.2 or H3.1 LOSP Azole level. This includes situations covered by NZS 3602 Table 1 Section D, "Members protected from the weather but with a risk of moisture penetration conducive to decay." This would include, for example, enclosed external framing situations including lintels, studs, boundary joists, etc.

Two Acceptable Solution options exist specifically for treated LVL in Clause B2/AS1:

1. H3.1 Azole LOSP treated, or
2. H1.2 glueline treated with a surface spray.

LVL products must be protected from water, condensation and dampness by good detailing. For uses where there is risk of temporary moisture, use appropriate treatment levels.

For more information, refer to technical note Futurebuild LVL: Durability and Moisture Statement available from [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz)

#### Sub-floor Applications

Good building practice ensures that raised timber floors are well ventilated underneath, as such the durability of these floors is subject to the floor space being ventilated for the life of the building to the provisions of NZS 3604 or E2/AS1. This is intended to eliminate the possibility of decay for sub-floor members and flooring therefore, in accordance with NZS 3602, untreated Futurebuild LVL may be safely used where standard practices for ventilation and clearance are followed.

#### External Use

Futurebuild LVL is NOT recommended for fully weather exposed applications, such as open deck joists and pergola beams.

### 3.8 PRESERVATIVE TREATMENT

For weather-protected applications covered by NZS 3602 Section D, "Members protected from the weather but with a risk of moisture penetration conducive to decay", LVL can be either H1.2 glueline treated with a surface spray (in accordance with NZS 3640) or H3.1 Azole LOSP treated to Table 6.2 of NZS 3640. Both treatments meet the requirements intended by H1.2 of the New Zealand Building Code Clause B2/AS1 and NZS 3604.

LVL can be preservative treated for weather-protected applications, such as verandah beams and for poorly ventilated or damp sub-floor applications.

All H3.1 LOSP treated LVL is envelope treated. Where section ends are cut, ends must be coated with a brush on timber preservative. Holdfast Metalex End Seal is recommended.

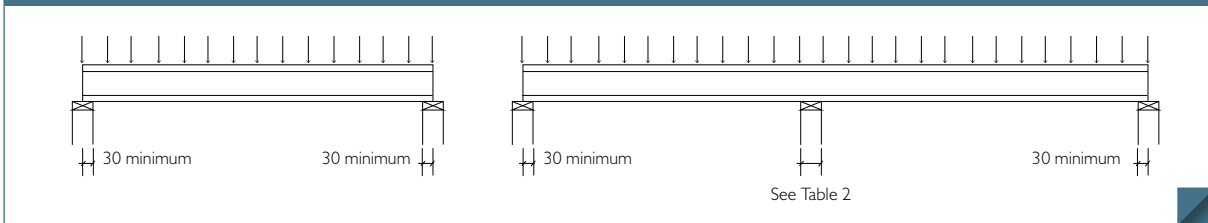
## 4.0 DESIGN CONSIDERATIONS – hyJOIST® I-BEAMS

hyJOIST® I-Beams are ideally suited for long span, low load applications such as floor joists and rafters.

The following design considerations should be taken into account in the design and detailing of hyJOIST floor systems sized and specified within this guide.

### 4.1 BEARING SUPPORT – JOIST NOT TRANSFERRING LOAD FROM UPPER WALLS

**Figure 2: For joists not transferring load from upper walls**

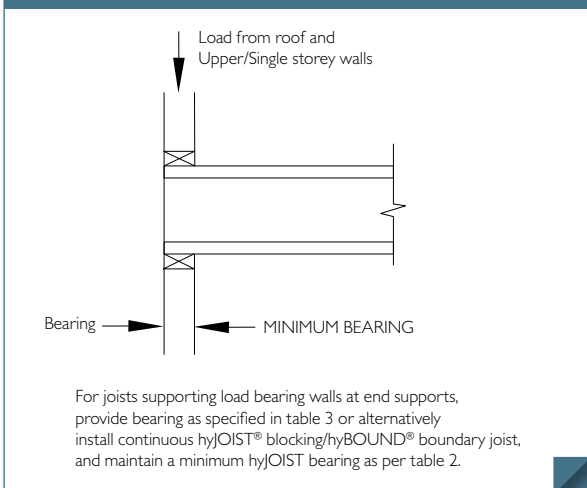


**TABLE 2: MINIMUM BEARING FOR hyJOIST® I-BEAMS SUPPORTING FLOOR LOADS ONLY**

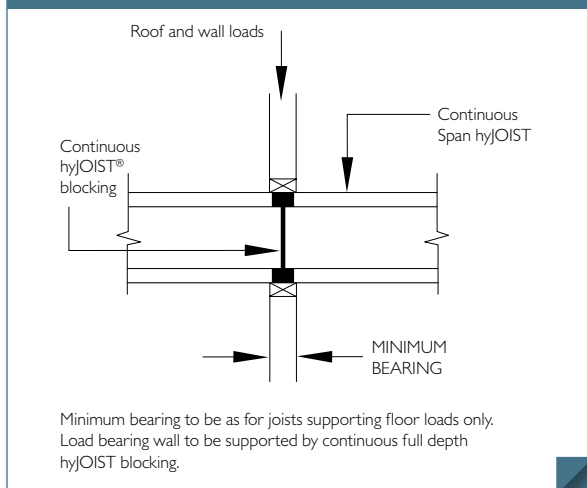
	End Supports Single or Continuous Span		Intermediate Supports Continuous Span	
	ALL	450	600	
Joint Spacing (mm)	ALL	450	600	
Minimum Bearing (mm)	30	45	65	
Minimum Bearing – Heavy Floors (mm)	30	55	75	

### 4.2 BEARING SUPPORT FOR JOISTS TRANSFERRING UPPER STOREY WALL AND ROOF LOADS AT SUPPORTS

**Figure 3: End Supports – Single or Continuous Span**



**Figure 4: Intermediate Supports – Continuous Span**



**TABLE 3: MINIMUM BEARING FOR hyJOIST® I-BEAMS TRANSFERRING UPPER STOREY ROOF OR FLOOR LOADS**

Load Type	Joist Spacing (mm)	
	450	600
	<b>Minimum Bearing (mm)</b>	
Light Roof and ceiling	30	65 <sup>1</sup>
Heavy Roof and ceiling	45	90 <sup>2</sup>

1. If web stiffeners installed bearing may be reduced to 45 mm
2. If web stiffeners installed bearing may be reduced to 65 mm
- For all cases bearing may be reduced to 30 mm if continuous full depth blocking or compression blocks are installed
- designIT® for houses software may give a reduced bearing requirement
- Roof mass allowances are defined in Table 7

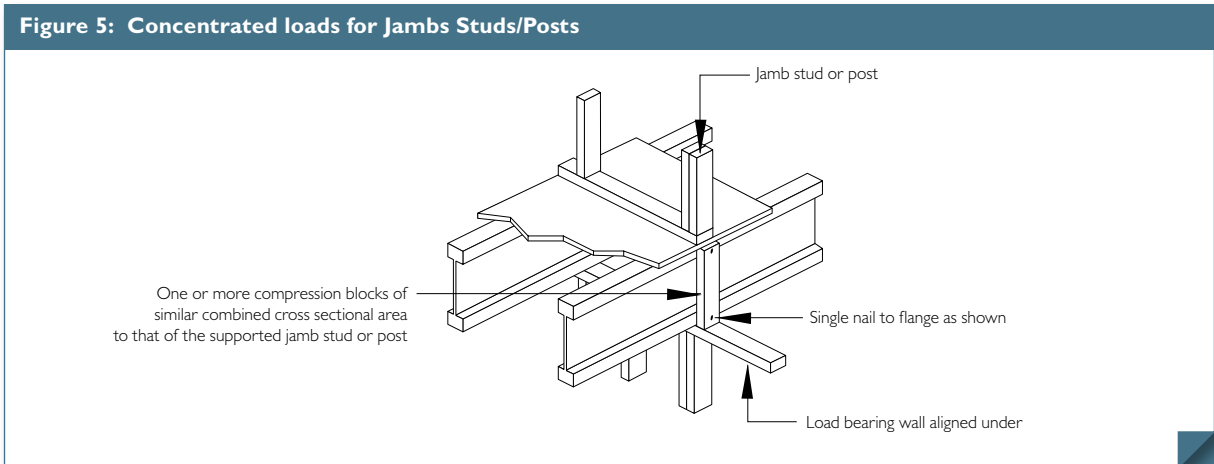
### 4.3 BEARING SUPPORT FOR LOWER STOREY OF TWO STOREY CONSTRUCTION

Continuous full depth hyJOIST® blocking should be installed to transfer compression loads from load bearing walls to the supports.

In most cases continuous hyJOIST blocking will be adequate to support the roof, wall and floor loads. Refer to designIT® for houses software for confirmation.

### 4.4 CONCENTRATED LOADS FROM JAMB STUDS/POSTS

Use compression blocks to transfer loads through to supports as shown.

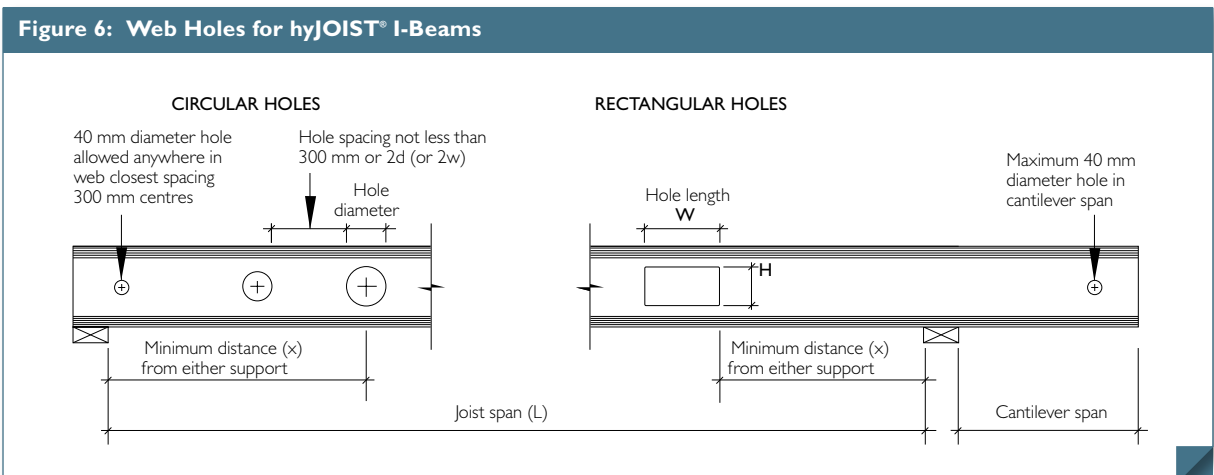


### 4.5 WEB HOLES FOR HYJOIST® I-BEAMS

Holes may be cut through the web of hyJOIST provided they are located within the central part of the span as specified below.

For cases involving non-uniform loading or where the possibility of locating the hole closer to supports needs to be assessed, use the web hole option in the floor joist calculator in designIT® for houses software.

For hole sizes other than those stated in tables 4 and 5 refer to the web hole calculator in designIT® for houses software, or the designIT site smartphone application



All treated Futurebuild® LVL is envelope treated. Holes and cuts made in treated hyJOIST must be adequately coated with

a brush on timber preservative. Holdfast Metalex End seal is recommended.

TABLE 4: CIRCULAR HOLES FOR hyJOIST® I-BEAMS

hyJOIST® Section Code	Maximum Hole Diameter (mm)	Minimum Distance from Support 'X'	Hole Diameter (mm)			
			80	110	125	150
			Circular Holes – Minimum Distance 'X' from support – (m)			
HJ200 45	118	0.34 L'	0.16 L	0.28 L	N/A	N/A
HJ240 63	158	0.38 L	0.12 L	0.21 L	0.26 L	0.33 L
HJ240 90						
HJ300 63	218	0.41 L	0.10 L*	0.15 L	0.18 L	0.24 L
HJ300 90				0.10 L*	0.14 L	0.20 L
HJ360 63	278	0.42 L	0.3 m*	0.08 L*	0.11 L	0.16 L
HJ360 90		0.40 L	0.3 m*	0.3 m*	0.3 m*	0.05 L*
HJ400 90	318	0.40 L	0.3 m*	0.3 m*	0.3 m*	0.08 L*

\* Minimum distance from any support is 0.3 metres

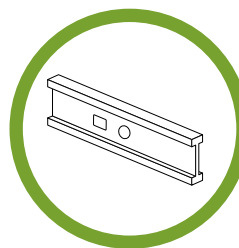
l. Example, if actual span 'L' = 4.0 m then minimum distance 'X' from hole to support (see figure 6) is 0.34 x 4.0 = 1.365 m

TABLE 5: RECTANGULAR HOLES FOR hyJOIST® I-BEAM

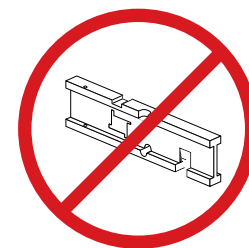
hyJOIST® Section Code	Hole Size		Permitted Locations for Rectangular Holes								
	Height (mm)	Length (mm)	L	Actual Span 'L' in metres							
			X	Minimum Distance from the side of the hole to any support – (m)							
HJ200 45	118	250	L	≤ 3.8	4.0	4.2	4.4	4.5			
			X	0.34 L	1.38	1.59	1.80	1.90			
HJ240 63	158	330	L	≤ 3.5	5.5						
			X	0.38 L	2.13						
HJ240 90	158	330	L	≤ 5.8	6.0	6.1					
			X	0.38 L	2.36	2.45					
HJ300 63	218	400	L	≤ 5.2	5.4	5.6	5.8	6.0	6.2	6.3	
			X	0.41 L	2.25	2.39	2.54	2.69	2.83	2.91	
HJ300 90	218	400	L	≤ 6.4	6.6	6.8	7.0				
			X	0.40 L	2.73	2.88	3.04				
HJ360 63	278	500	L	≤ 5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8
			X	0.42 L	2.37	2.49	2.62	2.75	2.88	3.02	3.15
HJ360 90	278	500	L	≤ 7.2	7.4	7.6	7.7				
			X	0.40 L	2.97	3.10	3.17				
HJ400 90	318	600	L	≤ 8.0							
			X	0.40 L							

Interpolate to obtain values of 'X' for spans intermediate between the values given

- Data applies for floor joists or rafters supporting uniform loads (and concentrated live load not exceeding 1.8 kN)
- Hole locations closer to supports may be possible for some load and support conditions; refer to the 'floor joist calculator' in designIT® for houses software
- Spacing between holes to be not less than 300 mm or twice the width (or twice the diameter) of the larger hole, whichever is greater
- Not more than three holes with width or diameter greater than 80 mm in any span
- For cantilever spans holes greater than 40 mm diameter are not permitted
- Not more than one rectangular (or square) hole per span



Do cut in web area as specified



Do NOT cut, notch or bore through flange

## 5.0 DESIGN CONSIDERATIONS – SOLID LVL

Solid Futurebuild® LVL products (including hySPAN®, hyONE®, hy90® and hyCHORD®) can be installed in accordance with traditionally recognised framing practice as described in NZ 3604 and other installation details contained and referenced within this guide.

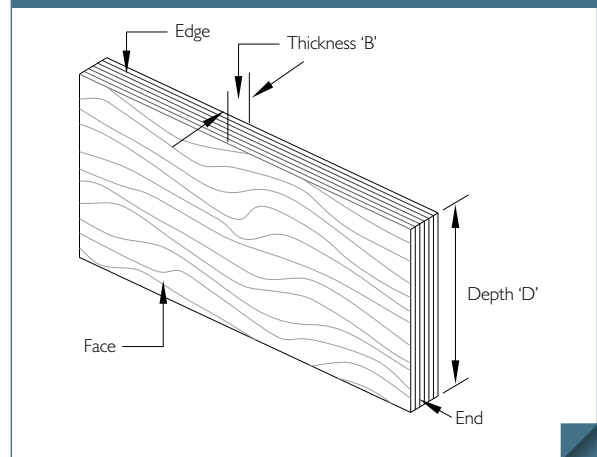
For specific support and tie-down calculation, consult designIT® for houses software where reactions are provided for all members for specification with typical connection details.

### 5.1 FASTENING FUTUREBUILD® LVL

Futurebuild LVL may be nailed, bolted or screw fixed exactly the same way as dry timber. For installation and performance of fasteners there is no need to distinguish between fasteners installed into either the face or edge (see figure 7). Due to the high density of Futurebuild LVL, to ensure adequate driving, pneumatic nailers should be operated at slightly higher pressures than normally used. Standard edge, end distances and spacings between fasteners appropriate for seasoned softwood timber may be used.

The load carrying capacity of nail, screw or bolt fasteners used with Futurebuild LVL depends on the type of fastener and its orientation. Refer to Table 4 of the Futurebuild LVL Specific Engineering Design Guide.

Figure 7: Solid Futurebuild LVL Profile



### 5.2 STORAGE OF FUTUREBUILD® LVL

Futurebuild LVL requires care in storage and handling prior to installation:

- Stack well clear of the ground (at least 150 mm) for good ventilation
- Stack on level bearers to keep flat and straight

- Store under cover to keep dry prior to installation
- During construction Futurebuild LVL may be exposed to limited sun and rain. Refer to the Futurebuild LVL Durability Statement downloadable from [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz) for detailed information

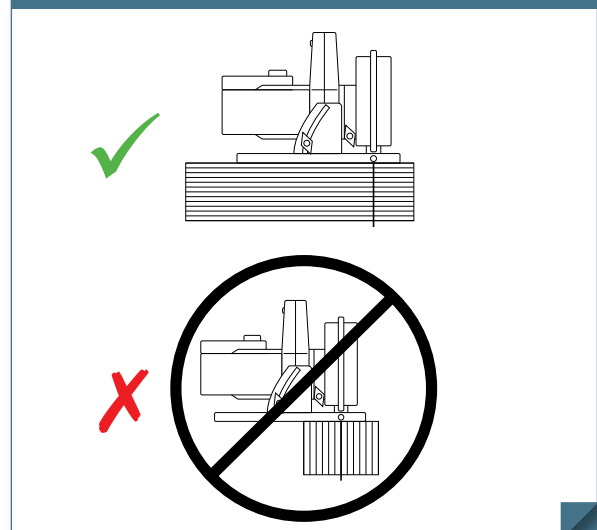
### 5.3 RIP SAWING FUTUREBUILD® LVL

Unlike graded timber, solid Futurebuild LVL products may be rip sawn through the thickness to the smaller standard section depths given in these span tables without affecting the basic strength properties. Care must be taken to comply with the no negative tolerance specification (i.e. do not cut undersize) if the maximum spans given in these tables are to apply.

**Rip sawing through the depth to produce sections of reduced thickness is not permitted and may adversely affect strength properties.**

Treated Futurebuild LVL is envelope preservative treated. Where ripping treated LVL, retreatment of the entire beam is required.

Figure 8: Ripsawing of Futurebuild LVL



## 5.4 USING DOUBLE SECTIONS

Where double sections are specified these need to be securely nail laminated. This does not apply for bearers used in pole frame construction. Whilst nail lamination may ordinarily be satisfactorily achieved using the procedures given in NZS 3604 the fixing will often not be adequate if double sections are required to support incoming members face fixed on one side.

Any moisture between the two sections of LVL which are to be joined must be avoided. In order to meet these requirements the following detail for jointing double sections of Futurebuild® LVL is recommended.

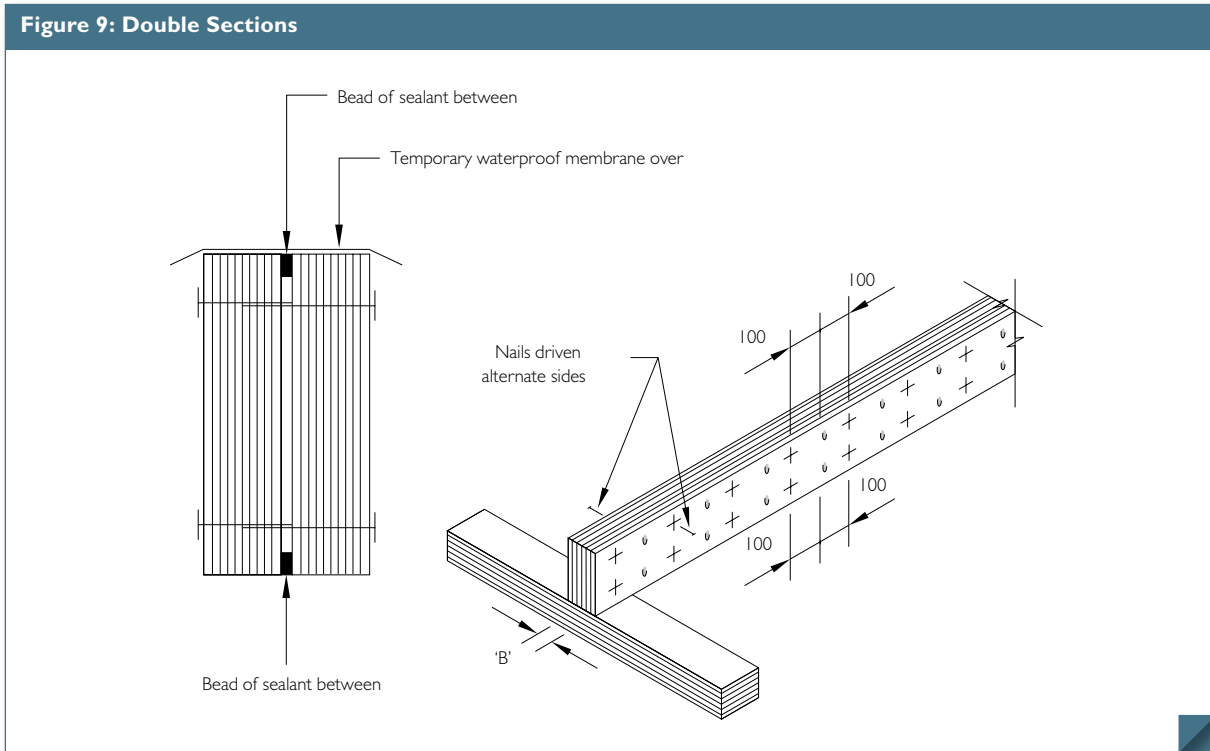


TABLE 6: FASTENER SIZES FOR NAIL LAMINATION OF FUTUREBUILD® LVL

Section Size 'B'	Minimum Nail Diameter (mm)	Minimum Nail Length (mm)
45	3.3	90
63	3.3	100

## 6.0 TERMINOLOGY

### 6.1 SPAN

For the purpose of using the following tables, span may be interpreted as the clear distance between supports measured along the beam.

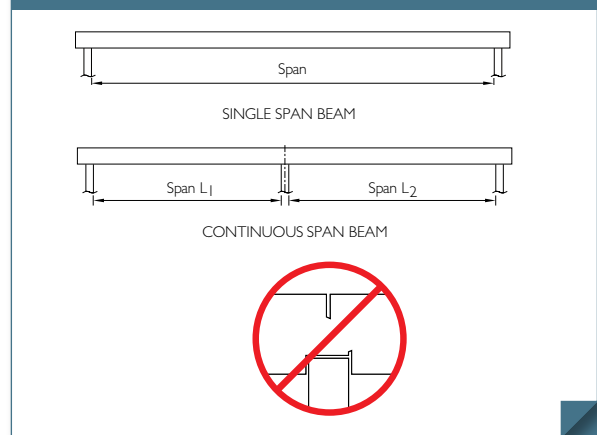
Single Span Beams are beams supported at two points only. Continuous Span Beams are beams supported at three or more points along their length.

Continuous span values given in the tables should only be used where:

- The beam is not notched or partially cut through at internal support points and,
- If the spans are not equal, the largest span is not greater than twice the smallest adjacent span.

However if either of the above conditions are not met, use the single span tables for the purpose of obtaining the appropriate size.

Figure 10: Beam Spans

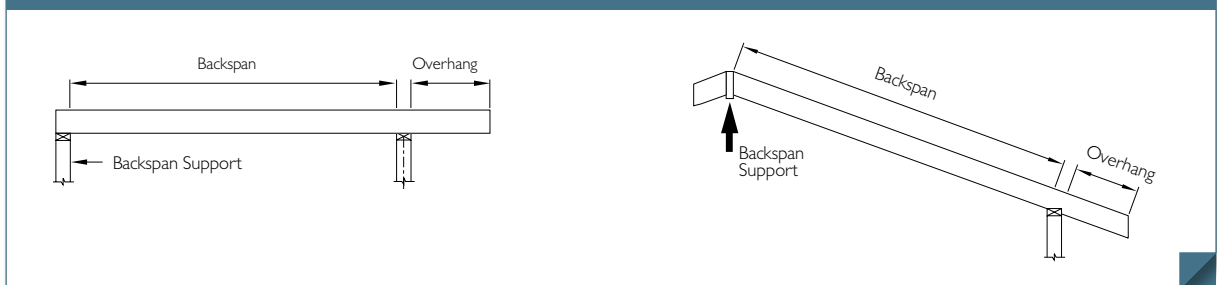


### 6.2 OVERHANG SPAN (CANTILEVER)

Sometimes referred to as cantilever, overhang is the distance from the face of the support to the free end of the beam, measured along the beam as illustrated.

For beams with overhangs, the backspan should be at least twice the length of the overhang in order to limit uplift forces on the backspan support.

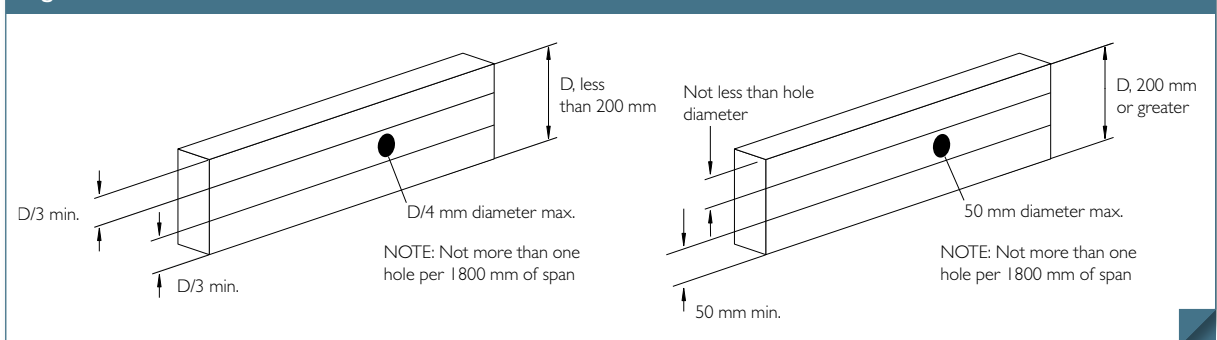
Figure 11: Beams with Overhangs



### 6.3 HOLES IN MEMBERS IN HOUSES AND RESIDENTIAL BUILDINGS

Holes may be drilled in Futurebuild® LVL members used in houses within the scope of NZS 3604 as detailed below.

Figure 12: Holes in Futurebuild® LVL members

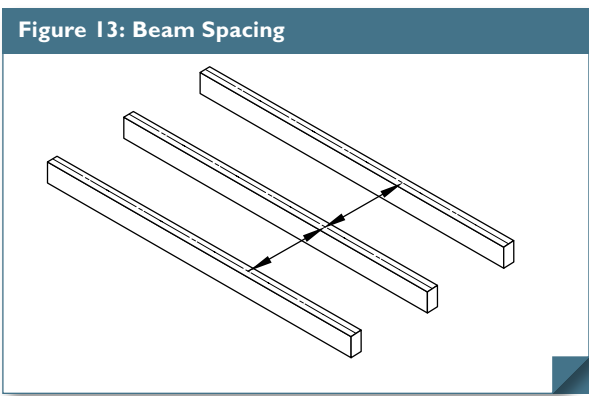


All treated Futurebuild LVL is envelope treated. Holes and cuts made in treated Futurebuild LVL must be coated with a brush on

timber preservative. Holdfast Metalex End Seal is recommended.

## 6.4 SPACING

Tables such as those for rafters, floor joists and ceiling joists, require the spacing of members to be known or selected in order to obtain the required size for a given span. Spacing should be interpreted as the centre to centre distance between adjacent parallel members.



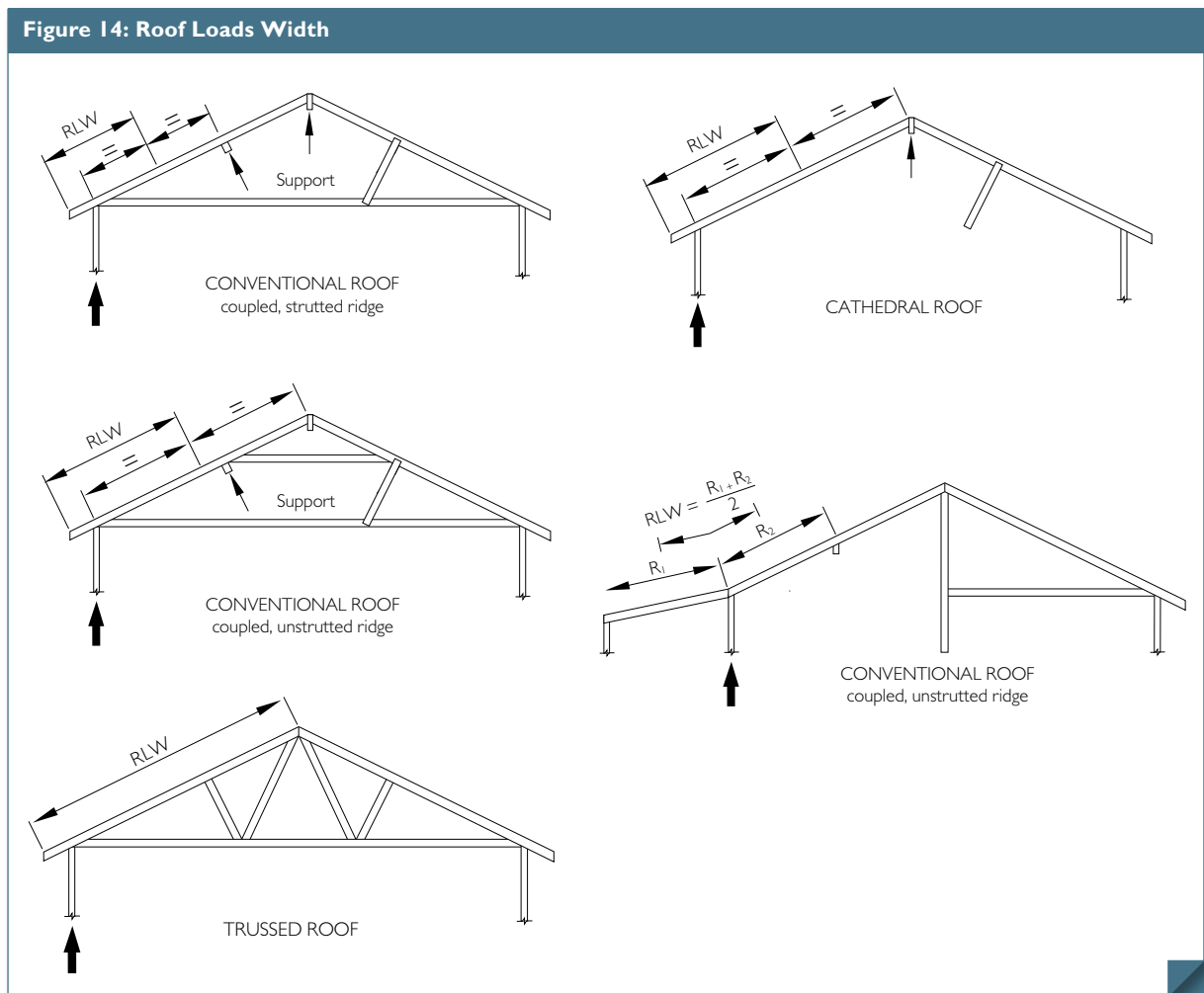
## 6.5 LOAD WIDTHS

Load width is used in these tables in order to determine the load applied to isolated beams such as lintels, bearers, hanging beams, etc. Roof load width (RLW), ceiling load width (CLW) and floor load width (FLW) are measures of the load applied from roofs, ceilings and floors respectively.

Roof load width (RLW) has a similar function to 'Roof dimensions' used in NZS 3604 in order to determine wall framing sizes, including lintels.

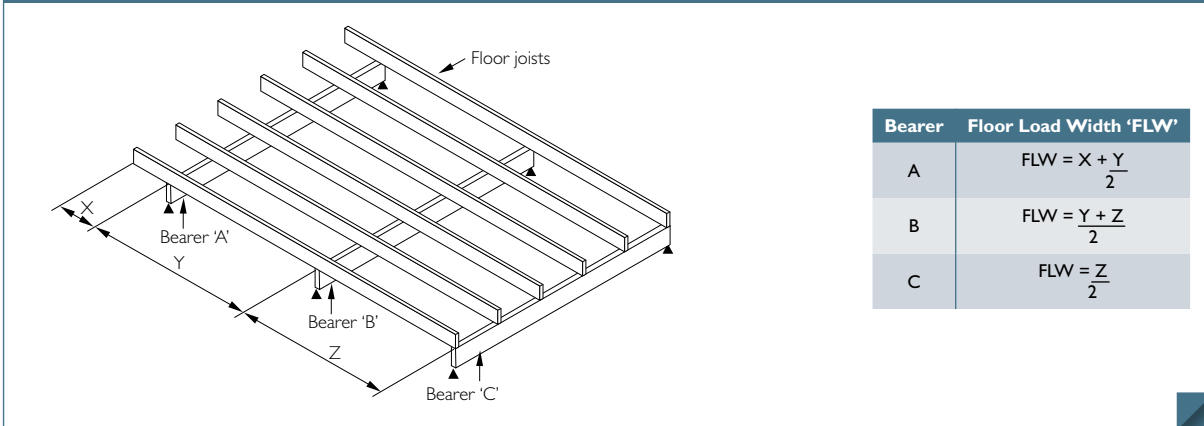
Examples showing the determination of roof load width, floor load width and ceiling load width are illustrated as appropriate throughout this guide

## 6.6 DETERMINATION OF ROOF LOAD WIDTH



## 6.7 DETERMINATION OF FLOOR LOAD WIDTH

Figure 15: Floor Load Width



## 6.8 LINTELS

Lintels are beams contained in walls required to support load over doors and windows. Their design includes stringent

limitations on deflection required in order to maintain clearance of non-structural joinery items below the lintels.

## 6.9 ROOF MASS

For most applications roof mass has been separated into four categories related to the type of roof cladding and whether or not a ceiling is included. The four categories together with the roof mass allowance for each case, are given in table 7 below.

A corrugated roof would be considered a light weight roof with a concrete tiled roof considered heavy.

For the rafter and verandah beam tables designers need to determine the applicable roof mass of framing and roof materials.

TABLE 7: ROOF MASS ALLOWANCES

Roof Type	Roof Mass Allowed
Light Roof	25 kg/m <sup>2</sup>
Light Roof and Ceiling	40 kg/m <sup>2</sup>
Heavy Roof	75 kg/m <sup>2</sup>
Heavy Roof and Ceiling	90 kg/m <sup>2</sup>

## 6.10 TECHNICAL SUPPORT

For further information on Futurebuild® LVL, guidance on the use of these tables or assistance with applications not included, please contact CHH Woodproducts.

Freephone: 0800 808 131  
 Website: [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz)  
 Software: [www.chhsoftware.com](http://www.chhsoftware.com)

For member types and other design options not in these tables use designIT® for houses software.

## 7.0 SPAN TABLES

### 7.1 FLOOR BEAMS OR BEARERS

Design Deflection Limits:  
 D.L. SPAN/300 OR 12 mm  
 L.L. SPAN/360 OR 9 mm

TABLE 8: BEARERS – FLOOR LOADS ONLY

Section D x B (mm)	Product	Floor Load Width 'FLW' (m)											
		1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.6	4.1	4.8	5.4	6.0
		Maximum Single Span (m)											
2/90 x 45	hyCHORD®	1.9	1.7	1.6	1.6	1.5	1.4	1.4	1.3	1.2	1.2	1.1	1.1
150 x 63	hySPAN®	2.9	2.7	2.6	2.4	2.3	2.2	2.2	2.0	1.9	1.8	1.7	1.7
150 x 90	hy90°	2.9	2.7	2.6	2.4	2.3	2.2	2.2	2.0	1.9	1.8	1.7	1.7
2/150 x 45	hySPAN	3.3	3.1	2.9	2.7	2.6	2.5	2.4	2.3	2.2	2.0	2.0	1.9
2/170 x 45	hySPAN	3.7	3.5	3.3	3.1	3.0	2.8	2.7	2.6	2.5	2.3	2.2	2.1
200 x 63	hySPAN	3.8	3.6	3.4	3.2	3.1	3.0	2.9	2.7	2.6	2.4	2.3	2.2
200 x 90	hy90	3.8	3.6	3.4	3.2	3.1	3.0	2.9	2.7	2.6	2.4	2.3	2.2
2/200 x 45	hySPAN	4.2	3.9	3.8	3.6	3.5	3.3	3.2	3.0	2.9	2.7	2.6	2.5
240 x 63	hySPAN	4.4	4.1	4.0	3.8	3.7	3.6	3.4	3.2	3.1	2.9	2.8	2.7
240 x 90	hy90	4.3	4.1	3.9	3.8	3.7	3.6	3.4	3.2	3.1	2.9	2.8	2.7
2/200 x 63	hySPAN	4.5	4.3	4.1	3.9	3.8	3.7	3.6	3.4	3.2	3.0	2.9	2.8
2/240 x 45	hySPAN	4.7	4.5	4.3	4.1	4.0	3.9	3.8	3.6	3.5	3.3	3.1	3.0
240 x 90	hyONE®	5.0	4.7	4.5	4.3	4.2	4.1	4.0	3.8	3.6	3.5	3.3	3.2
300 x 63	hySPAN	5.1	4.9	4.7	4.5	4.3	4.2	4.1	3.9	3.8	3.6	3.5	3.3
300 x 90	hy90	5.1	4.9	4.6	4.5	4.3	4.2	4.1	3.9	3.8	3.6	3.5	3.3
2/300 x 45	hySPAN	5.6	5.3	5.1	4.9	4.7	4.6	4.5	4.3	4.1	3.9	3.8	3.7
300 x 90	hyONE	5.8	5.5	5.3	5.1	4.9	4.8	4.7	4.5	4.3	4.1	4.0	3.9
360 x 90	hy90	5.8	5.5	5.3	5.1	5.0	4.8	4.7	4.5	4.3	4.1	4.0	3.9
360 x 63	hySPAN	5.9	5.6	5.3	5.1	5.0	4.8	4.7	4.5	4.3	4.1	4.0	3.9
2/360 x 45	hySPAN	6.3	6.0	5.8	5.6	5.4	5.2	5.1	4.9	4.7	4.5	4.4	4.3
400 x 63	hySPAN	6.3	6.0	5.8	5.5	5.4	5.2	5.1	4.8	4.7	4.5	4.3	4.2
400 x 90	hy90	6.3	6.0	5.7	5.5	5.3	5.2	5.1	4.8	4.7	4.5	4.3	4.2
360 x 90	hyONE	6.6	6.3	6.0	5.8	5.6	5.5	5.3	5.1	4.9	4.7	4.6	4.4
2/400 x 45	hySPAN	6.8	6.5	6.2	6.0	5.8	5.7	5.5	5.3	5.1	4.9	4.7	4.6
450 x 63	hySPAN	6.9	6.5	6.3	6.0	5.9	5.7	5.5	5.3	5.1	4.9	4.7	4.6
400 x 90	hyONE	7.1	6.8	6.5	6.3	6.1	5.9	5.8	5.5	5.3	5.1	4.9	4.8
2/400 x 63	hySPAN	7.3	7.0	6.7	6.5	6.3	6.1	6.0	5.7	5.5	5.3	5.1	5.0
2/450 x 63	hySPAN	7.9	7.6	7.3	7.1	6.8	6.7	6.5	6.2	6.0	5.8	5.6	5.4

- Indicates 90 mm required bearing at end supports
- Bearing requirements as per NZS 3604 unless otherwise indicated
- Where joists are loaded into sides of bearers, double sections built up by vertical lamination (see page 15 section 5.4)

Design Deflection Limits:

DL	LL
SPAN/300	SPAN/360
OR 12 mm	OR 9 mm

TABLE 8 CONTINUED: BEARERS – FLOOR LOADS ONLY

Section D x B (mm)	Product	Floor Load Width 'FLW' (m)											
		1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.6	4.1	4.8	5.4	6.0
		Maximum Continuous Span (m)											
2/90 x 45	hyCHORD®	2.3	2.2	2.1	1.9	1.9	1.8	1.7	1.6	1.6	1.4	1.3	1.3
150 x 63	hySPAN®	3.6	3.4	3.2	3.1	2.9	2.8	2.7	2.5	2.4	2.1	2.0	1.9
150 x 90	hy90®	3.6	3.4	3.2	3.1	2.9	2.7	2.6	2.4	2.2	2.0	1.9	1.8
2/150 x 45	hySPAN	3.9	3.7	3.5	3.4	3.3	3.2	3.1	2.9	2.8	2.5	2.3	2.2
2/170 x 45	hySPAN	4.3	4.1	3.9	3.7	3.6	3.5	3.4	3.3	3.0	2.8	2.7	2.5
200 x 63	hySPAN	4.4	4.2	4.0	3.9	3.7	3.6	3.5	3.3	3.0	2.7 <sup>■</sup>	2.6 <sup>■</sup>	2.4 <sup>■</sup>
200 x 90	hy90	4.4	4.2	4.0	3.9	3.7	3.6	3.4	3.1	2.8	2.6	2.4	2.3
2/200 x 45	hySPAN	4.8	4.6	4.4	4.2	4.1	4.0	3.9	3.7	3.6	3.2	3.0	2.9
240 x 63	hySPAN	5.1	4.8	4.6	4.4	4.3	4.2	4.0	3.8 <sup>■</sup>	3.5 <sup>■</sup>	3.2 <sup>■</sup>	3.1 <sup>■</sup>	2.9 <sup>■</sup>
240 x 90	hy90	-	-	4.6	4.4	4.3	4.2	4.0	3.6	3.3	3.1	2.9	2.7
2/240 x 45	hySPAN	5.6	5.3	5.0	4.8	4.7	4.5	4.4	4.2	4.1	3.8 <sup>■</sup>	3.6 <sup>■</sup>	3.4 <sup>■</sup>
240 x 90	hyONE®	-	-	-	-	-	-	4.6	4.4	4.3	4.1 <sup>■</sup>	4.0 <sup>■</sup>	3.9 <sup>■</sup>
300 x 63	hySPAN	6.0	5.7	5.4	5.2	5.1	4.9 <sup>■</sup>	4.8 <sup>■</sup>	4.6 <sup>■</sup>	4.3 <sup>■</sup>	#	#	#
300 x 90	hy90	-	-	-	-	-	-	-	4.4	4.1	3.8 <sup>■</sup>	3.5 <sup>■</sup>	3.3 <sup>■</sup>
2/300 x 45	hySPAN	6.6	6.2	5.9	5.7	5.5	5.4	5.2	5.0	4.7 <sup>■</sup>	4.4 <sup>■</sup>	4.2 <sup>■</sup>	4.0 <sup>■</sup>
360 x 63	hySPAN	6.9	6.5	6.2	6.0	5.8 <sup>■</sup>	5.6 <sup>■</sup>	5.5 <sup>■</sup>	#	#	#	#	#
360 x 90	hy90	-	-	-	-	-	-	-	-	-	4.5 <sup>■</sup>	4.2 <sup>■</sup>	4.0 <sup>■</sup>
2/300 x 63	hySPAN	7.1	6.8	6.5	6.2	6.0	5.8	5.7	5.4	5.3	5.1	4.9 <sup>■</sup>	4.8 <sup>■</sup>
2/360 x 45	hySPAN	7.5	7.1	6.8	6.6	6.3	6.2	6.0	5.5 <sup>■</sup>	5.2 <sup>■</sup>	4.9 <sup>■</sup>	#	#
400 x 63	hySPAN	7.5	7.1	6.7	6.5 <sup>■</sup>	6.3 <sup>■</sup>	6.1 <sup>■</sup>	5.9 <sup>■</sup>	#	#	#	#	#
450 x 63	hySPAN	8.1	7.7	7.4 <sup>■</sup>	7.1 <sup>■</sup>	6.9 <sup>■</sup>	#	#	#	#	#	#	#
2/400 x 45	hySPAN	8.2	7.7	7.4	7.1	6.8	6.5	6.3 <sup>■</sup>	5.8 <sup>■</sup>	5.5 <sup>■</sup>	5.2 <sup>■</sup>	#	#
2/400 x 63	hySPAN	-	8.4	8.0	7.7	7.5	7.2	7.1	6.7	6.5 <sup>■</sup>	6.3 <sup>■</sup>	6.1 <sup>■</sup>	#
2/450 x 63	hySPAN	-	-	-	8.4	8.1	7.9	7.7	7.4 <sup>■</sup>	7.1 <sup>■</sup>	6.9 <sup>■</sup>	#	#

- Indicates 45 mm required bearing at end supports and 135 mm required bearing at intermediate supports
- #Indicates bearing requirement is greater than the above. See designIT® for houses software for span and bearing information
- Bearing requirements as for NZS 3604 except where indicated otherwise
- Where joists are loaded into sides of bearers, double sections built up by vertical lamination (see page 15 section 5.4)

Design Deflection Limits:

DL. SPAN/300 OR 12 mm  
LL. SPAN/360 OR 9 mm

TABLE 9: BEARERS – SUPPORTING SINGLE OR UPPER STOREY WALLS

Section D x B (mm)	Product	Light Roof & Ceiling														
		Floor Load Width 'FLW' (m)														
		1.2					2.1					3.0				
		Roof Load Width 'RLW' (m)														
Maximum Single Span (m)																
		1.8	3.0	4.2	5.4	6.6	1.8	3.0	4.2	5.4	6.6	1.8	3.0	4.2	5.4	6.6
2/90 x 45	hyCHORD®	1.5	1.4	1.3	1.3	1.2	1.3	1.3	1.2	1.2	1.1	1.2	1.2	1.2	1.1	1.1
150 x 63	hySPAN®	2.4	2.2	2.1	2.0	1.9	2.1	2.0	1.9	1.9	1.8	1.9	1.9	1.8	1.8	1.7
150 x 90	hy90®	2.4	2.2	2.1	2.0	1.9	2.1	2.0	1.9	1.9	1.8	1.9	1.9	1.8	1.8	1.7
2/150 x 45	hySPAN	2.6	2.5	2.4	2.2	2.2	2.4	2.3	2.2	2.1	2.0	2.2	2.1	2.0	2.0	1.9
2/170 x 45	hySPAN	3.0	2.8	2.7	2.5	2.4	2.7	2.6	2.5	2.4	2.3	2.5	2.4	2.3	2.2	2.2
200 x 63	hySPAN	3.1	2.9	2.8	2.7	2.6	2.8	2.7	2.6	2.5	2.4	2.6	2.5	2.4	2.3	2.3
200 x 90	hy90	3.1	2.9	2.8	2.7	2.6	2.8	2.7	2.6	2.5	2.4	2.6	2.5	2.4	2.3	2.3
2/200 x 45	hySPAN	3.5	3.3	3.1	3.0	2.9	3.2	3.0	2.9	2.8	2.7	2.9	2.8	2.7	2.6	2.6
240 x 63	hySPAN	3.7	3.5	3.3	3.2	3.1	3.4	3.2	3.1	3.0	2.9	3.1	3.0	2.9	2.8	2.7
240 x 90	hy90	3.7	3.5	3.3	3.2	3.1	3.4	3.2	3.1	3.0	2.9	3.1	3.0	2.9	2.8	2.7
2/200 x 63	hySPAN	3.8	3.7	3.5	3.3	3.2	3.5	3.4	3.2	3.1	3.0	3.2	3.1	3.0	2.9	2.9
2/240 x 45	hySPAN	4.0	3.9	3.7	3.6	3.4	3.7	3.6	3.5	3.3	3.2	3.5	3.4	3.2	3.1	3.1
240 x 90	hyONE®	4.2	4.0	3.9	3.7	3.6	3.9	3.8	3.7	3.5	3.4	3.7	3.5	3.4	3.3	3.2
300 x 63	hySPAN	4.4	4.2	4.0	3.9	3.8	4.0	3.9	3.8	3.7	3.6	3.8	3.7	3.6	3.5	#
300 x 90	hy90	4.4	4.2	4.0	3.9	3.8	4.0	3.9	3.8	3.7	3.6	3.8	3.7	3.6	3.5	3.4
2/300 x 45	hySPAN	4.8	4.5	4.4	4.2	4.1	4.4	4.3	4.1	4.0	3.9	4.1	4.0	3.9	3.8	3.8
300 x 90	hyONE	5.0	4.7	4.6	4.4	4.3	4.6	4.4	4.3	4.2	4.1	4.3	4.2	4.1	4.0	3.9
Maximum Continuous Span (m)																
2/90 x 45	hyCHORD	2.0	1.9	1.8	1.7	1.6	1.8	1.7	1.6	1.6	1.5	1.7	1.6	1.5	1.5	1.5
150 x 63	hySPAN	3.2	3.0	2.8	2.7	2.5	2.8	2.7	2.6	2.5	2.4	2.6	2.4	2.3	2.3	2.2
150 x 90	hy90	3.2	3.0	2.8	2.6	2.4	2.8	2.6	2.5	2.4	2.2	2.4	2.3	2.2	2.2	2.1
2/150 x 45	hySPAN	3.5	3.3	3.2	3.0	2.9	3.2	3.0	2.9	2.8	2.7	2.9	2.8	2.7	2.6	2.6
2/170 x 45	hySPAN	3.9	3.7	3.6	3.4	3.3	3.6	3.4	3.3	3.2	3.1	3.3	3.2	3.1	3.0	2.9
200 x 63	hySPAN	4.0	3.9	3.7	3.6	3.2	3.7	3.6	3.5	3.3	3.1	3.3	3.1	3.0	3.0	2.9
200 x 90	hy90	4.0	3.8	3.7	3.4	3.1	3.6	3.4	3.3	3.1	2.9	3.1	2.9	2.9	2.8	2.7
2/200 x 45	hySPAN	4.4	4.2	4.0	3.9	3.8	4.1	3.9	3.8	3.7	3.6	3.8	3.7	3.6	3.5	3.4
240 x 63	hySPAN	4.6	4.4	4.2	4.1	3.9	4.3	4.1	4.0	3.9	3.7	3.8	3.7	3.6	3.5	3.4
240 x 90	hy90	4.6	4.4	4.2	4.0	3.7	4.3	4.1	3.9	3.7	3.5	3.6	3.5	3.4	3.3	3.2
2/200 x 63	hySPAN	4.8	4.5	4.4	4.2	4.1	4.4	4.3	4.1	4.0	3.9	4.1	4.0	3.9	3.8	3.8
2/240 x 45	hySPAN	5.0	4.8	4.6	4.5	4.3	4.6	4.5	4.4	4.2	4.1	4.4	4.2	4.1	4.1	4.0
240 x 90	hyONE	-	-	-	4.7	4.5	-	4.7	4.5	4.4	4.3	4.6	4.4	4.3	4.2	4.1
300 x 63	hySPAN	5.5	5.2	5.0	4.8	4.7	5.0	4.9	4.7	4.6	4.5	4.7	4.6	4.5	4.4	#
300 x 90	hy90	-	-	-	-	4.5	-	-	4.7	4.6	4.3	4.4	4.3	4.2	4.1	4.0
2/300 x 45	hySPAN	5.9	5.7	5.4	5.3	5.1	5.5	5.3	5.1	5.0	4.9	5.1	4.9	4.8	4.7	4.6
2/300 x 63	hySPAN	6.4	6.1	5.9	5.7	5.5	5.9	5.7	5.6	5.4	5.3	5.6	5.4	5.3	5.2	5.1

- Indicates 45 mm required bearing at end supports and 135 mm required bearing at intermediate supports
- # Indicates bearing requirement is greater than the above. See designIT® for houses software for span and bearing information
- Bearing requirements as for NZS 3604 except where indicated otherwise
- Where joists are loaded into sides of bearers, double sections built up by vertical lamination (see page 15 section 5.4)

Design Deflection Limits:

DL. SPAN/300 OR 12 mm  
LL. SPAN/360 OR 9 mm

TABLE 9 CONTINUED: BEARERS – SUPPORTING SINGLE OR UPPER STOREY WALLS

		Heavy Roof & Ceiling														
		Floor Load Width 'FLW' (m)														
Section D x B (mm)	Product	1.2					2.1					3.0				
		Roof Load Width 'RLW' (m)														
		1.8	3.0	4.2	5.4	6.6	1.8	3.0	4.2	5.4	6.6	1.8	3.0	4.2	5.4	6.6
		Maximum Single Span (m)														
2/90 x 45	hyCHORD®	1.3	1.2	1.1	1.1	1.0	1.2	1.1	1.1	1.0	1.0	1.2	1.1	1.0	1.0	0.9
150 x 63	hySPAN®	2.1	1.9	1.8	1.7	1.6	1.9	1.8	1.7	1.6	1.5	1.8	1.7	1.6	1.5	1.5
150 x 90	hy90®	2.1	1.9	1.8	1.7	1.6	1.9	1.8	1.7	1.6	1.5	1.8	1.7	1.6	1.5	1.5
2/150 x 45	hySPAN	2.4	2.2	2.0	1.9	1.8	2.2	2.0	1.9	1.8	1.7	2.0	1.9	1.8	1.7	1.7
2/170 x 45	hySPAN	2.7	2.4	2.3	2.1	2.0	2.5	2.3	2.1	2.0	1.9	2.3	2.2	2.1	2.0	1.9
200 x 63	hySPAN	2.8	2.5	2.4	2.2	2.1	2.6	2.4	2.2	2.1	2.0	2.4	2.3	2.1	2.0	2.0
200 x 90	hy90	2.8	2.5	2.4	2.2	2.1	2.6	2.4	2.2	2.1	2.0	2.4	2.3	2.1	2.0	2.0
2/200 x 45	hySPAN	3.1	2.9	2.7	2.5	2.4	2.9	2.7	2.5	2.4	2.3	2.7	2.5	2.4	2.3	2.2
240 x 63	hySPAN	3.4	3.1	2.8	2.7	2.5	3.1	2.9	2.7	2.6	2.4	2.9	2.7	2.6	2.5	2.4
240 x 90	hy90	3.4	3.1	2.8	2.7	2.5	3.1	2.9	2.7	2.6	2.4	2.9	2.7	2.6	2.5	2.4
2/200 x 63	hySPAN	3.5	3.2	3.0	2.8	2.7	3.2	3.0	2.8	2.7	2.6	3.0	2.8	2.7	2.6	2.5
2/240 x 45	hySPAN	3.7	3.4	3.2	3.0	2.8	3.5	3.2	3.0	2.9	2.7	3.3	3.1	2.9	2.8	2.7
240 x 90	hyONE®	3.9	3.6	3.4	3.2	3.0	3.7	3.4	3.2	3.0	2.9	3.4	3.2	3.1	2.9	2.8
300 x 63	hySPAN	4.0	3.8	3.5	3.3	#	3.8	3.6	3.4	3.2	#	3.6	3.4	#	#	#
300 x 90	hy90	4.0	3.8	3.5	3.3	3.2	3.8	3.6	3.4	3.2	3.0	3.6	3.4	3.2	3.1	2.9
2/300 x 45	hySPAN	4.4	4.1	3.9	3.7	3.6	4.1	3.9	3.7	3.6	3.4	3.9	3.8	3.6	3.4	3.3
300 x 90	hyONE	4.6	4.3	4.0	3.9	3.7	4.3	4.1	3.9	3.7	3.6	4.1	3.9	3.8	3.6	#
		Maximum Continuous Span (m)														
2/90 x 45	hyCHORD	1.8	1.6	1.5	1.4	1.4	1.7	1.5	1.4	1.4	1.3	1.5	1.5	1.4	1.3	1.3
150 x 63	hySPAN	2.8	2.6	2.4	2.2	2.1	2.6	2.4	2.3	2.1	2.0	2.4	2.2	2.2	2.1	1.9
150 x 90	hy90	2.8	2.6	2.4	2.1	2.0	2.6	2.4	2.2	2.0	1.8	2.3	2.1	2.0	1.9	1.8
2/150 x 45	hySPAN	3.2	2.9	2.7	2.5	2.4	2.9	2.7	2.5	2.4	2.3	2.7	2.6	2.4	2.3	2.2
2/170 x 45	hySPAN	3.6	3.3	3.0	2.9	2.7	3.3	3.1	2.9	2.7	2.6	3.1	2.9	2.8	2.6	2.5
200 x 63	hySPAN	3.7	3.4	3.2	3.0	2.7	3.5	3.2	3.0	2.9	2.6	3.0	2.9	2.8	2.6	2.4
200 x 90	hy90	3.7	3.4	3.1	2.8	2.6	3.4	3.1	2.9	2.7	2.4	2.9	2.7	2.6	2.4	2.3
2/200 x 45	hySPAN	4.1	3.8	3.6	3.4	3.2	3.8	3.6	3.4	3.2	3.1	3.6	3.4	3.2	3.1	3.0
240 x 63	hySPAN	4.3	4.0	3.7	3.6	3.3	4.0	3.8	3.6	3.3	3.1	3.6	3.4	3.2	3.1	3.0
240 x 90	hy90	4.3	4.0	3.6	3.4	3.1	3.9	3.7	3.4	3.1	3.0	3.4	3.2	3.0	3.0	2.8
2/200 x 63	hySPAN	4.4	4.1	3.9	3.7	3.6	4.1	3.9	3.7	3.6	3.4	3.9	3.8	3.6	3.4	3.3
2/240 x 45	hySPAN	4.6	4.3	4.1	3.9	3.8	4.4	4.1	3.9	3.8	3.6	4.2	4.0	3.8	3.7	3.5
240 x 90	hyONE	4.8	4.5	4.3	4.1	3.9	4.6	4.3	4.1	4.0	3.8	4.3	4.1	4.0	3.8	3.7
300 x 63	hySPAN	5.0	4.7	4.4	4.2	#	4.7	4.5	4.3	#	#	4.5	#	#	#	#
300 x 90	hy90	-	4.7	4.4	4.1	3.8	4.7	4.5	4.2	3.9	3.6	4.2	4.0	3.8	3.7	3.5
2/300 x 45	hySPAN	5.5	5.1	4.8	4.6	4.3	5.2	4.9	4.6	4.4	4.1	4.8	4.6	4.4	4.2	4.0
300 x 90	hyONE	-	-	-	-	4.6	-	-	-	4.7	4.5	-	-	4.7	4.5	#

- Indicates 45 mm required bearing at end supports and 135 mm required bearing at intermediate supports
- # Indicates bearing requirement is greater than the above. See designIT® for houses software for span and bearing information
- Bearing requirements as for NZS 3604 except where indicated otherwise
- Where joists are loaded into sides of bearers, double sections built up by vertical lamination (see page 15 section 5.4)

Design Deflection Limits:

DL. SPAN/300 OR 12 mm  
LL. SPAN/360 OR 9 mm

TABLE 10: BEARERS – SUPPORTING TWO STOREY LOAD BEARING WALLS

Section D x B (mm)	Product	Light Roof & Ceiling															
		Floor Load Width <sub>1</sub> 'FLW <sub>1</sub> ' (m)															
		1.5						3.0									
		Floor Load Width <sub>2</sub> 'FLW <sub>2</sub> ' (m)															
		1.5				3.0				1.5				3.0			
Roof Load Width 'RLW' (m)																	
2.4			4.5			6.6			2.4			4.5			6.6		
Maximum Single Span (m)																	
2/90 x 45	hyCHORD®	1.2	1.1	1.1	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.0	0.9				
150 x 63	hySPAN®	1.9	1.8	1.7	1.7	1.6	1.6	1.7	1.6	1.6	1.6	1.5	1.5				
150 x 90	hy90®	1.9	1.8	1.7	1.7	1.6	1.6	1.7	1.6	1.6	1.6	1.5	1.5				
2/150 x 45	hySPAN	2.1	2.0	1.9	1.9	1.8	1.8	1.9	1.8	1.8	1.8	1.7	1.7				
2/170 x 45	hySPAN	2.4	2.2	2.1	2.2	2.1	2.0	2.2	2.1	2.0	2.0	1.9	1.9				
200 x 63	hySPAN	2.5	2.3	2.2	2.3	2.2	2.1	2.3	2.2	2.1	2.1	2.0	2.0				
200 x 90	hy90	2.5	2.3	2.2	2.3	2.2	2.1	2.3	2.2	2.1	2.1	2.0	2.0				
2/200 x 45	hySPAN	2.8	2.6	2.5	2.5	2.4	2.3	2.5	2.4	2.3	2.4	2.3	2.2				
240 x 63	hySPAN	3.0	2.8	2.7	2.7	2.6	2.5	2.7	2.6	2.5	2.5	2.4	2.4				
240 x 90	hy90	3.0	2.8	2.7	2.7	2.6	2.5	2.7	2.6	2.5	2.5	2.4	2.4				
2/200 x 63	hySPAN	3.1	2.9	2.8	2.8	2.7	2.6	2.8	2.7	2.6	2.6	2.5	2.5				
2/240 x 45	hySPAN	3.3	3.2	3.0	3.0	2.9	2.8	3.0	2.9	2.8	2.8	2.7	2.6				
240 x 90	hyONE®	3.5	3.3	3.2	3.2	3.1	3.0	3.2	3.1	3.0	3.0	2.9	2.8				
300 x 63	hySPAN	3.7	3.5	3.4	#	#	#	#	#	#	#	#	#				
300 x 90	hy90	3.7	3.5	3.3	3.4	3.2	3.1	3.4	3.2	3.1	3.1	3.0	2.9				
2/300 x 45	hySPAN	4.0	3.9	3.7	3.7	3.6	3.5	3.7	3.6	3.5	3.5	3.4	3.3				
300 x 90	hyONE	4.2	4.0	3.9	3.9	3.8	3.7	3.9	3.8	3.7	#	#	#				
2/300 x 63	hySPAN	4.4	4.2	4.0	4.1	3.9	3.8	4.1	3.9	3.8	3.9	3.8	3.7				
Maximum Continuous Span (m)																	
2/90 x 45	hyCHORD	1.6	1.5	1.4	1.4	1.4	1.3	1.4	1.4	1.3	1.3	1.2	1.2				
150 x 63	hySPAN	2.5	2.4	2.3	2.2	2.1	2.0	2.2	2.1	2.0	1.9	1.9	1.9				
150 x 90	hy90	2.5	2.4	2.2	2.1	2.0	1.9	2.1	2.0	1.9	1.8	1.7	1.7				
2/150 x 45	hySPAN	2.8	2.7	2.5	2.6	2.4	2.4	2.6	2.4	2.4	2.4	2.3	2.2				
2/170 x 45	hySPAN	3.2	3.0	2.9	2.9	2.8	2.7	2.9	2.8	2.7	2.7	2.6	2.5				
200 x 90	hy90	3.2	3.0	2.8	2.6	2.6	2.5	2.6	2.6	2.5	2.4	2.3	2.2				
200 x 63	hySPAN	3.3	3.1	3.0	2.8 ■	2.7 ■	2.6 ■	2.8 ■	2.7 ■	2.6 ■	2.6 ■	2.5 ■	2.4 ■				
2/200 x 45	hySPAN	3.7	3.5	3.4	3.4	3.3	3.1	3.4	3.3	3.1	3.1	3.0	2.9				
240 x 63	hySPAN	3.9	3.7 ■	3.5 ■	3.3 ■	3.2 ■	3.1 ■	3.3 ■	3.2 ■	3.1 ■	3.1 ■	3.0 ■	2.9 ■				
240 x 90	hy90	3.9	3.6	3.3	3.1	3.1	3.0	3.1	3.1	3.0	2.9	2.8	2.7				
2/200 x 63	hySPAN	4.0	3.9	3.7	3.7	3.6	3.5	3.7	3.6	3.5	3.5	3.4	3.3				
2/240 x 45	hySPAN	4.2	4.1	3.9	3.9	3.7 ■	3.6 ■	3.9	3.7 ■	3.6 ■	3.6 ■	3.4 ■	3.4 ■				
240 x 90	hyONE	4.4	4.2	4.1	4.1 ■	4.0 ■	3.9 ■	4.1 ■	4.0 ■	3.9 ■	3.9 ■	3.8 ■	3.7 ■				
300 x 63	hySPAN	4.6 ■	4.4 ■	4.2 ■	#	#	#	#	#	#	#	#	#				
300 x 90	hy90	4.6	4.4	4.0	3.9	3.7 ■	3.6 ■	3.9	3.7 ■	3.6 ■	3.5 ■	3.4 ■	3.4 ■				
2/300 x 45	hySPAN	5.0	4.8	4.6 ■	4.5 ■	4.3 ■	4.2 ■	4.5 ■	4.3 ■	4.2 ■	4.2 ■	4.1 ■	3.9 ■				
300 x 90	hyONE	-	-	-	-	4.7 ■	4.6 ■	-	4.7 ■	4.6 ■	#	#	#				
2/300 x 63	hySPAN	5.4	5.2	5.0	5.1	4.9	4.8	5.1	4.9	4.8	4.8 ■	4.7 ■	4.6 ■				

- Indicates 45 mm required bearing at end supports and 135 mm required bearing at intermediate supports
- # Indicates bearing requirement is greater than the above. See designIT® for houses software for span and bearing information
- Bearing requirements as for NZS 3604 except where indicated otherwise
- Where joists are loaded into sides of bearers, double sections built up by vertical lamination (see page 15 section 5.4)

Design Deflection Limits:

DL. SPAN/300 OR 12 mm  
LL. SPAN/360 OR 9 mm

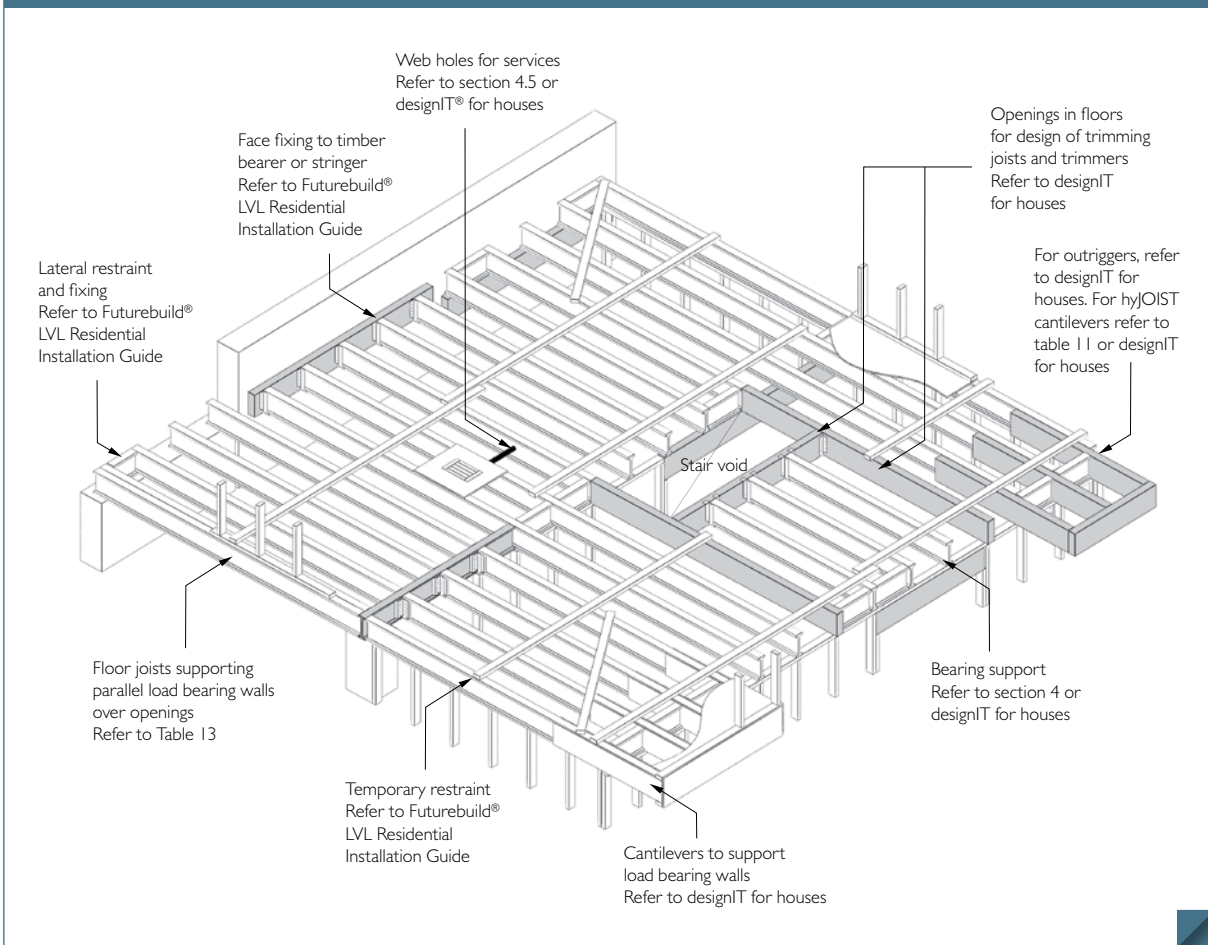
TABLE 10 CONTINUED: BEARERS – SUPPORTING TWO STOREY LOAD BEARING WALLS

		Heavy Roof & Ceiling											
		Ground Floor Load Width 'FLW' (m)											
		1.5						3.0					
Section D x B (mm)	Product	First Floor Load Width 'FLW' (m)											
		1.5			3.0			1.5			3.0		
		Roof Load Width 'RLW' (m)											
		2.4	4.5	6.6	2.4	4.5	6.6	2.4	4.5	6.6	2.4	4.5	6.6
		Maximum Single Span (m)											
2/90 x 45	hyCHORD®	1.1	1.0	0.9	1.0	0.9	0.9	1.0	0.9	0.9	1.0	0.9	0.8
150 x 63	hySPAN®	1.7	1.6	1.5	1.6	1.5	1.4	1.6	1.5	1.4	1.5	1.4	1.3
150 x 90	hy90°	1.7	1.6	1.5	1.6	1.5	1.4	1.6	1.5	1.4	1.5	1.4	1.3
2/150 x 45	hySPAN	1.9	1.8	1.6	1.8	1.7	1.6	1.8	1.7	1.6	1.7	1.6	1.5
2/170 x 45	hySPAN	2.2	2.0	1.9	2.0	1.9	1.8	2.0	1.9	1.8	1.9	1.8	1.7
200 x 63	hySPAN	2.3	2.1	1.9	2.1	2.0	1.9	2.1	2.0	1.9	2.0	1.9	1.8
200 x 90	hy90	2.3	2.1	1.9	2.1	2.0	1.9	2.1	2.0	1.9	2.0	1.9	1.8
2/200 x 45	hySPAN	2.6	2.4	2.2	2.4	2.2	2.1	2.4	2.2	2.1	2.2	2.1	2.0
240 x 63	hySPAN	2.8	2.5	2.3	2.6	2.4	#	2.6	2.4	#	2.4	#	#
240 x 90	hy90	2.8	2.5	2.3	2.6	2.4	2.2	2.6	2.4	2.2	2.4	2.2	2.1
2/200 x 63	hySPAN	2.9	2.6	2.4	2.7	2.5	2.3	2.7	2.5	2.3	2.5	2.4	2.2
2/240 x 45	hySPAN	3.1	2.8	2.6	2.9	2.7	2.5	2.9	2.7	2.5	2.7	2.5	2.4
240 x 90	hyONE®	3.3	3.0	2.8	3.0	2.8	2.6	3.0	2.8	2.6	2.9	2.7	2.5
300 x 63	hySPAN	3.4	#	#	#	#	#	#	#	#	#	#	#
300 x 90	hy90	3.4	3.1	2.9	3.2	3.0	2.8	3.2	3.0	2.8	3.0	2.8	#
2/300 x 45	hySPAN	3.8	3.5	3.3	3.6	3.3	#	3.6	3.3	#	3.4	#	#
300 x 90	hyONE	4.0	3.7	#	3.7	3.5	#	3.7	3.5	#	#	#	#
		Maximum Continuous Span (m)											
2/90 x 45	hyCHORD	1.5	1.3	1.2	1.4	1.3	1.1	1.4	1.3	1.1	1.3	1.2	1.0
150 x 63	hySPAN	2.3	2.1	1.9	2.0	1.9	1.7	2.0	1.9	1.7	1.9	1.7	1.5
150 x 90	hy90	2.3	2.0	1.8	1.9	1.8	1.7	1.9	1.8	1.7	1.8	1.7	1.5
2/150 x 45	hySPAN	2.6	2.4	2.2	2.4	2.2	2.1	2.4	2.2	2.1	2.3	2.1	1.9
2/170 x 45	hySPAN	2.9	2.7	2.5	2.7	2.5	2.4	2.7	2.5	2.4	2.6	2.4	2.2
200 x 90	hy90	3.0	2.6	2.3	2.6	2.3	2.2	2.6	2.3	2.2	2.3	2.2	2.0
200 x 63	hySPAN	3.1	2.7 <sup>■</sup>	2.4 <sup>■</sup>	2.7 <sup>■</sup>	2.4 <sup>■</sup>	2.2 <sup>■</sup>	2.7 <sup>■</sup>	2.4 <sup>■</sup>	2.2 <sup>■</sup>	2.5 <sup>■</sup>	2.3 <sup>■</sup>	2.0 <sup>■</sup>
2/200 x 45	hySPAN	3.5	3.2	2.9	3.2	3.0	2.7 <sup>■</sup>	3.2	3.0	2.7 <sup>■</sup>	2.9	2.7 <sup>■</sup>	2.6 <sup>■</sup>
240 x 90	hy90	3.5	3.1	2.7	3.0	2.8	2.6 <sup>■</sup>	3.0	2.8	2.6 <sup>■</sup>	2.7	2.6	2.4 <sup>■</sup>
240 x 63	hySPAN	3.7 <sup>■</sup>	3.3 <sup>■</sup>	2.9 <sup>■</sup>	3.1 <sup>■</sup>	3.0 <sup>■</sup>	#	3.1 <sup>■</sup>	3.0 <sup>■</sup>	#	2.9 <sup>■</sup>	#	#
2/200 x 63	hySPAN	3.8	3.5	3.3	3.6	3.3	3.1	3.6	3.3	3.1	3.4	3.2	3.0
2/240 x 45	hySPAN	4.0	3.7	3.4 <sup>■</sup>	3.7 <sup>■</sup>	3.5 <sup>■</sup>	3.2 <sup>■</sup>	3.7 <sup>■</sup>	3.5 <sup>■</sup>	3.2 <sup>■</sup>	3.4 <sup>■</sup>	3.2 <sup>■</sup>	3.0 <sup>■</sup>
240 x 90	hyONE	4.2	3.9 <sup>■</sup>	3.7 <sup>■</sup>	3.9 <sup>■</sup>	3.7 <sup>■</sup>	3.5 <sup>■</sup>	3.9 <sup>■</sup>	3.7 <sup>■</sup>	3.5 <sup>■</sup>	3.8 <sup>■</sup>	3.6 <sup>■</sup>	#
300 x 63	hySPAN	4.3 <sup>■</sup>	#	#	#	#	#	#	#	#	#	#	#
300 x 90	hy90	4.3	3.7 <sup>■</sup>	3.3 <sup>■</sup>	3.7 <sup>■</sup>	3.5 <sup>■</sup>	3.1 <sup>■</sup>	3.7 <sup>■</sup>	3.5 <sup>■</sup>	3.1 <sup>■</sup>	3.4 <sup>■</sup>	3.2 <sup>■</sup>	3.0 <sup>■</sup>
2/300 x 45	hySPAN	4.7	4.3 <sup>■</sup>	4.0 <sup>■</sup>	4.3 <sup>■</sup>	4.0 <sup>■</sup>	#	4.3 <sup>■</sup>	4.0 <sup>■</sup>	#	4.1 <sup>■</sup>	#	#
300 x 90	hyONE	-	4.6 <sup>■</sup>	#	4.7 <sup>■</sup>	#	#	4.7 <sup>■</sup>	#	#	#	#	#

- Indicates 45 mm required bearing at end supports and 135 mm required bearing at intermediate supports
- # Indicates bearing requirement is greater than the above. See designIT® for houses software for span and bearing information
- Bearing requirements as for NZS 3604 except where indicated otherwise
- Where joists are loaded into sides of bearers, double sections built up by vertical lamination (see page 15 section 5.4)

## 7.2 FLOOR JOISTS

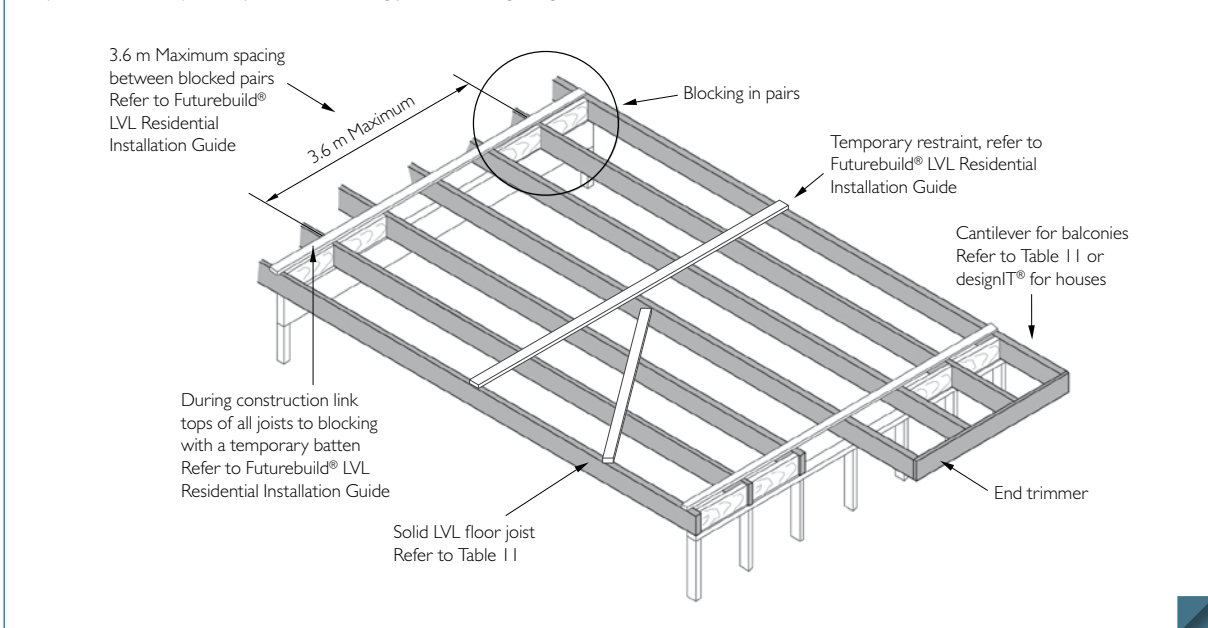
**Figure 16: Typical hyJOIST® Floor Layout**



- Refer to designIT® for houses software for floor design guidance

**Figure 17: Solid LVL Floor Joist Blocking or Lateral Support Requirements**

Joists should have intermittent blocking at supports as shown below. During construction, provide a temporary batten connecting the top of the blocked joists to the other joists to prevent them rolling prior to flooring being fixed.



Design Deflection Limits:

DL	L.L	Dynamic Criteria
SPAN/300	SPAN/360	2 mm/1 kN
OR 15 mm	OR 9 mm	

TABLE 11: FLOOR JOISTS

Floor Joists Section D x B (mm)	Product	Cross Section	Max hole diameter, i (mm)	Floor Joist Spacings (mm)							
				300		400		450		600	
				Maximum Single Span and Overhang 'O/H' (m)							
				Span	O/H	Span	O/H	Span	O/H	Span	O/H
90 x 45	hyCHORD®		20	2.0	0.5	1.7	0.4	1.6	0.4	1.6	0.3
140 x 45	hyCHORD		35	3.6	0.9	2.8	0.8	2.7	0.8	2.6	0.7
150 x 45	hySPAN®		35	4.0	1.0	3.3	0.9	3.1	0.9	3.0	0.8
170 x 45	hySPAN		40	4.4	1.2	3.8	1.1	3.6	1.0	3.4	0.9
HJ200 45	hyJOIST®		112	4.5	1.2	3.8	1.1	3.5	1.0	3.3	0.9
190 x 45	hyCHORD		44	4.6	1.2	4.1	1.1	3.8	1.1	3.6	1.0
200 x 45	hySPAN		50	5.0	1.4	4.6	1.2	4.4	1.2	4.1	1.1
HJ240 63	hyJOIST		152	5.4	1.5	5.0	1.4	4.9	1.3	4.5	1.2
240 x 45	hySPAN		50	5.7	1.6	5.3	1.5	5.1	1.4	4.8	1.3
HJ240 90	hyJOIST		152	6.0	1.7	5.6	1.5	5.4	1.5	5.0	1.4
HJ300 63	hyJOIST		212	6.2	1.7	5.7	1.6	5.5	1.5	5.1	1.4
300 x 45	hySPAN		50	6.7	1.9	6.3	1.8	6.1	1.7	5.7	1.6
HJ300 90	hyJOIST		212	6.8	1.9	6.3	1.8	6.1	1.7	5.7	1.6
HJ360 63	hyJOIST		272	6.9	1.9	6.4	1.8	6.2	1.7	5.7	1.6
HJ360 90	hyJOIST		272	7.6	2.1	7.0	2.0	6.8	1.9	6.3	1.8
360 x 45	hySPAN		50	7.7	2.2	7.2	2.0	7.0	2.0	6.5	1.8
HJ400 90	hyJOIST		312	8.1	2.3	7.5	2.1	7.2	2.0	6.7	1.9
400 x 45	hySPAN		50	8.3	2.4	7.8	2.2	7.5	2.1	7.0	2.0
Maximum Continuous Span and Overhang 'O/H' (m)											
90 x 45	hyCHORD		20	2.7	0.5	2.0	0.4	1.9	0.4	1.8	0.3
140 x 45	hyCHORD		35	4.2	0.9	3.5	0.8	3.2	0.8	3.0	0.7
150 x 45	hySPAN		35	4.6	1.0	4.2	0.9	3.8	0.9	3.5	0.8
170 x 45	hySPAN		40	5.1	1.1	4.8	1.0	4.4	1.0	4.0	0.9
HJ200 45	hyJOIST		112	5.1	1.2	4.7	1.0	4.3	1.0	3.9	0.9
190 x 45	hyCHORD		44	-	-	-	-	4.7	1.1	4.3	1.0
200 x 45	hySPAN		50	5.8	1.4	5.4	1.2	5.2	1.2	4.8	1.1
HJ240 63	hyJOIST		152	6.2	1.5	5.7	1.4	5.5	1.3	5.1	1.2
240 x 45	hySPAN		50	6.6	1.6	6.2	1.5	6.0	1.4	5.6	1.3
HJ240 90	hyJOIST		152	6.8	1.7	6.3	1.5	6.1	1.5	5.6	1.4
HJ300 63	hyJOIST		212	7.0	1.7	6.5	1.6	6.3	1.5	5.8	1.4
300 x 45	hySPAN		50	7.8	1.9	7.3	1.8	7.1	1.7	6.6	1.6
HJ300 90	hyJOIST		212	7.8	1.9	7.2	1.8	7.0	1.7	6.4	1.6
HJ360 63	hyJOIST		272	7.8	1.9	7.2	1.8	6.9	1.7	6.1	1.6
HJ360 90	hyJOIST		272	8.7	2.1	8.0	2.0	7.8	1.9	7.1	1.8
360 x 45	hySPAN		50	-	-	8.3	2.0	8.1	2.0	7.5	1.8
HJ400 90	hyJOIST		312	-	-	8.4	2.1	8.0	2.0	7.2	1.9
400 x 45	hySPAN		50	-	-	-	-	-	-	8.2	2.0

- Refer to section 6.3 or designIT® for houses software for permitted hole sizes and locations
- For solid LVL sections bearing at end supports as for NZS 3604, bearing at intermediate supports 60 mm minimum. For hyJOIST design considerations, refer to section 4: Design Considerations – hyJOIST
- Joists should be blocked at supports – refer to the Futurebuild LVL Residential Installation Guide.

**TABLE 12 FLOOR JOISTS – HEAVY FLOOR**

Tiled floors and heavy furniture may result in floor joists which have not been designed for these loads, deflecting excessively in the long term. The following tables should therefore be used where the loads from floor coverings or furniture are likely to exceed 50 kg/m but are not greater than 100 kg/m<sup>2</sup>. For other loading options consult designIT® for Houses.

**Design Deflection Limits:**

D.L.	LL	Dynamic Criteria
SPAN/300	SPAN/360	2 mm/1 kN
OR 15 mm	OR 9 mm	

Section D x B (mm)	Product	Cross Section	Max hole diameter, (mm)	Floor Joist Spacings (mm)			
				300	400	450	600
<b>Maximum Single Span (m)</b>							
90 x 45	hyCHORD®	█	20	2.0	1.7	1.6	1.6
140 x 45	hyCHORD	█	35	3.1	2.8	2.7	2.5
150 x 45	hySPAN®	█	35	3.5	3.2	3.1	2.8
170 x 45	hySPAN	█	40	4.0	3.6	3.5	3.2
HJ200 45	hyJOIST®	I	112	4.1	3.7	3.5	3.2
190 x 45	hyCHORD	█	44	4.2	3.8	3.7	3.4
200 x 45	hySPAN	█	50	4.6	4.3	4.1	3.8
HJ240 63	hyJOIST	I	152	5.0	4.7	4.5	4.1
240 x 45	hySPAN	█	50	5.3	4.9	4.8	4.5
HJ240 90	hyJOIST	I	152	5.5	5.2	5.0	4.7
HJ300 63	hyJOIST	I	212	5.7	5.3	5.2	4.8
300 x 45	hySPAN	█	50	6.2	5.8	5.6	5.3
HJ300 90	hyJOIST	I	212	6.3	5.9	5.7	5.3
HJ360 63	hyJOIST	I	272	6.4	5.9	5.7	5.3
360 x 45	hySPAN	█	50	7.0	6.6	6.4	6.0
HJ360 90	hyJOIST	I	272	7.0	6.5	6.3	5.9
HJ400 90	hyJOIST	I	312	7.4	6.9	6.7	6.3
400 x 45	hySPAN	█	50	7.6	7.1	6.9	6.5
<b>Maximum Continuous Span (m)</b>							
90 x 45	hyCHORD	█	20	2.5	2.0	1.9	1.8
140 x 45	hyCHORD	█	35	3.9	3.5	3.2	3.0
150 x 45	hySPAN	█	35	4.4	4.0	3.8	3.5
170 x 45	hySPAN	█	40	4.9	4.5	4.4	4.0
HJ200 45	hyJOIST	I	112	4.9	4.5	4.3	3.3
190 x 45	hyCHORD	█	44	-	4.7	4.6	4.2
200 x 45	hySPAN	█	50	5.5	5.1	5.0	4.6
HJ240 63	hyJOIST	I	152	5.8	5.4	5.2	4.3
240 x 45	hySPAN	█	50	6.2	5.8	5.7	5.3
HJ240 90	hyJOIST	I	152	6.4	6.0	5.8	5.3
HJ300 63	hyJOIST	I	212	6.6	6.1	5.9	5.4
300 x 45	hySPAN	█	50	7.3	6.9	6.7	6.3
HJ300 90	hyJOIST	I	212	7.3	6.8	6.6	6.1
HJ360 63	hyJOIST	I	272	7.3	6.8	6.5	5.8
HJ360 90	hyJOIST	I	272	8.1	7.5	7.3	6.6 ■
360 x 45	hySPAN	█	50	8.3	7.8	7.6	7.2
HJ400 90	hyJOIST	I	312	8.6	8.0	7.7	6.6 ■
400 x 45	hySPAN	█	50	-	8.5	8.2	7.7

- Indicates 90 mm required bearing at intermediate supports
- Refer to section 6.3 or designIT® for houses software for permitted hole sizes and locations
- Bearing at end supports as for NZS 3604, bearing at intermediate supports 60 mm minimum except where indicated otherwise
- Joists should be blocked at supports – refer to the Futurebuild LVL Residential Installation Guide for detailing

Design Deflection Limits:

DL	LL
SPAN/300	SPAN/360
OR 15 mm	OR 9 mm

**TABLE 13: FLOOR JOISTS – SUPPORTING PARALLEL LOAD BEARING WALLS OVER OPENINGS**

Floor joists supporting parallel load bearing walls over large spans are likely to deflect excessively even if the 'rule of thumb' practice of doubling joists is followed. The following tables give maximum spans for double joists for various roof loads. Roof load width may be determined by reference to the diagrams in section 6.6 Determination of Roof Load Width.

This table allows for the mass of lightweight claddings/linings such as horizontal boards or planks and sheet materials (plywood or plasterboard) to be partially offset by their contribution to overall wall stiffness.

Section D x B (mm)	Product	Cross Section	Light Roof & Ceiling								
			Roof Load Width 'RLW' (m)								
			1.2	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6
			Maximum Single Span (m)								
2/90 x 45	hyCHORD®	■	1.9	1.7	1.6	1.5	1.5	1.4	1.4	1.4	1.3
2/140 x 45	hyCHORD	■	2.9	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.0
150 x 90	hy90®	■	2.9	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.1
2/150 x 45	hySPAN®	■	3.3	2.9	2.8	2.7	2.6	2.5	2.4	2.4	2.3
2/170 x 45	hySPAN	■	3.7	3.3	3.2	3.0	2.9	2.9	2.8	2.7	2.6
2/HJ200 45	hyJOIST®	I	3.8	3.3	3.1	3.0	2.8	2.5	2.3	2.1	1.9
200 x 90	hy90	■	3.8	3.5	3.3	3.2	3.1	3.0	2.9	2.8	2.8
2/190 x 45	hyCHORD	■	3.9	3.5	3.3	3.2	3.1	3.0	2.9	2.8	2.8
HJ240 90	hyJOIST	I	4.3	3.8	3.3	2.8	2.5	2.2	2.0	1.8	1.6
2/200 x 45	hySPAN	■	4.3	3.9	3.7	3.6	3.5	3.3	3.3	3.2	3.1
240 x 90	hy90	■	4.6	4.1	4.0	3.8	3.7	3.6	3.5	3.4	3.3
2/HJ240 63	hyJOIST	I	4.7	4.3	4.0	3.9	3.7	3.3	3.0	2.7	2.5
HJ300 90	hyJOIST	I	5.0	4.5 ■	3.8 ■	3.3 ■	2.9 ■	2.6 ■	2.3 ■	2.1 ■	1.9 ■
2/240 x 45	hySPAN	■	5.0	4.6	4.4	4.3	4.1	4.0	3.9	3.8	3.7
240 x 90	hyONE	■	5.2	4.8	4.7	4.5	4.4	4.2	4.1	4.0	3.9
2/HJ300 63	hyJOIST	I	5.4	4.9	4.7	4.6	4.4	4.3	3.9	3.4	3.1
300 x 90	hy90	■	5.4	5.0	4.8	4.7	4.6	4.4	4.3	4.2	4.1 ■
HJ360 90	hyJOIST	I	5.5	4.6 ■	3.8 ■	3.3 ■	2.9 ■	2.6 ■	2.3 ■	2.0 ■	1.8 ■
2/300 x 45	hySPAN	■	5.8	5.4	5.2	5.1	5.0	4.9	4.8	4.7 ■	4.6 ■
HJ400 90	hyJOIST	I	5.9	4.6 ■	3.8 ■	3.3 ■	2.9 ■	2.6 ■	2.2 ■	2.0 ■	1.8 ■
2/HJ360 63	hyJOIST	I	6.0	5.5	5.3	5.1	4.9 ■	4.8 ■	4.3 ■	3.9 ■	3.6 ■
360 x 90	hy90	■	6.1	5.7	5.5	5.3	5.2	5.1	5.0 ■	4.9 ■	4.8 ■
300 x 90	hyONE	■	6.1	5.7	5.5	5.3	5.2	5.1	5.0 ■	4.9 ■	4.8 ■
2/360 x 45	hySPAN	■	6.7	6.2	6.0	5.8	5.7	5.6 ■	5.4 ■	5.3 ■	5.2 ■
400 x 90	hy90	■	6.6	6.1	5.9	5.8	5.6	5.5 ■	5.4 ■	5.3 ■	5.2 ■
360 x 90	hyONE®	■	7.0	6.5	6.3	6.1	5.9	5.8 ■	5.7 ■	5.6 ■	5.5 ■
2/400 x 45	hySPAN	■	7.2	6.7	6.5	6.3	6.1 ■	6.0 ■	5.9 ■	5.8 ■	5.7 ■

- Indicates minimum bearing at end supports = 45 mm
- Bearing at end supports as for NZS 3604 except where indicated otherwise

Design Deflection Limits:

D.L.	L.L.
SPAN/300	SPAN/360
OR 15 mm	OR 9 mm

**TABLE 13 CONTINUED: FLOOR JOISTS – SUPPORTING PARALLEL LOAD BEARING WALLS OVER OPENINGS**

















Section D x B (mm)	Product	Cross Section	Light Roof & Ceiling								
			Roof Load Width 'RLW' (m)								
			1.2	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6
Maximum Continuous Span (m)											
2/90 x 45	hyCHORD®	█	2.5	2.2	2.1	2.0	2.0	1.9	1.9	1.8	1.8
2/140 x 45	hyCHORD	█	3.8	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.6
150 x 90	hy90°	█	3.9	3.5	3.3	3.2	3.1	2.9	2.7	2.6	2.5
2/150 x 45	hySPAN®	█	4.4	3.9	3.7	3.6	3.5	3.4	3.3	3.2	3.1
2/HJ200 45	hyJOIST®	I	4.8	3.6	2.9	2.6	2.3	2.0	1.8	1.7	1.5
2/170 x 45	hySPAN	█	4.8	4.4	4.2	4.1	3.9	3.8	3.7	3.6	3.5
200 x 90	hy90	█	-	4.6	4.4	4.3	4.0	3.8	3.6	3.5	3.3
2/190 x 45	hyCHORD	█	-	4.6	4.5	4.3	4.1	4.0	3.9	3.7	3.5
HJ240 90	hyJOIST	I	5.2	3.0	2.5	2.3	2.0	1.8	1.6	1.5	1.3
2/200 x 45	hySPAN	█	5.4	5.0	4.9	4.7	4.6	4.5	4.4	4.2	4.1
240 x 90	hy90	█	-	-	-	-	4.7	4.5	4.3	4.0	3.9
2/HJ240 63	hyJOIST	I	5.7	4.5	3.7	3.2	2.8	2.7	2.4	2.2	2.0
HJ300 90	hyJOIST	I	5.9 <sup>■</sup>	3.5 <sup>■</sup>	2.9 <sup>■</sup>	2.7 <sup>■</sup>	2.3 <sup>■</sup>	2.1 <sup>■</sup>	1.9 <sup>■</sup>	1.7 <sup>■</sup>	1.6 <sup>■</sup>
HJ360 90	hyJOIST	I	6.1 <sup>■</sup>	3.5 <sup>■</sup>	2.9 <sup>■</sup>	2.7 <sup>■</sup>	2.3 <sup>■</sup>	2.1 <sup>■</sup>	1.9 <sup>■</sup>	1.7 <sup>■</sup>	1.6 <sup>■</sup>
HJ400 90	hyJOIST	I	6.1 <sup>■</sup>	3.5 <sup>■</sup>	2.9 <sup>■</sup>	2.7 <sup>■</sup>	2.3 <sup>■</sup>	2.1 <sup>■</sup>	1.9 <sup>■</sup>	1.7 <sup>■</sup>	1.6 <sup>■</sup>
2/240 x 45	hySPAN	█	6.1	5.7	5.5	5.4	5.3	5.1	5.0	4.8 <sup>■</sup>	4.6 <sup>■</sup>
2/HJ300 63	hyJOIST	I	6.5	5.9	4.9	4.2	3.7	3.6	3.2	2.9	2.7
2/HJ360 63	hyJOIST	I	7.2	6.5 <sup>■</sup>	5.8 <sup>■</sup>	4.9 <sup>■</sup>	4.3 <sup>■</sup>	4.1 <sup>■</sup>	3.7 <sup>■</sup>	3.4 <sup>■</sup>	3.1 <sup>■</sup>
2/300 x 45	hySPAN	█	7.3	6.7	6.5	6.4	6.2	6.0 <sup>■</sup>	5.7 <sup>■</sup>	5.5 <sup>■</sup>	5.3 <sup>■</sup>
2/360 x 45	hySPAN	█	8.3	7.7	7.5	7.2 <sup>■</sup>	6.8 <sup>■</sup>	6.5 <sup>■</sup>	6.3 <sup>■</sup>	6.1 <sup>■</sup>	5.8 <sup>■</sup>
2/400 x 45	hySPAN	█	8.9	8.2	7.8	7.4 <sup>■</sup>	7.0 <sup>■</sup>	6.8 <sup>■</sup>	6.5 <sup>■</sup>	6.4 <sup>■</sup>	6.2 <sup>❖</sup>

- Indicates minimum bearing at intermediate supports = 90 mm
- ❖ Indicates minimum bearing at end supports = 45 mm and intermediate supports = 135 mm
- Minimum bearing at end supports as per NZS 3604 & intermediate supports = 60 mm, unless otherwise indicated

Design Deflection Limits:

DL	LL
SPAN/300	SPAN/360
OR 15 mm	OR 9 mm

**TABLE 13 CONTINUED: FLOOR JOISTS – SUPPORTING PARALLEL LOAD BEARING WALLS OVER OPENINGS**

Section D x B (mm)	Product	Cross Section	Heavy Roof & Ceiling								
			Roof Load Width 'RLW' (m)								
			1.2	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6
			Maximum Single Span (m)								
2/90 x 45	hyCHORD®		1.6	1.4	1.3	1.2	1.2	1.2	1.1	1.1	1.0
2/140 x 45	hyCHORD		2.5	2.2	2.0	1.9	1.9	1.8	1.7	1.7	1.6
150 x 90	hy90®		2.5	2.2	2.1	2.0	1.9	1.8	1.8	1.7	1.7
2/150 x 45	hySPAN®		2.9	2.4	2.3	2.2	2.1	2.0	2.0	1.9	1.9
2/170 x 45	hySPAN		3.2	2.8	2.6	2.5	2.4	2.3	2.2	2.2	2.1
2/HJ200 45	hyJOIST®		3.2	2.7	2.5	2.3	2.0	1.8	1.6	1.4	1.3
200 x 90	hy90		3.4	2.9	2.7	2.6	2.5	2.4	2.3	2.3	2.2
2/190 x 45	hyCHORD		3.4	2.9	2.8	2.6	2.5	2.4	2.3	2.3	2.2
HJ240 90	hyJOIST		3.7	2.8	2.3	2.0	1.7	1.5	1.4	1.3	1.2
2/200 x 45	hySPAN		3.8	3.3	3.1	2.9	2.8	2.7	2.6	2.5	2.5
240 x 90	hy90		4.0	3.5	3.3	3.1	3.0	2.9	2.8	2.7	2.6
2/HJ240 63	hyJOIST		4.1	3.4	3.2	3.0	2.6	2.3	2.1	1.9	1.7
HJ300 90	hyJOIST		4.4 <sup>■</sup>	3.3 <sup>■</sup>	2.7 <sup>■</sup>	2.3 <sup>■</sup>	2.0 <sup>■</sup>	1.8 <sup>■</sup>	1.6 <sup>■</sup>	1.5 <sup>■</sup>	1.3 <sup>■</sup>
2/240 x 45	hySPAN		4.5	3.9	3.7	3.5	3.4	3.2	3.1	3.0	3.0
240 x 90	hyONE		4.7	4.1	3.9	3.7	3.6	3.4	3.3	3.2	3.1 <sup>■</sup>
2/HJ300 63	hyJOIST		4.8	4.1	3.8	3.6	3.4	3.1	2.8	2.5	2.3
300 x 90	hy90		4.9	4.3	4.1	3.9	3.7	3.6	3.5	3.4 <sup>■</sup>	3.3 <sup>■</sup>
HJ360 90	hyJOIST		4.9 <sup>■</sup>	3.3 <sup>■</sup>	2.7 <sup>■</sup>	2.3 <sup>■</sup>	2.0 <sup>■</sup>	1.8 <sup>■</sup>	1.6 <sup>■</sup>	1.5 <sup>■</sup>	1.3 <sup>■</sup>
HJ400 90	hyJOIST		5.2 <sup>■</sup>	3.3 <sup>■</sup>	2.8 <sup>■</sup>	2.3 <sup>■</sup>	2.0 <sup>■</sup>	1.8 <sup>■</sup>	1.6 <sup>■</sup>	1.5 <sup>■</sup>	1.3 <sup>■</sup>
2/300 x 45	hySPAN		5.3	4.8	4.6	4.4	4.2	4.0	3.9 <sup>■</sup>	3.8 <sup>■</sup>	3.7 <sup>■</sup>
2/HJ360 63	hyJOIST		5.4	4.7	4.5	4.2 <sup>■</sup>	4.0 <sup>■</sup>	3.6 <sup>■</sup>	3.2 <sup>■</sup>	2.9 <sup>■</sup>	2.7 <sup>■</sup>
360 x 90	hy90		5.6	5.0	4.8	4.6	4.5	4.3 <sup>■</sup>	4.2 <sup>■</sup>	4.1 <sup>■</sup>	3.9 <sup>■</sup>
300 x 90	hyONE®		5.6	5.0	4.8	4.6	4.4	4.3 <sup>■</sup>	4.1 <sup>■</sup>	4.0 <sup>■</sup>	3.9 <sup>■</sup>
400 x 90	hy90		6.0	5.4	5.2	5.0	4.8 <sup>■</sup>	4.7 <sup>■</sup>	4.6 <sup>■</sup>	4.5 <sup>■</sup>	4.4 <sup>◇</sup>
2/360 x 45	hySPAN		6.1	5.4	5.2	5.0	4.9 <sup>■</sup>	4.8 <sup>■</sup>	4.6 <sup>■</sup>	4.5 <sup>■</sup>	4.4 <sup>◇</sup>
360 x 90	hyONE		6.3	5.7	5.5	5.3 <sup>■</sup>	5.1 <sup>■</sup>	5.0 <sup>■</sup>	4.8 <sup>■</sup>	4.7 <sup>◇</sup>	4.6 <sup>◇</sup>
2/400 x 45	hySPAN		6.6	5.9	5.6	5.5 <sup>■</sup>	5.3 <sup>■</sup>	5.1 <sup>■</sup>	5.0 <sup>■</sup>	4.9 <sup>◇</sup>	4.8 <sup>◇</sup>

- Indicates minimum bearing at end supports = 45 mm
- ◇ Indicates minimum bearing at end supports = 60 mm
- Bearing at end supports as per NZS 3604 except where indicated otherwise

Design Deflection Limits:

D.L. SPAN/300 OR 15 mm  
L.L. SPAN/360 OR 9 mm

TABLE 13 CONTINUED: FLOOR JOISTS – SUPPORTING PARALLEL LOAD BEARING WALLS OVER OPENINGS

Section D x B (mm)	Product	Cross Section	Heavy Roof & Ceiling								
			Roof Load Width 'RLW' (m)								
			1.2	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6
Maximum Continuous Span (m)											
2/90 x 45	hyCHORD®	■	2.2	1.9	1.8	1.7	1.6	1.5	1.5	1.4	1.4
2/140 x 45	hyCHORD	■	3.4	2.9	2.7	2.6	2.5	2.4	2.3	2.2	2.2
150 x 90	hy90°	■	3.4	2.9	2.8	2.6	2.5	2.4	2.2	2.2	2.1
HJ240 90	hyJOIST®	I	3.7	2.3	1.9	1.6	1.3	1.2	1.1	1.0	0.9
2/150 x 45	hySPAN®	■	3.8	3.3	3.1	3.0	2.8	2.7	2.6	2.6	2.5
2/HJ200 45	hyJOIST	I	4.1	2.6	2.2	1.8	1.6	1.3	1.2	1.1	1.0
HJ360 90	hyJOIST	I	4.3 <sup>■</sup>	2.5 <sup>■</sup>	2.1 <sup>■</sup>	1.9 <sup>■</sup>	1.6 <sup>■</sup>	1.4 <sup>■</sup>	1.3 <sup>■</sup>	1.1 <sup>■</sup>	1.0 <sup>■</sup>
HJ400 90	hyJOIST	I	4.3 <sup>■</sup>	2.5 <sup>■</sup>	2.1 <sup>■</sup>	1.9 <sup>■</sup>	1.6 <sup>■</sup>	1.4 <sup>■</sup>	1.3 <sup>■</sup>	1.2 <sup>■</sup>	1.1 <sup>■</sup>
2/170 x 45	hySPAN	■	4.3	3.7	3.5	3.3	3.2	3.1	3.0	2.9	2.8 <sup>■</sup>
HJ300 90	hyJOIST	I	4.4 <sup>■</sup>	2.7 <sup>■</sup>	2.1 <sup>■</sup>	1.8 <sup>■</sup>	1.5 <sup>■</sup>	1.4 <sup>■</sup>	1.2 <sup>■</sup>	1.1 <sup>■</sup>	1.0 <sup>■</sup>
200 x 90	hy90	■	4.5	3.9	3.7	3.5	3.4	3.1	3.0	2.8	2.7
2/190 x 45	hyCHORD	■	4.5	3.9	3.7	3.5	3.4	3.2	3.1	3.0	3.0 <sup>■</sup>
2/200 x 45	hySPAN	■	4.9	4.4	4.1	3.9	3.8	3.6	3.5 <sup>■</sup>	3.4 <sup>■</sup>	3.3 <sup>■</sup>
2/HJ240 63	hyJOIST	I	5.0	3.4	2.7	2.3	2.0	1.8	1.6	1.4	1.3
240 x 90	hy90	■	5.2	4.6	4.4	4.2	4.0	3.8	3.5 <sup>■</sup>	3.3 <sup>■</sup>	3.2 <sup>■</sup>
2/240 x 45	hySPAN	■	5.6	5.0	4.8	4.7	4.5 <sup>■</sup>	4.4 <sup>■</sup>	4.2 <sup>■</sup>	4.1 <sup>■</sup>	4.0 <sup>■</sup>
2/HJ300 63	hyJOIST	I	5.8	4.3	3.6	3.0	2.6	2.3	2.1	1.9	1.7
240 x 90	hyONE®	■	-	-	-	-	4.7 <sup>■</sup>	4.6 <sup>■</sup>	4.5 <sup>■</sup>	4.3 <sup>❖</sup>	4.2 <sup>❖</sup>
300 x 90	hy90	■	-	-	-	-	-	4.5 <sup>■</sup>	4.3 <sup>■</sup>	4.1 <sup>■</sup>	4.0 <sup>■</sup>
2/HJ360 63	hyJOIST	I	6.4	5.0 <sup>■</sup>	4.2 <sup>■</sup>	3.5 <sup>■</sup>	3.1 <sup>■</sup>	2.7 <sup>■</sup>	2.4 <sup>■</sup>	2.2 <sup>■</sup>	2.0 <sup>■</sup>
2/300 x 45	hySPAN	■	6.6	5.9	5.7 <sup>■</sup>	5.5 <sup>■</sup>	5.3 <sup>■</sup>	5.1 <sup>■</sup>	5.0 <sup>❖</sup>	4.7 <sup>❖</sup>	4.5 <sup>❖</sup>
2/360 x 45	hySPAN	■	7.6	6.8 <sup>■</sup>	6.4 <sup>■</sup>	6.1 <sup>■</sup>	5.9 <sup>■</sup>	5.6 <sup>❖</sup>	5.4 <sup>❖</sup>	5.3 <sup>❖</sup>	5.0 <sup>❖</sup>
2/400 x 45	hySPAN	■	8.2	7.1 <sup>■</sup>	6.7 <sup>■</sup>	6.4 <sup>■</sup>	6.1 <sup>❖</sup>	5.9 <sup>❖</sup>	5.7 <sup>❖</sup>	5.5 <sup>❖</sup>	5.3 <sup>❖</sup>

- Indicates minimum bearing at intermediate supports = 90 mm
- ❖ Indicates minimum bearing at end supports = 45 mm and intermediate supports = 135 mm
- Minimum bearing at end supports as for NZS 3604 & intermediate supports = 60 mm, except where indicated otherwise

### 7.3 WALLS

Design Deflection Limits:

DL	LL
SPAN/300	SPAN/360
OR 10 mm	OR 10 mm

TABLE 14: LINTELS – UPPER/SINGLE STOREY

Section D x B (mm)	Product	Light Roof And Ceiling									
		Roof Load Width 'RLW' (m)									
		1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2
Maximum Span (m)											
90 x 45	hyCHORD®	1.7	1.5	1.3	1.2	1.1	1.1	1.0	1.0	0.9	0.8
2/90 x 45	hyCHORD	2.3	2.0	1.8	1.7	1.5	1.5	1.4	1.3	1.3	1.2
140 x 45	hyCHORD	2.7	2.5	2.4	2.3	2.1	2.0	1.8	1.8	1.7	1.6
150 x 45	hySPAN®	3.0	2.8	2.7	2.5	2.4	2.4	2.3	2.1	2.0	2.0
150 x 63	hySPAN	3.2	3.0	2.9	2.7	2.6	2.5	2.5	2.4	2.4	2.3
2/140 x 45	hyCHORD	3.2	3.0	2.8	2.7	2.6	2.5	2.5	2.4	2.4	2.3
150 x 90	hy90®	3.2	3.0	2.9	2.7	2.6	2.5	2.5	2.4	2.4	2.3
170 x 45	hySPAN	3.3	3.1	2.9	2.8	2.7	2.6	2.5	2.4	2.4	2.4
190 x 45	hyCHORD	3.4	3.2	3.0	2.9	2.8	2.7	2.6	2.5	2.5	2.4
2/150 x 45	hySPAN	3.5	3.3	3.1	3.0	2.9	2.8	2.7	2.6	2.6	2.5
200 x 45	hySPAN	3.7	3.5	3.3	3.1	3.0	2.9	2.8	2.8	2.7	2.6
2/170 x 45	hySPAN	3.8	3.6	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.8
200 x 63	hySPAN	4.0	3.7	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.9
2/190 x 45	hyCHORD	4.0	3.7	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.9
200 x 90	hy90	4.0	3.7	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.9
240 x 45	hySPAN	4.2	4.0	3.8	3.6	3.5	3.3	3.3	3.2	3.1	3.0
2/200 x 45	hySPAN	4.4	4.1	3.9	3.7	3.6	3.5	3.4	3.3	3.2	3.1
240 x 63	hySPAN	4.6	4.3	4.1	3.9	3.7	3.6	3.5	3.4	3.4	3.3
240 x 90	hy90	4.6	4.3	4.0	3.9	3.7	3.6	3.5	3.4	3.4	3.3
2/240 x 45	hySPAN	5.0	4.7	4.5	4.2	4.1	4.0	3.8	3.7	3.7	3.6
300 x 45	hySPAN	5.0	4.8	4.5	4.2	4.1	4.0	3.8	3.7	3.7	3.6 ■
240 x 90	hyONE®	5.2	4.9	4.7	4.5	4.3	4.1	4.0	3.9	3.8	3.7
300 x 90	hy90	5.3	5.0	4.8	4.6	4.5	4.3	4.2	4.1	4.0	3.9
300 x 63	hySPAN	5.4	5.1	4.8	4.6	4.5	4.3	4.2	4.1	4.0	3.9
360 x 45	hySPAN	5.7	5.3	5.1	4.9	4.8	4.6	4.5	4.3	4.2 ■	4.0 ■
2/300 x 45	hySPAN	5.8	5.4	5.2	5.0	4.9	4.8	4.6	4.5	4.4	4.2

- Indicates minimum bearing at end supports = 90 mm
- Minimum bearing at end supports 45 mm, except where indicated otherwise
- Double sections built-up by vertical lamination – see section 5.4

Design Deflection Limits:

D.L.	L.L.
SPAN/300	SPAN/360
OR 10 mm	OR 10 mm

TABLE 14 CONTINUED: LINTELS – UPPER/SINGLE STOREY

Section D x B (mm)	Product	Heavy Roof And Ceiling									
		Roof Load Width 'RLW' (m)									
		1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2
		Maximum Span (m)									
90 x 45	hyCHORD®	1.4	1.3	1.2	1.2	1.1	1.0	1.0	0.9	0.9	0.8
2/90 x 45	hyCHORD	1.7	1.5	1.4	1.4	1.3	1.2	1.2	1.2	1.2	1.1
140 x 45	hyCHORD	2.0	1.8	1.7	1.6	1.5	1.5	1.4	1.4	1.4	1.3
150 x 45	hySPAN®	2.4	2.2	2.0	1.8	1.7	1.7	1.6	1.5	1.5	1.4
150 x 63	hySPAN	2.6	2.4	2.2	2.0	1.9	1.9	1.8	1.7	1.7	1.6
170 x 45	hySPAN	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.7	1.7	1.6
2/140 x 45	hyCHORD	2.6	2.4	2.2	2.0	1.9	1.8	1.8	1.7	1.6	1.6
150 x 90	hy90®	2.6	2.4	2.2	2.0	1.9	1.9	1.8	1.7	1.7	1.6
190 x 45	hyCHORD	2.8	2.6	2.4	2.2	2.1	2.0	1.9	1.8	1.8	1.7
2/150 x 45	hySPAN	2.9	2.6	2.5	2.4	2.2	2.1	2.0	1.9	1.9	1.8
200 x 45	hySPAN	3.0	2.8	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
2/170 x 45	hySPAN	3.2	3.0	2.8	2.6	2.5	2.4	2.3	2.3	2.2	2.1
200 x 63	hySPAN	3.4	3.1	2.9	2.7	2.6	2.5	2.4	2.4	2.3	2.2
2/190 x 45	hyCHORD	3.4	3.1	2.9	2.7	2.6	2.5	2.4	2.4	2.3	2.2
200 x 90	hy90	3.3	3.1	2.9	2.7	2.6	2.5	2.4	2.4	2.3	2.2
240 x 45	hySPAN	3.5	3.3	3.1	2.9	2.8	2.7	2.6	2.5	2.4	2.4
2/200 x 45	hySPAN	3.6	3.4	3.2	3.0	2.9	2.8	2.7	2.6	2.6	2.5
240 x 63	hySPAN	3.8	3.6	3.4	3.2	3.1	3.0	2.9	2.8	2.7	2.6
240 x 90	hy90	3.8	3.6	3.4	3.2	3.1	3.0	2.9	2.8	2.7	2.6
2/240 x 45	hySPAN	4.1	3.8	3.7	3.5	3.4	3.2	3.2	3.1	3.0	2.9
300 x 45	hySPAN	4.1	3.8	3.7	3.5	3.4	3.2	3.1	3.1	3.0	2.9 ■
240 x 90	hyONE®	4.3	4.0	3.8	3.7	3.6	3.4	3.3	3.2	3.1	3.1
300 x 63	hySPAN	4.5	4.2	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2
300 x 90	hy90	4.4	4.2	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2
360 x 45	hySPAN	4.8	4.4	4.2	4.0	3.8	3.8	3.7	3.6	3.5 ■	3.4 ■
2/300 x 45	hySPAN	4.9	4.6	4.3	4.1	4.0	3.8	3.8	3.7	3.6	3.5

- Indicates minimum bearing at end supports = 90 mm
- Minimum bearing at end supports 45 mm, except where indicated otherwise
- Double sections built-up by vertical lamination – see section 5.4

Design Deflection Limits:

DL. SPAN/300 OR 10 mm  
LL. SPAN/360 OR 10 mm

TABLE 15: LINTELS – LOWER STOREY

Section D x B (mm)		Product		Light Roof And Ceiling														
				Floor Load Width 'FLW' (m)														
				1.8			2.4					3.0						
				Roof Load Width 'RLW' (m)														
				1.8	3.0	4.2	5.4	6.6	1.8	3.0	4.2	5.4	6.6	1.8	3.0	4.2	5.4	6.6
				Maximum Span (m)														
90 x 45	hyCHORD®	1.2	1.1	1.1	1.0	1.0	1.1	1.0	1.0	1.0	0.9	1.0	1.0	1.0	0.9	0.9		
2/90 x 45	hyCHORD	1.5	1.4	1.3	1.3	1.3	1.4	1.3	1.3	1.2	1.2	1.3	1.3	1.2	1.2	1.2		
140 x 45	hyCHORD	1.7	1.7	1.6	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.5	1.5	1.4	1.4	1.4		
150 x 45	hySPAN®	2.0	1.9	1.8	1.7	1.7	1.9	1.8	1.7	1.6	1.6	1.8	1.7	1.6	1.6	1.5		
150 x 63	hySPAN	2.2	2.1	2.0	1.9	1.9	2.1	2.0	1.9	1.8	1.8	2.0	1.9	1.8	1.8	1.7		
170 x 45	hySPAN	2.2	2.1	2.0	1.9	1.9	2.1	2.0	1.9	1.9	1.8	2.0	1.9	1.8	1.8	1.7		
2/140 x 45	hyCHORD	2.2	2.1	2.0	1.9	1.9	2.1	2.0	1.9	1.8	1.8	2.0	1.9	1.8	1.8	1.7		
150 x 90	hy90®	2.2	2.1	2.0	1.9	1.9	2.1	2.0	1.9	1.8	1.8	2.0	1.9	1.8	1.8	1.7		
190 x 45	hyCHORD	2.3	2.2	2.1	2.0	2.0	2.2	2.1	2.0	2.0	1.9	2.1	2.0	1.9	1.9	1.8		
2/150 x 45	hySPAN	2.5	2.4	2.3	2.2	2.1	2.3	2.2	2.2	2.1	2.0	2.2	2.1	2.1	2.0	1.9		
200 x 45	hySPAN	2.6	2.5	2.4	2.3	2.2	2.5	2.3	2.3	2.2	2.1	2.3	2.2	2.2	2.1	2.0		
2/170 x 45	hySPAN	2.8	2.7	2.5	2.4	2.4	2.6	2.5	2.4	2.3	2.3	2.5	2.4	2.3	2.3	2.2		
200 x 63	hySPAN	2.9	2.8	2.6	2.5	2.5	2.7	2.6	2.5	2.4	2.4	2.6	2.5	2.4	2.3	2.3		
200 x 90	hy90	2.9	2.8	2.6	2.5	2.5	2.7	2.6	2.5	2.4	2.4	2.6	2.5	2.4	2.3	2.3		
2/190 x 45	hyCHORD	2.9	2.8	2.7	2.6	2.5	2.8	2.6	2.5	2.5	2.4	2.6	2.5	2.4	2.4	2.3		
240 x 45	hySPAN	3.1	3.0	2.8	2.7	2.6	2.9	2.8	2.7	2.6	2.5	2.8	2.7	2.6	2.5	2.4		
2/200 x 45	hySPAN	3.2	3.1	3.0	2.9	2.8	3.1	2.9	2.8	2.7	2.7	2.9	2.8	2.7	2.6	2.6		
240 x 63	hySPAN	3.4	3.2	3.1	3.0	2.9	3.2	3.1	3.0	2.9	2.8	3.1	3.0	2.9	2.8	2.7		
240 x 90	hy90	3.4	3.2	3.1	3.0	2.9	3.2	3.1	3.0	2.9	2.8	3.1	3.0	2.9	2.8	2.7		
300 x 45	hySPAN	3.6	3.5	3.4	3.3	3.2	3.5	3.4	3.3	3.2	3.1	3.3	3.3	3.2	3.1	3.0		
2/240 x 45	hySPAN	3.7	3.5	3.4	3.3	3.2	3.5	3.4	3.3	3.2	3.1	3.4	3.3	3.2	3.1	3.1		
240 x 90	hyONE®	3.8	3.7	3.6	3.5	3.4	3.6	3.5	3.4	3.3	3.3	3.5	3.4	3.3	3.2	3.2		
300 x 63	hySPAN	4.0	3.8	3.7	3.6	3.5	3.8	3.7	3.6	3.5	3.4	3.6	3.5	3.4	3.4	3.3		
300 x 90	hy90	3.9	3.8	3.7	3.6	3.5	3.8	3.7	3.6	3.5	3.4	3.6	3.5	3.4	3.4	3.3		
360 x 45	hySPAN	4.2	4.0	3.9	3.8	3.7	4.0	3.9	3.8	3.7	3.6	3.8	3.7	3.6	3.6	3.5		
2/300 x 45	hySPAN	4.3	4.2	4.0	3.9	3.8	4.1	4.0	3.9	3.8	3.7	4.0	3.9	3.8	3.7	3.6		

- Indicates minimum bearing at end supports = 90 mm
- Minimum bearing at end supports 45 mm, except where indicated otherwise
- Double sections built-up by vertical lamination – see section 5.4

Design Deflection Limits:

DL. SPAN/300 OR 10 mm  
LL. SPAN/360 OR 10 mm

TABLE 15 CONTINUED: LINTELS – LOWER STOREY

Section D x B (mm)	Product	Heavy Roof And Ceiling														
		Floor Load Width 'FLW' (m)														
		1.8					2.4					3.0				
		Roof Load Width 'RLW' (m)														
Maximum Span (m)																
		1.8	3.0	4.2	5.4	6.6	1.8	3.0	4.2	5.4	6.6	1.8	3.0	4.2	5.4	6.6
90 x 45	hyCHORD®	1.1	1.0	0.9	0.9	0.8	1.0	0.9	0.9	0.8	0.8	1.0	0.9	0.9	0.8	0.8
2/90 x 45	hyCHORD	1.4	1.2	1.2	1.1	1.1	1.3	1.2	1.1	1.1	1.0	1.2	1.2	1.1	1.0	1.0
140 x 45	hyCHORD	1.6	1.5	1.4	1.3	1.2	1.5	1.4	1.3	1.3	1.2	1.4	1.4	1.3	1.2	1.2
150 x 45	hySPAN®	1.8	1.7	1.5	1.5	1.4	1.7	1.6	1.5	1.4	1.4	1.6	1.5	1.5	1.4	1.3
150 x 63	hySPAN	2.0	1.8	1.7	1.6	1.6	1.9	1.8	1.7	1.6	1.5	1.8	1.7	1.6	1.5	1.5
170 x 45	hySPAN	2.0	1.9	1.7	1.7	1.6	1.9	1.8	1.7	1.6	1.5	1.9	1.7	1.6	1.6	1.5
2/140 x 45	hyCHORD	2.0	1.8	1.7	1.6	1.6	1.9	1.8	1.7	1.6	1.5	1.8	1.7	1.6	1.5	1.5
150 x 90	hy90®	2.0	1.8	1.7	1.6	1.6	1.9	1.8	1.7	1.6	1.5	1.8	1.7	1.6	1.5	1.5
190 x 45	hyCHORD	2.1	2.0	1.8	1.7	1.7	2.0	1.9	1.8	1.7	1.6	1.9	1.8	1.7	1.6	1.6
2/150 x 45	hySPAN	2.3	2.1	2.0	1.8	1.8	2.2	2.0	1.9	1.8	1.7	2.1	1.9	1.8	1.8	1.7
200 x 45	hySPAN	2.4	2.2	2.1	1.9	1.8	2.3	2.1	2.0	1.9	1.8	2.2	2.0	1.9	1.8	1.8
2/170 x 45	hySPAN	2.6	2.4	2.2	2.1	2.0	2.4	2.3	2.1	2.0	1.9	2.3	2.2	2.1	2.0	1.9
200 x 63	hySPAN	2.7	2.4	2.3	2.2	2.1	2.5	2.4	2.2	2.1	2.0	2.4	2.3	2.2	2.1	2.0
2/190 x 45	hyCHORD	2.7	2.5	2.3	2.2	2.1	2.6	2.4	2.2	2.1	2.0	2.4	2.3	2.2	2.1	2.0
200 x 90	hy90	2.7	2.4	2.3	2.2	2.1	2.5	2.4	2.2	2.1	2.0	2.4	2.3	2.2	2.1	2.0
240 x 45	hySPAN	2.9	2.6	2.5	2.3	2.2	2.7	2.5	2.4	2.3	2.2	2.6	2.4	2.3	2.2	2.1
2/200 x 45	hySPAN	3.0	2.8	2.6	2.4	2.3	2.9	2.7	2.5	2.4	2.3	2.7	2.6	2.4	2.3	2.2
240 x 63	hySPAN	3.1	2.9	2.7	2.6	2.5	3.0	2.8	2.7	2.5	2.4	2.9	2.7	2.6	2.5	2.4
240 x 90	hy90	3.1	2.9	2.7	2.6	2.5	3.0	2.8	2.7	2.5	2.4	2.9	2.7	2.6	2.5	2.4
2/240 x 45	hySPAN	3.4	3.2	3.1	2.9	2.8	3.3	3.1	3.0	2.8	2.7	3.2	3.0	2.9	2.8	2.7
300 x 45	hySPAN	3.4	3.2	3.0	2.9	2.8	3.3	3.1	3.0	2.8	2.7	3.2	3.0	2.9	2.7	2.6
240 x 90	hyONE®	3.6	3.4	3.2	3.1	2.9	3.4	3.3	3.1	3.0	2.9	3.3	3.2	3.0	2.9	2.8
300 x 63	hySPAN	3.7	3.5	3.3	3.2	3.1	3.6	3.4	3.2	3.1	3.0	3.5	3.3	3.2	3.1	2.9
300 x 90	hy90	3.7	3.5	3.3	3.2	3.1	3.6	3.4	3.2	3.1	3.0	3.5	3.3	3.2	3.1	2.9
360 x 45	hySPAN	3.9	3.7	3.5	3.3	3.2	3.8	3.6	3.4	3.3	3.2	3.6	3.5	3.3	3.2	3.1
2/300 x 45	hySPAN	4.0	3.8	3.6	3.5	3.3	3.9	3.7	3.5	3.4	3.3	3.8	3.6	3.5	3.3	3.2

- Indicates minimum bearing at end supports = 90 mm
- Minimum bearing at end supports 45 mm, except where indicated otherwise
- Double sections built-up by vertical lamination – see section 5.4

## 7.4 CEILING JOISTS

Design Deflection Limits:

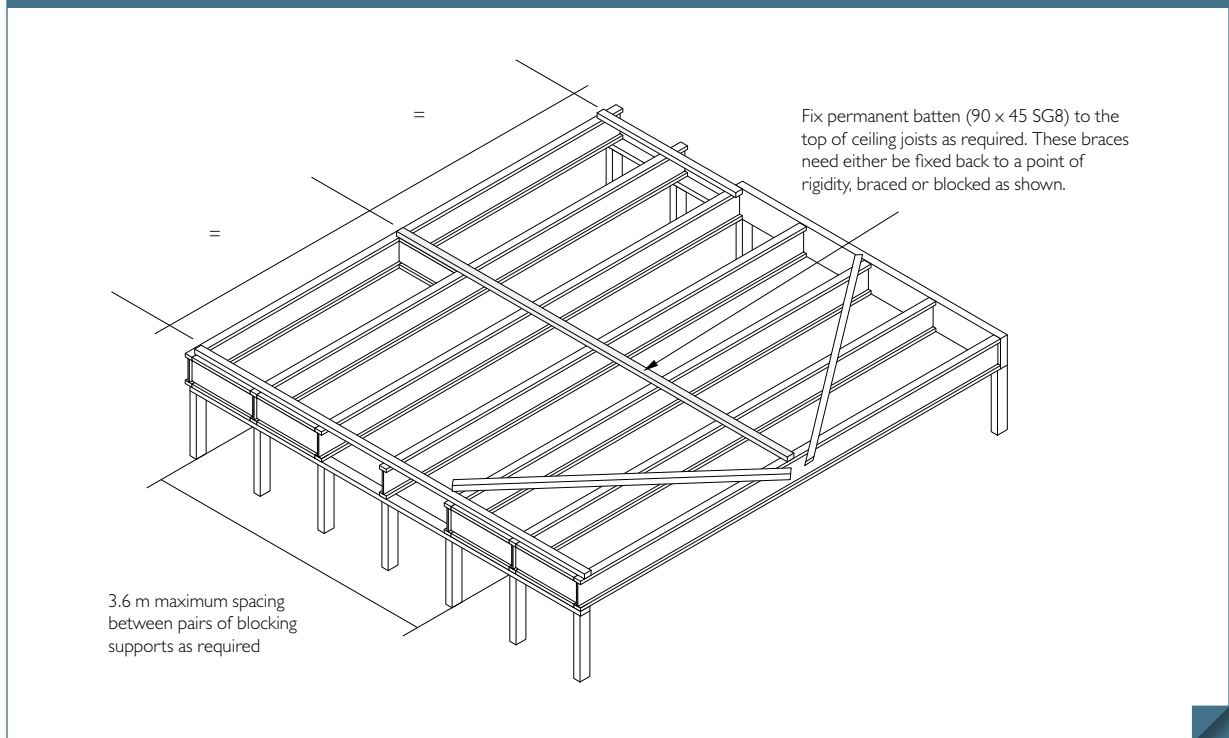
DL  
SPAN/400  
OR 12 mm

TABLE 16: CEILING JOISTS

Section D x B (mm)	Product	Cross Section	Single Span				Continuous Span			
			Joist Spacing (mm)							
			450	600	900	1200	450	600	900	1200
90 x 45	hyCHORD®		2.6	2.6	2.6	2.4	3.0	3.0	3.0	3.0
140 x 45	hyCHORD		4.7 <sup>■</sup>	4.4 <sup>■</sup>	4.0 <sup>■</sup>	3.7 <sup>■</sup>	-	-	-	-
150 x 45	hySPAN®		5.2 <sup>■</sup>	4.9 <sup>■</sup>	4.5 <sup>■</sup>	4.2 <sup>■</sup>	6.4 <sup>■</sup>	6.1 <sup>■</sup>	5.7 <sup>■</sup>	5.4 <sup>■</sup>
170 x 45	hySPAN		5.6 <sup>■</sup>	5.3 <sup>■</sup>	5.0 <sup>■</sup>	4.7 <sup>■</sup>	7.0 <sup>■</sup>	6.7 <sup>■</sup>	6.2 <sup>■</sup>	5.9 <sup>■</sup>
190 x 45	hyCHORD		5.7 <sup>*■</sup>	5.5 <sup>*■</sup>	5.1 <sup>*■</sup>	4.9 <sup>*■</sup>	-	-	-	-
HJ200 45	hyJOIST®		5.8 <sup>■</sup>	5.5 <sup>■</sup>	5.0 <sup>■</sup>	4.8 <sup>■</sup>	6.7 <sup>■</sup>	6.3 <sup>■</sup>	5.8 <sup>■</sup>	5.5 <sup>■</sup>
200 x 45	hySPAN		6.2 <sup>*■</sup>	5.9 <sup>*■</sup>	5.6 <sup>*■</sup>	5.3 <sup>*■</sup>	7.7 <sup>*■</sup>	7.4 <sup>*■</sup>	6.9 <sup>*■</sup>	6.6 <sup>*■</sup>
200 x 63	hySPAN		6.5	6.2	5.9	5.6	8.1	7.8	7.3	7.0
240 x 45	hySPAN		7.0 <sup>*■</sup>	6.7 <sup>*■</sup>	6.3 <sup>*■</sup>	6.0 <sup>*■</sup>	8.7 <sup>*■</sup>	8.3 <sup>*■</sup>	7.8 <sup>*■</sup>	7.4 <sup>*■</sup>
HJ240 63	hyJOIST		7.2 <sup>■</sup>	6.8 <sup>■</sup>	6.3 <sup>■</sup>	5.9 <sup>■</sup>	-	8.4 <sup>■</sup>	7.7 <sup>■</sup>	7.2 <sup>■</sup>
HJ300 63	hyJOIST		7.3 <sup>■</sup>	6.9 <sup>■</sup>	6.3 <sup>■</sup>	6.1 <sup>■</sup>	8.6 <sup>■</sup>	8.1 <sup>■</sup>	7.4 <sup>■</sup>	7.2 <sup>■</sup>
HJ240 90	hyJOIST		7.6 <sup>■</sup>	7.3 <sup>■</sup>	6.8 <sup>■</sup>	6.4 <sup>■</sup>	-	-	8.3 <sup>■</sup>	7.9 <sup>■</sup>
HJ300 90	hyJOIST		8.6 <sup>■</sup>	8.2 <sup>■</sup>	7.7 <sup>■</sup>	7.3 <sup>■</sup>	-	-	-	-

- Indicates that a permanent batten should be fixed at mid span to the top of all joists and braced back to a point of rigidity to prevent roll over under construction and maintenance loads – see figure 18
- \* Indicates ceiling joists not fixed to rafters should be blocked at supports to prevent roll over – see figure 18
- Mass of ceiling lining and battens not to exceed 15 kg/m<sup>2</sup>

Figure 18: Ceiling Joists (hySPAN® similar showing hyJOIST below)





## 7.5 HANGING BEAMS

Design Deflection Limits:

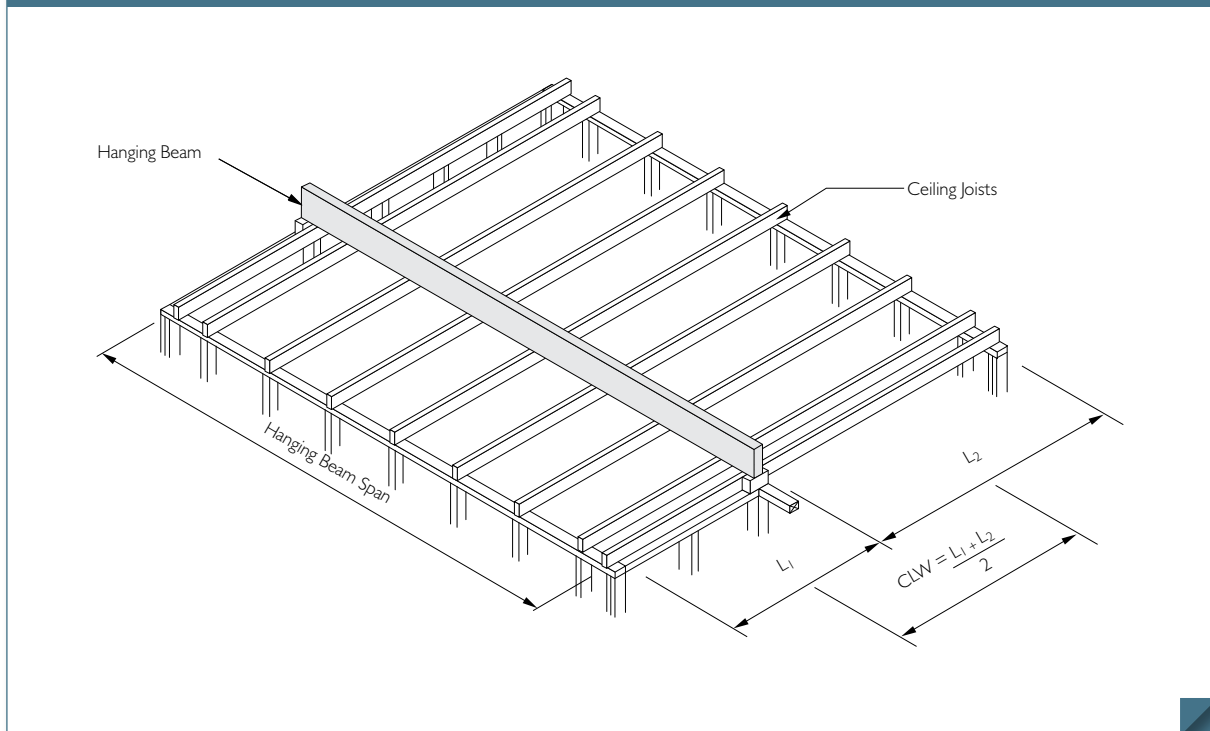
DL.	L.L.
SPAN/300	SPAN/270
OR 20 mm	OR 50mm

TABLE 17: HANGING BEAMS

Section D x B (mm)	Product	Ceiling Load Width 'CLW' (m)									
		1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.6	4.2	4.8
		Maximum Span (m)									
90 x 45	hyCHORD®	2.0	2.0	2.0	1.9	1.8	1.8	1.7	1.6	1.5	1.4
140 x 45	hyCHORD	3.6	3.4	3.1	3.0	2.8	2.7	2.6	2.4	2.3	2.1
150 x 45	hySPAN®	4.1	3.8	3.6	3.4	3.2	3.1	3.0	2.8	2.6	2.4
150 x 63	hySPAN	4.5	4.2	4.0	3.8	3.6	3.4	3.3	3.1	2.9	2.7
170 x 45	hySPAN	4.6	4.3	4.0	3.8	3.6	3.5	3.4	3.1	2.9	2.8
190 x 45	hyCHORD	4.8	4.5	4.2	4.0	3.8	3.7	3.5	3.3	3.1	2.9
200 x 45	hySPAN	5.4	5.0	4.7	4.5	4.3	4.1	3.9	3.7	3.4	3.2
200 x 63	hySPAN	5.9	5.5	5.2	4.9	4.7	4.5	4.4	4.1	3.8	3.6
240 x 45	hySPAN	6.3	6.0	5.6	5.3	5.1	4.9	4.7	4.4	4.1	3.9
240 x 63	hySPAN	6.7	6.4	6.1	5.9	5.6	5.4	5.2	4.9	4.6	4.3
300 x 45	hySPAN	7.3	7.0	6.7	6.5	6.2	6.0	5.8	5.4	5.1	4.8
300 x 63	hySPAN	7.8	7.5	7.2	6.9	6.7	6.5	6.3	6.0	5.7	5.4

- Mass of ceiling lining, battens and ceiling joists not to exceed 20 kg/m<sup>2</sup>
- Minimum bearing at end supports 30 mm

Figure 19: Hanging Beams



## 7.6 HIP OR VALLEY RAFTERS

Design Deflection Limits:

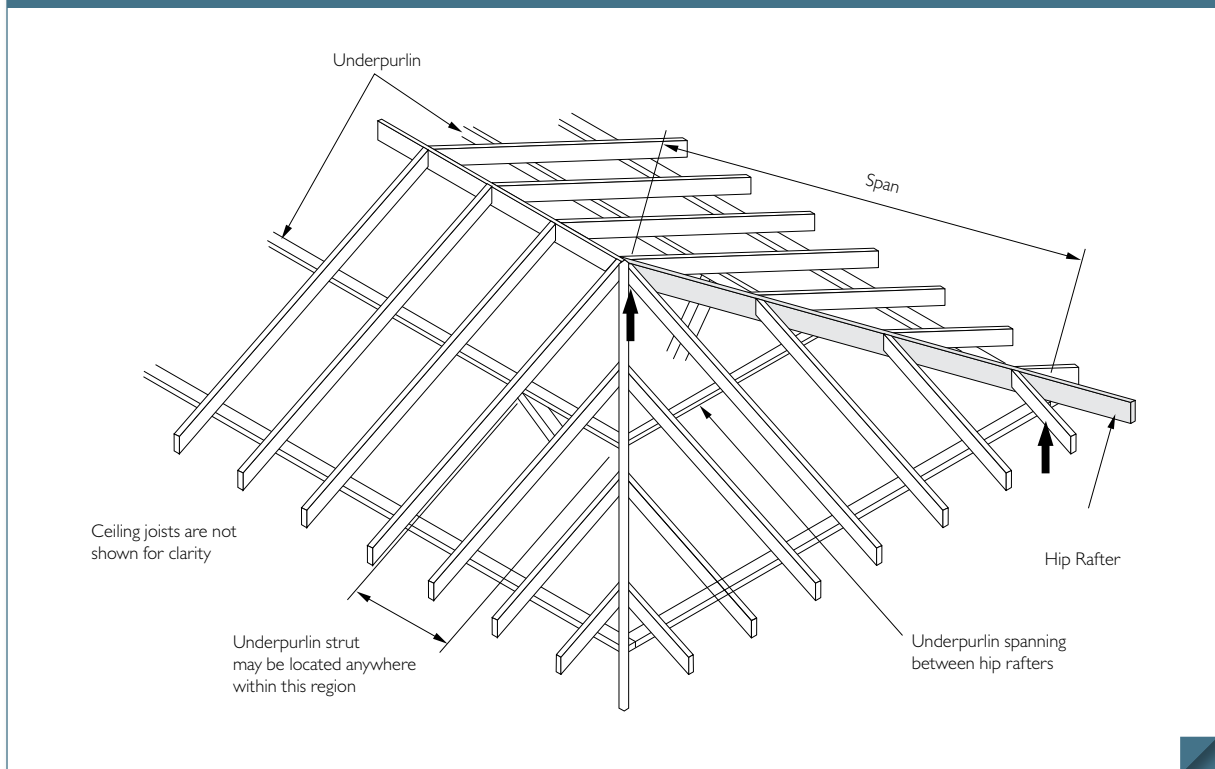
DL.	LL.
SPAN/300	SPAN/250
OR 20 mm	OR 20 mm

TABLE 18: HIP RAFTERS – SUPPORTING RAFTERS AND UNDERPURLINS

Section D x B (mm)	Product	Light Roof	Heavy Roof
		Maximum Hip Rafter Span (m)	
150 x 45	hySPAN®	3.5	2.7
170 x 45	hySPAN	3.8	3.0
200 x 45	hySPAN	4.3	3.3
240 x 45	hySPAN	4.8	3.8
240 x 63	hySPAN	5.4	4.2
300 x 45	hySPAN	5.1	4.5
300 x 63	hySPAN	6.3	4.9
360 x 45	hySPAN	5.4	5.2
360 x 63	hySPAN	7.0	5.7
400 x 45	hySPAN	5.5	5.6
400 x 63	hySPAN	7.4	6.1

- See Table 7 for Roof Mass Allowances

Figure 20: Supporting Rafters and Underpurlins



7.6 HIP OR VALLEY RAFTERS CONTINUED

Figure 21: Single Span Hip Rafter

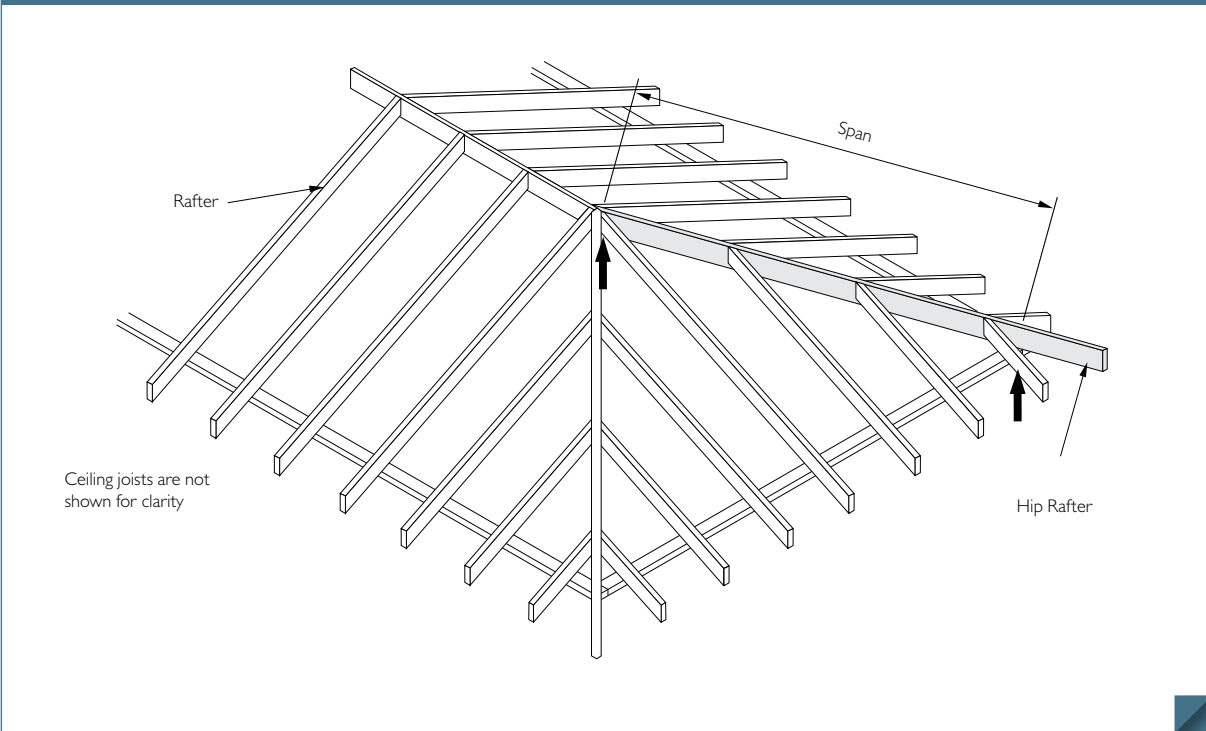
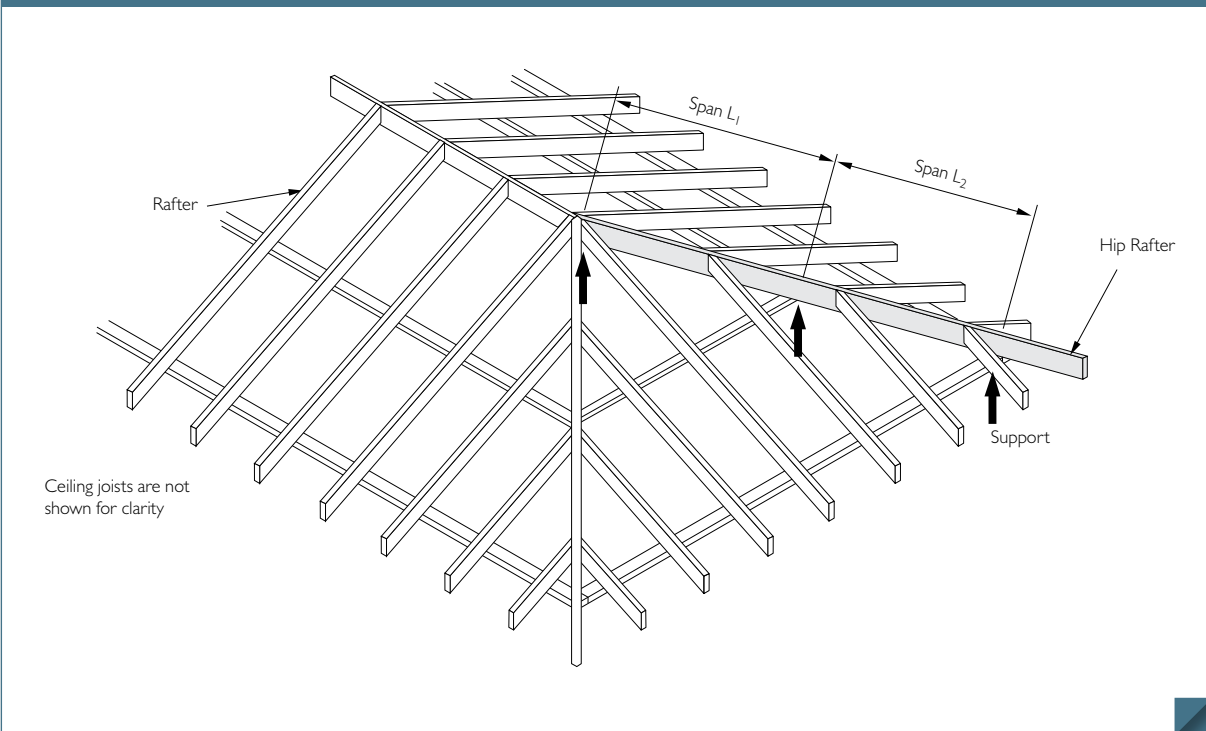


Figure 22: Continuous Span Hip Rafter



Notes

- Use the largest span ( $L_1$  or  $L_2$ ) to enter the table
- The largest span should not be greater than twice the adjacent span otherwise use the single span table

Design Deflection Limits:

DL	LL
SPAN/300	SPAN/250
OR 20 mm	OR 20 mm

TABLE 19: HIP RAFTERS – SUPPORTING RAFTERS ONLY

Section D x B (mm)	Product	Light Roof	Light Roof & Ceiling	Heavy Roof	Heavy Roof & Ceiling
		Maximum Single Span (m)			
150 x 45	hySPAN®	3.7	3.4	2.9	2.8
170 x 45	hySPAN	4.1	3.7	3.2	3.1
200 x 45	hySPAN	4.6	4.2	3.6	3.5
240 x 45	hySPAN	5.3	4.8	4.2	4.0
240 x 63	hySPAN	5.7	5.2	4.5	4.3
300 x 45	hySPAN	6.0	5.7	4.9	4.7
300 x 63	hySPAN	6.5	6.1	5.3	5.1
360 x 45	hySPAN	6.3	5.9	5.7	5.4
360 x 63	hySPAN	7.3	6.8	6.1	5.9
400 x 45	hySPAN	6.5	6.1	6.1	5.9
400 x 63	hySPAN	7.7	7.2	6.5	6.3
Maximum Continuous Span (m)					
150 x 45	hySPAN	4.7	4.2	3.7	3.5
170 x 45	hySPAN	5.1	4.6	4.0	3.9
200 x 45	hySPAN	5.8	5.2	4.6	4.4
240 x 45	hySPAN	6.2	6.0	5.2	5.0
240 x 63	hySPAN	6.9	6.4	5.7	5.4
300 x 45	hySPAN	6.7	6.4	6.1	5.8
300 x 63	hySPAN	7.8	7.3	6.5	6.3
360 x 45	hySPAN	7.1	6.8	6.4	6.2
360 x 63	hySPAN	8.7	8.1	7.3	7.0
400 x 45	hySPAN	7.3	7.0	6.7	6.5
400 x 63	hySPAN	-	8.6	7.7	7.5

• See Table 7 for Roof Mass Allowances



## 7.8 RAFTER SPAN TABLES

Design Deflection Limits:

DL	LL
SPAN/300	SPAN/250
OR 20 mm	OR 20 mm

TABLE 20A: RAFTERS – LOW AND MEDIUM WIND EXPOSURE

Section D x B (mm)	Product	Cross Section	Single Span								Continuous Span								
			450		600		900		1200		450		600		900		1200		
			Maximum Rafter Span and Overhang 'O/H' (m) for Light Roofs and Ceilings = 40 kg/m'																
Span		O/H		Span		O/H		Span		O/H		Span		O/H		Span		O/H	
90 x 45	hyCHORD®	█	2.7	0.7	2.4	0.7	2.2	0.6	2.0	0.6	3.1	0.7	3.0	0.6	2.8	0.6	2.6	0.6	
140 x 45	hyCHORD	█	4.0	1.1	3.7	1.0	3.3	1.0	3.0	1.0	-	-	-	-	4.4	0.9	4.1	0.9	
150 x 45	hySPAN®	█	4.6	1.3	4.2	1.2	3.8	1.1	3.4	1.2	6.1	1.1	5.7	1.0	5.0	1.0	4.6	1.0	
150 x 63	hySPAN	█	5.0	1.5	4.6	1.4	4.2	1.3	3.8	1.3	6.5	1.3	6.2	1.2	5.6	1.1	5.1	1.1	
170 x 45	hySPAN	█	5.2	1.5	4.8	1.3	4.2	1.3	3.9	1.3	6.7	1.3	6.3	1.2	5.7	1.1	5.2	1.2	
190 x 45	hyCHORD	█	5.4	1.5	5.0	1.4	4.4	1.4	4.1	1.3	-	-	-	-	-	-	-	-	
HJ200 45	hyJOIST®	I	5.6	1.4	5.1	1.4	4.4	1.3	4.0	1.3	7.0	1.3	6.5	1.2	5.8	1.2	4.8	1.2	
200 x 45	hySPAN	█	6.0	1.7	5.6	1.6	5.0	1.5	4.6	1.5	7.5	1.6	7.1	1.4	6.5	1.3	6.1	1.4	
200 x 63	hySPAN	█	6.4	2.0	6.0	1.8	5.5	1.7	5.0	1.7	7.9	1.8	7.5	1.6	7.0	1.5	6.5	1.6	
240 x 45	hySPAN	█	6.8	2.1	6.4	1.9	5.9	1.8	5.4	1.9	8.5	1.9	8.0	1.8	7.4	1.7	6.9	1.6	
HJ240 63	hyJOIST	I	6.8	1.9	6.3	1.8	5.7	1.7	5.2	1.7	8.3	1.8	7.8	1.7	7.0	1.6	6.2	1.6	
240 x 63	hySPAN	█	7.2	2.4	6.9	2.2	6.3	2.1	6.0	2.0	-	-	8.5	2.0	7.9	1.9	7.5	1.8	
HJ240 90	hyJOIST	I	7.3	2.3	6.9	2.1	6.3	2.0	5.9	1.9	-	-	8.5	1.9	7.7	1.8	7.2	1.8	
HJ300 63	hyJOIST	I	7.7	2.4	7.2	2.2	6.6	2.1	6.1	2.0	-	-	-	-	8.0	1.9	7.4	1.9	
300 x 45	hySPAN	█	7.9	2.8	7.5	2.5	6.9	2.3	6.5	2.3	-	-	-	-	8.6	2.1	8.1	2.1	
300 x 63	hySPAN	█	8.3	3.2	8.0	2.9	7.4	2.7	7.0	2.6	-	-	-	-	-	-	8.7	2.4	
HJ300 90	hyJOIST	I	8.3	2.8	7.8	2.6	7.2	2.4	6.7	2.3	-	-	-	-	-	-	8.2	2.2	

TABLE 20B: RAFTERS – LOW AND MEDIUM WIND EXPOSURE

Section D x B (mm)	Product	Cross Section	Single Span								Continuous Span								
			450		600		900		1200		450		600		900		1200		
			Maximum Rafter Span and Overhang 'O/H' (m) for Heavy Roofs and Ceilings = 90 kg/m'																
Span		O/H		Span		O/H		Span		O/H		Span		O/H		Span		O/H	
90 x 45	hyCHORD®	█	2.1	0.8	1.9	0.8	1.7	0.7	1.5	0.7	2.8	0.7	2.5	0.7	2.2	0.6	2.0	0.6	
140 x 45	hyCHORD	█	3.2	1.3	2.9	1.2	2.6	1.1	2.3	1.1	4.3	1.1	3.9	1.0	3.5	1.0	3.1	1.0	
150 x 45	hySPAN®	█	3.6	1.4	3.3	1.3	2.9	1.3	2.7	1.2	4.9	1.3	4.5	1.2	3.9	1.1	3.6	1.1	
150 x 63	hySPAN	█	4.0	1.6	3.7	1.5	3.3	1.4	3.0	1.4	5.4	1.4	4.9	1.3	4.4	1.3	4.0	1.2	
170 x 45	hySPAN	█	4.1	1.6	3.8	1.5	3.3	1.4	3.0	1.4	5.5	1.4	5.0	1.3	4.4	1.3	4.1	1.2	
190 x 45	hyCHORD	█	4.3	1.7	3.9	1.6	3.5	1.5	3.2	1.5	-	-	-	-	4.7	1.3	4.3	1.3	
HJ200 45	hyJOIST®	I	4.3	1.6	3.8	1.5	3.3	1.4	3.0	1.4	5.6	1.4	5.0	1.4	4.2	1.3	3.2	1.4	
200 x 45	hySPAN	█	4.8	1.9	4.4	1.8	3.9	1.7	3.5	1.6	6.3	1.7	5.9	1.6	5.2	1.5	4.8	1.5	
200 x 63	hySPAN	█	5.3	2.2	4.9	2.0	4.3	1.9	3.9	1.8	6.8	1.9	6.4	1.8	5.8	1.7	5.3	1.6	
HJ240 63	hyJOIST	I	5.5	2.1	4.9	2.0	4.3	1.9	3.8	1.8	6.8	1.9	6.3	1.8	5.5	1.7	4.2	1.8	
240 x 45	hySPAN	█	5.7	2.3	5.2	2.1	4.6	2.0	4.2	2.0	7.2	2.1	6.8	1.9	6.2	1.8	5.7	1.7	
HJ240 90	hyJOIST	I	6.1	2.4	5.6	2.3	4.9	2.2	4.4	2.1	7.5	2.2	7.0	2.1	6.3	2.0	5.5	2.0	
240 x 63	hySPAN	█	6.2	2.6	5.8	2.4	5.1	2.3	4.7	2.2	7.7	2.4	7.3	2.2	6.7	2.0	6.2	2.1	
HJ300 63	hyJOIST	I	6.4	2.6	5.9	2.4	5.1	2.3	4.6	2.2	7.8	2.4	7.2	2.2	6.4	2.1	5.6	2.1	
300 x 45	hySPAN	█	6.8	2.9	6.4	2.7	5.8	2.5	5.3	2.4	8.4	2.7	7.9	2.4	7.3	2.3	6.8	2.2	
HJ300 90	hyJOIST	I	7.0	3.0	6.5	2.8	5.9	2.6	5.3	2.5	8.5	2.8	7.9	2.6	7.1	2.4	6.4	2.4	
300 x 63	hySPAN	█	7.2	3.4	6.8	3.1	6.3	2.8	5.8	2.8	-	-	8.5	2.8	7.8	2.6	7.3	2.5	

The following notes relate to TABLE 20A and TABLE 20B.

- Maximum overhangs (O/H) have been determined for the support conditions and a minimum backspan of twice O/H
- Bottom edge to be restrained by ceiling or ceiling battens at maximum 600 c/c

Design Deflection Limits:

DL.	LL.
SPAN/300	SPAN/250
OR 20 mm	OR 20 mm

TABLE 21A: RAFTERS – HIGH AND VERY HIGH WIND EXPOSURE

Section D x B (mm)	Product	Cross Section	Single Span								Continuous Span							
			450		600		900		1200		450		600		900		1200	
			Maximum Rafter Span and Overhang 'O/H' (m) for Light Roofs and Ceilings = 40 kg/m <sup>2</sup>															
Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	
90 x 45	hyCHORD®	■	2.7	0.7	2.4	0.7	2.2	0.6	2.0	0.6	3.1	0.7	3.0	0.6	2.8	0.6	2.6	0.6
140 x 45	hyCHORD	■	4.0	1.1	3.7	1.0	3.3	1.0	3.0	1.0	-	-	-	-	4.4	0.9	4.1	0.9
150 x 45	hySPAN®	■	4.6	1.3	4.2	1.2	3.8	1.1	3.4	1.2	6.1	1.1	5.7	1.0	5.0	1.0	4.6	1.0
150 x 63	hySPAN	■	5.0	1.5	4.6	1.4	4.2	1.3	3.8	1.3	6.5	1.3	6.2	1.2	5.6	1.1	5.1	1.1
170 x 45	hySPAN	■	5.2	1.5	4.8	1.3	4.2	1.3	3.9	1.2	6.7	1.3	6.3	1.2	5.7	1.1	5.2	1.2
190 x 45	hyCHORD	■	5.4	1.5	5.0	1.4	4.4	1.4	4.1	1.3	-	-	-	-	-	-	-	-
HJ200 45	hyJOIST®	■	5.6	1.4	5.1	1.4	4.4	1.3	4.0	1.3	7.0	1.3	6.5	1.2	5.8	1.2	4.8	1.2
200 x 45	hySPAN	■	6.0	1.7	5.6	1.6	5.0	1.5	4.6	1.4	7.5	1.6	7.1	1.4	6.5	1.3	6.1	1.4
200 x 63	hySPAN	■	6.4	2.0	6.0	1.8	5.5	1.7	5.0	1.7	7.9	1.8	7.5	1.6	7.0	1.5	6.5	1.6
240 x 45	hySPAN	■	6.8	2.1	6.4	1.9	5.9	1.8	5.4	1.7	8.5	1.9	8.0	1.8	7.4	1.7	6.9	1.6
HJ240 63	hyJOIST	■	6.8	1.9	6.3	1.8	5.7	1.7	5.2	1.7	8.3	1.8	7.8	1.7	7.0	1.6	6.2	1.6
240 x 63	hySPAN	■	7.2	2.4	6.9	2.2	6.3	2.1	6.0	2.0	-	-	8.5	2.0	7.9	1.9	7.5	1.8
HJ240 90	hyJOIST	■	7.3	2.3	6.9	2.1	6.3	2.0	5.9	1.9	-	-	8.5	1.9	7.7	1.8	7.2	1.8
HJ300 63	hyJOIST	■	7.7	2.4	7.2	2.2	6.6	2.1	6.1	2.0	-	-	-	-	8.0	1.9	7.4	1.9
300 x 45	hySPAN	■	7.9	2.8	7.5	2.5	6.9	2.3	6.5	2.0	-	-	-	-	8.6	2.1	8.1	2.0
300 x 63	hySPAN	■	8.3	3.2	8.0	2.9	7.4	2.7	7.0	2.5	-	-	-	-	-	-	8.7	2.4
HJ300 90	hyJOIST	■	8.3	2.8	7.8	2.6	7.2	2.4	6.7	2.3	-	-	-	-	-	-	8.2	2.2

TABLE 21B: RAFTERS – HIGH AND VERY HIGH WIND EXPOSURE

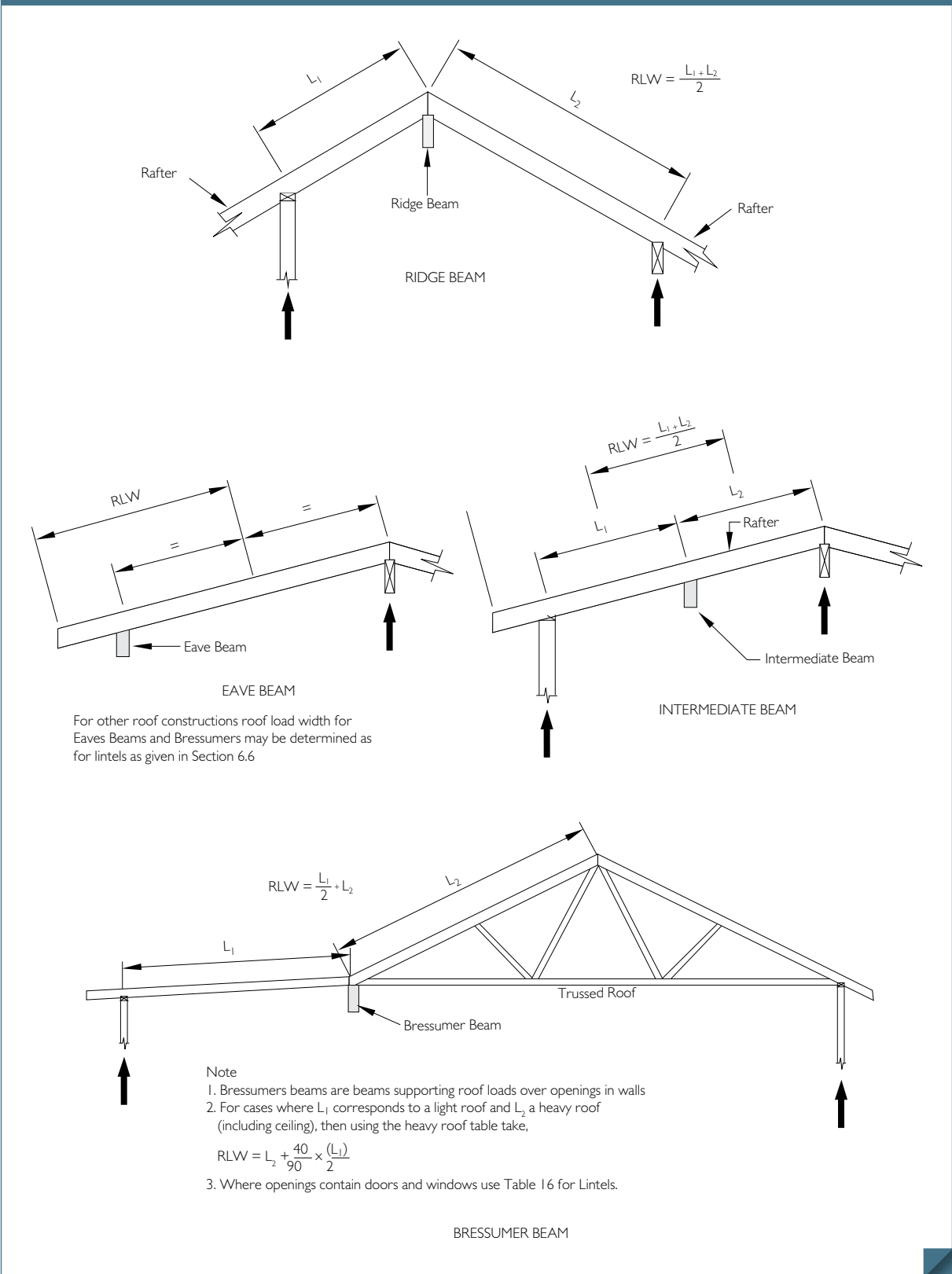
Section D x B (mm)	Product	Cross Section	Single Span								Continuous Span							
			450		600		900		1200		450		600		900		1200	
			Maximum Rafter Span and Overhang 'O/H' (m) for Heavy Roofs and Ceilings = 90 kg/m <sup>2</sup>															
Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	Span	O/H	
90 x 45	hyCHORD®	■	2.1	0.8	1.9	0.8	1.7	0.7	1.5	0.7	2.8	0.7	2.5	0.7	2.2	0.6	2.0	0.6
140 x 45	hyCHORD	■	3.2	1.3	2.9	1.2	2.6	1.1	2.3	1.1	4.3	1.1	3.9	1.0	3.5	1.0	3.1	1.0
150 x 45	hySPAN®	■	3.6	1.4	3.3	1.3	2.9	1.3	2.7	1.2	4.9	1.3	4.5	1.2	3.9	1.1	3.6	1.1
150 x 63	hySPAN	■	4.0	1.6	3.7	1.5	3.3	1.4	3.0	1.4	5.4	1.4	4.9	1.3	4.4	1.3	4.0	1.2
170 x 45	hySPAN	■	4.1	1.6	3.8	1.5	3.3	1.4	3.0	1.4	5.5	1.4	5.0	1.3	4.4	1.3	4.1	1.2
190 x 45	hyCHORD	■	4.3	1.7	3.9	1.6	3.5	1.5	3.2	1.5	-	-	-	-	4.7	1.3	4.3	1.3
HJ200 45	hyJOIST®	■	4.3	1.6	3.8	1.5	3.3	1.4	3.0	1.4	5.6	1.4	5.0	1.4	4.2	1.3	3.2	1.4
200 x 45	hySPAN	■	4.8	1.9	4.4	1.8	3.9	1.7	3.5	1.6	6.3	1.7	5.9	1.6	5.2	1.5	4.8	1.5
200 x 63	hySPAN	■	5.3	2.2	4.9	2.0	4.3	1.9	3.9	1.8	6.8	1.9	6.4	1.8	5.8	1.7	5.3	1.6
HJ240 63	hyJOIST	■	5.5	2.1	4.9	2.0	4.3	1.9	3.8	1.8	6.8	1.9	6.3	1.8	5.5	1.7	4.2	1.7
240 x 45	hySPAN	■	5.7	2.3	5.2	2.1	4.6	2.0	4.2	1.9	7.2	2.1	6.8	1.9	6.2	1.8	5.7	1.7
HJ240 90	hyJOIST	■	6.1	2.4	5.6	2.3	4.9	2.2	4.4	2.0	7.5	2.2	7.0	2.1	6.3	2.0	5.5	2.0
240 x 63	hySPAN	■	6.2	2.6	5.8	2.4	5.1	2.3	4.7	2.2	7.7	2.4	7.3	2.2	6.7	2.0	6.2	2.1
HJ300 63	hyJOIST	■	6.4	2.6	5.9	2.4	5.1	2.3	4.6	2.1	7.8	2.4	7.2	2.2	6.4	2.1	5.6	2.0
300 x 45	hySPAN	■	6.8	2.9	6.4	2.7	5.8	2.5	5.3	2.3	8.4	2.7	7.9	2.4	7.3	2.3	6.8	2.2
HJ300 90	hyJOIST	■	7.0	3.0	6.5	2.8	5.9	2.6	5.3	2.3	8.5	2.8	7.9	2.6	7.1	2.4	6.4	2.3
300 x 63	hySPAN	■	7.2	3.3	6.8	3.1	6.3	2.8	5.8	2.6	-	-	8.5	2.8	7.8	2.6	7.3	2.5

The following notes relate to TABLE 21A and TABLE 21B.

- Maximum overhangs (O/H) have been determined for the support conditions and a minimum backspan of twice O/H
- Bottom edge to be restrained by ceiling or ceiling battens at maximum 600 c/c

## 7.9 ROOF BEAMS

Figure 27: Ridge, Intermediate, Eave and Bressumer Beams



Design Deflection Limits:

DL.	LL.
SPAN/300	SPAN/250
OR 20 mm	OR 20 mm

TABLE 22A: ROOF BEAMS

Section D x B (mm)	Product	Light Roof and Ceiling											
		Roof Load Width 'RLW' (m)											
		1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.8	5.4	6.0
Maximum Single Span (m)													
150 x 45	hySPAN®	3.0	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.0	1.9
2/140 x 45	hyCHORD®	3.2	3.1	2.9	2.8	2.7	2.6	2.5	2.5	2.4	2.3	2.2	2.1
150 x 63	hySPAN	3.3	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1
170 x 45	hySPAN	3.3	3.2	3.0	2.9	2.8	2.7	2.6	2.5	2.5	2.3	2.2	2.1
190 x 45	hyCHORD	3.5	3.3	3.2	3.0	2.9	2.8	2.7	2.7	2.6	2.5	2.3	2.3
2/150 x 45	hySPAN	3.7	3.5	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4
200 x 45	hySPAN	3.9	3.7	3.6	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.6	2.5
2/170 x 45	hySPAN	4.1	3.9	3.8	3.6	3.5	3.4	3.3	3.2	3.1	2.9	2.8	2.7
200 x 63	hySPAN	4.3	4.1	3.9	3.8	3.7	3.5	3.4	3.3	3.2	3.1	2.9	2.8
2/200 x 45	hySPAN	4.8	4.6	4.4	4.2	4.1	3.9	3.8	3.7	3.6	3.4	3.3	3.2
240 x 63	hySPAN	5.2	4.9	4.7	4.5	4.4	4.2	4.1	4.0	3.9	3.7	3.5	3.4
2/240 x 45	hySPAN	5.8	5.5	5.3	5.1	4.9	4.7	4.6	4.4	4.3	4.1	3.9	3.8
300 x 63	hySPAN	6.3	6.1	5.9	5.6	5.4	5.3	5.1	4.9	4.8	4.6	4.4	4.2
2/300 x 45	hySPAN	6.8	6.6	6.4	6.2	6.0	5.9	5.7	5.5	5.4	5.1	4.9	4.7
Maximum Continuous Span (m)													
150 x 45	hySPAN	4.0	3.8	3.6	3.4	3.3	3.2	3.1	3.0	2.9	2.7	2.4	2.3
150 x 63	hySPAN	4.4	4.2	4.0	3.8	3.7	3.6	3.4	3.3	3.3	3.1	3.0	2.7
2/140 x 45	hyCHORD	4.3	4.1	3.9	3.8	3.6	3.5	3.4	3.3	3.2	3.1	2.9	2.8
170 x 45	hySPAN	4.5	4.3	4.1	3.9	3.7	3.6	3.5	3.3	3.2	2.9	2.8	2.6
190 x 45	hyCHORD	4.7	4.5	4.3	4.1	3.8	3.6	3.5	3.3	3.2	2.9	2.7	2.6
2/150 x 45	hySPAN	4.9	4.7	4.5	4.3	4.1	4.0	3.9	3.8	3.7	3.5	3.3	3.2
200 x 45	hySPAN	5.3	5.0	4.8	4.6	4.4	4.1	4.0	3.9	3.7	3.5	3.2	3.1
2/170 x 45	hySPAN	5.5	5.3	5.0	4.8	4.7	4.5	4.4	4.2	4.1	3.9	3.8	3.6
200 x 63	hySPAN	5.8	5.5	5.3	5.1	4.9	4.7	4.6	4.4	4.3	4.1	3.8	3.6
2/200 x 45	hySPAN	6.4	6.1	5.9	5.7	5.5	5.3	5.1	5.0	4.8	4.6	4.4	4.2
240 x 63	hySPAN	6.7	6.5	6.2	6.1	5.9	5.7	5.5	5.3	5.2	4.8	4.5	4.3
2/240 x 45	hySPAN	7.2	7.0	6.8	6.6	6.4	6.2	6.0	5.9	5.6	5.3	5.1	4.8
300 x 63	hySPAN	7.9	7.6	7.3	7.1	6.9	6.8	6.6	6.4	6.1	5.8 <sup>■</sup>	5.5 <sup>■</sup>	5.2 <sup>■</sup>
2/300 x 45	hySPAN	8.5	8.2	7.9	7.6	7.3	7.0	6.8	6.6	6.4	6.0	5.7	5.5

- Indicates minimum bearing at end supports = 45 mm and minimum bearing at intermediate supports = 135 mm
- Unless otherwise indicated minimum bearing at end supports = 45 mm and minimum bearing at intermediate supports = 90 mm
- Double sections built up by vertical lamination (see section 5.4)

Design Deflection Limits:

DL	LL
SPAN/300	SPAN/250
OR 20 mm	OR 20 mm

TABLE 22B: ROOF BEAMS

Section D x B (mm)	Product	Heavy Roof and Ceiling											
		Roof Load Width 'RLW' (m)											
		1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.8	5.4	6.0
Maximum Single Span (m)													
150 x 45	hySPAN®	2.3	2.2	2.1	2.0	1.9	1.9	1.8	1.8	1.7	1.6	1.6	1.5
150 x 63	hySPAN	2.6	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.9	1.8	1.8	1.7
170 x 45	hySPAN	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.0	2.0	1.9	1.8	1.7
2/140 x 45	hyCHORD®	2.5	2.4	2.3	2.2	2.1	2.1	2.0	2.0	1.9	1.8	1.7	1.7
190 x 45	hyCHORD	2.8	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	1.9	1.8
2/150 x 45	hySPAN	2.9	2.7	2.6	2.5	2.4	2.4	2.3	2.2	2.2	2.1	2.0	1.9
200 x 45	hySPAN	3.1	2.9	2.8	2.7	2.6	2.5	2.4	2.4	2.3	2.2	2.1	2.0
2/170 x 45	hySPAN	3.3	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.5	2.3	2.2	2.2
200 x 63	hySPAN	3.4	3.3	3.1	3.0	2.9	2.8	2.7	2.6	2.6	2.4	2.3	2.3
2/200 x 45	hySPAN	3.8	3.6	3.5	3.4	3.2	3.1	3.0	3.0	2.9	2.7	2.6	2.5
240 x 63	hySPAN	4.1	3.9	3.7	3.6	3.5	3.3	3.2	3.2	3.1	2.9	2.8	2.7
2/240 x 45	hySPAN	4.6	4.4	4.2	4.0	3.9	3.8	3.6	3.5	3.4	3.3	3.2	3.0
300 x 63	hySPAN	5.1	4.9	4.6	4.5	4.3	4.2	4.0	3.9	3.8	3.7	3.5	3.4
2/300 x 45	hySPAN	5.7	5.4	5.2	5.0	4.8	4.7	4.5	4.4	4.3	4.1	3.9	3.8
Maximum Continuous Span (m)													
150 x 45	hySPAN	3.1	2.9	2.8	2.7	2.6	2.5	2.4	2.4	2.3	2.2	2.1	2.0
2/140 x 45	hyCHORD	3.4	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2
150 x 63	hySPAN	3.5	3.3	3.1	3.0	2.9	2.8	2.7	2.7	2.6	2.5	2.4	2.3
170 x 45	hySPAN	3.5	3.3	3.2	3.1	2.9	2.9	2.8	2.7	2.6	2.5	2.3	2.2
190 x 45	hyCHORD	3.7	3.5	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.4	2.3	2.1
2/150 x 45	hySPAN	3.9	3.7	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6
200 x 45	hySPAN	4.1	3.9	3.7	3.6	3.5	3.4	3.3	3.2	3.1	2.8	2.7	2.5
2/170 x 45	hySPAN	4.4	4.2	4.0	3.8	3.7	3.6	3.5	3.4	3.3	3.1	3.0	2.9
200 x 63	hySPAN	4.6	4.4	4.2	4.0	3.9	3.7	3.6	3.5	3.4	3.3	3.1	3.0
2/200 x 45	hySPAN	5.1	4.9	4.7	4.5	4.3	4.2	4.1	4.0	3.9	3.7	3.5	3.4
240 x 63	hySPAN	5.5	5.2	5.0	4.8	4.6	4.5	4.3	4.2	4.1	3.9	3.8	3.5
2/240 x 45	hySPAN	6.1	5.8	5.6	5.4	5.2	5.0	4.9	4.7	4.6	4.4	4.2	4.1
300 x 63	hySPAN	6.6	6.4	6.2	6.0	5.8	5.6	5.4	5.3	5.1	4.9	4.6	4.3
2/300 x 45	hySPAN	7.2	6.9	6.7	6.5	6.2	6.0	5.9	5.6	5.5	5.2	4.9	4.7

- Indicates minimum bearing at end supports = 45 mm and minimum bearing at intermediate supports = 135 mm
- Unless otherwise indicated minimum bearing at end supports = 45 mm and minimum bearing at intermediate supports = 90 mm
- Double sections built up by vertical lamination (see section 5.4)

## 8.0 VERANDAH BEAMS

Design Deflection Limits:

DL.	LL.
SPAN/400	SPAN/250
OR 10 mm	OR 12 mm

TABLE 23A: VERANDAH BEAMS – HIGH AND VERY HIGH WINDS

Section D x B (mm)	Product	Single Span							Continuous Span						
		Roof Load Width 'RLW' (m)													
		0.9	1.2	1.5	1.8	2.1	2.4	2.7	0.9	1.2	1.5	1.8	2.1	2.4	2.7
Maximum Span (m) for Roof Mass = 10 kg/m <sup>2</sup>															
150 x 45	hySPAN®	3.8	3.5	3.3	3.1	2.9	2.8	2.7	4.9	4.5	4.3	4.1	3.9	3.8	3.5
150 x 63	hySPAN	4.3	4.0	3.6	3.4	3.3	3.1	3.0	5.3	5.0	4.8	4.5	4.3	4.2	4.1
170 x 45	hySPAN	4.3	4.0	3.7	3.4	3.3	3.2	3.0	5.4	5.0	4.8	4.5	4.3	4.2	3.9
190 x 45	hyCHORD®	4.5	4.2	3.9	3.6	3.4	3.3	3.2	-	-	-	-	4.5	4.3	3.9
200 x 45	hySPAN	4.9	4.6	4.3	4.1	3.9	3.7	3.5	6.1	5.7	5.4	5.2	5.0	4.8	4.6
200 x 63	hySPAN	5.3	5.0	4.8	4.5	4.4	4.2	4.0	6.6	6.2	5.9	5.6	5.4	5.2	5.1
240 x 45	hySPAN	5.6	5.2	5.0	4.8	4.6	4.5	4.3	7.0	6.5	6.2	5.9	5.7	5.4	5.2
240 x 63	hySPAN	6.0	5.7	5.4	5.2	5.0	4.9	4.7	7.5	7.2	6.7	6.4	6.2	6.0	5.8
300 x 45	hySPAN	6.6	6.2	5.8	5.6	5.4	5.3	5.1	8.3	7.7	7.3	7.0	6.5	6.2	5.9
300 x 63	hySPAN	7.2	6.7	6.4	6.1	5.8	5.7	5.5	-	8.4	8.0	7.6	7.3	7.2	6.9

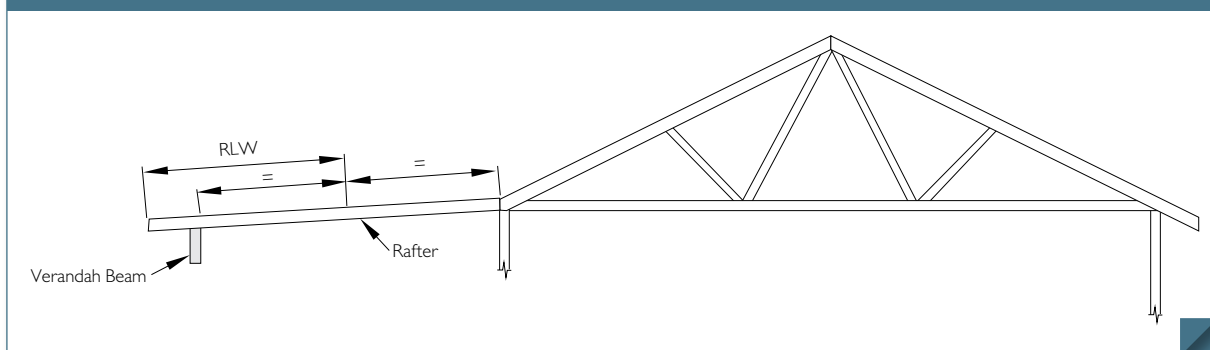
TABLE 23B: VERANDAH BEAMS – HIGH AND VERY HIGH WINDS

Section D x B (mm)	Product	Single Span							Continuous Span						
		Roof Load Width 'RLW' (m)													
		0.9	1.2	1.5	1.8	2.1	2.4	2.7	0.9	1.2	1.5	1.8	2.1	2.4	2.7
Maximum Span (m) for Roof Mass = 40 kg/m <sup>2</sup>															
150 x 45	hySPAN®	3.3	3.0	2.8	2.7	2.6	2.5	2.4	4.3	4.1	3.8	3.6	3.4	3.2	3.1
150 x 63	hySPAN	3.7	3.3	3.1	3.0	2.8	2.7	2.7	4.7	4.3	4.2	3.9	3.8	3.6	3.4
170 x 45	hySPAN	3.8	3.4	3.2	3.0	2.9	2.8	2.6	4.8	4.4	4.2	4.0	3.8	3.6	3.5
190 x 45	hyCHORD®	3.9	3.6	3.3	3.1	3.0	2.8	2.8	-	4.6	4.3	4.2	4.0	3.8	3.7
200 x 45	hySPAN	4.3	4.0	3.7	3.5	3.3	3.1	3.0	5.3	5.0	4.8	4.5	4.3	4.2	4.1
200 x 63	hySPAN	4.6	4.4	4.1	3.9	3.7	3.5	3.4	5.8	5.4	5.1	4.9	4.8	4.5	4.4
240 x 45	hySPAN	4.9	4.6	4.4	4.2	4.0	3.8	3.6	6.1	5.7	5.4	5.2	5.0	4.9	4.7
240 x 63	hySPAN	5.3	5.0	4.7	4.5	4.4	4.2	4.1	6.5	6.2	5.9	5.6	5.4	5.2	5.1
300 x 45	hySPAN	5.7	5.4	5.1	4.9	4.8	4.6	4.4	7.2	6.7	6.4	6.1	5.9	5.7	5.5
300 x 63	hySPAN	6.1	5.8	5.5	5.3	5.1	5.0	4.8	7.6	7.3	6.8	6.6	6.4	6.2	6.0

The following notes relate to Table 23A and Table 23B.

- Minimum bearing at end supports = 45 mm & intermediate supports = 90 mm

Figure 28: Verandah Beams





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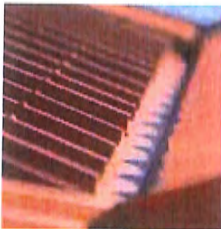
[www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz)  
[www.chhsoftware.com](http://www.chhsoftware.com)

July 2014





# F I V E R I B



Five Rib is light, strong and stylish producing distinctive design solutions for both domestic and commercial applications.

## F E A T U R E S

Its distinctive, aesthetic profile - clean, straight lines and unique angled swage - makes Five Rib suitable, not just for roofing, but for wall cladding, decorative panels and fencing.

**Long Run:** Modern roll forming technology allows Five Rib roofing and cladding to be manufactured in continuous lengths.

**Pitch:** The rib height makes it suitable for low pitch roofing.

**Pan Swage:** The pan swage enhances appearance.

**Crimp Curving:** Five Rib can be crimp-curved.

**Colour Choice:** A wide range of standard colours is available. Additional colours and coatings are available on request.

## MATERIALS AND DURABILITY

### Available in:

- COLORSTEEL®, ZINCALUME® and GALVSTEEL™ in .40mm G550 and .55mm G550 base metal thickness (BMT).
- Aluminium plain and pre-painted in .70mm and .90mm BMT.
- Other non-ferrous metals.

Various types of coatings are available to suit all environments including industrial and coastal conditions.

For optimum performance, the environment in which the cladding will be installed should determine both the metal and type of coating to be used.

## DESIGN REQUIREMENTS

The minimum pitch for Five Rib is 3 degrees.

Five Rib will spring curve to a minimum radius of 20 metres for .40mm BMT G550.

Specifications and product performance statements for specific projects are

## ROOFING ACCESSORIES

A full range of accessories including rainwater goods, flashings, underlays, fasteners and matching translucent sheeting are also available.

## REFERENCE LITERATURE

For additional information, please refer to:

- New Zealand Steel Installers Guide
- New Zealand Steel Specifiers and Builders Guide
- New Zealand Metal Roof and Wall Cladding Code of Practice

## MAINTENANCE

To prevent the accumulation of dirt, debris or other material not removed by rain, manual washing is required. For cladding, every:

- 6 months in severe environments.
- 12 months in moderate environments.

For unwashed areas that do not receive adequate or any rain washing such as soffits, wall cladding under eaves, underside of gutters, fascias, sheltered areas of garage doors and unwashed roof areas, washing is required every:

- 3 months for severe environments.
- 6 months for moderate environments.

Surfaces should not be in continuous contact with moisture and all debris must be removed from them (this applies mainly to gutters).

With the first sign of surface corrosion the affected area should be cleaned, spot primed and repainted. Any fixings that have deteriorated to a point where leakage is evident should be replaced.

Fading will occur over time. Periodic overpainting will be necessary to retain aesthetic value.

## WARRANTY

Five Rib is covered by warranty for:

- Coating performance
- Corrosion resistance
- Substrate integrity

NB Warranty is subject to the use of the appropriate product for the environment.

A written warranty is available on request.

# F I V E R I B



All profile dimensions are nominal

### MAXIMUM SPAN for 1.1kn Concentrated Load for G550 Steel

Location of span on roof	Thickness (BMT)	
	.40mm	.55mm
Roof End Span	1000	1100
Roof Intermediate Span	1500	1800
Wall End Span	1400	1900
Wall Intermediate Span	2000	2700

### SHEET COVER

1x Sheet	815mm	6x Sheet	4648mm
2x Sheet	1600mm	7x Sheet	5410mm
3x Sheet	2362mm	8x Sheet	6172mm
4x Sheet	3124mm	9x Sheet	6934mm
5x Sheet	3886mm	10x Sheet	7696mm

Single spans should be limited to 80% of the above end spans.

Purlin spacing should be reduced in high traffic areas or areas supporting items such as air conditioning units or walkways that are provided for maintenance.

### FASTENERS

Recommended roof fasteners:

Nails 75mm    Timbertites 12g x 65mm    Steeltites 12g x 55mm.

Wall fastenings also available.

The fastener and its coatings must be compatible and suitable for environment and roofing product.

**GALVSTEEL™**

**COLORSTEEL®**

**Zincalume®**

# Installation guide

## Rinnai INFINITY A-Series continuous flow water heaters

REU-A2626WG-ZK



REU-A2426WG-ZK



REU-A2024WG-ZK



REU-A1620WG-ZK



**The Rinnai INFINITY A-Series models are not suitable for commercial or solar applications**

## **Important**

This appliance must be installed in accordance with:

- Manufacturer's installation instructions
- Current AS/NZS 3000, AS/NZS 3500, AS/NZS 5601.1 and G12/AS1

For use with Natural Gas or Universal LPG as indicated on the appliance.

Not suitable as a spa or swimming pool heater.

Not suitable for commercial or solar applications.

Appliance must be installed, commissioned and serviced by an authorised person, being in New Zealand a licensed gasfitter, in accordance with these instructions and all applicable local rules and regulations.

## **Warning**

Improper installation, adjustment, alteration, service and maintenance can cause property damage, personal injury or loss of life.

For more information about buying, using, and servicing of Rinnai appliances call: 0800 RINNAI (0800 746 624).

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Web: [rinnai.co.nz](http://rinnai.co.nz)  
[youtube.com/rinnainz](https://www.youtube.com/rinnainz)  
[facebook.com/rinnainz](https://www.facebook.com/rinnainz)

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## Before installation

- **Check for damage:** Unpack the appliance and check for damage. DO NOT install any damaged items.
- **Check components and gas type:** Check all components have been supplied and that you have the correct gas type.
- **Read these instructions:** Get an overview of the steps required before starting the installation. Failure to follow these instructions could cause a malfunction of the appliance. This could result in serious injury and property damage.
- **Applicable models:** These instructions apply only to the Rinnai A-Series continuous flow water heater models listed on the cover page of this guide.

## Appliance location

This appliance is designed for outdoor installations only. It MUST BE located above ground in open air with natural ventilation, without stagnant areas, where gas leakage and products of combustion can be rapidly dispersed by wind and natural convection.

The appliance MUST BE mounted on a vertical structure with the water and gas connections on the underside pointing downwards.

Location of the flue terminal MUST BE in accordance with Section 6 and Figure 6.2 of the AS/NZS 5601.

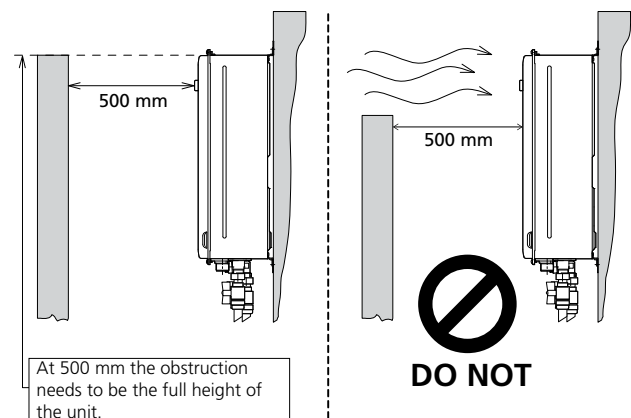
The appliance MUST BE placed **as close as practicable to the most frequently used hot water outlet** or outlets to reduce the delay time for hot water delivery<sup>1</sup>. For installations where the distance between the water heater and the outlets is considerable, a flow and return system can be used to minimise the waiting time for hot water delivery. Alternatively multiple appliances can be strategically placed to serve outlets with minimal delay time.

An AC 230 V, 10 A earthed power point must be provided adjacent<sup>2</sup> to the appliance. This power point must be weatherproof. It must be clear of the gas and water connections to the appliance and also the flue exhaust and water pressure relief valve. The power cord of the appliance is 1.5 m long.

All appliances MUST BE installed to ensure access can be gained without hazard or undue difficulty for maintenance and servicing. Sufficient clearances shall allow access and removal of all serviceable components. Appliances should not be mounted more than 2.5 m above the ground or floor level unless the customer can arrange permanent and safe access, or can provide another means of safe access.

### Horizontal obstructions

AS/NZS 5601 states a minimum horizontal clearance of 500 mm between a building structure and obstruction facing the terminal. At 500 mm the obstruction needs to be the full height of the unit (as shown), and not a partial obstruction. A partial obstruction of less than 1 m could result in wind pushing the flue gases back into the flue terminal.



<sup>1</sup> Rinnai recommend a maximum pipe run of 10 m.

<sup>2</sup> Power point can be within the pipe cover if a pipe cover is installed—must comply with AS/NZS Wiring rules

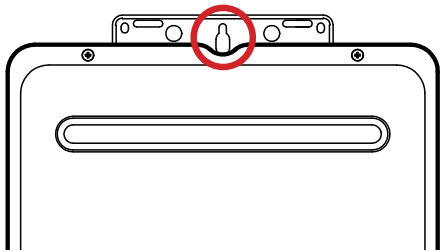
# General installation information

## Securing the Rinnai INFINITY

The wall or structure on which the units are mounted **MUST BE** capable of supporting the weight of the appliance and associated pipe work. Refer p. 7 for the specific model weight.

Ensure that suitable fixing screws or bolts are used to secure the unit to the wall, in accordance with AS/NZS 5601 section 6. Wooden plugs shall not be used.

The top bracket has a keyhole slot so that the appliance can be positioned by hanging it on one screw, once in position the appliance can then be secured with appropriate fittings.



The appliance can be mounted directly against the wall or structure. There is no need to use non-combustible sheeting between the appliance back panel and the wall or structure for the purposes of meeting the temperature hazard requirements of AS/NZS 5601.

## Pipe sizing

If the gas pipe sizing is insufficient the appliance won't perform properly. Gas pipe sizing must consider the gas input into this appliance as well as other gas appliances in the premises. The gas meter and regulator must be specified for this gas rate.

An approved sizing chart such as the one in AS/NZS 5601 should be used. Refer p. 7 for model specific gas consumption details.

Water pipe sizing and layout should be performed in accordance with AS/NZS 3500. All hot water pipe work should be insulated to optimise performance and energy efficiency.

## Water supply

The appliance is intended to be permanently connected to the water mains.

Refer p. 7 for model specific operational water pressure limitations. Approved pressure limiting valves may be required if the maximum rated water supply pressures are exceeded. To achieve the rated flow, the minimum water supply pressures must be met.

The A-Series water heaters will operate at lower pressures than the specifications, but will not achieve the rated flow. Contact Rinnai for gravity fed or low pressure installations.

Water chemistry and impurity limits are detailed in the operation guide within the warranty section. Most metropolitan water supplies fall within the requirements.

If you are unsure about your local water quality, contact your water authority. If sludge or foreign matter is present in the water supply, a suitable filter or strainer should be incorporated in the water supply to the Rinnai INFINITY.

# Water delivery temperature

Requirements of AS/NZS 3500 MUST BE considered regarding the temperature limitations of hot water supplied to areas used primarily for personal hygiene. The temperature of these areas may be limited to 55 °C or less.

If the appliance is to deliver water primarily for the purposes of personal hygiene in an early childhood centre, school, nursing home or similar facility as defined in AS/NZS 3500.4, a Temperature Limiting Device (TLD), such as a tempering valve may be required, even if the appliance is set to 55 °C or less. For these types of applications contact Rinnai.

## Requirements for Rinnai INFINITY units installed without controllers

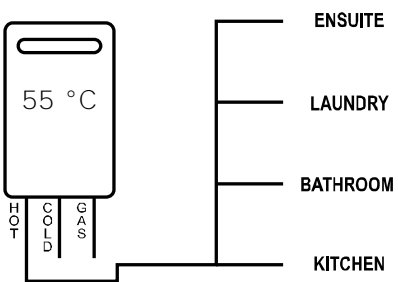


Diagram 1 - 55 °C Appliance

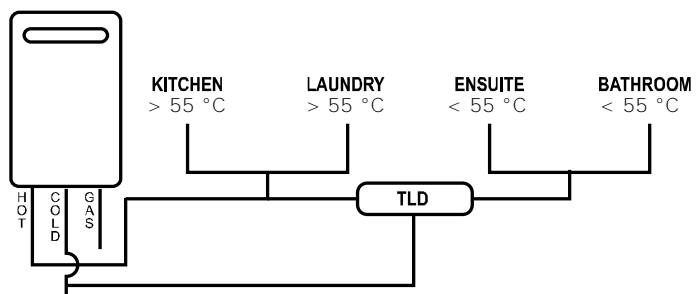
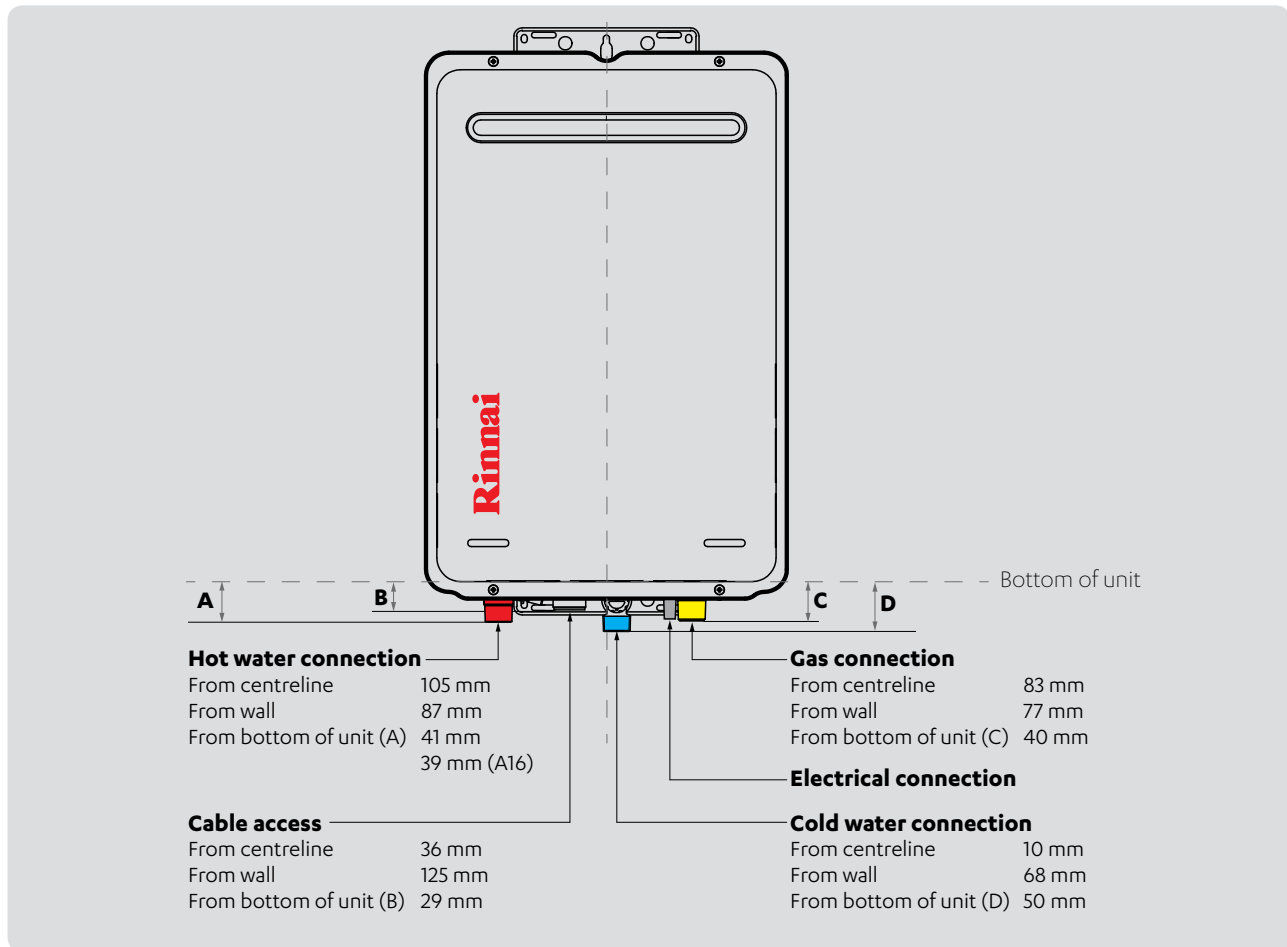


Diagram 2 - Not a 55 °C Appliance  
(TLD = Temperature Limiting Device)

When the Rinnai INFINITY is set to deliver water at a temperature higher than 55 °C, it will be necessary to fit a Temperature Limiting Device for delivery to areas used for the purposes of personal hygiene.

# Connections and fittings



Model	Gas consumption MJ/h	Water Supply kPa		Weight kg	Fittings		
		Min.	Max.		Hot	Cold	Gas
A16 external REU-A1620WG-ZK	16.3-124	120	1000	13	R $\frac{1}{2}$ (15 mm)	R $\frac{1}{2}$ (15 mm)	R $\frac{3}{4}$ (20 mm)
A20 external REU-A2024WG-ZK	19.9-156	160	1000	14	R $\frac{3}{4}$ (20 mm)	R $\frac{3}{4}$ (20 mm)	R $\frac{3}{4}$ (20 mm)
A24 external REU-A2426WG-ZK	16.3-184	200	1000	15	R $\frac{3}{4}$ (20 mm)	R $\frac{3}{4}$ (20 mm)	R $\frac{3}{4}$ (20 mm)
A26 external REU-A2626WG-ZK	16.3-199	200	1000	15	R $\frac{3}{4}$ (20 mm)	R $\frac{3}{4}$ (20 mm)	R $\frac{3}{4}$ (20 mm)

## Service connection points

An approved full flow isolation valve and disconnection union **MUST BE** fitted to the cold water inlet. A non-return valve is not required unless required by local regulations.

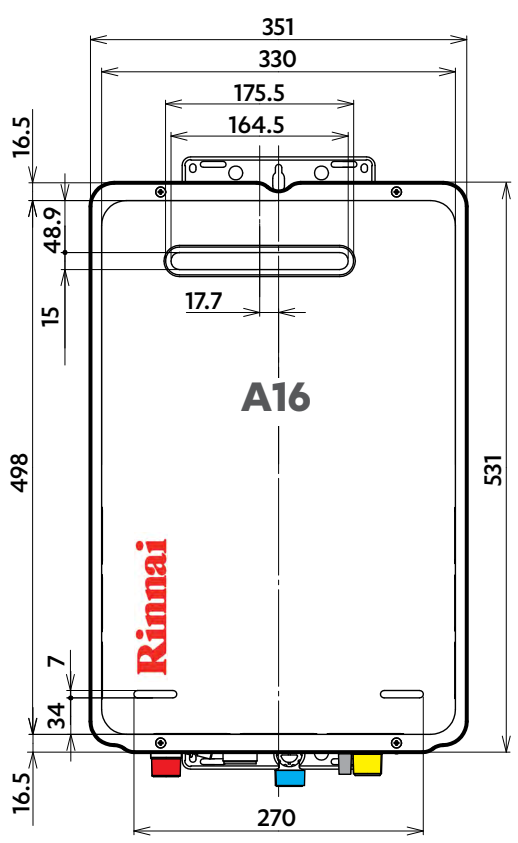
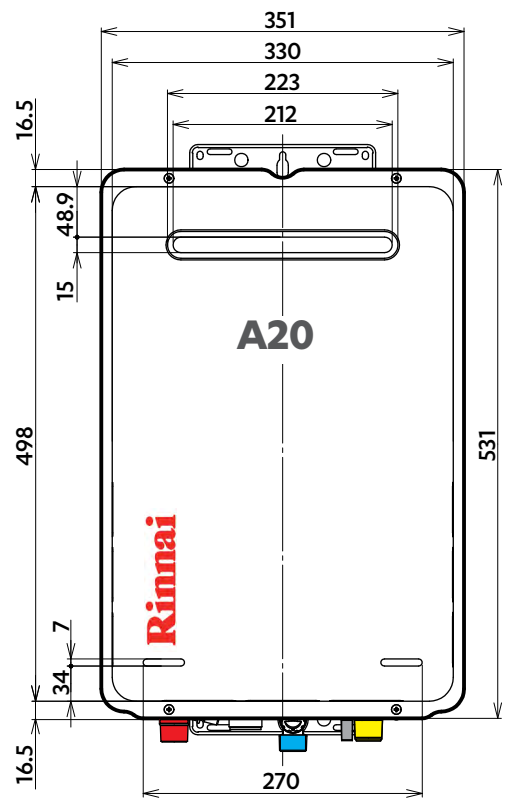
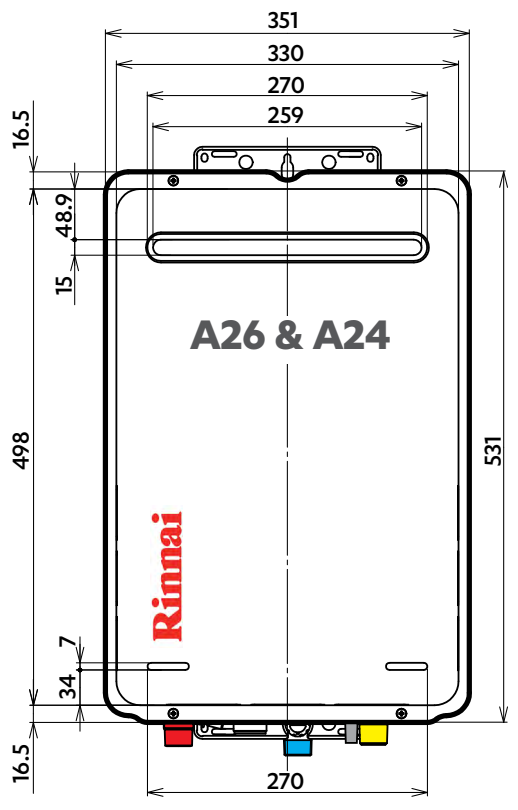
Isolation valves **MUST NOT** be fitted directly to the appliance.

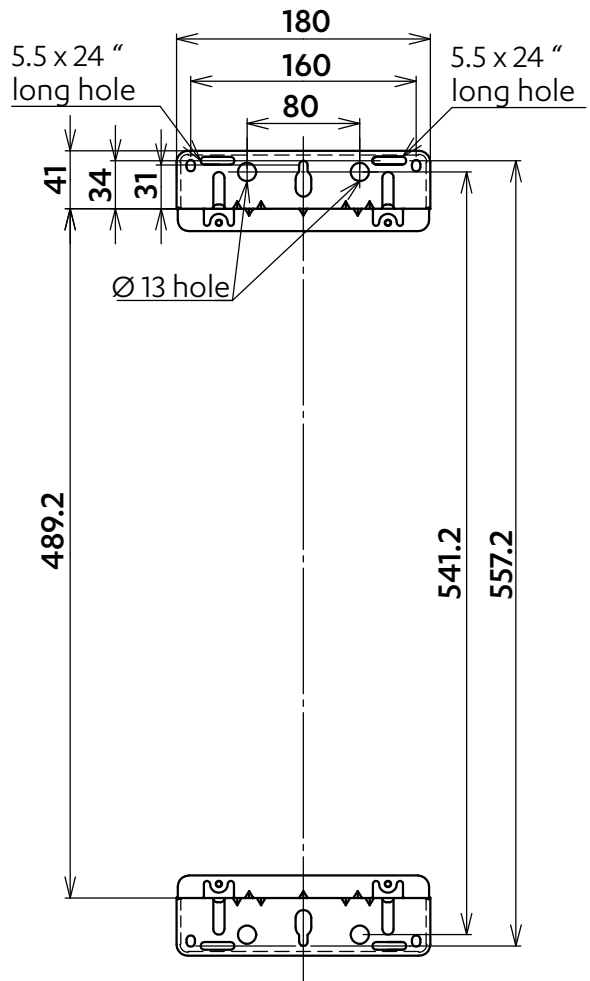
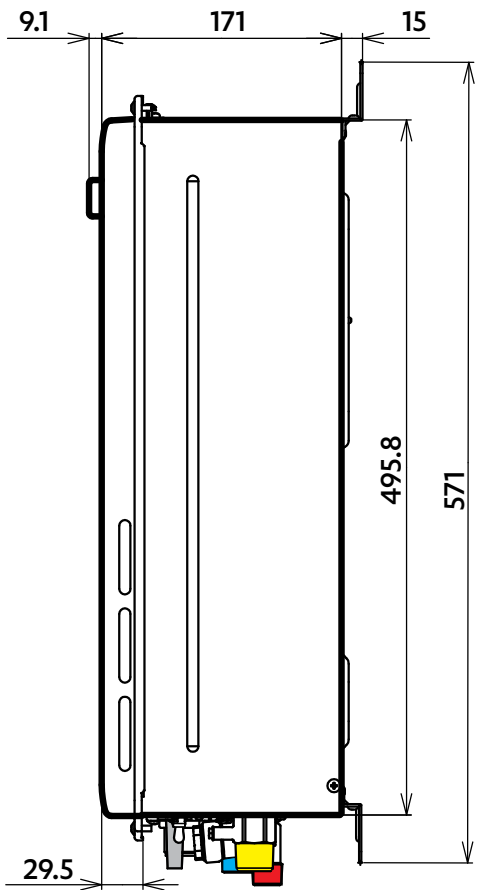
It may be necessary to fit a temperature limiting device for delivery to areas used primarily for the purposes of personal hygiene, refer previous page for 'Water delivery temperature' information.

Purge gas and cold water supply lines to remove air and swarf before final connection. Swarf in the gas or water supplies may cause damage, a common problem, which is not covered by warranty.

# Dimensions (mm)

The basic dimensions, (height, width, and depth) are the same. The difference between the models are the dimensions and position of the flue outlet.





# Commissioning

AS/NZS 5601.1, clauses 2.6.8 and 6.11.2, states that every part of a gas installation shall be commissioned prior to initial use. It is the installer's responsibility to ensure all current AS/NZS 5601 requirements are met. The URL's provided are links to short videos on how key steps are performed.



The appliance operation must be tested after installation. Ensure the building occupants do not have access to the hot water outlets during this procedure.

## Please note

The Rinnai INFINITY A-Series comes with a factory preset outlet temperature of 55 °C. The high and low gas operating pressures are also factory preset. Under normal circumstances the operating pressures do not require adjustment during installation. Make adjustments ONLY if the unit is not operating correctly and all other possible causes for incorrect operation have been eliminated.

Inlet supply pressure to the appliance **MUST BE** checked and set within the operating parameters of the appliance in all instances.

If the appliance can not be adjusted to perform correctly call 0800 RINNAI (0800 746 624) for assistance.

## Steps to commissioning a Rinnai INFINITY A-Series model

- 1 Flush water pipes, and gas line**  
 Before final connection of the water heater flush the gas, hot and cold water supply lines. Swarf in the gas or water supplies may cause damage, a common problem, which is not covered by warranty.

---

- 2 Connect gas line**

---

- 3 Purge the gas line of air**

---

- 4 Final connection test**

---

- 5 Check supply pressure**  
 Operate ALL other gas appliances at their maximum gas rate. With all gas appliances on maximum the supply pressure must read between 1.13-3.0 kPa on Natural Gas. On LPG the pressure must be 2.75-3.0 kPa.

If the pressure is lower, the gas supply is inadequate and the appliance will not operate to specification. It is the installer's responsibility to check the gas meter, service regulator and pipe work for correct operation and sizing, and rectify as required.

## 6 **PCB and/or dip switch settings checked.**

Refer p.12-14.

PCB settings checked if the factory default temperature has been changed.

Dip switch settings checked if a flue diverter is fitted.

 Short video: <http://rinnai.co.nz/007>

---

## 7 **Operate and test for gas leaks**

Replace the appliance front cover otherwise the unit won't operate correctly, and operate and test for gas leaks using an electronic leak detector.

---

## 8 **Operational test—water flow and temperature at the hot water outlets**

Confirm the hot water delivery temperatures using a thermometer.

If water controllers are fitted, it is necessary to test their operation through the complete range of functions, refer separate instructions provided with the water controllers.

---

## 9 **Check cold water inlet filter**

Inspect and clean the water inlet filter. This may need to be repeated to ensure the filter remains clear, especially on new installations.

 Short video: <http://rinnai.co.nz/006>

If you feel the customer is capable of doing this check it would be beneficial to show them how to inspect and clean the filter as well.

---

## 10 **Customer handover**

After testing is completed, explain to the customer the functions and operation of the water heater and water controllers (if fitted).

Also talk to them about the gas, power, and water connections, how frost protection works, the procedure for draining the water heater, where to find the data plate, maintenance and servicing. If the customer is not there try and contact them by phone to relay the important points.

Ensure the installer details section is completed in the operation guide, the commissioning checklist has been completed and signed, and that guide and checklist are left with the customer.

## PCB interface and dip switch settings

The PCB interface and dip switch settings must only be changed by a licensed gasfitter. They have been provided as there may be a requirement to change the temperature of the water delivered from the water heater or change the dip switch settings if fitting a flue diverter.



Care must be taken when changing the temperature or dip switch settings as they can be easily switched or bumped into the wrong position. Fully check the operation of the water heater before leaving including the temperature of the water delivered.

The cover of the water heater will need to be removed to carry out this operation. As this will expose live mains voltage wiring **please disconnect the power supply before removing the front cover.**

We wish to draw your attention to the requirements of the New Zealand Building Code and compliance document G12. This requires that water delivered to sanitary fixtures be no more than 55 °C. Increasing the water heater set temperature will require that you protect all sanitary fixtures to which the appliance is plumbed with suitable tempering valves or something similar.

Rinnai will accept no liability for issues arising out of the use of this information.

If you have any doubts about the performance of the water heater, please contact Rinnai by phoning 0800 RINNAI (0800 746 624).

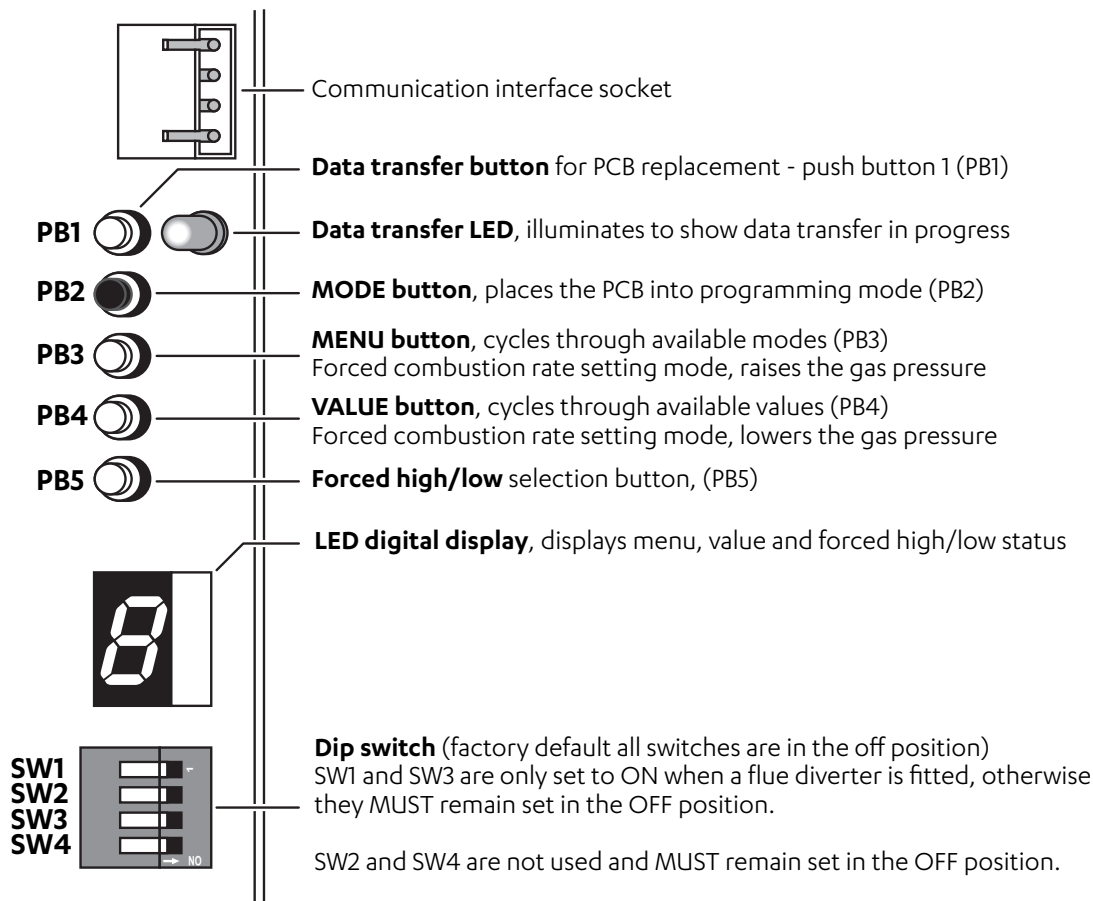
The following information details settings for the Rinnai INFINITY A-Series models only. They are not applicable for other models.

### Basic operation of the PCB interface

- To place the PCB into programming mode press PB2 until the LED digital display shows *1*, noting that the current set value will be displayed shortly afterwards.
- To alter a value press PB4, each press of the button will select the next available value.
- To change to another menu, press PB3, each press of the button will select the next available menu.
- To exit the programming mode and save the selected settings press PB2 until the LED display goes blank.

### Note:

- If no buttons are pressed the PCB will automatically exit programming mode after 10 mins.
- Exiting programming mode sets the value last viewed as the current value.



Menu	Menu description	Value							
		A	b	C	d	E	F	H	J
1	Gas type	ULPG	NG	N/A	N/A	N/A	N/A	N/A	N/A
2*	Model	2626	2426	2024	1620	N/A	N/A	N/A	N/A
3	Fixed / Max. temp	55 °C <sup>1</sup>	65 °C	60 °C	50 °C	42 °C	40 °C	N/A	N/A
4	OFF water flow rate	+ 3 °C <sup>2</sup>	+ 6 °C	N/A	N/A	N/A	N/A	N/A	N/A
5	50 °C delivery adjustment temp.	Min Step 0	Increase Step 1	Increase Step 2	Increase Step 3	Increase Step 4	Increase Step 5	Increase Step 6	Increase Max

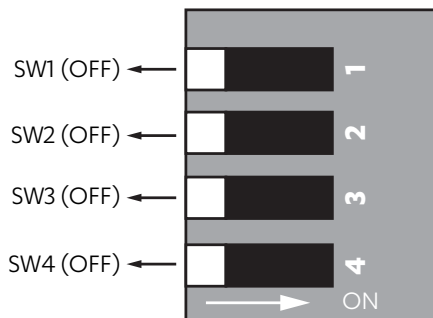
The temperature of outgoing hot water is constantly monitored by a built-in sensor. If the temperature of the outgoing hot water rises to more than 3 °C (6 °C #) above the selected temperature shown on the digital monitor or the preset limit when water controllers are fitted, the burner will automatically go out.

\* Values in menu 2 cannot be adjusted.  
 1 Factory default  
 2 OFF water flow rate (+3 °C, factory default)

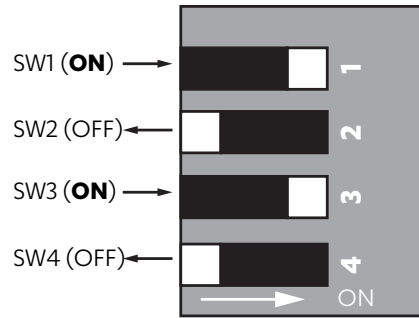
## Flue diverter dip switch changes

When delivered ex-factory, by default SW1, SW2, SW3, and SW4 of the DipSW are set to the OFF position.

If a flue diverter is installed onto the water heater, SW1 and SW3 of the DipSW must be set to the ON position.



Default dip switch settings as they are ex-factory.



Dip switch settings required for flue diverter installation.

The dip switch change for flue diverters is required to increase the combustion fan speed, which helps overcome the friction losses from have a flue diverter installed on the water heater.

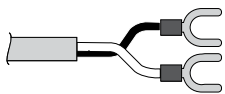
# Appendix 1: Water controller communication cables

Wired water controllers operate at an extra low voltage (12 V DC) which is supplied from the water heater, a 10 m long communication cable is supplied for connection to the water heater. Only Rinnai supplied communication cables may be used.

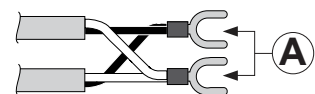
The water heater end of the cables is fitted with spade terminals. Only two pairs of cables (four spade connectors in total) may be terminated. When attaching three or four cables it is necessary to join the cable terminators as shown below.

For each pair cut off the existing spade connectors and re-terminate each pair into a new spade connector (A). Spade connectors are available from your local electrical component retailer

Single cables can be used when terminating up to two communication cables.



Paired cables are to be used when terminating three or four communication cables.

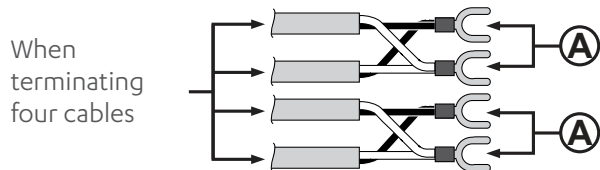
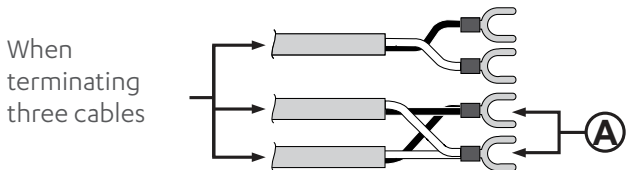


## Connecting one or two communication cables

Follow steps one through five below to terminate the cables to the water heater.

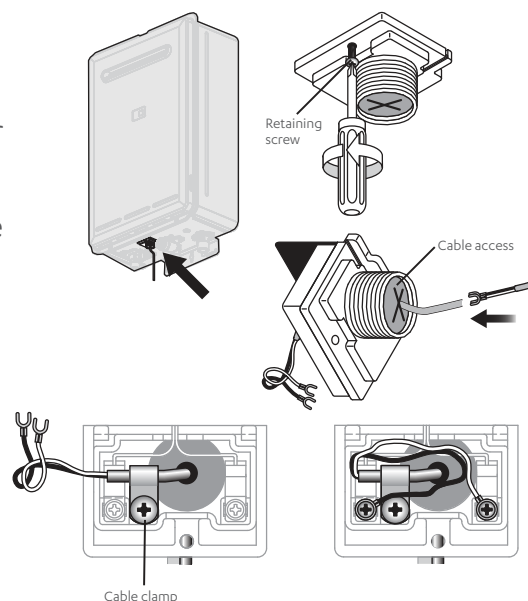
## Connecting three or four communication cables

To connect three or four cables, separate all the cables to be fitted into pairs.



Follow steps one through five below to terminate the joined cable pairs to the water heater.

1. Isolate the power supply by switching the power point off and removing the power plug of the water heater from the electric power socket.
2. Removing the retaining screw of the cable connector at the base of the unit.
3. Swing the cable connector door open and thread the cable through the weather seal of the cable access hole, allowing sufficient cable length so that the sheath of the cable can be secured with the cable clamp supplied with the transceiver.
4. Loosen the screw terminals and connect the cable spade connectors to these terminals and re-tighten.  
Polarity is not important, either wire colour can be connected to either terminal.
5. Return the cable connector to the original position, taking care not to damage the cable wires in the process, and replace the retaining screw.



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of magic



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U340-1336(01)

**Rinnai****INFINITY A-series**

continuous flow gas hot water heaters

**PTS**

01:18

A Product Technical Statement (PTS) is a way to show how a product or system is fit for purpose for use in New Zealand and to demonstrate compliance with the New Zealand Building Code (Building Code Amendment Act 2013).

**Product description**

Designed and made in Japan, the Rinnai INFINITY A-series are continuous flow gas hot water heaters with inbuilt frost protection. They have electronic ignition and require electricity to operate. The temperature dip switch setting is factory preset at 55 °C.

The INFINITY A-series comes in a range of sizes, model selection is dependent on the number of outlets in the house. Click on any of the thumbnail images to view the product information.

**Scope of use**

Suitable for mains and medium pressure residential applications. They are designed to be externally mounted on an outside wall and located as close as practicable to the most frequently used hot water outlet(s), to reduce the delay for hot water delivery.

They are not suitable as a spa or swimming pool heater. They are also not suitable for commercial installations.

Hard or acidic water will need to be treated to use this product.

Available for connection to natural gas or LPG, this must be specified at the time of purchase.

Flue terminations must comply with the flue terminal locations shown in AS/NZS 5601.1.

**Design guidelines**

Specification and installation must be in accordance with Rinnai installation requirements and with the Building Code.

Rinnai specify that installation must be in compliance with AS/NZS 5601.1:2013, AS/NZS 3000:2007, and AS/NZS 3500.

**Quality assurance**

- ISO 9001 Certified System
- ISO 14001 Certified System

**A16****A20****A24****A26**

www.intlcert.com



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# INFINITY A-series

continuous flow gas hot water heaters

# PTS

01:18

## Compliance with the NZ Building Code

If specified, installed and maintained in accordance with all Rinnai requirements the INFINITY A-series will comply with the below provisions of the NZ Building Code. AS/NZS 5601.1 is an acceptable solution within the NZBC for gas installations as per NZBC G11/AS1 9.0.1.

Code clause	Evidence of compliance
B1.3.1 B1.3.2 B1.3.3 (a, b, c, h, , m)	The INFINITY A-series units are certified to AS/NZS 4552, a series of standards for safety, performance and energy efficiency in gas fired water heaters for hot water supply and/or central heating.
B.2.3.1 (c)	In service history.
C2.2 and C2.3	Certification of continuous flow gas water heaters to AS/NZS 4552.
E2.3.2	Achieved by following E2/AS1
G4.3.3 (f, i)	Achieved as long as the building complies with G4/AS1
G9.3.1 (a, b, c, d, f), G9.3.3	G9/AS1 as required by Rinnai installation guidance
G10.3.1 (a, b, c, d), G10.3.2, G10.3.3, G10.3.4, G10.3.5, G10.3.6	G10/AS1 (NZS 5442 natural gas) and (NZS 5435 LPG)
G11.3.1, G11.3.2, G11.3.3, G11.3.4	G11/AS1 (AS/NZS 5601.1) as required by Rinnai installation guidance
H1.3.4	Certification of continuous flow gas water heaters to AS/NZS 4552.2 (Minimum energy performance standards for gas water heaters).

## Additional evidence to support the above statements

Energy Safety Supplier Declaration of Compliance:

- INFINITY A16: Declaration number - [1825920179](#)
- INFINITY A20: Declaration number - [1825820179](#)
- INFINITY A24: Declaration number - [1825720179](#)
- INFINITY A26: Declaration number - [1825620179](#)

## Seismic restraint

Rinnai has prepared a seismic restraint calculation using NZS 4219. This can be accessed from the A-series product page (technical tab) on the Rinnai website.

## Special conditions - installation requirements

Full appliance information can be found at [www.rinnai.co.nz](http://www.rinnai.co.nz).

Limitations: To be installed in accordance with all Rinnai installation requirements and by a licensed gasfitter/plumber, and electrician. Upon completion of the installation, a final inspection and test to demonstrate that the gas appliance has been installed in accordance with Rinnai's instructions and in accordance with Gas (safety and measurement) Regulations 2013 is required by the installer. The gasfitter is to issue a certificate of compliance.

## Special conditions - maintenance requirements

For reliable operation Rinnai INFINITY units should be serviced every two years. Installation, servicing and repair shall be carried out only by authorised personnel.



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<http://www.youtube.com/rinnainz>

# Seismic force calculation

## (as per NZS 4219:2009)



Product: Rinnai **INFINITY A-series** gas continuous flow water heaters

### Earthquake load demand as per section 3.4

EQ load demand	F	23.409
F=C x W (equation 3.1) Appliance weight <sup>1</sup>	W	17.00
Building placement factor <sup>2</sup>	CH	1
Zone factor <sup>3</sup>	Z	0.6
Performance factor	CP	0.85
Risk factor <sup>4</sup>	Rc	1
Lateral force coefficient 2.7 x CH x Z x CP x Rc (equation 3)	C	1.377

<sup>1</sup> Assumes 15 kg max for A26, other A-series models weigh less  
<sup>2</sup> Assumes appliance is located at ground floor level  
<sup>3</sup> Assumes worst case zone factor based on table NZS 4219 Table 3  
<sup>4</sup> Assumes building importance of 4 and component value of P5 based on NZS 4219:2009 Table 2 and Table 1 calculated as per NZS 4219:2009 3.4.3 Table 5

### Relative seismic displacement as per section 3.5

Height between fixing points <sup>1</sup>	Hz	0.571
Component displacement 0.025 x Rc x Hz (equation 3.3)	D	0.001428

<sup>1</sup> Assumes 571 mm on a A-series unit between top and bottom bracket hole centroids

### Combined action on component

kg - 273.9906
kn - 2.685108 (safety factor 1.936607)

Rinnai A-series CFWH mounting brackets and hardware has been tested for shear force by SGS in test reports INZ 61025-01 and 61025-02

- Shear force of mounting bracket 5.2 kN
- Shear force of M5 screw 10.0 kN

### Fixing suggestions

- Timber fixing: as per NZS 4219:2009 Table 9, 8 mm diameter coach screw inserted into grain side dry radiata pine timber
- Steel fixing: as per NZS 4219:2009 Table 10, M8 bolt
- Masonry drill in fixing: 8 mm (M6) Ramset dynabolt as per Ramset Technical Resource 31.1

**Please note:** The calculation only pertains to the appliance and not the associated pipework.

JOHN SWARBRICK  
 Technical and Compliance Manager (01-18)



## FORM 7 CODE COMPLIANCE CERTIFICATE NUMBER BCon19/0212

Section 95(3), Building Act 2004

Mr DW Blythe, Mrs EL Blythe  
5A Toi Street  
Tawhero  
Whanganui 4501

**Building Consent  
No:** BCon19/0212

**Issue Date:** 24/11/2021

**The building:**

<b>Street address of building:</b>	<b>Legal description of land where building is located:</b>
5A Toi St WHANGANUI	LOT 1 DP 45374 0.1003 Ha
<b>Building name:</b>	<b>Location of building within site/block number:</b>
<b>Level/unit number:</b>	<b>Current, lawfully established, use:</b> [include number of occupants per level and per use if more than 1]
	Single Detached Residential
<b>Year first constructed:</b>	
2019	

**The owner:**

<b>Name of Owner:</b>	
Mr DW Blythe, Mrs EL Blythe	
<b>Mailing address:</b>	<b>Street Address/registered Office:</b>
5A Toi Street Tawhero Whanganui 4501	5A Toi Street Tawhero Whanganui 4501

**Phone numbers:**

<b>Landline:</b>	063485595	<b>Mobile:</b>	0274072412
<b>Daytime:</b>	063439488	<b>After hours:</b>	
<b>Facsimile number:</b>			
<b>Email address:</b>	erin.daz.b@gmail.com	<b>Website:</b>	

**First point of contact for communications with the building consent authority:**

<b>Contact Person:</b>	
BuildBIM	
<b>Mailing address:</b>	<b>Street Address/registered Office:</b>
1/77 Gloucester Street, Christchurch Central, Christchurch 8013	1/77 Gloucester Street, Christchurch Central, Christchurch 8013

**Phone number:**

<b>Landline:</b>		<b>Mobile:</b>	0211091583Jody
<b>Daytime:</b>		<b>After hours:</b>	
<b>Facsimile number:</b>			
<b>Email address:</b>		<b>Website:</b>	

**Building Work**

<b>Building consent number:</b>	<b>Issued by:</b>
BCon19/0212	Whanganui District Council
<b>Type of Work</b>	
Single Detached Residential	
<b>Description of Work</b>	
Construct a new residential dwelling with detached garage/sleepout. + Alteration.1 Amendment to Bracing.	
<b>Intended Life</b>	<b>Estimated Value</b>
Indefinite but not less than 50 years.	\$250000.00

**Code compliance:**

The building consent authority named below is satisfied, on reasonable grounds that the building work complies with the building consent.

\*Compliance schedule

There are no specified systems in this building.

This is a final Code Compliance Certificate issued in respect of all of the building work under the above Building Consent.

Signed for and on behalf of the Whanganui District Council:



GJ Hoobin

**Building Control Team Leader**