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Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

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

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

THE BUILDING

Street address: 21 Pajet Street, Lot 428 Prestons Park

Suburb: Marshlands

Town/City: Christchurch

Postcode: 8083

THE OWNER

Name(s): BHC Ltd (Trading as Signature Homes North)

Mailing address: 30 Main North Road

Suburb: Papanui

PO Box/Private Bag:

Town/City: Christchurch

Postcode: 8053

Phone number: 0800 7444 66

Email address:

BASIS FOR PROVIDING THIS MEMORANDUM

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

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

I, Adam Cooper, supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is restricted building work	Description	Carried out/ supervised	Reference to plans and specifications
Tick(✓) if included Cross (X) if excluded	[If appropriate, provide details of the restricted building work]	[Specify whether you carried out this design work or supervised someone else carrying out this design work]	[If appropriate, specify references]

Primary structure

All RBW Design work relating to B1	(√)		() Carried out (√) Supervised	
Foundations and subfloor framing	()	<i>Refer Firth ribraft</i>	() Carried out () Supervised	
Walls	()		() Carried out () Supervised	
Roof	()	<i>Refer Truss design</i>	() Carried out () Supervised	
Columns and beams	()		() Carried out () Supervised	
Bracing	()		() Carried out () Supervised	
Other	()		() Carried out () Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2	(√)		() Carried out (√) Supervised	
Damp proofing	()		() Carried out () Supervised	
Roof cladding or roof cladding system	()		() Carried out () Supervised	
Ventilation system (for example, subfloor or cavity)	(x)	<i>No subfloor</i>	() Carried out (x) Supervised	
Wall cladding or wall cladding system	()		() Carried out () Supervised	
Waterproofing	()		() Carried out () Supervised	
Other	()		() Carried out () Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

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

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

Note: continue on another page if necessary.

WAIVERS AND MODIFICATIONS

Waivers or modifications of the building code are required ☐ Yes ☒ No

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

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

Note: continue on another page if necessary.

ISSUED BY

Name: Adam Cooper	LBP or Registration number: 127872
The practitioner is a: ☒ Design LBP ☐ Registered architect	☐ Chartered professional engineer
Design Entity or Company (optional): AP Design Ltd	
Mailing address (if different from below):	
Street address / Registered office: 128 Montreal Street, Sydenham 8024	
Suburb: Christchurch	Town/City: Christchurch
PO Box/Private Bag: 281	Postcode: 8140
Phone number: 03 942 1977	Mobile:
After Hours:	Fax:
Email address:	Website:

DECLARATION

I Adam Cooper *[name of practitioner]*, LBP, 127872

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

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

Signature:



Date:

3-5-2019

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: Dec 11, 2018

VENDOR: CDL Land New Zealand Limited

PURCHASER: Peregrino Silvano CADIVEN & Carmelita Aranco CADIVEN

and/or nominee

The vendor is registered under the GST Act in respect of the transaction evidenced by this agreement and/or will be so registered at settlement:

Yes/No

PROPERTY

Address: Lot 428 Stage U, Prestons Park Subdivision

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

Legal Description:

Area (more or less):
458sqm2

Lot/Flat/Unit:
428

DP:
525627

Unique Identifier or CT:

As shown on the attached Stage Subdivision Plan, subject to the Further Terms of Sale (a separate title for the Property is yet to issue).

PAYMENT OF PURCHASE PRICE

Purchase price: \$240,000

Two Hundred & Forty Thousand Dollars

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): The settlement date

Deposit (refer clause 2.0): \$ 10% of the purchase price inclusive of GST (if any) payable to the Vendor's Solicitors Trust Account upon the last of the Purchaser's conditions being satisfied.

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

(1) By payment in cleared funds on the settlement date which is 5 working days after the Vendor notifies the Purchaser that a search copy of the separate title for the Property is available or 15th February 2019 whichever is the later.

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

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

CONDITIONS (refer clause 10.0)

Finance condition:

Lender:

Amount required:

Finance date:

LM required: (refer clause 10.2) Yes/No

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

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

Land Act/OIA date: 20 working days after the last of the Purchaser's conditions is satisfied

TENANCIES (if any)

Name of tenant:

Bond: **Rent:** **Term:** **Right of renewal:**

SALE BY:

Professionals Christchurch Limited

Licensed Real Estate Agent under Real Estate Agents Act 2008

It is agreed that the vendor sells and the purchaser purchases the property, and the chattels listed in Schedule 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

BKC

1

Udovon

Sky

Prestons Park Stage U Pre Title Non DB

GENERAL TERMS OF SALE

1.0 Definitions, time for performance, notices, and interpretation

1.1 Definitions

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

1.2 Time for Performance

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

1.3 Notices

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

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

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

1.4 Interpretation

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

2.0 Deposit

- 2.1 The purchaser shall pay the deposit to the vendor or the vendor's agent immediately upon execution of this agreement by both parties and/or at such other time as is specified in this agreement.
- 2.2 If the deposit is not paid on the due date for payment, the vendor may at any time thereafter serve on the purchaser notice requiring payment. If the purchaser fails to pay the deposit on or before the third working day after service of the notice, time being of the essence, the vendor may cancel this agreement by serving notice of cancellation on the purchaser. No notice of cancellation shall be effective if the deposit has been paid before the notice of cancellation is served.
- 2.3 The deposit shall be in part payment of the purchase price.
- 2.4 The person to whom the deposit is paid shall hold it as a stakeholder until:
 - ~~(1) the requisition procedure under clause 6.0 is completed without either party cancelling this agreement; and~~
 - ~~(2) where this agreement is entered into subject to any condition(s) expressed in this agreement, each such condition has been fulfilled or waived; and~~
 - ~~(3) where the property is a unit title:~~
 - (a) a pre-settlement disclosure statement, certified correct by the body corporate, under section 147 of the Unit Titles Act 2010; and
 - (b) an additional disclosure statement under section 140 of the Unit Titles Act 2010 (if requested by the purchaser within the time prescribed in section 140(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
- the transfer of the property is to be registered against a new title yet to be issued; and
 - a search copy, as defined in section 172A of the Land Transfer Act 1952, of that title is not obtainable by the ~~tenth~~ ^{fifth} working day prior to the settlement date, ^{fifth} ~~tenth~~
 - 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~~ ^{fifth} working day following the ~~later of~~ the date on which:
 - the vendor has given the purchaser notice that a search copy is obtainable; or
 - ~~the 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:
- 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:
 - 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
 - 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;
 - 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
 - any payments payable by the purchaser on account of the purchase price shall be deemed to have been paid to the extent that:
 - RLWT has been withheld from those payments by the purchaser or the purchaser's conveyancer as required by the RLWT rules; and
 - 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:
- 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
 - 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:
- 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
 - 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:
- the costs payable by the vendor under subclause 4.1(2) that the purchaser or the purchaser's conveyancer intends to deduct; and
 - 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:
- if the destruction or damage has been sufficient to render the property untenantable and it is untenantable on the settlement date, the purchaser may:
 - complete the purchase at the purchase price, less a sum equal to any insurance moneys received or receivable by or on behalf of the vendor in respect of such destruction or damage, provided that no reduction shall be made to the purchase price if the vendor's insurance company has agreed to reinstate for the benefit of the purchaser to the extent of the vendor's insurance cover; or
 - cancel this agreement by serving notice on the vendor in which case the vendor shall return to the purchaser immediately the deposit and any other moneys paid by the purchaser, and neither party shall have any right or claim against the other arising from this agreement or its cancellation;
 - if the property is not untenantable on the settlement date the purchaser shall complete the purchase at the purchase price less a sum equal to the amount of the diminution in value of the property which, to the extent that the destruction or damage to the property can be made good, shall be deemed to be equivalent to the reasonable cost of reinstatement or repair;
 - in the case of a property zoned for rural purposes under an operative District Plan, damage to the property shall be deemed to have rendered the property untenantable where the diminution in value exceeds an amount equal to 20% of the purchase price; and
 - 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~~ ^{date of the Agreement}.
- 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.~~ (subject to the Further Terms of Sale)
- (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:~~
- ~~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;~~
 - ~~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;~~
 - ~~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:~~
- ~~in the case of a cross lease title:-~~
 - ~~alterations to the external dimensions of any leased structure; or~~
 - ~~buildings or structures not intended for common use which are situated on any part of the land that is not subject to a restricted user covenant;~~
 - ~~in the case of a unit title, encroachments out of the principal unit or accessory unit title space (as the case may be);~~
~~then the purchaser may requisition the title under subclause 6.2 requiring the vendor:-~~
 - ~~in the case of a cross lease title, to deposit a new plan depicting the buildings or structures and register a new cross lease or cross leases (as the case may be) and any other ancillary dealings in order to convey good title; or~~
 - ~~in the case of a unit title, to deposit an amendment to the unit plan, a redevelopment plan or new unit plan (as the case may be) depicting the principal and/or accessory units and register such transfers and any other ancillary dealings in order to convey good title.~~

- ~~(2) The words "alterations to the external dimensions of any leased structure" shall only mean alterations which are attached to the leased structure and enclosed.~~
- 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 3.0(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 10.0(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 10.0(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 10.0(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 1940 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

Refer to the Prestons Park Further Terms of Sale for Stage U, being Lots 425-438 (non Development Blocks), attached.

30.0 Solicitors Approval

BKC
BKC

uas:vm
cac

SW
psc

30.1 This agreement is conditional on the Purchaser's solicitor's approval of the form and content (including commercial matters) of this Agreement, within 5 (five) working days after the date of this Agreement. This condition is inserted for the sole benefit of the Purchaser(s).

31.0 Finance

BKC
BKC

uas:vm
cac

SW
psc

31.1 This agreement is subject to and conditional upon the Purchaser(s) obtaining finance to enable the Purchaser(s) to complete the purchase of the property on terms and conditions satisfactory to the Purchaser(s) in all respects within 5 (five) working days and by 4.00pm on the last day for confirmation.

This condition is inserted for the sole benefit of the Purchaser(s).

32.0 Deposit

BKC
BKC

uas:vm
cac

SW
psc

32.1 The person to whom the deposit is paid shall hold it as stakeholder until this agreement becomes unconditional or is earlier validly cancelled or avoided.



BKC

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uas:vm

SW

Prestons Park Stage U Pre Title Non DB

SCHEDULE 1**(GST Information – see clause 15.0)**

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

Section 1

1.	The vendor's registration number (if already registered): 59728586	
2.	Part of the property is being used as a principal place of residence at the date of this agreement. That part is: (e.g. "the main farmhouse" or "the apartment above the shop")	Yes/No
3.	The purchaser is registered under the GST Act and/or will be so registered at settlement.	Yes/No
4.	The purchaser intends at settlement to use the property for making taxable supplies.	Yes/No

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

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

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

Section 2

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

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

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

SCHEDULE 2

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

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

BKC


cac


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

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

Acknowledgements

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

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

Signature of Purchaser(s):**Signature of Vendor(s):**

Carmelita Aranco Cadiven (Dec 7, 2018)
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


Boo Keng Chiu (Dec 11, 2018)
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


Peregrino Silva Cadiven (Dec 7, 2018)
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].



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Prestons Park Stage U Pre Title Non DB

FURTHER TERMS OF SALE

Prestons Park Stage U Pre title issuing Non-Development Blocks

19. Subdivision

- 19.1 Title for the Property has not yet issued. There are a range of documents available on the Prestons Park website (www.prestonspark.co.nz) including a list which provides up to date information on when titles are expected to issue.
- 19.2 The Vendor has obtained the subdivision consents referred to in clause 29 (as varied or replaced from time to time), (the "**Subdivision Consent**"), which provide for a staged subdivision known as Prestons Park (the "**Subdivision**").
- 19.3 The Subdivision Consent includes consent for the subdivision of Stages Q, R, S, T, U, W, X and Y. The Property forms part of Stage U (the "**Stage**"). The current head title reference for the Stage is 820452, but this reference may change as a result of the completion of intervening stages of the Subdivision.
- 19.4 The Vendor will use its best endeavours to complete the subdivision of the Stage, generally in accordance with the Stage subdivision plan **attached** to this Agreement (the "**Stage Subdivision Plan**"), either as a single stage or as two or more substages, and in accordance with the Subdivision Consent, in order to provide a separate title for the Property. However, if a search copy for the separate title for the Property is not available within 12 months after the date of this Agreement, then either party may by notice in writing to the other avoid this Agreement, at any time prior to a search copy of a separate title for the Property becoming available. If the Agreement is avoided under this clause 19.4, the Purchaser will be entitled to a refund of any deposit paid, and any net interest earned thereon.
- 19.5 The Purchaser acknowledges and accepts that:
- (a) Easements, consent notices, covenants and other interests may be registered or noted against the title to the Property as part of the Subdivision, to the extent these are required by the Subdivision Consent, or are shown as required or proposed on the Stage Subdivision Plan, or are referred to in clause 20, or are shown on the head title;
 - (b) Any other interest required by the Vendor for the benefit of the Stage or the Subdivision may also be registered or noted against the title to the Property, and the Purchaser will raise no objection to such interests, except as stated in clause 19.6 below; and
 - (c) The Vendor may also make changes to the Stage Subdivision Plan if these are required or desirable for completion of the Stage or the Subdivision, and the Purchaser will raise no objection to such interests, except as stated in clause 19.6 below.
- 19.6 However, if an interest to be registered or noted under clause 19.5(b), or a change to the Stage Subdivision Plan under clause 19.5(c), would have a material adverse effect on the ability to use the Property for residential purposes, the Purchaser may avoid this Agreement by notice in writing within 5 Working Days after the date of being notified of the interest or change (time being of the essence). To avoid doubt, the following will not constitute a material adverse effect:
- (a) a reduction in land area of the Property of 3% or less;
 - (b) removal of an existing or proposed easement, consent notice, covenant or other interest which only burdens and does not benefit the Property;
 - (c) changes to the staging of the Subdivision;

- (d) registration of the consent notice contemplated by clause 30 of the subdivision consent for the Stage (regarding the requirement for foundation design by an engineer as part of the Purchaser's building consent application, and compliance with zoning requirements).
- 19.7 If this Agreement is avoided 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.
- 19.8 If there is any disagreement between the Vendor and the Purchaser as to whether there has been a "material adverse effect" on the ability to use the Property for residential purposes under clause 19.6, then such disagreement may be referred by either party to an independent person nominated by the President of the New Zealand Law Society (the "**expert**") for determination. The expert shall act as an expert and not as an arbitrator and his or her decision shall be final and binding upon the parties. The costs of the expert shall be borne equally by the parties. No notice of avoidance by the Purchaser pursuant to clause 19.6 will be effective until determination by the expert if the Vendor disputes the validity of the notice.

20. Land Covenants and Fencing

Land Covenants

- 20.1 Land covenants providing for restrictions on the Property substantially in the form **attached** (the "**Land Covenants**") will be noted against the titles for the sections in the Stage which are intended for residential use, except for those sections intended as development blocks (the "**Development Blocks**"), and the benefit of the Land Covenants may be noted against the title to any recreation reserves within the Stage.
- 20.2 Separate land covenants, substantially in the form **attached**, will be noted against the titles for any Development Blocks (the "**Development Block Land Covenants**").
- 20.3 The Purchaser will be bound by the Land Covenants, but not the Development Block Land Covenants.
- 20.4 Subject to the terms of the Land Covenants, the Purchaser (while it is a registered owner of the Property) and the Vendor (as Developer) will be able to enforce the Land Covenants and any Development Block Land Covenants from the Settlement Date against the registered owners of other residential sections in the Stage, or (if there are substages) against the registered owners of other residential sections in the substage that the Property forms part of.
- 20.5 By way of explanation, development of the Development Blocks will be subject to the same approval of the Developer as outlined in clause 3(h) of the Land Covenants. It is the Vendor's intention to work with developers of the Development Blocks who have purchased from the Vendor to ensure that development of the Development Blocks is of a high standard of design and quality.
- 20.6 The Purchaser must comply with the Land Covenants from and including the Settlement Date or the date the Purchaser takes possession of the Property (if earlier).
- 20.7 If the Purchaser transfers, assigns or otherwise disposes of his interest under this Agreement prior to becoming the registered proprietor of the Property, then the Purchaser shall procure from the recipient of the Property a deed of covenant in favour of the Vendor under which the recipient of the Property undertakes to fulfil the Purchaser's obligations under clause 20.6.

Fencing

- 20.8 The Land Covenants include provisions regarding fencing. These fencing covenants are additional to the fencing provisions in the Christchurch City Council district plan and the fencing provisions contained in the Subdivision Consent.

- 20.9 The Purchaser must not remove any fencing between the Property and any adjoining reserve if the fence exists when the Purchaser takes possession of the Property, unless the written consent of the Christchurch City Council is first obtained.

21 Indemnity

- 21.1 The Purchaser must indemnify (and keep indemnified) the Vendor against:
- (a) Any liability the Vendor suffers as a result of the Purchaser breaching this Agreement or the Land Covenants;
 - (b) Any damage caused by the Purchaser to any roads within the Subdivision (including berms, footpaths, curbs, trees/shrubs, and easement facilities within or above those roads) or any land of the Vendor or any fixture or chattel situated on the Vendor's land, and will upon demand pay the Vendor the cost of making good any damage so caused.
- 21.2 The Purchaser must indemnify (and keep indemnified) a registered proprietor of land purchased directly from the Vendor against any damage caused by the Purchaser to that land of the proprietor or to any fixture or chattel situated on that land of the proprietor, and will upon demand pay that proprietor the cost of making good any damage so caused.
- 21.3 For the purposes of clause 21.1, the actions and omissions of the Purchaser's contractor and suppliers will be deemed to be the acts and omissions of the Purchaser.

22. Rates and possession

- 22.1 Notwithstanding any other provision of this Agreement, the Purchaser will be responsible for local authority rates (including water rates, if any) from the date of the last of the Purchaser's conditions being satisfied ("**Effective Date**").
- 22.2 From the Effective Date until the Property is separately rated the Purchaser will, on demand, refund to the Vendor rates on the basis of an estimate of \$600.00 plus GST per annum.
- 22.3 Requests for early possession may be granted if emailed to the Vendor (admin@cdli.co.nz) provided the request is not for a date earlier than the issue of the section 224(c) certificate for the Stage, or (if there are substages), the substage which includes the Property.

23. Accruals

- 23.1 The parties agree for the purposes of the Income Tax Act that the purchase price is the lowest price for which the Vendor would have sold the Property if the purchase price had been paid in full on the date of execution of this Agreement and that there is no element of interest contained in the purchase price.

24 No Warranties

- 24.1 The Purchaser acknowledges reading this Agreement and the attachments to it, and purchases the Property solely in reliance upon his/her judgment and not upon any representation or warranty made by the Vendor or any employee or agent of the Vendor.

25 Negotiations

- 25.1 Where the Purchaser wishes to negotiate matters such as minor contract variations, extensions of time, and related issues with the Vendor, the Purchaser shall correspond with the Vendor directly (admin@cdli.co.nz) unless requested otherwise by the Vendor.

26 Stockpiled Soil

- 26.1 If at the date of this Agreement there is surplus stockpiled soil on the Property, the Vendor undertakes to remove the surplus stockpiled soil from the Property by the Settlement Date or as soon as weather conditions permit (whichever is the later).

27 No impediments to Vendor's completion of Subdivision

- 27.1 The Purchaser must not lodge a caveat in relation to its interest in the Property under this Agreement.
- 27.2 The Purchaser must not object to methods employed by the Vendor in an endeavour to complete and sell other parts or the Subdivision.
- 27.3 The Purchaser must not at any time oppose, obstruct or object in any way, or provide support in any form to any person in opposition to, any planning proposal by the Vendor or its successors in title in respect of the Subdivision. In particular the Purchaser shall not (without limitation):
- (a) make, lodge, be party to or finance any request, complaint, submission, application, appeal or other proceeding which is designed, intended or likely to limit, prohibit or restrict the completion of the Subdivision;
 - (b) bring any proceedings in any Court or tribunal for damages, negligence, nuisance, trespass or interference or otherwise arising as a result of the completion of the Subdivision; or
 - (c) object to the development by the Vendor or any other party of the commercial lots contained in the Subdivision.
- 27.4 If required, the Purchaser shall on request by the Vendor or its successors in title, provide affected party approval to any planning application referred to in this clause in accordance with the provisions of section 95D(e) Resource Management Act 1991.
- 27.5 The Purchaser hereby irrevocably appoints the Vendor or any nominee of the Vendor to be the Purchaser's true and lawful attorney for the purposes of making all applications and executing all consents, approvals and other documents and plans and performing all acts, matters and things as may be necessary:
- (a) to complete the Subdivision; and
 - (b) to have any caveat lodged by the Purchaser in breach of clause 27.1 withdrawn.

28 Electronic signature

- 28.1 In addition to clause 18, the parties consent to receiving this Agreement by email and to both parties signing this Agreement using an electronic signature (as may be the case), as defined in the Electronic Transactions Act 2002, and acknowledge that an electronic signature to this Agreement is binding and valid. If such an electronic signature is used, such party warrants for the benefit of the other party that the means of creating their electronic signature was linked to and was under the control of the signatory or signatories only and to no other person.

29 Subdivision information

- 29.1 The Purchaser acknowledges that the following documents are available at www.prestonspark.co.nz or on request to the agent of the Vendor:
- (a) Subdivision Consent RMA92022731 as varied by RMA92030318 and RMA/2015/2023/A;
 - (b) Stage Subdivision Plan;
 - (c) Indicative plan for entire Subdivision;
 - (d) Land Covenants and Development Block Land Covenants;
 - (e) Update on timing for the expected issue of titles;
 - (f) Christchurch City Council LIM Report; and
 - (g) Site/Lot specific geotechnical reports (upon request to the agent of the Vendor only).

LAND COVENANTS

Prestons Park Stage U

These land covenants bind Lots 425-438 on Deposited Plan 525627 (being the residential lots in Stage U which are not Development Blocks)

EXPLANATORY NOTES:

The explanatory notes and missing information in square brackets will be removed/completed, and the text will be added to a Land Information New Zealand standard form, before the land covenants are noted against the titles.

*References to "**Neighbours**" mean the other residential sections marketed as within the same Stage U of Prestons Park Subdivision, of any density band.*

Scope and definitions

- 1 The Grantor [the Purchaser] hereby covenants and agrees with the Grantee [Neighbours and Developer] in the manner set out below so that such covenants shall:
 - (a) Burden and run with the burdened land referred to in Schedule A [ie. Lots 425-438 on Deposited Plan 525627]; and
 - (b) Be for the benefit of and appurtenant to the benefited land referred to in Schedule A [i.e. Purchaser's title and Neighbours' titles] and for the benefit of the Covenantee in gross referred to in schedule A [i.e. the Developer].
- 2 For the purposes of this instrument the following terms have the following meaning (unless the context otherwise requires):
 - (a) "**corner section**" means Land which (in the reasonable opinion of the Developer) has two legal road frontages;
 - (b) the "**continuous length**" of a fence includes:
 - (i) any attached fence return within two metres of the road boundary; and
 - (ii) any gate attached to the fence;
 - (c) "**DB Developer**" means a registered proprietor of a DB Lot which has not been Subdivided since the Developer ceased to be the registered proprietor of the DB Lot. By way of explanation, usually the DB Developer will have purchased from the Developer, with the intention of building a comprehensive residential development, subdividing, and selling the Subdivided parts. The Developer cannot be a DB Developer;
 - (d) "**DB Lot**" means a development block, being each of the Lots 421-424 on Deposited Plan 525627;
 - (e) "**Density B Lot**" means each of the Lots 425-430 on Deposited Plan 525627;
 - (f) "**Developer**" means CDL Land New Zealand Limited or its nominee, or if CDL Land New Zealand Limited ceases to exist and there is no nominee, means any director of CDL Land New Zealand Limited immediately before that company ceased to exist;
 - (g) "**fence**" includes a wall; and
 - (h) "**Land**" means the burdened land described in Schedule A [i.e. Lots 425-438 on Deposited Plan 525627].

- (i) **"Subdivide"** means subdivide or subdivided within the meaning of the Resource Management Act 1991 or any modification, amendment or re-enactment of it.

Restrictions on development and use of the Land

- 3 The Grantor [the Purchaser] shall, in relation to any Land owned by the Grantor [the Purchaser]:

Dwelling size and garaging

- (a) Not erect or permit to be erected on the Land any dwelling unless both of the following apply:
- (i) the dwelling has fully integrated garaging with (at least) a double garage;
and
 - (ii) the dwelling has a floor area (including the floor area of the fully integrated garage, and taken over the foundation) of more than:
 - (A) 150m² for all Density B Lots;
 - (B) 175m² for all Land of a size between 600m² – 650m² (inclusive);
 - (C) 220m² for all Land of a size 800m² or bigger.

Dwelling construction

- (b) Ensure that the perimeter (on a horizontal plane) of the roof of any dwelling on the Land shall not form a rectangle unless the roof contains at least one roof break or full valley.
- (c) Ensure any dwelling on the Land has at least 80% of its non-glazed exterior cladding in any one or more of the following materials:
- (i) Kiln fired or concrete brick;
 - (ii) Stucco textured finish;
 - (iii) Stone;
 - (iv) Timber weather boards;
 - (v) Linea weather boards;
 - (vi) Metal laminate on timber;
 - (vii) Any other exterior cladding material for which the Grantor [the Purchaser] has obtained the Developer's written consent.
- (d) Not use metal clad roofing that has not been pre-painted, nor use copper or unpainted metal roof material, gutters, downpipes or external cladding.

Restrictions on certain improvements

- (e) Without limiting any other covenant, not permit a building to be erected on the Land other than:
- (i) a new dwelling (with a fully integrated garage);
 - (ii) a building normally appurtenant to a residential dwelling, provided that any walls of the building visible from the road frontage of the Land are of the same material as the walls of the dwelling.
- (f) Not erect or permit to be erected or placed on the Land any carport unless attached and fully integrated into the roofline of the dwelling or garage and screened from view from the road by fencing or landscaping approved by the Developer.

- (g) Not erect or permit to be erected a multi-storey dwelling house on the Land, unless the Grantor's [Purchaser's] Land is either of Lots 425 or 430 on Deposited Plan 525627

Design approval

- (h) Not do any work or permit any work for the erection of buildings, accessory buildings, landscaping, fences, driveways, or other improvements (and this shall also include exterior finishes and excavation of foundations upon the Land) unless plans and specifications and all other details of construction, finish and location as the Developer at the Developer's absolute discretion may require, have first been submitted to the Developer and have received the Developer's written approval.

Restriction on subdivision

- (i) For Land in a title containing greater than 400m², not Subdivide the Land nor amalgamate the title to the Land with another title.

Fencing and fencing contributions

- (j) Ensure that all internal boundary fences are erected in a tradesman like manner using appropriate materials.
- (k) Without prejudice to clause 3(h), not erect or permit to be erected on the Land a fence:
- (i) Which is made out of corrugated iron or post and wire; or
 - (ii) Which does not comply with Christchurch City Council requirements (such as, for example, rule 14.5.2.10 in the District Plan) unless authorised by a resource consent; or
 - (iii) Which, if it is an internal boundary fence, is higher than 1.2 metres above the natural ground level at any point within 2 metres of the road boundary (except where approval has been granted by the Developer to erect a front fence within the building setback on a corner lot); or
 - (iv) Which, if it is a fence between the Land and an adjoining reserve, is less than 80% open if it is more than 1.2 metres in height above the natural ground level; or
 - (v) Which is higher than 1.8 metres above the natural ground level, at any point (subject to clauses 3(j)(ii) & (iii)); or
 - (vi) Which is made of materials which (in the Developer's opinion) are not harmonious with the materials used in the dwelling on the Grantor's Land.
- (l) Not call upon Christchurch City Council to pay for or contribute towards the cost of erection or maintenance of any boundary fence between the Land and any adjoining reserve or other land owned by Christchurch City Council.
- (m) Not call upon the Developer to pay for or contribute towards the cost of erection or maintenance of any boundary fence between the Land and any adjoining Land owned by the Developer, provided that this covenant will not endure for the benefit of any subsequent registered proprietor of any such adjoining Land. This clause 3(l) overrides clause 3(m).
- (n) Pay 50% of the reasonable cost of a Qualifying Fence to any neighbour that erected the Qualifying Fence, if that neighbour has not previously received a contribution towards the cost of the Qualifying Fence in accordance with this clause 3(m). A **"Qualifying Fence"** means a fence on a shared boundary between the Grantor's [Purchaser's] Land and adjoining Land owned by the neighbour. However this

clause does not benefit the Developer or need to be complied with by the Developer.

- (o) If the Land is adjoining a reserve, maintain the fence between the Land and the adjoining reserve and if such fence is wholly or partly destroyed, replace with a new fence that complies with clause 3(j) and has Christchurch City Council approval.

Building timeframes and crossings

- (p) Ensure that:
 - (i) any building, driveway and landscaping is completed within nine months of laying down the foundations for such building and no building once under construction shall be left without substantial work being carried out for a period exceeding three months;
 - (ii) entry and exit to and from the Land during building is via a single entry/exit point on the Land boundary, of a maximum 4 metre width, which must be notified to and approved by the Developer as part of the approval required under clause 3(h);
 - (iii) any other requirements for the construction phase which form part of the Developer's approval under clause 3(h) are complied with by the Grantor.

Tidy appearance

- (q) Not permit a temporary building or structure to be erected on the Land except that which may be used in conjunction with the construction of permanent buildings and which will be removed from the Land upon completion of the work.
- (r) Keep the Land in a neat and tidy condition and shall not permit excessive growth of grass (beyond 100mm in length).
- (s) Maintain all road reserves adjoining the Land in a neat and tidy condition and immediately repair (to the satisfaction of the Developer) any damage to the footpath and berms adjoining the Land caused by the Grantor or its contractors, employees, agents and invitees.
- (t) Not cut, trim, damage, remove or relocate any tree, shrub or plant on the road reserve without the prior approval of the Developer and the Christchurch City Council.

Monitoring

- (u) Not prevent the Developer, its officers, employees or agents from entering onto the Land at all reasonable times for the purposes of ensuring compliance with the foregoing covenants and remedying any breaches thereof subject to the Developer first giving at least 48 hours' prior written notice of its intention to enter on to the Land. If the Developer enters on to the Land it shall not be responsible for any damage occasioned to the Land or anything placed thereon as a result of a reasonable exercise by the Developer of its powers.

Aerials etc

- (v) Not install or attach any accessory (including but not limited to satellite dishes, television aerials, and solar panels) on the Land, unless they are constructed in such a way as to be discreetly integrated with the design of buildings on the Land so that they are not highly visible from any road, thoroughfare or any other Land.
- (w) Fully encase any chimney in materials and in a manner approved by the Developer in writing.

- (x) Ensure that any garden shed on the land is adequately screened from view from any road, thoroughfare, reserve or any other land by fencing or landscaping approved by the Developer in writing.

No interference with DB Developers

- (y) Not at any time oppose, obstruct or object in any way, or provide support in any form to any person in opposition to, any planning proposal by any DB Developer in respect of the subdivision and sale of a DB Lot owned by the DB Developer;
- (z) Not make, lodge, be party to or finance any request, complaint, submission, application, appeal or other proceeding which is designed, intended or likely to limit, prohibit or restrict the completion (in accordance with these covenants) of the subdivision and sale of a DB Lot owned by any DB Developer;
- (aa) Not bring any proceedings in any Court or tribunal for damages, negligence, nuisance, trespass or interference or otherwise arising as a result of the completion of the subdivision and sale of a DB Lot owned by any DB Developer;
- (ab) If required, on request by a DB Developer, provide affected party approval to any planning application referred to in clause 3(y) in accordance with the provisions of section 95D(e) Resource Management Act 1991;

No interference with development of Prestons Park subdivision

- (ac) Clauses 3(y) to 3(ab) inclusive will also apply (with all necessary modifications) to the development, subdivision and sale by the Developer of any land owned by the Developer within the Prestons Park subdivision.
- (ad) The Grantor [the Purchaser], in relation to any Land owned by the Grantor [the Purchaser], acknowledges that Prestons Park has or may in future have reserves which may contain playground equipment, and agrees not to complain about the existence, layout or reasonable use of any such playground within Prestons Park, to the Christchurch City Council or the Developer or any DB Developer. Clauses 3(y) to 3(ab) inclusive will apply (with all necessary modifications) to the existence, layout and reasonable use of the playgrounds.

Nuisance

- (ae) Not allow any animal to be kept on or about the Land which is likely to cause a nuisance or annoyance to occupiers of other Land, and in particular without otherwise limiting this restriction, not to keep on or about the Land any dog which in whole or part appears to be a Pit Bull Terrier, Rottweiler or Doberman Pinscher.
- (af) Not use the Land in any way which in the reasonable opinion of the Developer detrimentally affects the amenities of the neighbourhood including permitting noise to escape from the Land which is likely to cause offense or a nuisance to occupiers of other Land.

Show Home

- (ag) Not allow any building on the Land to be used as a show home without the written consent of the Developer (such consent to be at the Developer's absolute discretion and subject to such conditions as the Developer considers necessary). Any consent given by the Developer under this clause may be limited as to time.

Enforcement

- 4 The Developer shall not be required or obligated to enforce all or any of the foregoing covenants, stipulations and restrictions, nor will the Developer be liable to any other party for any breach thereof by any Grantor [Purchaser].

- 5 If there should be any breach or non-observance of any of the foregoing covenants then without prejudice to any other liability which the Grantor [the Purchaser] may have to any Grantee [Neighbours and Developer], the Grantor [the Purchaser] will upon written demand being made by any Grantee [Neighbours and Developer]:
- (a) Pay to any Grantee [Neighbours and Developer] making such demand as liquidated damages the sum of \$250.00 (Two Hundred and Fifty Dollars) per day for every day that such breach or non-observance continues after the date upon which written demand has been made, provided that if more than one person is making such demand then that sum shall be shared between those persons; and
 - (b) If applicable, remove or cause to be removed from the Grantor's [Purchaser's] Land any second hand or used dwelling, garage, carport, building or other structure erected or placed on the Grantor's [Purchaser's] Land in breach or non-observance of the foregoing covenants; and
 - (c) If applicable, replace any building materials used or permitted to be used in breach or non-observance of the foregoing covenants.
- 6 The Grantor [the Purchaser] covenants that the Grantor [the Purchaser] will at all times indemnify the Grantee [Neighbours and Developer] from all proceedings, costs, claims and demands in respect of breaches by the Grantor [the Purchaser] of any of the stipulations, restrictions and covenants in this instrument.

General

- 7 Any requirement in this instrument to submit plans and specifications to the Developer, or to obtain the Developer's approval, will cease to apply 7 years after the date of this instrument (but without prejudice to the liability of any party for any breaches which have already occurred).
- 8 Without prejudice to clause 7, the covenants in this instrument will immediately cease to apply to any Land (or part thereof) which is intended to vest in the Crown or any territorial authority as a road or reserve, upon any survey plan relating to such vesting being approved as to survey and being accepted for deposit by Land Information New Zealand.
- 9 Subject to clause 3(l), but despite any other provision of this instrument, if the written consent of the Developer is obtained to any action or omission, that action or omission will be deemed to not constitute a breach of any covenant within this instrument.



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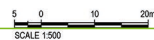
SALE PLAN ONLY - AREAS AND DIMENSIONS
ARE SUBJECT TO MINOR CHANGE.

STREET LIGHTS, TREES & LANDSCAPING ARE
INDICATIVE ONLY

- | | |
|---|-------------------------|
|  | DENSITY A - (200-250m²) |
|  | DENSITY B - (450-500m²) |
|  | DENSITY C - (600-650m²) |
|  | COMMERCIAL |

-  POTENTIAL 2 STOREY DWELLING
 PROPOSED TREE
 PROPOSED STREET LIGHT

NOTE : A MULTI-STOREY DWELLING HOUSE IS NOT TO BE ERRECTED OR PERMITTED TO BE ERRECTED ON THE LAND, UNLESS THE GRANTOR'S (PURCHASER'S) LAND IS ANY OF LOTS 421, 422, 423 OR 424 HEREON.



PROJECT

PRESTONS PARK

TITLE

STAGE 2
SUB-STAGE U1

BEFORE SIGNING THE AGREEMENT

- It is recommended both parties seek professional advice before signing. This is especially so if:
 - o there are any doubts. Once signed, this will be a binding contract with only restricted rights of termination.
 - o property such as a hotel or a farm is being sold. The agreement is designed primarily for the sale of residential and commercial property.
 - o 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.
 - o there is any doubt as to the position of the boundaries.
 - o 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:
 - o the vendor **must** provide to the purchaser a pre-contract disclosure statement under section 146 of the Unit Titles Act 2010;
 - o 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:
 - o are able to be complied with; and if not
 - o 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: Dec 11, 2018

VENDOR:

CDL Land New Zealand Limited

Contact Details:

C/- Natasha Hood/Simone Crowhout
Level 13, 280 Queen Street, Auckland
PO Box 3248, Shortland Street, Auckland 1140
Natasha Hood Ph: 09 353 5019 Fax: 09 353 5098
Simone Cromhout Ph: 09 353 5074
Email: admin@cdli.co.nz

VENDOR'S LAWYERS:

Firm:

Individual Acting:

Contact Details:

Please refer to the Vendor using the above contact details

PURCHASER:

Peregrino & Carmelita Cadiven

Contact Details:

275 Sawyers Arms Road
Bishopdale, Christchurch 8053
P: 03 359 1036
C: 021 162 3967 (Pere)
E: perecadiven@yahoo.com

PURCHASER'S LAWYERS:

Firm: Alpers & Co

Individual Acting: Oscar Alpers

Contact Details: PO Box 29115

Fendalton
Christchurch 8540
P: 03 359 8311
F: 033594496
E: oscar.alpers@advocate.nz

LICENSED REAL ESTATE AGENT:

Agent's Name: Professionals Christchurch Limited

Manager: Colin Lock

Salesperson: Colin Lock

Contact Details:

33 Halswell Road, Hoon Hay, Christchurch 8025
P: 03 338 5924
F: 03 338 1480
E: service@prof.co.nz

Signature: *Shelagh Gleeson*
Shelagh Gleeson (Dec 11, 2018)

Email: shelagh@prof.co.nz



Prestons Subdivision
GEOTECHNICAL REPORT FOR LOT 428
CDL Land NZ Limited

24 October 2018
Revision: 1
Reference: 235361

*Bringing ideas
to life*

Document control record

Document prepared by: James Muirson

Aurecon New Zealand Limited

Level 2, Iwikau Building
93 Cambridge Terrace
Christchurch 8013
New Zealand

T +64 3 366 0821

F +64 3 379 6955

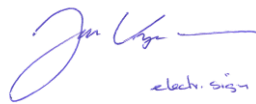
E christchurch@aurecongroup.com

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Name	Clinton Wilson	Name	Dr Jan Kupec
Title	Civil Technician	Title	Technical Director

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Appendices

Appendix A

Figures

Appendix B

Test Results

1 Executive Summary

CDL Land NZ Ltd has commissioned Aurecon New Zealand Ltd to undertake site specific geotechnical investigations and assessments for individual residential lots for building consent purposes for the Prestons South Subdivision Stage 2. This report documents the results of the geotechnical assessment and presents geotechnical comments together with foundation recommendations for the residential house on Lot 428 at the Prestons South Subdivision.

As part of the subdivision development extensive geotechnical testing, including cone penetration tests (CPT), were carried out to define the liquefaction potential at the overall subdivision and to monitor the site works that have occurred. **Based on our information the property is likely to perform to a level equivalent to Technical Category 1 (TC1 - Grey) set by the Ministry of Business, Innovation and Employment (MBIE) in their guidelines issued in December 2012.**

The site development has included extensive bulk earthworks. All earthworks and compliance testing have been undertaken in accordance with the earthworks specification. The engineering sign off and bulk earthworks are documented in the Geotechnical Completion Report for Prestons South Stage 2. The earthfill at the subdivision construction stage was placed and signed off in accordance with NZS4431:1989. Based on review of the available geotechnical information, including bulk earthworks information and NZS4431 compliance records, we consider that a determination in accordance with NZS3604:2011 Section 3.1.3 is appropriate and the property meets the requirements for NZS3604 type foundations.

The geotechnical site specific assessment comprised a review of previous geotechnical investigations undertaken for the subdivision development and a site specific geotechnical investigation. A single hand auger borehole was undertaken to assess the upper soil profile and groundwater level. Two dynamic cone penetrometer (DCP) were carried out on the lot, one of the DCPs was located immediately adjacent to the hand auger borehole with the second DCP located on the opposite half of the lot.

Based on our knowledge of the site setting and our past work we recommend that any residential structure that is to be developed on Lot 428 be founded on standard NZS3604:2011 compliant foundations. These foundations require a minimum geotechnical ultimate bearing capacity of at least 300kPa, which for Lot 428 is achieved at a minimum depth of 0.4m below ground level as this represents the current thickness of the topsoil and loose soil.

This report shall be read as a whole. Our limitations are presented in Section 7.

2 Introduction

CDL Land NZ Ltd is currently undertaking a large residential subdivision with associated commercial lots. Previously Aurecon New Zealand Ltd has undertaken detailed geotechnical investigations and assessments for the purpose of the plan change, subdivision resource consent application, liquefaction assessment, technical classification of the entire subdivision, and observation of bulk earthworks construction.

Aurecon New Zealand Ltd has since been commissioned to undertake site specific geotechnical investigations and assessment of individual lots for building consent application purposes. The site which this report is focused on comprises a single lot, designated Lot 428 at the Prestons South Subdivision to the south of Prestons Road in Marshland, Christchurch. This report documents the results of the geotechnical assessment and presents geotechnical comments together with foundation recommendations for the proposed house on the lot. We note that at the time of writing this report the location and structural form of the dwelling were unknown, and it is inferred to comprise NZS3604:2011 type residential buildings only.

This report shall be read as a whole. Our limitations are presented in Section 7.

3 Site Conditions

3.1 Site Description

The Prestons Subdivision is located on the northern fringes of Christchurch City. The site is made up of a series of adjacent properties forming an irregular and elongated rectangle shape, orientated approximately north to south. The total area of the overall Prestons Subdivision site is approximately 190ha. The site can be separated into two distinct blocks, Prestons North which runs from the Lower Styx Road in the north through to Prestons Road in the south, and the Prestons South development which continues from Prestons Road through to Mairehau Road to the south.

This building consent report is for Lot 428 which is located in Stage 2 of the Prestons South Subdivision development (refer Figure 1 in Appendix A). The lot is bordered by residential lots to the south and east, and access roads to the north and west.

3.2 Surface Water

There are no natural sources of surface water on the subdivision. There is a storm water channel to the west of Lot 428.

3.3 Regional Geology

The geology of the site is described in the 1:250,000 scale geological map – *'Geology of the Christchurch Area'*, published in 2008 by the Institute of Geological and Nuclear Sciences. Note this map has been referenced as it is at an appropriate scale and covers the entire site. The map indicates the underlying geology comprises *'Dominantly sand of fixed and semi-fixed dunes and beach deposits'* and *'drained peat swamp'*. The subdivision geotechnical investigation identified that this area was predominantly underlain by aeolian (dune) and beach sand deposits.

The GNS Active Fault System database (GNS, 2012a) indicates that the site is located approximately:

- 27km north east of the eastern end of the Greendale Fault System. Movement on the Greendale Fault System was responsible for the Magnitude 7.1 Darfield (Canterbury) Earthquake on 4 September 2010.
- 14km north of the epicentre of the Magnitude 6.2 Christchurch Earthquake on 22 February 2011.
- 12km north west of the Magnitude 6.0 earthquake on 13 June 2011 (GNS, 2012b).
- 8km north west of the Magnitude 5.9 earthquake on 23 December 2012.

3.4 Site Earthworks

Site earthworks have been undertaken to prepare the site for residential building purposes. The subsurface profile was stripped back and the site was built up with compacted engineered fill. In addition to the filling, part of the site is within cut ground. The cut ground is within the western side of the site and based on the earthworks plans it appears to have been cut down by up to 0.5m.

During bulk earthworks shallow organic material, where encountered, was removed as part of the bulk earthworks.

All earthworks and compliance testing have been undertaken in accordance with the earthworks specification. Details of the site bulk earthworks are provided in the Aurecon report titled *'Prestons Park Subdivision – Stage U1 Geotechnical Completion Report'*, Revision 0 dated 9 October 2018. The Geotechnical Completion Report has been completed as part of the requirements of NZS4404:2010 *'Land development and subdivision infrastructure'* and Christchurch City Council *'Infrastructure Design Standards - Part 4: Geotechnical Requirements'*. The compacted fill was placed and signed off in accordance with NZS4431:1989 *'Code of practice for earth fill for residential development'*.

3.5 Technical Classification

The landcheck maps historically provided on the Canterbury Earthquake Recovery Authority (CERA) website indicated the site is classified as rural and unmapped. The technical categories were developed by the Ministry for Business, Innovation and Employment (MBIE) with the support from the Engineering Advisory Group (EAG) in mid-2011 and hence prior to start of the subdivision development. The site has since been modified by civil engineering and bulk earthworks.

As part of the subdivision consent geotechnical assessment, site specific liquefaction assessment was carried out over the wider subdivision area. This is detailed in the Aurecon reports titled '*Prestons Road Subdivision, Geotechnical Assessment Report for Resource Consent*', Revision 2 dated 5 March 2012, '*Prestons Road Subdivision, Detailed Geotechnical Design Report*', Revision 2 dated 12 July 2012 and '*Prestons South Subdivision Resource Consent Geotechnical Report*', Revision 1 dated 6 June 2013.

Based on the results from our liquefaction assessment and bulk earthworks undertaken on the wider subdivision, Lot 428 is likely to perform to a level equivalent to Technical Category 1 (TC1 - Grey) in the historic (and now superseded) MBIE Guidelines issued in December 2012.

4 Geotechnical Assessment

4.1 General

The geotechnical assessment comprised a review of relevant previous geotechnical investigations and construction data and an in-situ geotechnical investigation. The geotechnical investigation comprised hand held testing on the individual lot and a review of the previous geotechnical investigations undertaken for the subdivision within the vicinity of the lot. A single hand auger borehole was undertaken to assess the upper soil profile and the groundwater level. Two dynamic cone penetrometer (DCPs) were carried out on the lot. The handheld testing was undertaken on the lot following the site earthworks. The testing density is considered reasonable as the geotechnical project engineers were involved in the observation of the civil engineering works.

4.2 Previous Investigations

The previous geotechnical testing and investigations undertaken by Aurecon across the entire subdivision site comprised of a combination of cone penetrometer tests (CPT) and machine excavated test pits. Further details regarding these investigation locations are found in the Aurecon reports titled '*Prestons Road Subdivision, Geotechnical Assessment Report for Resource Consent*', Revision 2 dated 5 March 2012, '*Prestons Road Subdivision, Detailed Geotechnical Design Report*', Revision 2 dated 12 July 2012 and '*Prestons South Subdivision Resource Consent Geotechnical Report*', Revision 1 dated 6 June 2013. In addition, testing carried out as part of the subdivision development is presented in the Aurecon Geotechnical Completion Report.

4.3 Hand Held Testing

One hand auger borehole was undertaken on the lot as part of the geotechnical investigation to assess the upper soil profile and the groundwater level. The test location and the borehole log have been uploaded to New Zealand Geotechnical Database (NZGD). The borehole log is attached in Appendix B.

The hand auger borehole log indicates the upper soil profile consists of topsoil underlain by sand to the termination depth. The hand auger borehole was terminated when soils samples became saturated and the hole began to collapse.

The logging of the recovered hand auger samples was undertaken in accordance with the New Zealand Geotechnical Society's '*Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes: 2005*'.

4.4 Dynamic Cone Penetrometers

Two DCPs were carried out with the locations and results uploaded to the NZGD. The DCP test results are attached in Appendix B. One of the DCPs was located adjacent to the hand auger borehole, with the second DCP located on the opposite half of the lot. Where the DCP data was not conclusive two additional DCPs were undertaken to confirm the soil profile.

DCP logs indicate 5 blows per 100mm penetration, which is equivalent to an ultimate bearing capacity of 300kPa, was consistently encountered from a depth of 0.4m onwards.

4.5 Groundwater Levels

Groundwater levels were measured within the hand auger borehole at the time of the investigation and correlated to our site specific knowledge. An indicative groundwater level was noted where holes collapsed due to saturated soil. Groundwater was encountered at 1.8m depth below ground level. It should be noted that groundwater levels may vary seasonally.

A review of the NZGD indicates that regional groundwater levels are likely to be in the order of 1m to 2m below ground level. These groundwater levels are reasonably consistent with those measured during the investigation, when taking into account the subdivision earthworks filling and cutting.

4.6 Topsoil Depths

The depth of topsoil has been determined from the single hand auger and two DCPs undertaken on site. We note that the topsoil depths may vary by +/- 100mm between the testing locations and hence it is recommended that at least a 100mm tolerance should be allowed for building foundation excavations.

If greater certainty of topsoil depths across the whole site is required for construction or costing then further testing would be necessary across the proposed footprint of the proposed structure (unknown at the time of writing this report). **The responsibility and liability for any additional testing shall be met by the section purchaser.**

5 Foundation Recommendations

The site is expected to perform in line with TC1 requirements in future earthquakes. Due to the residential land use of the development, the presence of certified fill and the TC1 technical classification, future residential development will be able to adopt standard NZS3604 compliant foundations.

5.1 Foundation Types

It is recommended that residential structures that are built on Lot 428 are founded on standard NZS3604:2011 compliant foundations. These foundations require a minimum geotechnical ultimate bearing capacity of at least 300kPa. The site investigation results indicate the bulk fill was covered with approximately 300mm of topsoil, which will need to be removed and the clean bulk fill exposed for foundation construction.

Based on our understanding of the site works and the investigation results, we recommend that NZS3604:2011 compliant foundations are embedded a minimum depth of 0.4m below current ground level.

5.2 Foundation Construction Recommendations

Construction should proceed in accordance with the NZS3604:2011. Topsoil should be removed from beneath the floor slab and compacted hardfill placed under the floor slab to the required level. In addition, the following recommendations should be considered:

1. To ensure that excavated footings are adequately founded we recommend that excavations should be undertaken by a digger fitted with a smooth edge bucket. The base should be tidily trimmed by hand, lightly compacted with a plate compactor and immediately covered with a concrete tidy slab or 100mm of compacted granular hardfill. A suitable qualified engineer with foundation experience or territorial authority building inspector should be retained to verify the adequate founding has been achieved and all loose and soft or compressible material was removed.
2. If there are significant soft layers beneath a sub-excavation, the softer material will have to be excavated and backfilled with 10MPa concrete or compacted hardfill underneath all load bearing foundation elements. For the hardfill, the sub-excavation will have to have plan dimensions of $B+2D$ where B is the footing width and D is the depth of undercut. For 10MPa concrete the sub-excavation can have the same dimensions as the footing.
3. Depending on the soil encountered, the time of year, and fluctuations of the groundwater level, it is possible that excavations may encounter groundwater. The building contractor is to take appropriate measures to deal with any groundwater ingress to the foundation excavations and keep the excavations and backfill free of groundwater intrusions until the footings are cast.
4. The footing excavations are likely to expose layers of granular soils, which can be adversely affected by rainfall or stormwater. Foundation excavations should not be left open for more than three days. In addition, rainfall and stormwater should not be allowed to pond within the footing excavations as this may affect the bearing capacity of the subsoils.

6 References

Forsyth, Barrell & Jongers, (compilers), 2008. Geology of the Christchurch Area. Institute of Geological and Nuclear Sciences, 1:250,000 Geological Map 16.

Canterbury Earthquake Recovery Authority (2014) Canterbury Geotechnical Database. Retrieved 1 May 2017 from <https://canterburygeotechnicaldatabase.projectorbit.com/>

Christchurch City Council, 2010. Infrastructure Design Standards - Part 4: Geotechnical Requirements.

Geonet, 2012. <ftp://ftp.geonet.org.nz/strong/processed/Proc> (23/10/12)

GNS, 2012a. <http://maps.gns.cri.nz/website/af/viewer.htm> (23/10/12)

GNS, 2012b. <http://www.gns.cri.nz/Home/News-and-Events/Media-Releases/earthquake-part-of-aftershock-sequence> (23/10/12)

Ministry of Business Innovation and Employment (MBIE), 2012 'Repairing and rebuilding houses affected by the Canterbury earthquakes'.

NZGS, 2005. Guidelines for the Classification and Field Description of Soils and Rocks in Engineering. NZ Geotechnical Society Inc, Wellington, New Zealand.

NZS 3604:2011. Timber Framed Buildings. Standards New Zealand, Wellington, New Zealand.

NZS 4404:2010 Land development and subdivision infrastructure. Standards New Zealand, Wellington, New Zealand.

NZS 4431:1989 Code of practice for earth fill for residential development. Standards New Zealand, Wellington, New Zealand.

7 Limitations

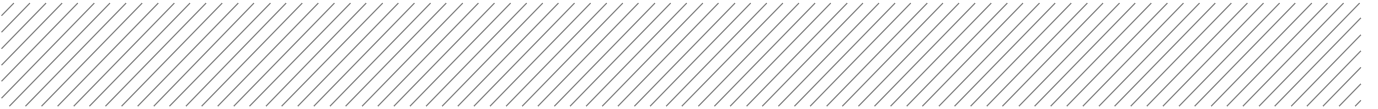
We have prepared this report in accordance with the brief as provided. The contents of the report are for the sole use of the Client for the purpose of building consent application only, and no responsibility or liability will be accepted to any other third party. Data or opinions contained within the report may not be used in other contexts or for any other purposes without our prior review and agreement.

The recommendations in this report are based on data collected at specific locations and by using suitable investigation techniques with limited site coverage. Only a finite amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground and groundwater between test locations has been inferred using experience and judgment and it must be appreciated that actual conditions could vary from the assumed model.

Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

Subsurface conditions, such as groundwater levels, can change over time. This should be borne in mind, particularly if the report is used after a protracted delay.

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Appendix Figures



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CLIENT
PRESTONS PARK

REV	DATE	REVISION DETAILS
A	28/09/18	ISSUE FOR INFORMATION

APPROVED
T BROWNE

DRAWN
R DAWSON

CHECKED
J MUIRSON

APPROVED
T BROWNE

DESIGNED
-

DATE
28/09/18

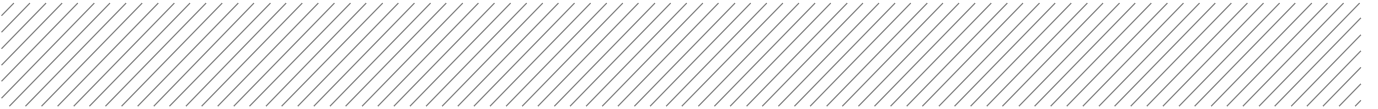
T BROWNE

PROJECT
PRESTONS PARK

TITLE
**LOT 428
SITE LOCATION PLAN
FIGURE 1**

INFORMATION

PROJECT No.	235361
SCALE	1:400
DRAWING No.	GO-PS-S2-IN-428
SIZE	A4
REV	A



Appendix Test Results

HAND AUGER RECORD

HOLE NO. **HA1**

PROJECT NO. **235361**

PROJECT **Prestons Subdivision
Lot 428**

CLIENT **CDL Land Development Ltd**

CO-ORDINATES (NZTM)

SHEET **1** of **1**

METHOD **HA**

E 1573407

DATE from **23/09/2018** to **23/09/2018**

N 5185683

MACHINE & NO. **NA**

ORIENTATION **VERTICAL**

GROUND-LEVEL **+13.29** m RL

STRATA DESCRIPTION

SUBORDINATE FRACTION, MAJOR FRACTION, MINOR FRACTION, COLOUR,
STRUCTURE, STRENGTH, MOISTURE CONDITION
GRADING, BEDDING, PLASTICITY, ETC...
(NZ GEOTECHNICAL SOCIETY - FIELD DESCRIPTION OF SOIL AND ROCK)

Water level	Tests	Samples	Reduced Level	Depth (m)	Legend	
		Type Ref Depth		0.00		
		HA				
			+12.99	0.30		SILT with some sand; dark brown. Moist; sand, fine. (TOPSOIL)
						Fine to coarse SAND; grey. Moist.
						1.10m Becomes light brownish grey.
						1.50m Becomes wet.
			+11.29	2.00		1.90m Becomes dark grey, saturated.
						End of Hand Auger at 2.00m, on 23/09/2018 Termination Reason: Hole collapse.

- Small Disturbed Sample
- Large Disturbed Sample
- SPT Liner Sample
- Thin Wall Undisturbed Sample
- U100 Undisturbed Sample
- Pocket Penetrometer Test
- Piston Sample
- Water Level
- Impression Packer Test
- Standard Penetration Test
- Permeability Test
- Piezometer / Standpipe Tip
- Packer Test
- In-situ Vane Shear Test

LOGGED **C. WILSON**

DATE **23/09/2018**

CHECKED **J. MARTIN**

DATE **04/10/2018**

REMARKS

Groundwater encountered at 1.8m bgl.
Co-ordinates and elevation from site survey.
Elevation based on Lyttelton Vertical Datum.

PROJECT **Prestons Subdivision
Lot 428**

PROJECT NO. **235361**

CO-ORDINATES (NZTM)

E 1573407

N 5185683

GROUND LEVEL **+13.29 m RL**

TESTED / SUPERVISED BY **C. WILSON**

DATE **23/09/2018**

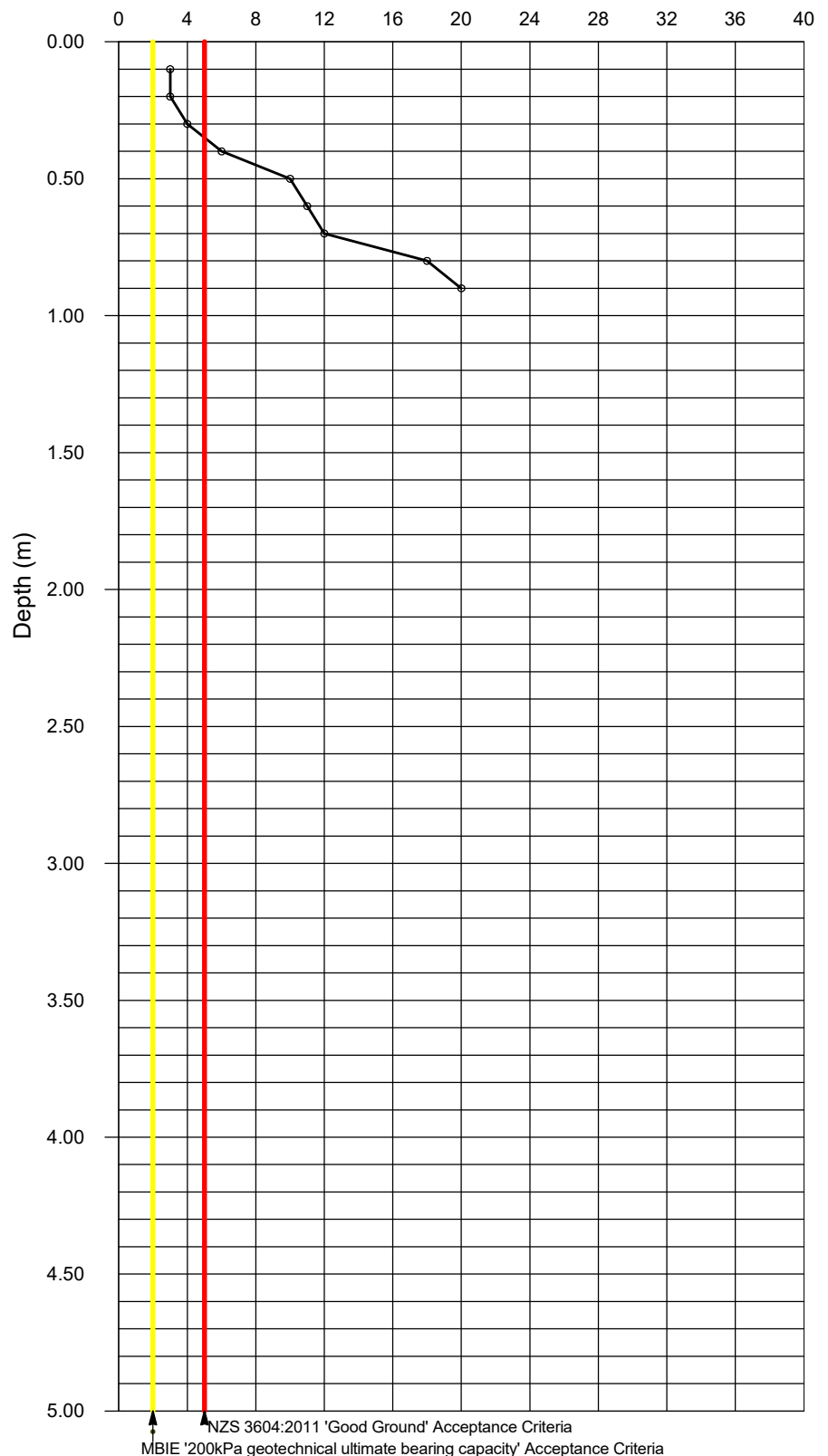
CHECKED BY **J. MARTIN**

DATE **04/10/2018**

Results

Depth (m)	Blows per 100 mm	Depth (m)	Blows per 100 mm
0.0	3	3.5	
	3		
	4		
	6		
0.5	10	4.0	
	11		
	12		
	18		
	20		
1.0		4.5	
1.5		5.0	
2.0			
2.5			
3.0			
3.5			

Number of blows per 100mm



Remarks:

20 blows for 100mm in the last increment.
Co-ordinates and elevation data from site survey.
Elevation based on Lyttelton Vertical Datum.
Effective refusal, 20+ blows per 100mm of penetration.

PROJECT **Prestons Subdivision
Lot 428**

PROJECT NO. **235361**

CO-ORDINATES (NZTM)

E 1573409

N 5185693

GROUND LEVEL **+13.29 m RL**

TESTED / SUPERVISED BY **C. WILSON**

DATE **23/09/2018**

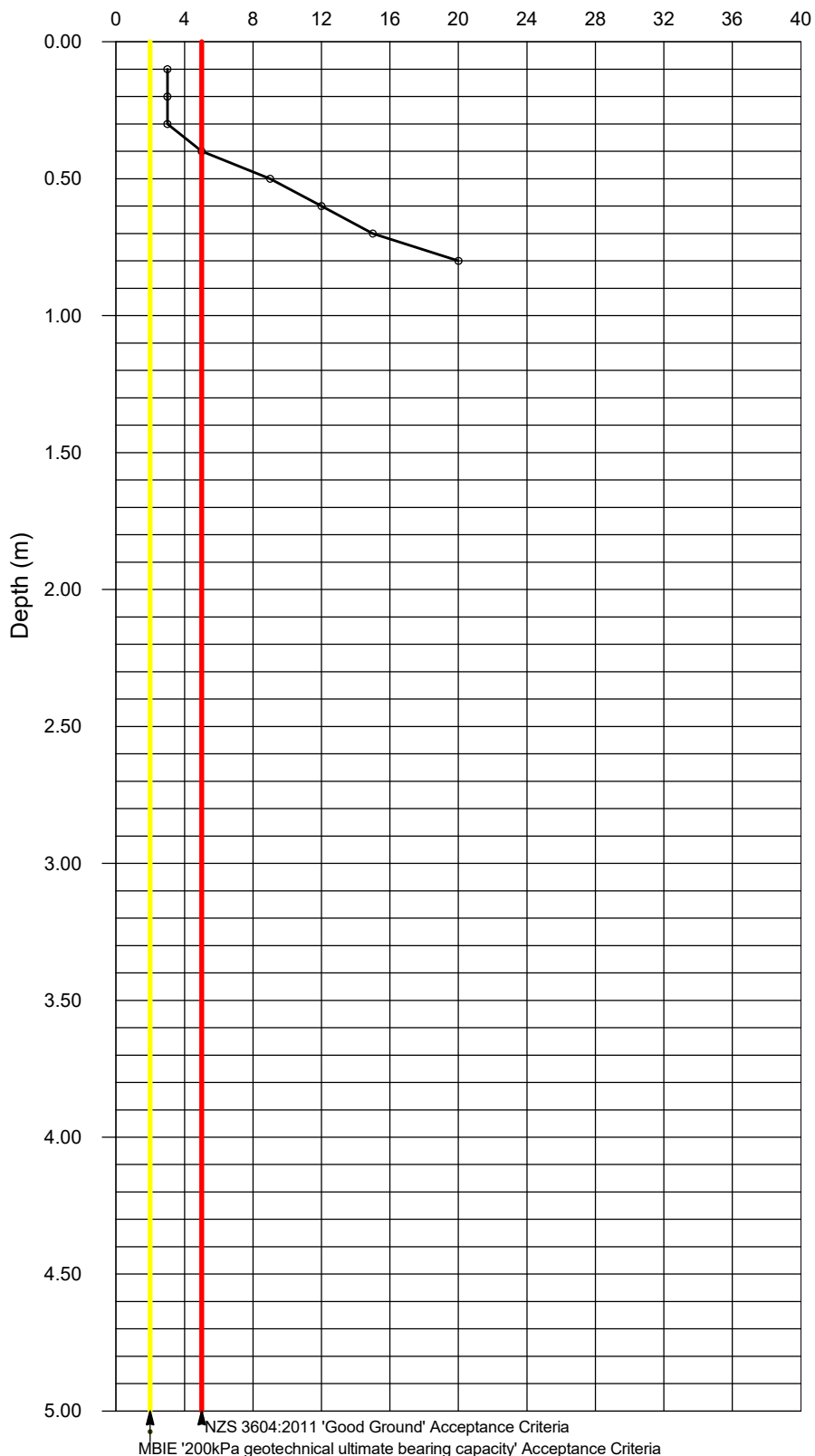
CHECKED BY **J. MARTIN**

DATE **04/10/2018**

Results

Depth (m)	Blows per 100 mm	Depth (m)	Blows per 100 mm
0.0	3	3.5	
	3		
	3		
	5		
0.5	9	4.0	
	12		
	15		
	20		
1.0		4.5	
1.5		5.0	
2.0			
2.5			
3.0			
3.5			

Number of blows per 100mm



Remarks:

20 blows for 100mm in the last increment.
Co-ordinates and elevation data from site survey.
Elevation based on Lyttelton Vertical Datum.
Effective refusal, 20+ blows per 100mm of penetration.



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to life*

Aurecon New Zealand Limited

Level 2, Iwikau Building
93 Cambridge Terrace
Christchurch 8013
New Zealand

T +64 3 366 0821

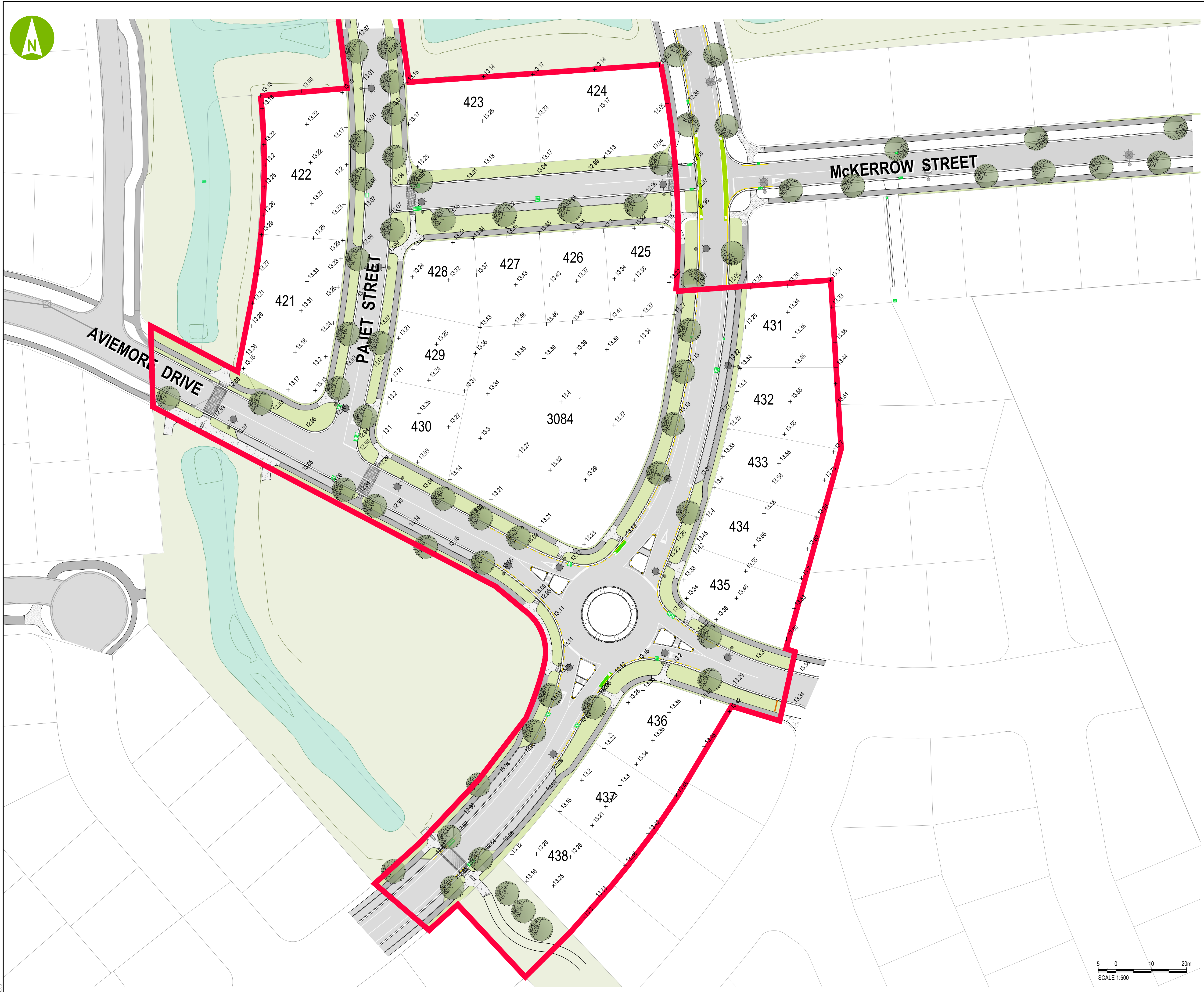
F +64 3 379 6955

E christchurch@aurecongroup.com

W aurecongroup.com

Aurecon offices are located in:

Angola, Australia, Botswana, China,
Ghana, Hong Kong, Indonesia, Kenya,
Lesotho, Macau, Mozambique,
Namibia, New Zealand, Nigeria,
Philippines, Qatar, Singapore, South Africa,
Swaziland, Tanzania, Thailand, Uganda,
United Arab Emirates, Vietnam.



LEGEND

- SUB-STAGE P BOUNDARY
- PROPOSED TREE
- PROPOSED STREET LIGHT
- DOUBLE SUMP
- SINGLE SUMP
- CORNER SUMP

ROAD APPROVED ROAD NAME

NOTES:

- KERB LEVELS ARE AT TOP OF KERB.
- PROPOSED TREES & LANDSCAPING ARE INDICATIVE ONLY

SURVEY ORIGIN DATA

- THE PROPERTY DATA HAS BEEN SOURCED FROM AURECON (SEPTEMBER 2018) AND IS SUBJECT TO FINAL LEGAL REVIEW BY LAND INFORMATION NEW ZEALAND (LINZ).
- VERTICAL ELEVATIONS ARE IN TERMS OF CHRISTCHURCH DRAINAGE DATUM, SCIRT PUBLISHED JUNE 2011.
- THE ORIGIN OF LEVELS IS BM 3257 (EHDK), RL 15.160m

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CLIENT


CDL LAND
NEW ZEALAND LIMITED

REV	DATE	REVISION DETAILS	APPROVED
A	10/10/18	ISSUE FOR INFORMATION	K ASHBY
B	28/02/19	REISSUE FOR INFORMATION	K ASHBY

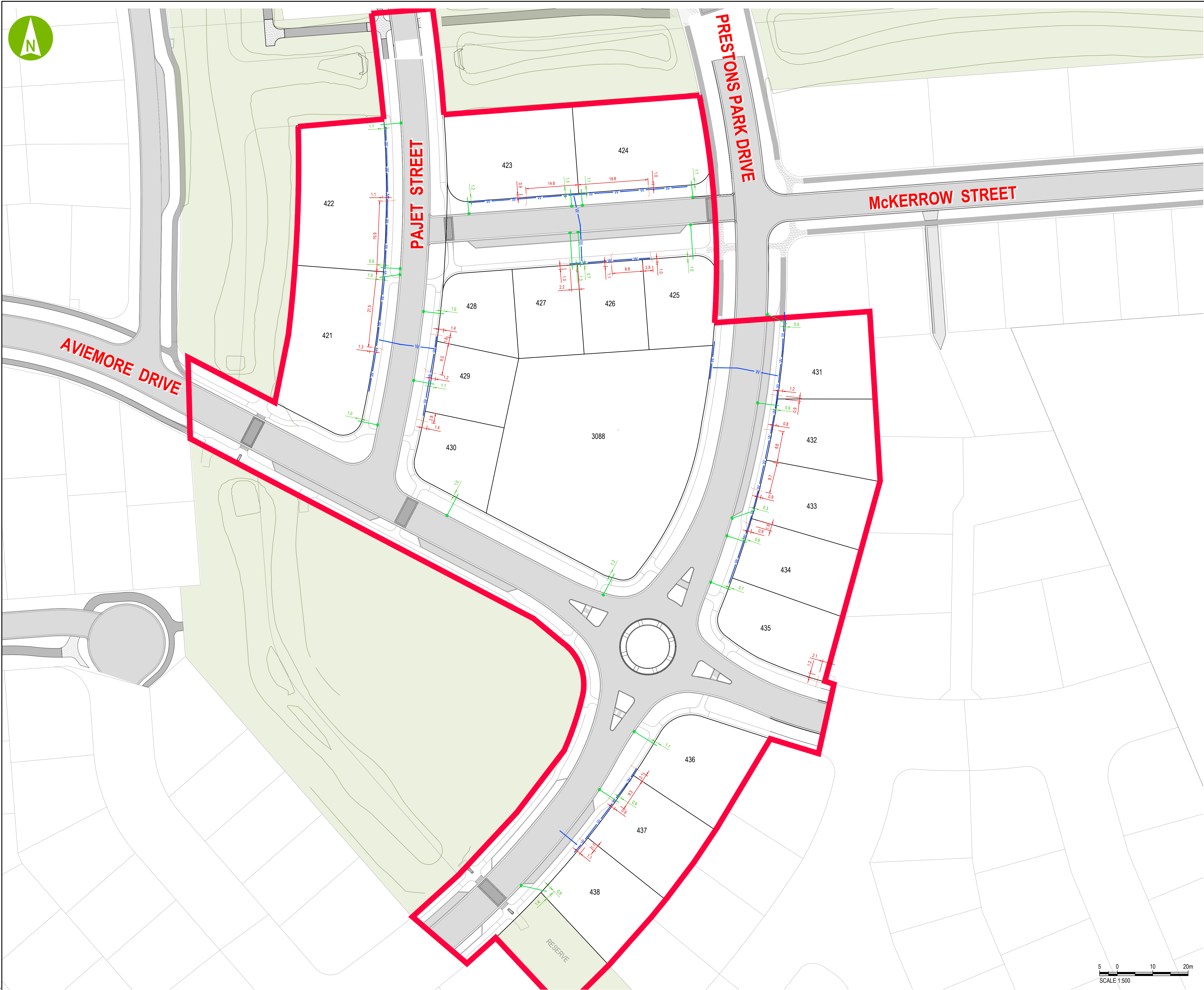
PROJECT

PRESTONS PARK

TITLE

SITE LEVELS PLAN
SUBSTAGE U1
STAGE 2

DRAWN	DESIGNED	INFORMATION	
R DAWSON	C DOHERTY	NOT FOR CONSTRUCTION	
CHECKED		PROJECT No.	
M CROWE		235361	
APPROVED		SCALE	SIZE
DATE		1:500	A1
		DRAWING No.	REV
K ASHBY		SU-PS-S2-IN-22	B



LEGEND

SUB-STAGE X BOUNDARY

STORMWATER TO STREET

DOUBLE SUMP

SINGLE SUMP

CORNER SUMP

SEWER LATERAL TO MAINS

WATER SUBMAIN

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CLIENT

CDL LAND
NEW ZEALAND LIMITED

REV	DATE	REVISION DETAILS	APPROVED
A	29/10/18	ISSUE FOR INFORMATION	K ASHBY

PROJECT

PRESTONS PARK

TITLE

AS BUILT SEWER & STORMWATER
SUBSTAGE U1
STAGE 2

DRAWN A GRAY	DESIGNED C DOHERTY	PRELIMINARY NOT FOR CONSTRUCTION
CHECKED M CROWE	APPROVED K ASHBT	PROJECT No. 235361
APPROVED K ASHBY	DATE 29/10/2018	SCALE 1:500
		SIZE A1
		REVISION AB-PS-S2-SP-07



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: 13:21:11 23 Apr 2019

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

ISSUED BY: **MiTek New Zealand Limited**

TO: **CARTERS**

IN RESPECT OF: **MiTek® Truss Designs**

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **291435C1** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

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

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

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

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

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

On behalf of MiTek New Zealand Limited,

Date: Tuesday, 23 April 2019

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

Job: 291435C1

Client: BHC Limited
Phone:Site: Cadiven Res
Lot 428, Prestons Park
MarshlandsDescription:
Building Consent No.:
MiTek 20/20 Engineering 4.7.301.0

Phone:

Printed: 13:21:11 23 Apr 2019

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **CARTERS**, 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 DDP H1.2	Pitch:	25.000 deg	Nominal Overhang:	300 mm
Roof		Ceiling		Wind	
Material:	Metal Tiles	Material:	Gib Board 13mm	Area:	High (44.0 m/s)
Dead Load:	0.210 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	400 mm centres	Restraints:	600 mm centres	Snow	
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 kPa

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

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
*HB1	2	7579	18.249	900	J16	2	1212	25.000	900	V1	1	2735	25.000	900
*HB2	2	3072	18.249	900	J17	2	1212	25.000	900	V2	1	1835	25.000	900
*HB3	2	5638	18.249	900	*R1	2	1333	25.000	900	V3	1	935	25.000	900
*HB4	2	4662	18.249	900	*R2	8	591	25.000	900	V4	1	2280	25.000	900
J1	2	2842	25.000	900	*R3	2	1293	25.000	900	V5	1	1459	25.000	900
J3	2	1942	25.000	900	*R4	2	603	25.000	900	J2	1	2842	25.000	900
J4	2	1942	25.000	900	*R5	1	1800	25.000	900	J2A	1	2842	25.000	900
J5	1	2842	25.000	900	T2	1	7450	25.000	900	J10	1	2802	25.000	900
J6	2	2842	25.000	900	T3	1	7450	25.000	900	J10A	1	2802	25.000	900
J7	2	2842	25.000	900	T4	1	7450	25.000	900	J15	1	2112	25.000	900
J8	1	2802	25.000	900	T5	2	7450	25.000	900	J15A	1	2112	25.000	900
J9	2	2802	25.000	900	T6	2	6070	25.000	900	T1	1	11130	25.000	900
J11	2	1902	25.000	900	TR1	1	11130	25.000	900	TG1	1	8243	25.000	900
J12	2	1902	25.000	900	TR2	1	8243	25.000	900	TG2	1	7450	25.000	900
J13	1	2112	25.000	900	TR3	1	8243	25.000	900	TG3	1	6070	25.000	900
J14	2	2112	25.000	900	TR4	1	8243	25.000	900	T7	1	6070	25.000	900

Total quantity : 75

The computer design input has been carried out by:

MiTek 20/20 Software Operator: Brent Yellowlees

MiTek Candidate Number and Qualifications: 10010 - MiTek 101, 201, 301, COC

Accredited Fabricator:



Tuesday, 23 April 2019

Job: 291435C1

Client: BHC Limited
Phone:Site: Cadiven Res
Lot 428, Prestons Park
MarshlandsDescription:
Building Consent No.:
MiTek 20/20 Engineering 4.7.301.0

Phone:

MiTek New Zealand Limited

Printed: 13:21:15 23 Apr 2019

TRUSS BEARINGS EXCEEDING 8KN REPORT - Ultimate Limit State Loads

MiTek® Truss List

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

Critical Trusses	Qty	Span (mm)	Joint	Bearing Reactions (kN)	
				Down	Uplift
T1	1	11130	O	9.867	7.955
TG1	1	8243	N	15.384	11.769
TG2	1	7450	B	8.183	6.157
			G	8.183	6.157

Note:

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

BUILDABLE CONSENT LAYOUT

For valley/saddle truss fixing unless stated otherwise use a pair of wire dogs at 900mm centres for up to and including a very high wind zone.
Or a pair of CT200's at 900mm centres for extra high wind zone.
This fixing is to meet the minimum requirements as per NZS3604.



CARTERS
Carters Manufacturing Christchurch
(03) 3592731

JOB No **291435C1**

Client: BHC Limited
Job: Cadiven Res
Site: Lot 428, Prestons Park
Marshlands

Pitch: 25.0deg
Roof Type: Metal Tiles
Overhang: 300mm
Wind Area: High
Roof Snow: 0.526kPa

Trusses and rafters at 900 mm
max centres unless stated otherwise.
This layout is to be read in conjunction
with the Architectural plans.

DRAWN Brent Yellowlees 23 Apr,2019

FIXINGS

- A = 47x90 Joist Hanger
- B = 47x120 Joist Hanger
- C = CT200 (pair)
- D = 47x190 Joist Hanger
- E = 95x165 Joist Hanger
- F = SH-140 Split Hanger
- G = SH-180 Split Hanger
- H = SH-220 Split Hanger
- J = 2x6kN Strap (12kN Total)
- K = 6kN Strap
- L = Multigrip (single)
- M = Multigrips (pair)
- N = Nailon Plate (200x100)
- P = 16kN Pack
- Q = 9kN Pack
- S = CPC 40 Single Cleat
- T = CPC 40 Short (pair)
- U = CPC 80 Single Cleat
- V = 16kN Uplift
- W= 24kN Uplift
- X = 25kN Uplift
- Y = 35kN Uplift
- Z = 45kN Uplift

Unless otherwise indicated, all specified truss fixings are to use L/Lok product nail fasteners (as per the MiTek On-site Guide) when the choice of using screws or nails is optional.

All truss to frame fixings require 2 additional 2/90x3.15dia skew nails.

All truss fixings not indicated as above must have 2 wire dogs for cross joints and 2/90x3.15dia nails for butt joints.

Fixings shown are for fixing trusses to the top plate. Any other point load uplift fixings down through the framing stud to top plate, stud to bottom plate, bottom plate to floor remain the responsibility of the architect / draughtsman.



If metal ceiling battens on clips are used, 90x45 SG8 bottom chord restraints are required at 1800mm centres fixed with 2/90x3.15dia nails (skew nails if on edge).

All gable trusses are designed to suit cladding manufacturer's framing requirements.

If a gable truss requires a windbeam brace, the type of MiTek brace will be noted as such on the layout.

CARTERS **Your Building Partner**



FTMA
NEW ZEALAND

Demand Calculation Sheet

Job Details

Name: New House
 Street and Number: 21 Pajet Street, Prestons Park, Marshlands
 Lot and DP Number: Lot 428, DP525627
 City/Town/District: Christchurch
 Designer: LH
 Company: AP Design Ltd
 Date: 01-04-2019

Building Specification

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

 Cladding Weight: **Single** Heavy
 Roof Weight: Light
 Room in Roof Space: No
 Roof Pitch (degrees): 25
 Roof Height above Eaves (m): 2.7
 Building Height to Apex (m): 5.15
 Ground to Lower Floor (m): 0.15

 Average Stud Height (m): 2.4
 Building Length (m): 15
 Building Width (m): 13
 Building Plan Area (m²): 166.5

Building Location

Wind Zone = High

Earthquake Zone 2

Soil Type

D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (NZS3604:2011 Default)

Bracing Units required for Wind

	Along	Across
Single Level	725	873

Bracing Units required for Earthquake

	Along & Across
Single Level	1031

Single Level Along Resistance Sheet

Job Name: New House

									Wind	EQ
									Demand	
									725	1031
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1223 169%	1179 114%
A	1	1.80		2.4	GS1-N	GIB®	124	108		
	2	0.80		2.4	GS1-N	GIB®	49	47		
	3	0.90		2.4	GS1-N	GIB®	57	53		
	4	0.45		2.4	GS1-N	GIB®	24	26		
	5	0.45		2.4	GS1-N	GIB®	24	26		
External Length = 15									278 OK	261 OK
B	1	2.10		2.4	GS2-NOM	GIB®	105	105		
	2	4.90		2.4	GS2-NOM	GIB®	245	245		
									350 OK	350 OK
C	1	1.00		2.4	GS1-N	GIB®	65	60		
	2	2.90		2.4	GS2-NOM	GIB®	145	145		
	3	2.80		2.4	GS2-NOM	GIB®	140	140		
External Length = 4.9									350 OK	345 OK
D	1	2.40		2.4	GS1-N	GIB®	166	144		
	2	0.70		2.4	GS1-N	GIB®	41	41		
	3	0.65		2.4	GS1-N	GIB®	38	38		
External Length = 10.1									245 OK	223 OK

Single Level Across Resistance Sheet

Job Name: New House

									Wind	EQ
									Demand	
									873	1031
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1148 132%	1070 104%
M	1	0.70		2.4	GS1-N	GIB®	41	41		
	2	2.30		2.4	GS1-N	GIB®	159	138		
	3	0.60		2.4	GS1-N	GIB®	34	35		
									234 OK	214 OK
N	1	0.60		2.4	GS1-N	GIB®	34	35		
	2	2.20		2.4	GS2-NOM	GIB®	110	110		
	3	1.40		2.4	GS1-N	GIB®	97	84		
	4	0.60		2.4	GS1-N	GIB®	34	35		
									275 OK	264 OK
O	1	1.20		2.4	GS1-N	GIB®	83	72		
	2	1.20		2.4	GS2-NOM	GIB®	60	60		
	3	2.00		2.4	GS2-NOM	GIB®	100	100		
	4	1.50		2.4	GS2-NOM	GIB®	75	75		
									318 OK	307 OK
P	1	1.20		2.4	GS1-N	GIB®	83	72		
	2	2.80		2.4	GS1-N	GIB®	193	168		
	3	0.75		2.4	GS1-N	GIB®	45	44		
									321 OK	284 OK



CERTIFICATE OF CONFORMITY

This is to certify that

Firth Ribraft® Floor System



Complies with the New Zealand Building Code:

1. B1.3.1, B1.3.2 & B1.3.3 - Structure
2. B2.3.1(a) - Durability
3. E2.3.3 - External Moisture
4. F2.3.1 - Hazardous Building Materials
5. H1.3.1 - Energy Efficiency (Refer to limitation c)

Product Description

The Firth RibRaft® Floor System comprises of polystyrene pods, steel reinforcing rods, plastic spacers and Firth RibRaft® concrete.

Refer A1 below for further detail.

Certificate Holder

Fletcher Concrete and Infrastructure Ltd.

T/A Firth Industries

NZBN: 942903777548

585 Great South Road
Penrose Auckland NZ 1061

Ph: 0800 800 576

W: www.firth.co.nz

Certification Body

CertMark International Pty Ltd

ABN: 80 111 217 568

JAS-ANZ Accreditation No. Z4450210AK

PO Box 321 Tuakau 2121

+64 (09) 951 8246

www.CertMark.org

Product Purpose or Use

The Firth RibRaft® Floor System is a method of concrete floor construction, suitable for all slab-on ground concrete floors for domestic or residential buildings, which fall within the scope of NZS 3604:2011 – Timber-framed buildings.

Subject to the following Conditions & Limitations:

- a. Must be installed in accordance with the [Firth RibRaft® Technical Manual October 2018 Rev A](#).
- b. Specified products must be supplied by Firth Industries or a Firth Industries approved supplier.
- c. The energy efficiency rating of the Firth RibRaft® Floor System relates only to the floor.
- d. Nothing in this document should be construed as a warranty or guarantee by CMI, and the only applicable warranties will be those provided by the Certificate Holder.
- e. The Certificate Holder must maintain compliance with the conditions set out in Section 15 of the Building (Product Certification) Regulations 2008.

John Thorpe

CertMark International Pty Ltd

30/11/2018

Date of Issue

CM40015-I02-R02

Certificate Number

- 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
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- Nothing in this document should be construed as a warranty or guarantee by CMI, and the only applicable warranties will be those provided by the Certificate Holder.



A1 Product or System Specification

- The Firth RibRaft® Floor System is a reinforced concrete waffle raft floor slab-on-ground. Typically it consists of an 85mm thick slab supported by a grid of ribs normally 100mm wide at 1200mm x 1200mm centres. The overall depth is 305mm. Edge beams and ribs under load bearing walls are 300mm wide to provide for the extra load carried by these members. Where heating coils of less than 25mm diameter are embedded in the topping, the slab concrete thickness shall be 110mm meaning the overall thickness is 330mm.
- Where the top floor surface is honed to provide a decorative finish, a slab thickness of 100mm (before honing) should be specified.

Pods

- Firth RibRaft® polystyrene pods 1100mm square and 220mm thick are placed directly on levelled ground and are arranged in such a way as to form a reinforced concrete floor slab with a grid of reinforced concrete ribs and edge beams when concrete is placed onto them.
- Pods may be cut to suit specific architecture layout and also to accommodate services.
- 300mm thick pods are available if needed for deeper edge beams and internal ribs.

Steel

1. Reinforcing steel in the slab shall consist of Welded Reinforcing Mesh complying with AS/NZS 4671:2001 with a minimum weight of 2.27kg/m², a lower characteristic stress of 500MPa, square configuration of orthogonal bars between 150 to 200mm centres, and ductility class L or E, hereafter referred to "mesh".
2. The presence of Class E reinforcing bars in the ribs and beams provides adequate ductility of the system which allows the use of class L mesh.
3. Typically the topping mesh reinforcement will be 665 mesh (class L) or SE62 ductile mesh, each being equally applicable.
4. The reinforcing bars in the ribs and edge beams shall conform to AS/NZS 4671:2001 "Steel Reinforcing Materials". Specifically designed spacers are used to position the polystyrene pods and the rib and edge beam reinforcing steel bars in a secure manner until the concrete is placed.
5. The reinforcing mesh is held in place by mesh chairs.
6. Conventional timber or steel formwork is used to form the edge of the slab.

Concrete

One of the following Firth concrete products shall be used in the system:

- 1) Raftmix: a 20MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix.
- 2) Raftmix25: a 25MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix. This mix shall be specified for buildings constructed in the 'sea spray zone' (i.e. within 500m of the sea including harbours, within 100m of tidal estuaries or inlets, on offshore islands and elsewhere defined as exposure zone D in 4.2.3.3 of NZS 3604:2011).

Type and Use of Product

As per page one.

A2 Installation Requirements

The Firth RibRaft® Floor System must be constructed in accordance with [Firth RibRaft® Technical Manual October 2018 Rev A](#).

- 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.
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- Nothing in this document should be construed as a warranty or guarantee by CMI, and the only applicable warranties will be those provided by the Certificate Holder.

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A3 Other Relevant Technical Data

The Firth RibRaft® Floor System, if designed, installed, used and maintained in accordance with the statements and conditions of this Certificate of Conformity, will meet the following provisions of the New Zealand Building Code (NZBC):

Clause(s)	Compliance
B1.3.1, B1.3.2 & B1.3.3	Engineering Opinions, based on testing and load calculations, confirm the systems compliance with B1.3.1, B1.3.2 & B1.3.3.
B2.3.1(a)	Durability of 50 years has been confirmed.
E2.3.3	Reliance is placed on the 0.25 polythene membrane placed beneath the pods to provide sufficient resistance to vapour transmission from the ground into the substructure and building as detailed in NZS 3604:2011; therefore, compliance has been demonstrated.
F2.3.1	The system has been confirmed as non-hazardous.
H1.3.1	R-values confirm compliance of the system to H1.3.1.

Structure Limitations

For relevant information on structural limitations refer [Firth RibRaft® Technical Manual October 2018 Rev A](#).

B1 Basis of CodeMark Certification

CMI has followed the following procedures for certifying the Firth RibRaft® Floor System:

- Testing and assessment of the Firth RibRaft® Floor System;
- Assessing a quality plan for the Firth RibRaft® Floor System that conforms to ISO 10005:2018 and the CodeMark scheme rules;
- By reviewing testing of samples supplied to ascertain whether or not the product meets the performance requirements specified on this certificate; and
- Conducting site audits of the factory to verify compliance of the Firth RibRaft® Floor System.

B2 Sources of Information

- OPUS; Report 10-524A91.00; B2 Durability; Dated: 24 May 2010.
- OPUS; Report; Seismic Shear Key; Dated: 28 June 2006.
- Holmes Consulting Group; Structural Peer Review; Dated: 23 September 2010.
- Holmes Consulting Group; Structural Review; Dated: 17 May 2012.
- eCubed Building Workshop Ltd; Thermal Performance Report; Dated: 17 September 2010
- Arbitration New Zealand; Report on compliance with the NZBC; Dated: 18 December 2011.
- NZS 4214:2006 - Methods of determining the total thermal resistance of parts of buildings.
- AS/NZS 4671:2001 "Steel Reinforcing Materials.
- NZS 3604:2011 "Timber Framed Buildings".
- NZS 3109:1997 "Concrete Construction".
- NZS 1170.5:2004 Earthquake actions – New Zealand.

The Certificate Holder has chosen not to make the above listed reports publicly available, as they are considered commercial in confidence.

- 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
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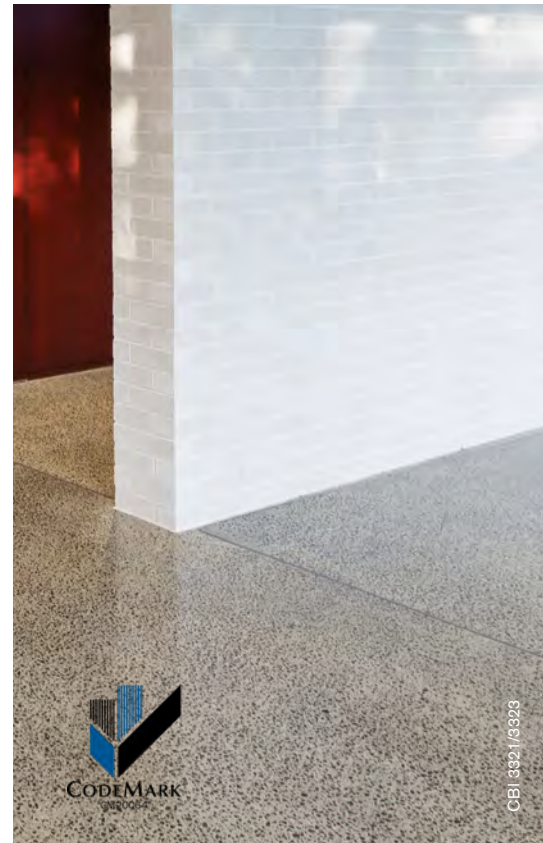




OCTOBER 2018

+RibRaft®

TECHNICAL
MANUAL





This document contains design and installation information. A variation to any of the information given requires specific engineering design and is hence beyond the scope of this document.

The Firth RibRaft® Floor System can be constructed for all slab-on-ground concrete floors for domestic or residential buildings that fall within the scope of NZS 3604:2011 “Timber Framed Buildings” and Clause 3 “Scope” of Section 1 of this Manual. The design and installation details in this Manual shall be used to design and construct such a floor.

The Firth RibRaft® Floor System is covered by the MBIE Codemark®. This is conditional on the system being used as described in CertMark Australasia certification decision, which in turn requires design in accordance with Section 1 and installation in accordance with Section 2 of this Manual and on site verification in accordance with Section 3.

Note that a MBIE Codemark® means that if this Manual is rigidly followed the relevant Building Control Authority will automatically provide a building permit without the need for producer statements. To comply with the Manual does mean that Firth Certified Concrete® must be used.

THIS MANUAL CONSISTS OF 3 SECTIONS:

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Contains information
principally useful for
the specifier or
building designer

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Primarily aimed at the
person on site installing
the Firth RibRaft®
Floor system

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Describes the required
verification checks

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SECTION: DESIGN INFORMATION

1

1.0 THIS SECTION OF THIS MANUAL CONTAINS DESIGN INFORMATION NOT REQUIRING SPECIFIC ENGINEERING INPUT FOR THE FIRTH RIBRAFT® FLOOR SYSTEM (THE SYSTEM). FULL INFORMATION ON THE INSTALLATION PROCEDURES IS DESCRIBED IN SECTION 2 OF THIS MANUAL (INSTALLATION INFORMATION). WHERE STANDARDS ARE REFERENCED IN THIS MANUAL, THESE SHALL INCLUDE THE LATEST AMENDMENTS.

2.0 TECHNICAL INFORMATION

2.1 Overview

The Firth RibRaft® Floor System is a reinforced concrete waffle raft floor slab-on-ground. Typically it consists of an 85mm thick slab supported by a grid of ribs normally 100mm wide at 1200mm x 1200mm centres. The overall depth is 305mm. Edge beams and ribs under load bearing walls are 300mm wide to provide for the extra load carried by these members. Where heating coils of less than 25mm diameter are embedded in the topping, the slab concrete thickness shall be 110mm meaning the overall thickness is 330mm. Where the top floor surface is honed to provide a decorative finish, a slab thickness of 100mm (before honing) should be specified.

2.2 Pods

Firth RibRaft® polystyrene pods 1100mm square and 220mm thick are placed directly on levelled ground and are arranged in such a way as to form a reinforced concrete floor slab with a grid of reinforced concrete ribs and edge beams when concrete is placed onto them. Pods may be cut to suit specific architecture layout and also to accommodate services. 300mm thick pods are available if needed for deeper edge beams and internal ribs.

2.3 Steel

Reinforcing steel in the slab shall consist of Welded Reinforcing Mesh complying with AS/NZS 4671:2001 with a minimum weight of 2.27kg/m², a lower characteristic stress of 500MPa, square configuration of orthogonal bars between 150 to 200mm centres, and ductility class L or E, hereafter referred to “mesh”. The presence of Class E reinforcing bars in the ribs and beams provides adequate ductility of the system which allows the use of class L mesh. Typically the topping mesh reinforcement will be 665 mesh (class L) or SE62 ductile mesh, each being equally applicable. The reinforcing bars in the ribs and edge beams shall conform to AS/NZS 4671:2001 “Steel Reinforcing Materials”. Specifically designed spacers are used to position the polystyrene pods and the rib and edge beam reinforcing steel bars in a secure manner until the concrete is placed. The reinforcing mesh is held in place by mesh chairs. Conventional timber or steel formwork is used to form the edge of the slab.

2.4 Concrete

One of the following Firth concrete products shall be used in the system:

- 1) Raftmix: a 20MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix.
- 2) Raftmix25: a 25MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix. This mix shall be specified for buildings constructed in the ‘sea spray zone’ (i.e. within 500m of the sea including harbours, within 100m of tidal estuaries or inlets, on offshore islands and elsewhere defined as exposure zone D in 4.2.3.3 of NZS3604).

3.0 SCOPE

This Clause sets out the limitations that apply to the use of the system to ensure that specific engineering input is not required. The concrete floor slab for buildings or ground conditions that do not meet this scope must be subjected to specific engineering design to comply with the requirements of the New Zealand Building Code.

3.1 Structure Limitations

Specific engineering input shall not be required only where the structure supported by the system complies with the following criteria:

- > The structure supported by the system is constructed in a location where the Seismic Hazard Factor Z (defined in NZ1170.5) is less than or equal to 0.45 (refer to Figure 6).
- > The system is laid level, or has a maximum step of 600mm detailed in accordance with this Manual.
- > The structure supported by the system has no basement, part basement or foundation walls.
- > The total height from the lowest ground level to the highest point of the roof shall not exceed 10m.
- > The structure supported by the system has a roof pitch limited to 60 degrees maximum from the horizontal.
- > The maximum height of a single or top storey is 4.8m and any other storey is 3m.
- > Only ground floor walls of the structure supported by the system are permitted to be "heavy external walls" (as defined in Clause 3.3).
- > The roof truss span shall be less than or equal to 12m when the roof and ceiling loads are supported entirely by the external walls. Where internal support of roof trusses is used the footings below point loads identified by the truss designer shall comply with this Manual.
- > Where internal load bearing walls are used to support the roof or floors, the loaded dimensions stated in Tables 8.2 and 14.10 of NZS3604:2011 shall apply, and the load bearing wall shall be supported on a 300mm wide load bearing rib as detailed in this Manual.
- > Floors may be of unlimited size provided that the maximum dimension between free joints shall not exceed 30m. Where free joints are required they should be detailed in accordance with this Manual.

3.2 Live Loading

The live loading cases of structures covered by these designs are:

- > 1.5kPa and 3.0kPa as per NZS3604 "Timber Framed Buildings".
- > 13kN concentrated load in garage over area of 0.3 x 0.3m (vehicle limited to 2500kg gross).

3.3 Snow Loading

Open ground snow loading as defined in NZS3604 of up to 2kPa.

3.4 Dead Loading for Use with This Manual

The dead load cases of structures covered by these designs are:

- > Light external walls with total mass not exceeding 60kg/m² – e.g. timber framing with weather boards and interior wall linings.
- > Heavy external walls with total mass greater than 60kg/m² but not exceeding 290kg/m² – e.g. timber framing with masonry veneer or partially filled 20 series masonry blocks.
- > Internal walls with total mass not exceeding 45kg/m² – e.g. timber framing and linings.
- > Light roofs with total mass not exceeding 45kg/m² – e.g. ceiling linings and metal roof, including framing.
- > Heavy roofs with total mass greater than 45kg/m² but not exceeding 85kg/m² – e.g. ceiling lining and concrete tiles or slates, including framing.
- > Mid-floors with total mass not exceeding 60kg/m² – e.g. timber framing and flooring, including ceiling linings.
- > Heavy internal walls and/or load bearing internal walls supported on a load bearing rib.



The RibRaft® System

- A** Steel mesh reinforcing
- B** Firth 300mm spacer
- C** Firth RibRaft® polystyrene pods
- D** Steel reinforcing

3.5 Foundation Requirement for Different Building Types

The designs given in this Manual are limited to where the system supports Building Types as described in Table 1. The classification of wall and roof weights are as detailed in Clause 3.4 of this Section. Single and two storey shall be as defined in NZS 3604:2011.

Table 1 Foundation Type Identifier

NUMBER OF STORIES	ROOF	GROUND FLOOR EXTERNAL WALLS	SECOND STOREY EXTERNAL WALLS	1.5KPA LIVE LOAD & UP TO 1KPA SNOW LOAD	3KPA LIVE LOAD & /OR 2KPA SNOW LOAD
SINGLE STOREY	Light	Light		A	A
	Heavy	Light		A	B
	Light	Heavy		B	B
	Heavy	Heavy		C	C
DOUBLE STOREY	Light	Light	Light	C	D
	Heavy	Light	Light	D	E
	Light	Heavy	Light	D	E
	Heavy	Heavy	Light	E	G

3.6 Foundation Soils

The system may be used when the supporting ground meets the definitions of “good ground” given in Section 3 of NZS 3604:2011 (as modified by B1 of the Building Compliance Documents). In addition, the system shall not be used for damp sites i.e. where it can be reasonably expected that the ground water level could come within 600mm of the underside of the system. The acceptability of the ground shall be verified in accordance with Clause 3.1.3 of NZS 3604:2011.

Solutions for soils prone to liquefaction or expansive soils are available using the Firth RibRaft® technology, however these are outside the scope of this Manual and require specific engineering design.

Where the ultimate bearing capacity required of the supporting ground is verified by Scala Penetrometer testing in accordance with Clause 3.3 of NZS3604:2011 or for cohesive soils using a calibrated shear vane in accordance with the NZGS Guideline for Hand Held Shear Vane Test, the bearing capacity shall exceed the values in Table 2 for the proposed building type. For scala penetrometer testing, the bearing capacity shall be considered adequate when the number of blows per 300mm depth of penetration below the underside of the system at each test site exceeds the values given in Table 2 below.

For RibRaft® foundations compliance with Table 2 allows ultimate bearing capacities of less than 300kPa. However, with the exception of bearing capacity all other requirements in NZS3604:2011 for “good ground” shall be complied with.

Table 2 Scala Penetrometer Blows Required and Ultimate Bearing Capacity

FOUNDATION TYPE	ULTIMATE BEARING CAPACITY (KPA)	MIN. BLOWS PER 300MM DEPTH FOR SCALA TESTING
A	140	4
B	175	5
C	210	6
D	240	7
E	275	8
G	Good ground	9

3.7 Flow Diagrams

The flow diagrams on the following pages (adapted from NZS3604:2011) will help in determining whether the non-specific details for the system can be used for the purposes of the concrete floor slab construction. There are two checks in the process. The first is to determine whether the proposed building complies with the requirements set out in this Manual (Building Check), and the second is to determine whether the site complies with the requirements set out in this Manual (Site Check).

(Note: NZS3604:2011 provides for parts of buildings to be considered as individual buildings. These flow diagrams apply to those parts of the building where slab-on-ground is being considered and where the part of the building can be considered as an individual building under NZS3604:2011).

Figure 1 Building Check Flow Diagram

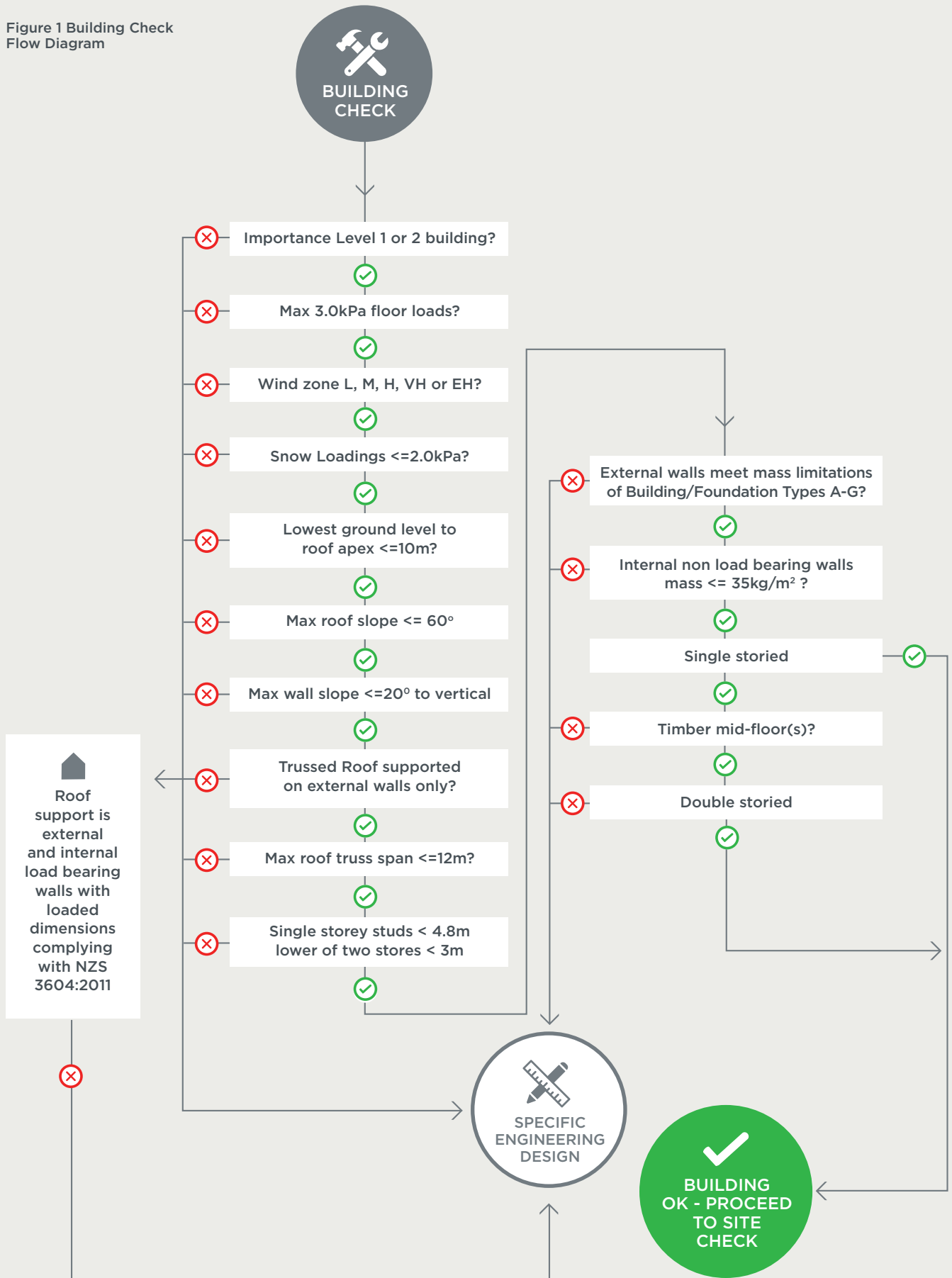
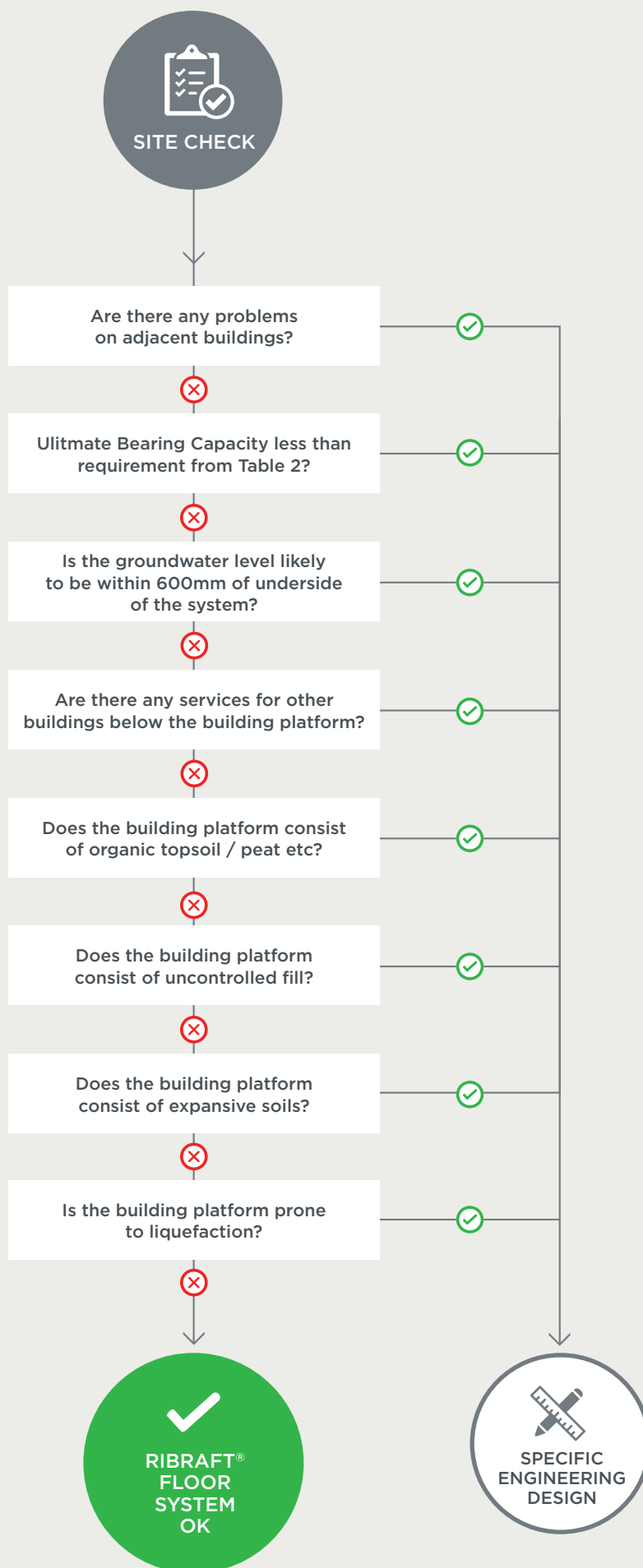


Figure 2 Building Check
Flow Diagram



4.0 CONSTRUCTION DETAILS

Standard construction details for the system are provided here for buildings that fall within the below scope.

4.1 Pod Layout

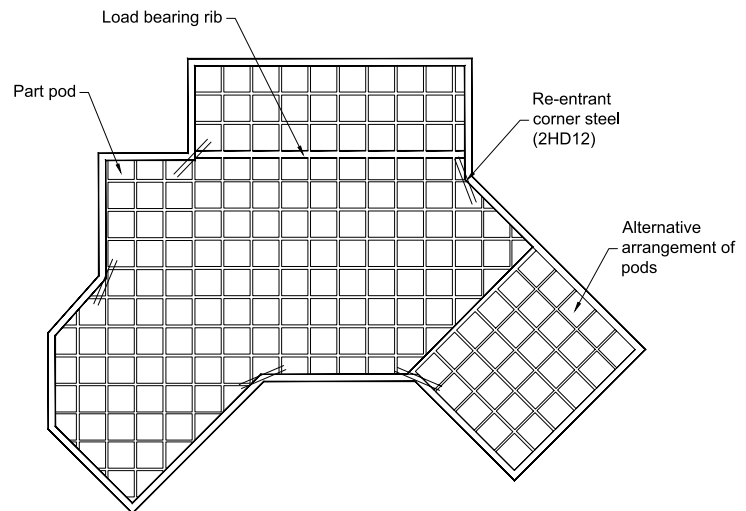
RibRaft® polystyrene pods supplied by Firth (1100 x 1100 x 220mm thick) shall be placed on levelled ground and arranged in a waffle pattern. The pods are used as void formers while the concrete is curing. These pods are an integral component of the system and shall not be substituted.

Pods shall be placed so as to provide the necessary spacing between the edge beams and ribs as described below. The first rib out from the edge beam shall have a maximum clear separation of 1100mm however in all other cases the centre to centre distance between the ribs, whether they are 100mm or 300mm wide, shall be 1200mm. In the case of 100mm ribs this centre to centre spacing is achieved by the 1100mm square pods however between 100mm and 300mm ribs, or between two 300mm ribs, the pods shall be cut down to suit. Pods may be cut down to size but shall not be added to, where this is necessary to suit the building layout, penetrations or orientation of beams and ribs.

Figure 3 shows a typical layout of the pods and ribs. Note the part pods around the edge, where the building shape dictates, and adjacent to the 300mm rib.

Firth suggests that when drawing the building plan, a generic RibRaft® grid (100mm wide ribs at 1200mm centres) is set out using the corner of the building as a starting point. The location of any load bearing ribs, or point loads greater than 10kN, are identified and pods cut to establish 300mm wide ribs or foundation pads as described in this Manual. The most cost effective solution being a simple grid layout which requires minimum cutting of the pods. Ribs can be used at less than 1200mm centres, however it is more cost effective to use the 1200mm centres wherever practicable.

Figure 3 Typical RibRaft® Plan



4.2 Edge Beam Width and Reinforcement

Edge beams around the perimeter of the floor slab shall be 300mm to provide bearing capacity for external load bearing walls, and contain 2-HD12 bars (Grade 500E) as bottom steel and 1-HD12 bar (Grade 500E) in the top. This top bar shall be tied to the underside of the reinforcement mesh. Refer Figure 5, below for construction details. The edge beam shall be rebated for brick veneers where necessary as shown in Figure 5(C).

4.3 Internal Ribs (non load bearing) Width and Reinforcement

Each standard internal rib shall be 100mm wide and shall contain 1-HD12 steel bar (Grade 500E) held in place at the bottom of the rib by a Firth spacer. Refer Figure 5E for construction details.

4.4 Internal Ribs (load bearing) Width and Reinforcement

For all load bearing walls and heavy internal walls, the pods shall be cut to create a 300mm wide rib directly under the load bearing wall, with 2-HD12 (Grade 500E) steel bars as bottom steel. Refer Figure 5(D) for construction details under load bearing walls. Where the load bearing ribs meet and terminate at an edge beam or internal rib the bottom reinforcement from the load bearing rib shall be bent into the adjacent rib and tied together. The reinforcement shall lap for at least 720mm.

4.5 Point Loads

Truss manufacturers often support the roof trusses internally which are described on the truss manufactures drawings as falling into various ultimate limit state categories. Table 3 summaries when individual footings are required below the reactions, and the form these should take.

Table 3 Foundation Requirements for Individual Point Loads

FOUNDATION OPTIONS BELOW POINT LOAD:

ULTIMATE LIMIT POINT LOAD REACTION	PAD OPTION, GOOD GROUND	BEAM OPTION, BEARING CAPACITY GREATER THAN 140KPA ⁽³⁾
Up to 10kN	No thickening required	No thickening required
Up to 20 kN	375x375 pad ⁽¹⁾	300mm wide load under point load as detailed in Figure 5
Up to 30kN	450x450 pad ⁽²⁾	300mm wide load under point load as detailed in Figure 5

Notes

(1) Pad thickness to match depth of pods plus topping (bears on ground not polystyrene) and reinforced with 5

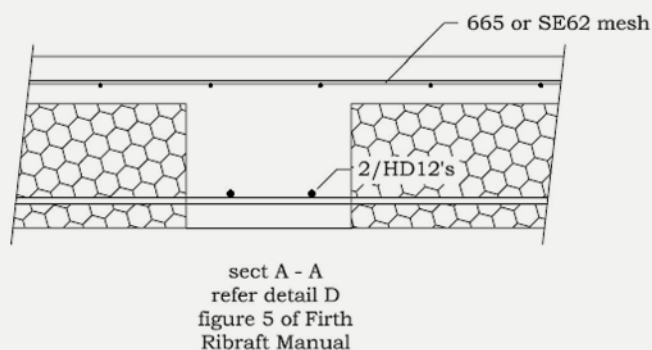
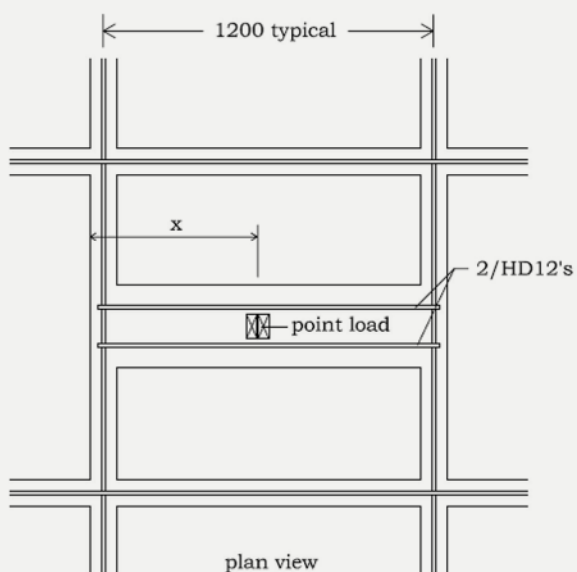
(2) Pad thickness to match depth of pods plus topping (bears on ground not polystyrene) and reinforced with 5

(3) Refer section 3.6 for confirmation of bearing capacity. With exception of bearing capacity all other requirements in NZS3604 for good ground shall be complied with.

Figure 4 Details for Beam Option Thickening Under Point Loads

ULTIMATE LIMIT LOAD P FROM TRUSS DESIGNER	MINIMUM EDGE DISTANCE X IN MM
20kN	200 *
30 kN	400 *

* If minimum edge distances cannot be achieved extend thickening to next 100mm ribs



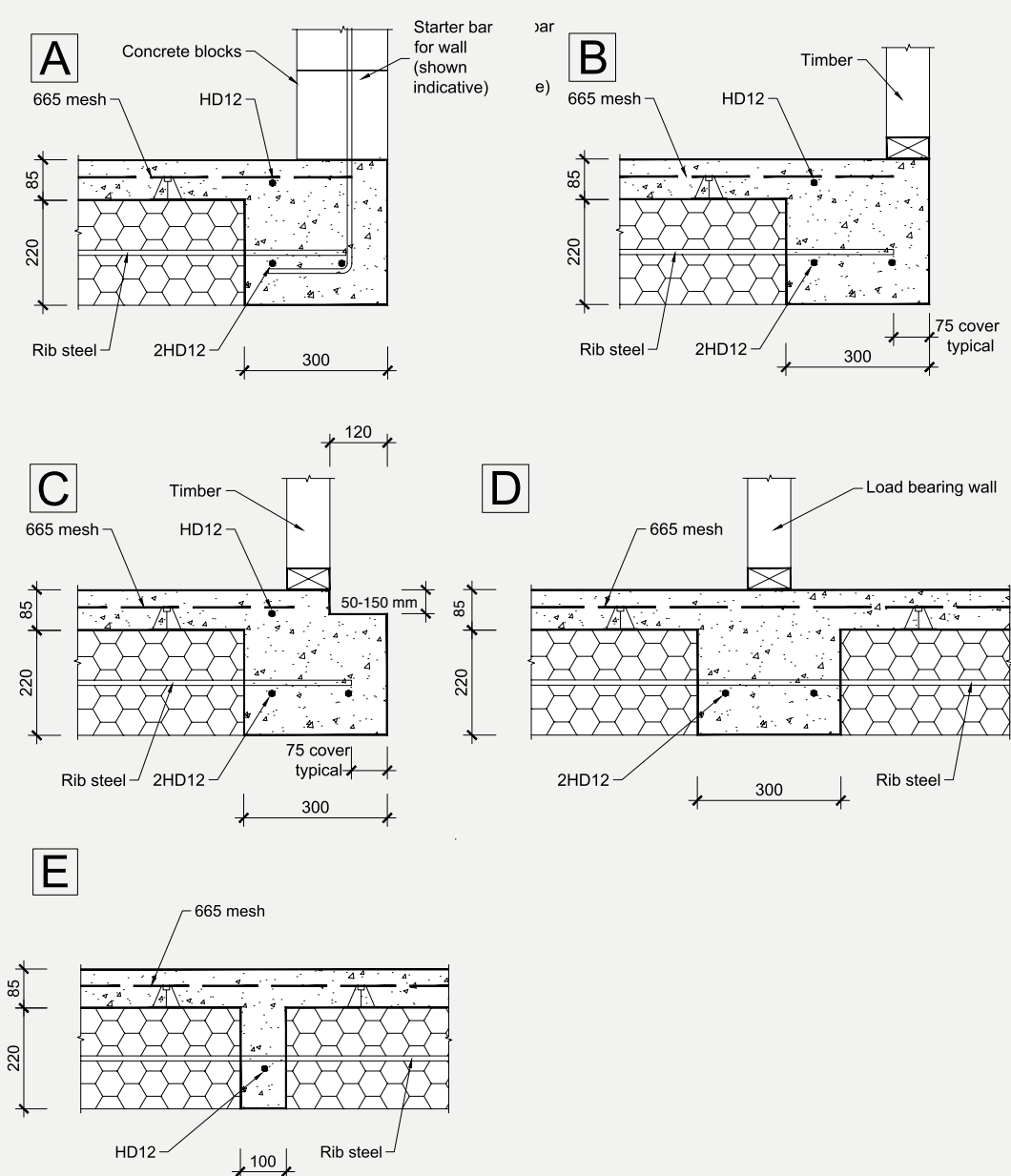
4.6 Mesh Reinforcement

The entire floor slab shall be reinforced with 665 mesh supported on 40mm mesh chairs sitting on the polystyrene pods.

4.7 Re-entrant Corners

In order to limit the width of cracking at the re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover from the internal corner - refer Figure 3.

Figure 5
Standard RibRaft®
Construction Details



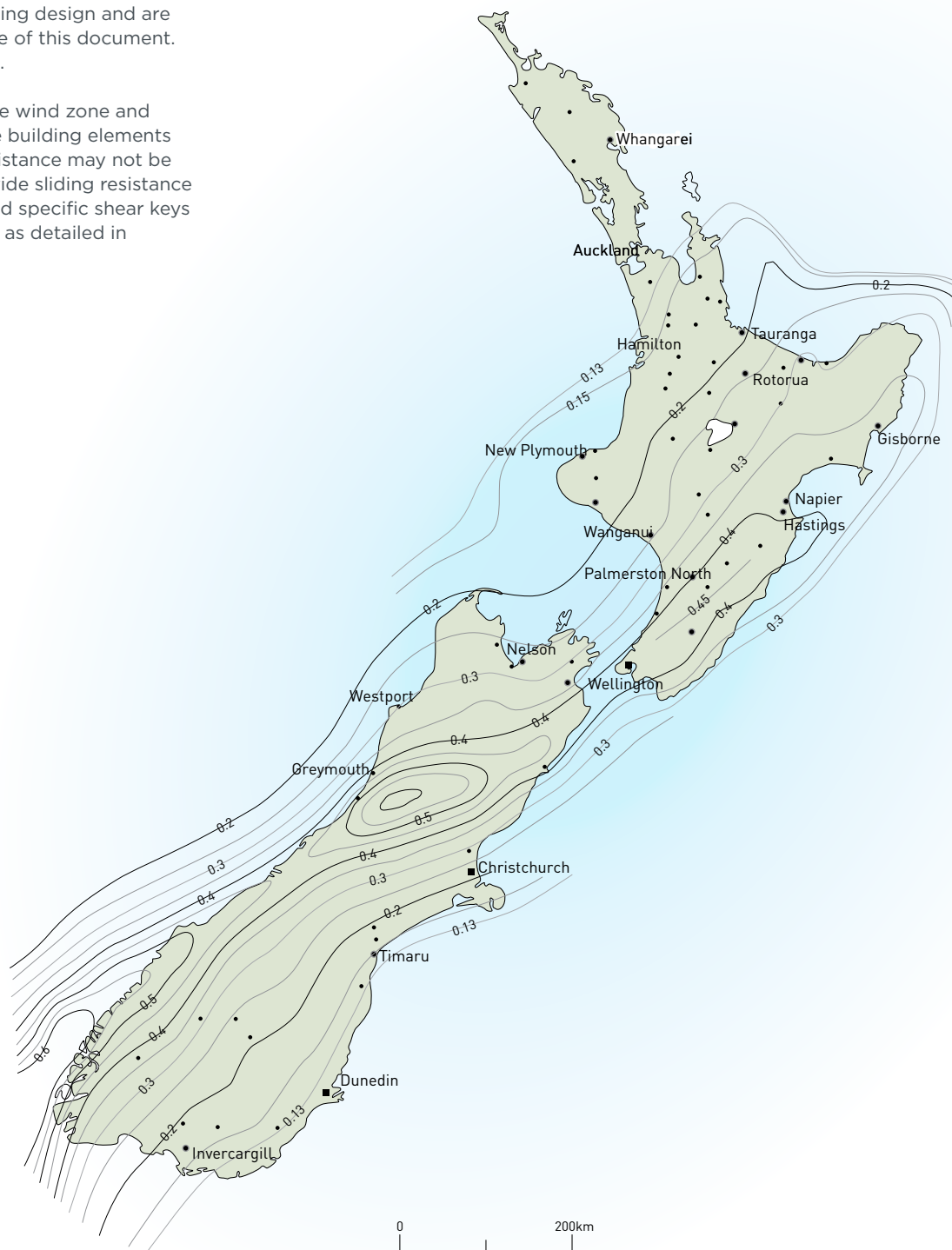
5.0 LATERAL RESISTANCE

5.1 Earthquake Resistance

Unlike conventional foundation systems, the Firth RibRaft® system is not embedded into the ground. Sliding resistance to horizontal seismic loads is provided by frictional contact with the soil. In locations where the Seismic Hazard Factor Z is greater than 0.45, shear keys maybe required to resist seismic loads. Such buildings require specific engineering design and are outside the scope of this document. Refer to Figure 6.

Depending on the wind zone and the weight of the building elements this frictional resistance may not be sufficient to provide sliding resistance to wind loads, and specific shear keys may be required, as detailed in Clause 5.2.

Figure 6
Seismic Hazard
Factor Z to
NZS 1170.5



5.2 Wind Resistance

The building's bracing demand from wind loading shall be assessed from Section 5 of NZS 3604:2011 for both directions (i.e. along and across the building). The bracing capacity of the system must exceed the greater of the bracing demands determined.

The bracing capacity of the system shall be determined as the sum of the bracing capacity provided by frictional resistance (i.e. friction between the system and the ground) and the bracing capacity provided by the shear keys (if any) necessary to meet the requirements of Clause 5.2.

The bracing capacity provided by frictional resistance shall be determined from Table 4 depending on the building type, roof weight, and floor live loading. The bracing capacity provided by the shear keys shall be the sum of the bracing capacity of the individual shear keys determined as follows. If the shear key is in clay, each shear key shall be considered to contribute 170 BU's. If the shear key is in sand, each shear key shall be considered to contribute 200 BU's. If the bracing capacity of the system, determined from the frictional resistance and the shear keys as described above, is less than the bracing demand further shear keys shall be added until the bracing demand is met.

BUILDING TYPE	ROOF TYPE	GROUND FLOOR EXTERNAL WALLS	SECOND STOREY EXTERNAL WALLS	BU's PROVIDED PER 100M ² 1.5KPA	FOR LIVE LOADING OF: 3.0KPA
Single Storey	Light	Light		1630	1746
Single Storey	Heavy	Light		1737	1857
Single Storey	Light	Heavy		1802	1922
Single Storey	Heavy	Heavy		1909	2029
Double Storey	Light	Light	Light	2163	2403
Double Storey	Heavy	Light	Light	2270	2510
Double Storey	Light	Heavy	Light	2335	2575
Double Storey	Heavy	Heavy	Light	2442	2682

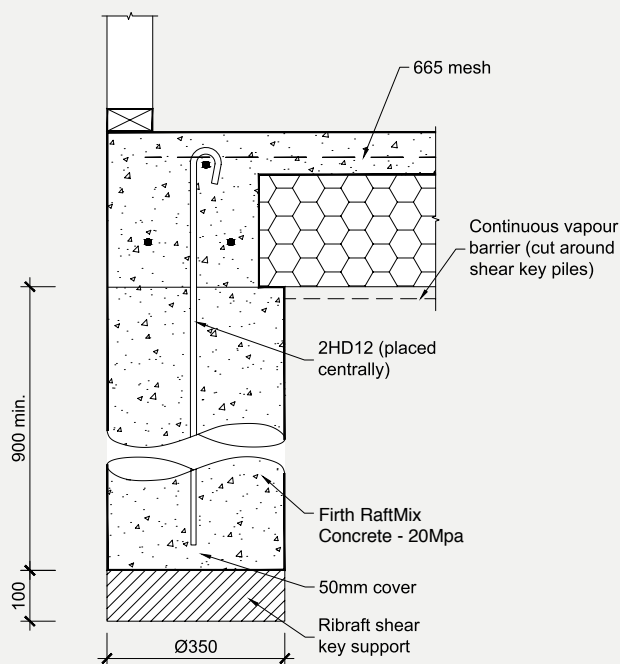
Table 4 Bracing Capacity Provided By Frictional Resistance Per 100m² Of Ground Floor Area

5.3 Shear Keys

Shear key piles required by Clause 5.2 must be uniformly distributed around the perimeter of the building, and be located at the edge beam/internal rib junction. Where a shear key is required, the minimum number of shear keys shall be two per floor plan. Where two shear keys are used they shall be placed at diagonally opposite ends of the floor plan.

Construction details of the shear keys shall be as shown on Figure 7. Shear keys shall be a minimum of 900mm long. The holes shall be over-drilled at least 100mm and a polystyrene RibRaft® Shear Key Support placed into the bottom of each hole. This will support only the plastic (wet) concrete and then allow movement of the shear key if settlement of the supporting ground occurs. The effective end bearing of the shear keys is therefore eliminated.

Figure 7 RibRaft® Shear Key



5.4 Design Example For Lateral Resistance Calculation

The following is a short example to demonstrate the process of determining whether shear piles are required.

Consider a 180m² single storey home with a light roof located in Palmerston North in a VH wind zone as defined by NZS3604. Assume the building height is 6m with 3m above the eaves. The length for across wind considerations is 15m and the width (along wind) is 12m.

First consider seismic actions. From Figure 6 the seismic hazard factor is 0.4. Since this is less than 0.45 shear keys will not be required for earthquake resistance.

Now consider wind loading. Table 5.5 of NZS3604 requires 95 bracing units per meter (BU/m) across the building and 90 BU/m along. As it's a very high wind zone these figures need to be increased by a factor of 1.3.

The BU demand for across building wind is therefore = $95 \times 1.3 \times 15 = 1853\text{BU}$
The BU demand along the building = $90 \times 1.3 \times 12 = 1404\text{BU}$

From Table 4 for a single storey light weight roof with 1.5kPa live load the capacity is 1150BU per 100m². Therefore for 180m² the capacity is 2070BU. As the capacity (2070) is greater than the demand (1853) no shear keys are required.

If the demand had exceeded the capacity then any shortfall can be provided by supplying shear keys in accordance with Section 5.3 with each shear key providing the BU specified in Section 5.2.

6.0 OTHER DESIGN DETAILS

6.1 R-Values

The insulation performance of a building element is measured by the "R-Value". The schedule method is the simplest method to achieve compliance with Clause H1 of the Building Code. Using this method the minimum R-Values required for floors are R1.3 for light timber frame construction, and typically R1.5 for masonry construction. R-values of R1.3 can be used for masonry construction if glazing with greater insulation is used (refer NZBC, Clause H1). If in-floor heating is used the minimum required R-Value is increased to R1.9, and the resistance to thermal movement into the room must be one tenth of that to the outside environment.

The fourth edition of H1 (amendment 3, January 2017) states that "Concrete slab-on-ground floors are deemed to achieve a construction R-value of 1.3, unless a higher R-value is justified by calculation or physical testing". RibRaft® is therefore a deemed to comply solution however in some instances designers may wish to determine the R-value as part of the design process. There are numerous methods for calculating R-values for slabs on ground, with many of the processes giving quite different R-values. NZBC clause H1 prescribed that an "Acceptable methods for determining the thermal resistance (R-values) of building elements are contained in NZS 4214."

The R-values provided in this Manual use the NZS4214 methodology.

If the R-value calculation is required to demonstrate compliance with the Building Code, then the NZS4214 methodology is probably the best alternative due to its reference in H1. However, more technically robust calculation methodologies exist and where the R-values are important, for example heated floors, use can be made of the BRANZ Home Insulation Guide. For these instances edge insulation is also recommended.

When slab edge insulation is specified, it is recommended that Firth HotEdge® is used as it has been designed to be compatible with Firth RibRaft®.

The R-Value of a concrete floor is dependent on the floor area to perimeter ratio, and the details of the floor perimeter. The R-Value for various solutions are illustrated below. The R-Values have been independently calculated using NZS4214:2006 "Methods of Determining the Total Thermal Resistance of Parts of Buildings," though modified for perimeter heat loss using recommendations from the Building Research Establishment.

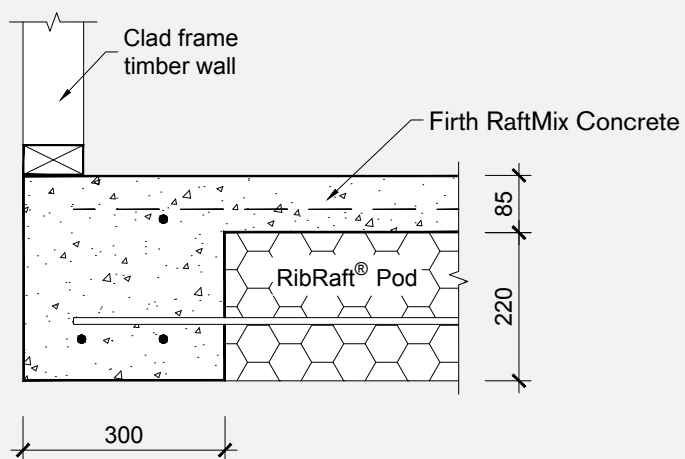


Figure 8
RibRaft® R Values
For 90mm Thick
Walls On The
Floor Edge

	FLOOR AREA TO PERIMETER RATIO M ² /M										
	1.00	1.25	1.50	1.75	2.00	2.25	2.5	2.75	3.0	3.5	4.00
R-Value m ² °C/W	1.28	1.40	1.52	1.64	1.75	1.86	1.97	2.07	2.17	2.38	2.57

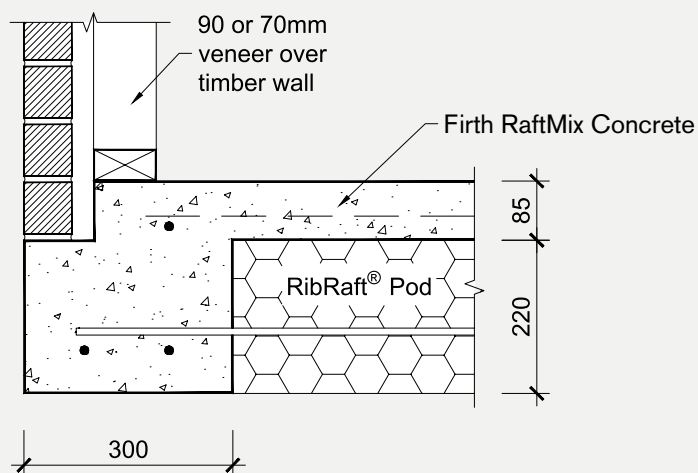


Figure 9
RibRaft® R Values
For 70-90mm
Thick Veneer,
Cavity, and
90mm Walls.

	FLOOR AREA TO PERIMETER RATIO M ² /M									
	1.25	1.50	1.75	2.00	2.25	2.5	2.75	3.0	3.5	4.00
R-Value m ² °C/W	1.54	1.67	1.80	1.93	2.05	2.17	2.28	2.40	2.62	2.84

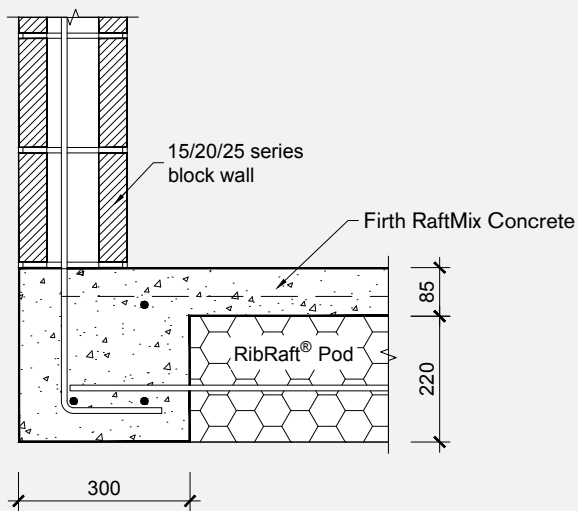


Figure 10
RibRaft® R Values
For Various
Thicknesses
Of Masonry Walls

	BLOCK	FLOOR AREA TO PERIMETER RATIO M ² /M									
		1.25	1.50	1.75	2.00	2.25	2.5	2.75	3.0	3.5	4.00
R-Value m ² °C/W	15 SERIES	1.48	1.60	1.73	1.85	1.96	2.08	2.19	2.30	2.51	2.72
	20 SERIES	1.54	1.67	1.80	1.93	2.05	2.17	2.28	2.40	2.62	2.84
	25 SERIES	1.59	1.73	1.86	1.99	2.12	2.24	2.37	2.49	2.72	2.95

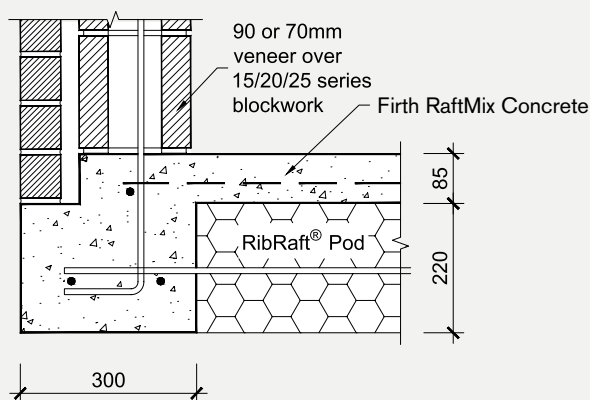


Figure 11
RibRaft® R-Values
For 70-90mm Thick
Veneer, Cavity, And
Various Thickness
Masonry Walls

	BLOCK	FLOOR AREA TO PERIMETER RATIO M ² /M									
		1.25	1.50	1.75	2.00	2.25	2.0	2.75	3.0	3.5	4.00
R-Value m ² °C/W	15 SERIES	1.59	1.73	1.86	1.99	2.12	2.24	2.37	2.49	2.72	2.95
	20 SERIES	1.64	1.78	1.92	2.06	2.19	2.32	2.44	2.56	2.81	3.04
	25 SERIES	1.69	1.83	1.98	2.11	2.25	2.38	2.51	2.64	2.88	3.12

6.2 Shrinkage Control

Shrinkage control joints reduce the risk of unwanted cracks, and their placement needs to be carefully considered where uncontrolled cracking could be unacceptable. Two types are described here: saw cut joints (which are tied joints), and free joints.

6.2.1 Saw Cut Joints

Saw cuts are located at positions in which the concrete is likely to crack due to stresses induced by restrained shrinkage. The aim of providing them is for the concrete to crack at the bottom of the saw cut thus minimizing the potential for a visible crack wandering over the surface. The level of reinforcement provided in a RibRaft® mean that cracks have no structural implications being only an aesthetics issue. Factors to consider are the type of floor finish, the location of ribs and ground beams, underfloor heating, and the effect of piles restraining shrinkage.

Preference should be given to using early entry saws which are used immediately after finishing. Shrinkage control joints cut using diamond blades shall be cut as early as possible which is typically within 24 hours of hardening in summer, and 48 hours in winter. They shall be cut to a depth of 25mm. Shrinkage control joints do not guarantee elimination of all visible or unwanted cracks but should minimise number.

Joints shall be positioned to coincide with major changes in floor plan. Where concrete is to be exposed, for example in a garage, or brittle covering placed over, the maximum intermediate bay sizes shall be limited to 5m. Bay dimensions formed by shrinkage control joints shall be limited to a maximum ratio of length:width of 1.5:1. Shrinkage control joints shall be placed over 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide load bearing rib, then the joint shall be located directly above one edge of that rib.

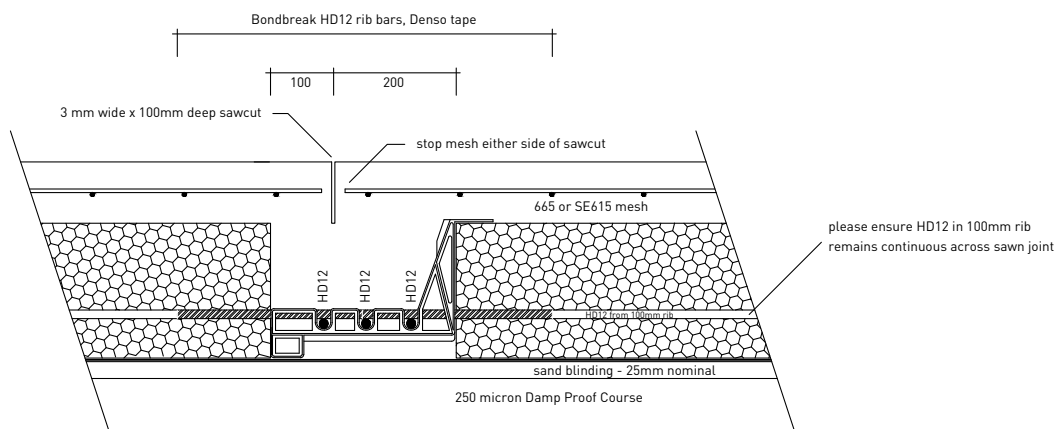
In order to limit the width of cracks at re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner – refer Figure 3.

6.2.2 Free Joints

Where the length of the floor exceeds 30m a free joint shall be provided as detailed in Figure 12. Movement, shrinkage and thermal, will occur over this joint so it shall be positioned to minimize the impact of this movement on floor coverings and wall elements.

Where the bottom of the RibRaft® is not flat (for example the floor incorporates a step down), free joints shall be provided if the distance from the step down to edge of slab exceeds 15m.

Figure 12
Free Joint
Details



RibRaft® control / free joint detail at 300mm wide thickening
align sawcut with internal corner where possible

6.3 Services Detailing

Two options exist for running service, both of which are appropriate, however some regional Building Control Authorities and Builders have clear preferences. The options being within slab, or under slab. Experience from the Christchurch earthquakes shows that the most seismically robust solution is for services to run within the plane of the pods (within slab).

6.3.1 Within Slab Running of Services

Pipes services can be run within the plane of the pods either exiting out of the side of the perimeter ring beam or going underground at the edge beam. Pipes shall be laid at a fall to comply with NZBC G13/AS1. For pipe up to 65mm diameter the minimum gradient is typically 1 in 40, while for 100mm pipes it's 1 in 60, however greater falls may be required dependent upon the required number of discharge units. Table 5 provides distances from the edge of the slab to pipe surface penetration to achieve minimum pipe gradients. A 300mm pod alternative is often used where the proposed positioning of the service means minimum required gradients cannot be achieved. Where gradients cannot be achieved with a 300mm pod, then service will require to be run under the slab.

Pipes shall be located to pass perpendicular to the ribs and beams and shall not be laid along the length of ribs or beams. Pods are cut as required to achieve the required fall and position. Pipes shall be laid to ensure 15mm concrete cover between pipe and reinforcement in the perimeter beam. All pipes in contact with concrete shall be lagged with an impermeable material of at least 6mm thickness.

Table 5 Maximum Distance From Exterior To Entrance Point Of Plumbing Pipes

PIPE DIAMETER (ID)MM	GRADIENT	MAXIMUM DISTANCE TO EDGE WITH 220MM THICK POD	MAXIMUM DISTANCE TO EDGE WITH 300MM THICK POD
40	1 in 40	3400	6600
50	1 in 40	3000	6200
65	1 in 40	2400	5600
100	1 in 60	1200	4400

6.3.2 Under Slab Running Of Services

For this option, services ducts shall be conveyed underground to their plan location then brought up through the polystyrene pod and the concrete floor slab, within the limitation imposed by Table 8. Services shall not be placed within any concrete except to cross that section of concrete i.e. services shall not run along ribs or edge beams. In accordance with AS/NZS3500.4:2015 pipes penetrating through concrete shall be:

- > Installed at right angles to the slab surface.
- > Lagged with an impermeable material for the full depth of the concrete penetration.
- > Lagging must be at least 6mm thick.

The maximum diameter of the services shall be as outlined in Table 6.

Any services crossing ribs or the edge beam horizontally shall be placed only within the middle third of the member. Except as noted in Figure 13, services crossing the ribs vertically shall also be constrained to the middle third of the width of the edge or internal load bearing rib. Except as noted in Figure 15 at no stage shall any of the reinforcement bars be relocated or cut to allow for the services (it is acceptable, however to cut the mesh). In some instances this will dictate the location of the ribs. The pods shall be cut to allow for this and if necessary, the spacing of the ribs shall be decreased locally. There shall be 600mm minimum clear spacing in each direction between penetrations through the system.

Table 6 Maximum Diameter Of Pipe Services

ELEMENT	VERTICAL SERVICE	HORIZONTAL SERVICE
300mm wide edge beam	50mm nominal bore pipe	100mm NB pipe
500mm localized wide edge beam (1)	100mm NB pipe	100mm NB pipe
300mm wide internal load bearing rib	50 NB pipe	100mm NB pipe
100mm wide internal rib	Nil	100mm NB pipe
Slab	100 NB pipe, or for large services 450mm square see also Note 3	Nil

Notes:

- (1) For situations where a 100mm diameter pipe is required to pass vertically through the edge beam, the edge beam shall be locally increased in width to a minimum of 500mm wide. This shall be achieved by keeping flush the outside face of the edge beam and removing 200mm from the pod. The width shall remain at 500mm for a distance of 600mm beyond the service pipe. Refer to Figure 15 for details.
- (2) Where a gas pipe line runs through the RibRaft® floor system, in addition to the requirements above, the pipeline shall enter the building through the outside face of the perimeter foundation beam and be located in the plane of the pods. The aim being to ensure that damage to the gas pipe will most likely occur outside the building envelope should movement occur between the ground and RibRaft® in a large earthquake.
- (3) Larger penetrations or voids up to 450mm square (e.g. for shower waste/traps) are permitted through the slab provided all the conditions of this paragraph are met. These openings shall be trimmed with 1 HD12 (Grade 500E) bar 1500mm long placed along each side of the opening, tied to the mesh. One set of parallel bars shall be placed on top of the mesh and the other set placed under the mesh. These openings shall not be placed over a rib or edge beam. If necessary, the rib spacing shall be reduced or the pod layout altered to ensure that the opening occurs solely in the slab above a polystyrene pod. Penetrations such as these shall not be installed in garages or other areas where large (>3kN) point loads could be present. Only one penetration greater than 110mm is permitted in the slab above any single pod or part pod. Where two large openings are required to be in close proximity, an internal rib shall separate them. For these large penetrations/voids in the slab, the services shall not be within 25mm of the edges of the void through which they pass, and the opening shall be sealed to prevent materials entering the subfloor cavities. (This type of opening is normally only required for a shower waste/trap and the installation of the shower will ensure that the void is sealed/covered).

A pictorial of some of the above requirements is illustrated in Figure 13 and 14.

Figure 13 Example of Detailing Requirements For Services

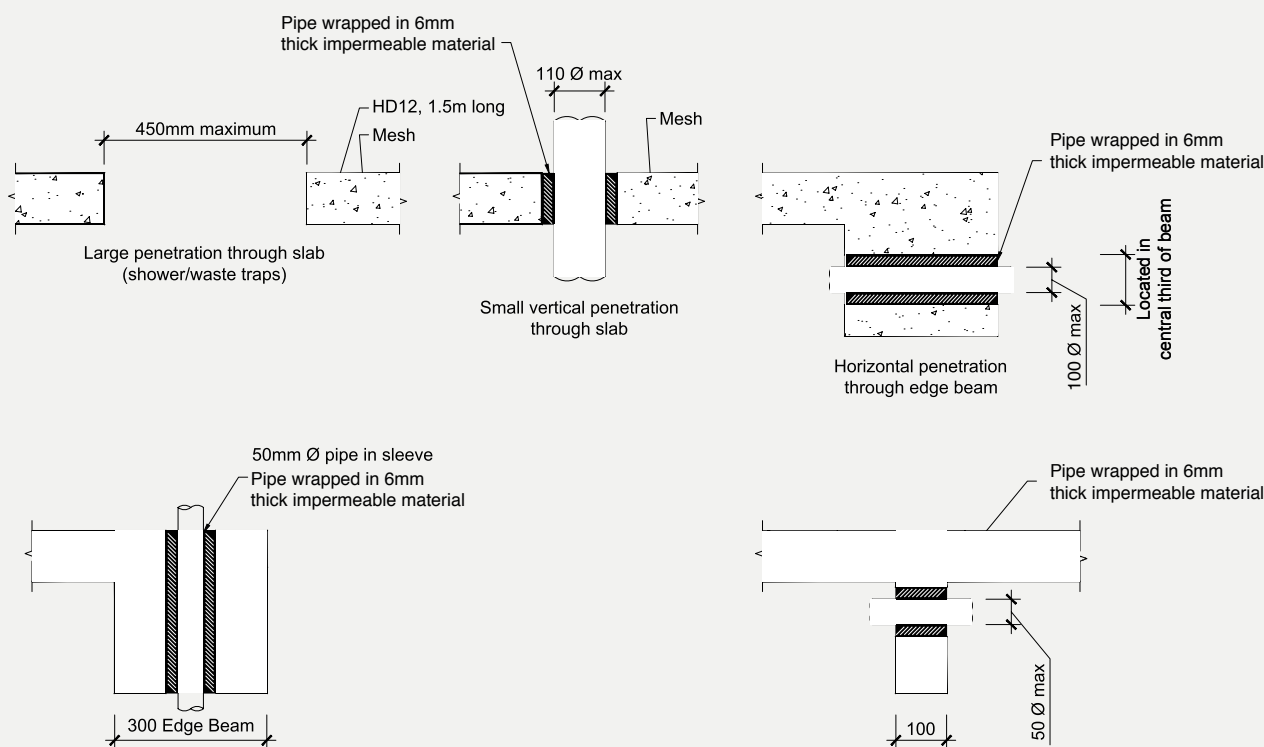
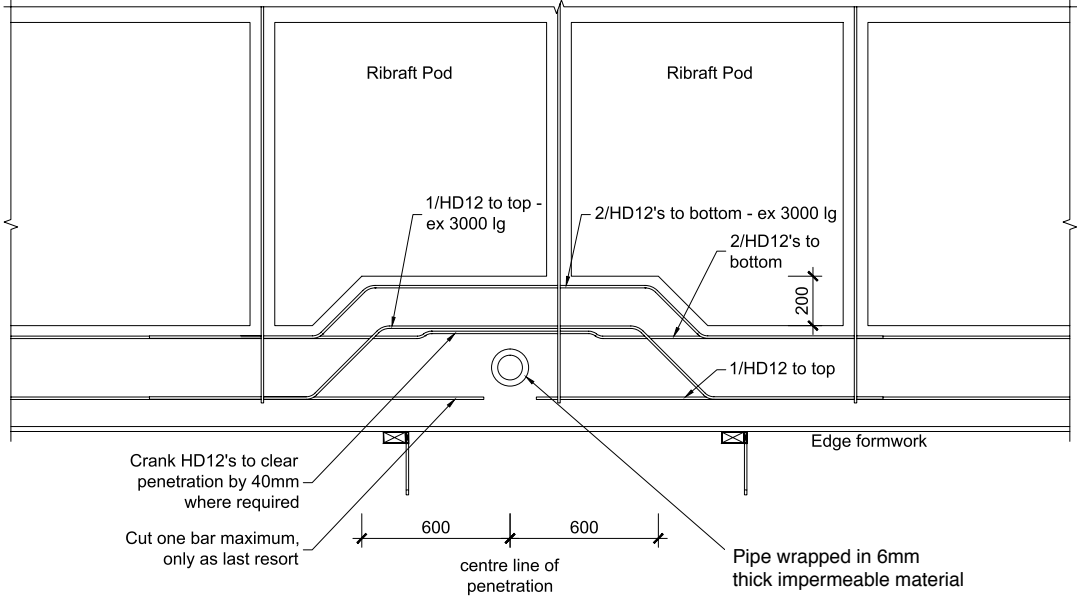


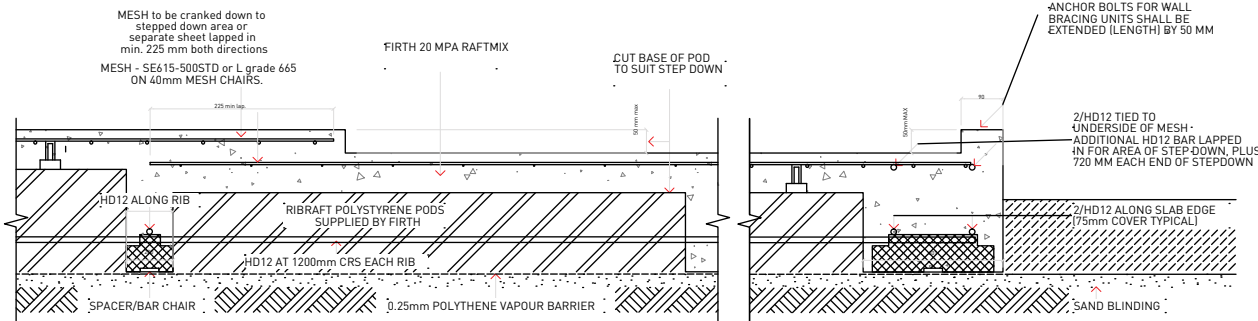
Figure 14
Localised Increase
In Width At Edge
Beam Where
Vertical Service Up
To 100mm Diameter
Are Required



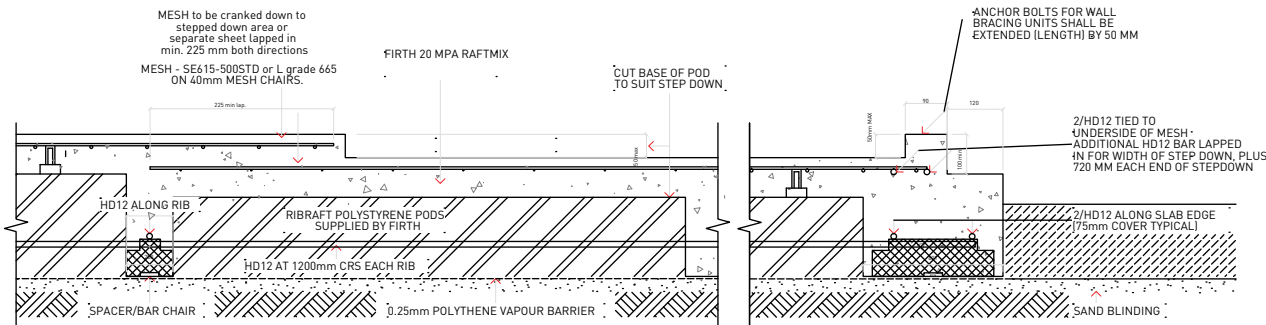
6.3.3 Recesses for Showers

Where showers are rebated up to 50mm into the RibRaft® concrete topping, the details specified shall be in accordance with Figure 15.

Figure 15 Details where recesses of up to 50mm are required for rebated showers

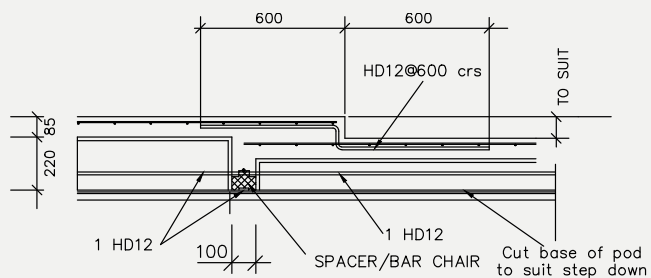


RIB RAFT FLOOR - SET-DOWN DETAIL FOR MAX. 50mm REBATED SHOWER

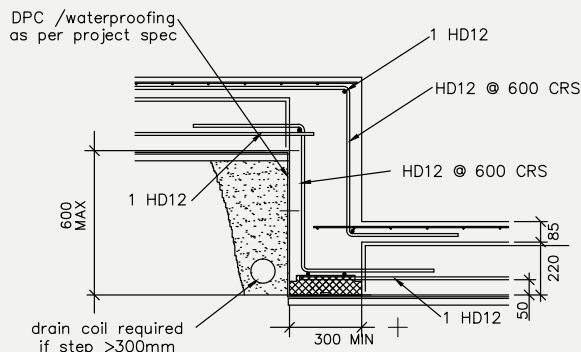


RIB RAFT FLOOR - SET-DOWN DETAIL FOR MAX. 50mm REBATED SHOWER

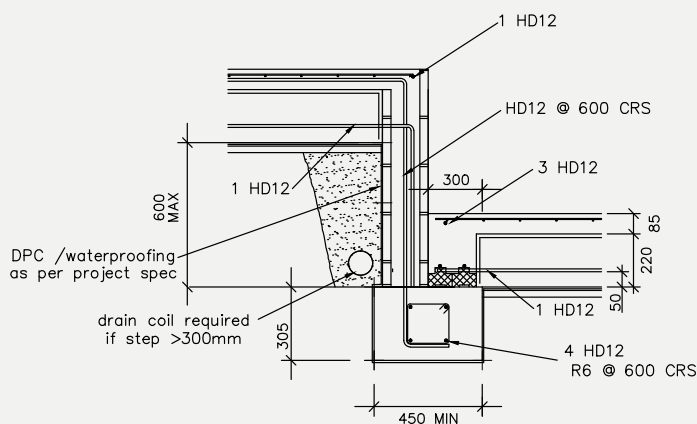
Figure 16 Details where step downs are required in the floor



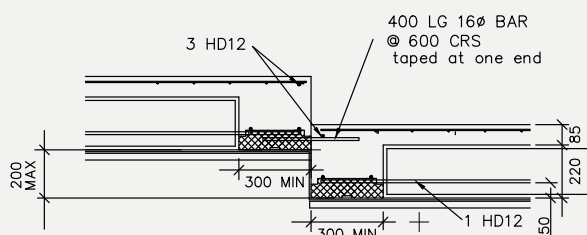
7
S2
SET-DOWN
DETAIL FOR STEP
UP TO 100mm
1:20



9
S2
SET-DOWN DETAIL
IN CONCRETE
FOR STEP LESS
THAN 600mm
1:20



8
S2
SET-DOWN DETAIL
IN MASONRY
FOR STEP LESS
THAN 600mm
1:20



10
S2
SET-DOWN
DETAIL FOR STEP
100 TO 200mm
FOR SEPARATELY
POURED SLABS
1:20

6.3.4 Step Down Of Up To 600mm In The RibRaft® Floor

Where the site topography requires a step down in the slab, steps of upto 600mm can be accommodated using one of the details provided in Figure 16. A step down in the RibRaft® floor system anchors the floor in that location with respect to volume changes associated with drying shrinkage. As required by 6.2.2, a free joint shall be provided if the distance from the step down to the slab edge exceeds 15m.

SECTION: INSTALLATION INFORMATION

2

1.0 THIS SECTION DETAILS THE INSTALLATION INFORMATION REQUIRED FOR THE FIRTH RIBRAFT® FLOOR SYSTEM (THE SYSTEM). FULL INFORMATION ON THE DESIGN PROCEDURES NOT REQUIRING SPECIFIC ENGINEERING INPUT, AND REQUIREMENTS FOR THE SITE ASSESSMENT ARE DESCRIBED IN SECTION 1 OF THIS MANUAL (DESIGN INFORMATION). WHERE STANDARDS ARE REFERENCED IN THIS MANUAL THESE SHALL INCLUDE THE LATEST AMENDMENTS.



2.0 SITE REQUIREMENTS

2.1 General

The site requirements of this Manual are concerned solely with the soil conditions under or immediately adjacent to the system. If a site does not comply with this Manual, the system shall be subject to specific engineering design.

This Section shall only apply for building sites such that:

- > The ground is as specified in Section 1 of this Manual;
- > Any system erected at the top of a slope (whether fill compacted in accordance with NZS4431, or natural ground) shall be located as shown in Figure 1 so that the finished ground is always outside the dashed line shown. (The vertical distance, V, shall be measured to 50mm below the underside of the slab).

Where the finished ground does not comply with Figure 1, the slope shall be retained by a specifically designed retaining wall.

2.2 Temporary Excavations

No excavation shall take place at a location or in a manner where the stability of the foundation material is likely to be compromised. The backfilled material shall match the compaction and strength of, and have similar properties to, the surrounding material. The sides of the excavation shall be propped as necessary.

Temporary excavations shall be open for no longer than 48 hours and shall take place only above the critical depth line as shown on Figure 2. Should temporary excavations be required below this line, specific engineering design is required.

2.3 Surface Water

Surface water from the site shall not flow across the slab platform. For example, on cut and fill sites the ground uphill from the system shall be graded to direct any surface run-off away from the system as shown in Figure 3.

Figure 1
Relationship
Of RibRaft®
To Sloping
Ground Surface

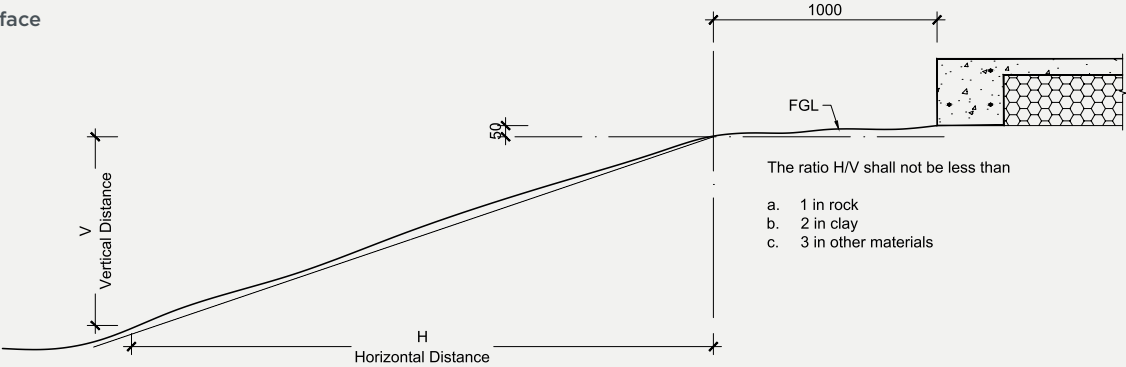


Figure 2
Temporary
Excavation
Limited

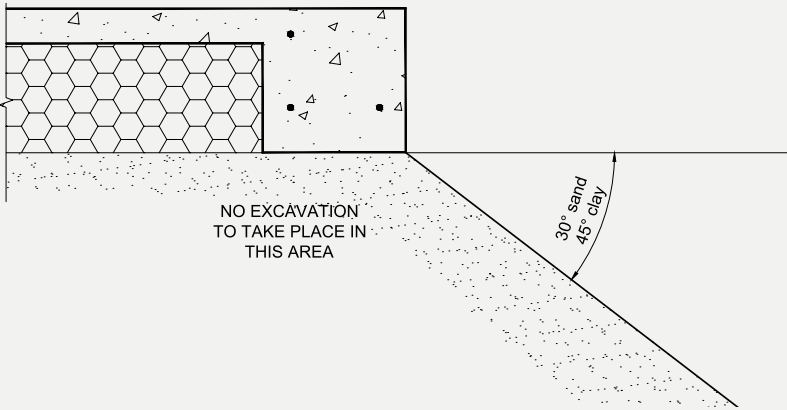
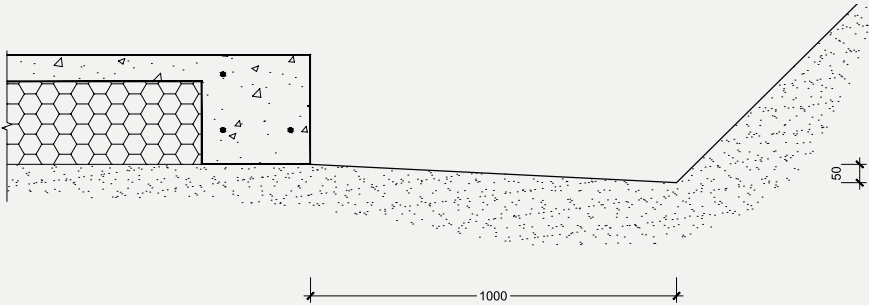


Figure 3
Site Grading



3.0 INSTALLATION PROCEDURE

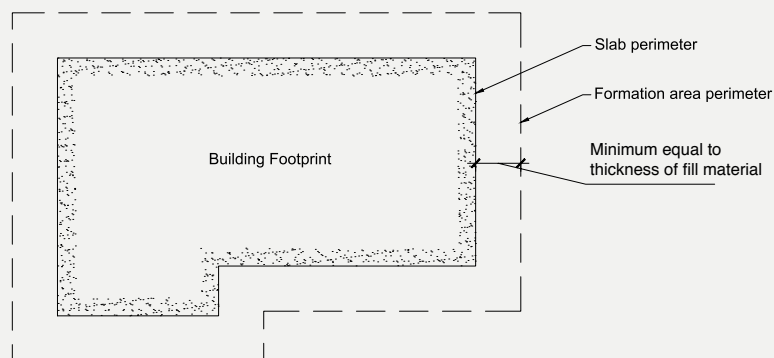
3.1 Site Preparation

All vegetation, topsoil and other organic or deleterious material shall be removed from the area to be covered by the building (formation area) prior to commencing construction of the system.

3.2 Earthworks

The formation area shall be cut or filled to a level approximately 330mm below finished floor level. Where fill is required to achieve this level, the fill shall be certified by a geotechnical engineer (outside the scope of this Manual) or shall be granular fill in accordance with Clause 7.5.3 of NZS 3604:2011 "Timber Framed Buildings". The formation area shall also extend a distance equal to the thickness of the fill material beyond the slab perimeter as shown in Figure 4. The installer shall confirm the acceptability of the ground over the entire building platform before proceeding with the construction. Refer to Clause 3.5 of Section 1 (Design Information) for requirements.

Figure 4 Plan of Formation Area



3.3 Shear Keys

Where shear keys are required, the holes shall be drilled following the site clearing and earthworks, in accordance with Clause 4 in this section, and prior to the construction of the system commencing.

3.4 Plumbing and Services

Plumbing and services required beneath the system should preferably be conveyed underground to their plan location then brought up through the system. The trenching, placing, and bedding of the pipes/ducts and the backfilling of the trenches shall conform to the requirements of the consent documentation. Services shall not run along ribs or edge beams. The maximum diameters of the services shall be as dictated in Clause 6.3 of Section 1.

Where required, the services can be installed by removing unnecessary polystyrene and placing pipes within the pod depth. All pipes shall be held firmly in place and have temporary end covers. Any services crossing ribs or the edge beam horizontally shall be placed only within the middle third of the member. Except as noted in Figure 14 (Section 1) services crossing the ribs vertically shall also be constrained to the middle third of the width of the edge or internal load bearing rib. Except as noted in Figure 13 (section 1) at no stage shall any of the reinforcement bars be relocated or cut to allow for the services (it is acceptable, however to cut the mesh). In some instances this will dictate the location of the ribs. The pods shall be cut to allow for this and if necessary, the spacing of the ribs shall be decreased locally. There shall be 600mm minimum clear spacing in each direction between penetrations through the system.

Where the services pass through the top of the pods, the opening shall be sealed to prevent materials entering the

subfloor cavities. (This can be achieved with Denso tape and a type of easily compressible foam.)

Larger penetrations or voids that are required, up to 450mm square (e.g. for shower waste/traps), shall be installed in accordance with all the conditions of this paragraph. These openings shall be trimmed with 1 HD12 bar (Grade 500E) 1500mm long placed along each side of the opening, tied to the mesh. One set of parallel bars shall be placed on top of the mesh and the other set placed under the mesh. These openings shall not be placed over a rib or edge beam. If necessary, the rib spacing shall be reduced or the pod layout altered to ensure that the opening occurs solely in the slab above a polystyrene pod. Penetrations such as these shall not be installed in garages or other areas where large (>3kN) point loads could be present. Only one penetration greater than 110mm is permitted in the slab above any single pod or part pod. Where two large openings are required to be in close proximity, an internal rib shall separate them. For these large penetrations/voids in the slab, the services shall not be within 25mm of the edges of the void through which they pass, and the opening shall be sealed to prevent materials entering the subfloor cavities. (This type of opening is normally only required for a shower waste/trap and the installation of the shower ensure that the void is sealed/covered).

Where a recess of up to 50mm is required in the topping to provide a rebate for a shower, the construction details shall be as shown in Figure 15 (Section 1).

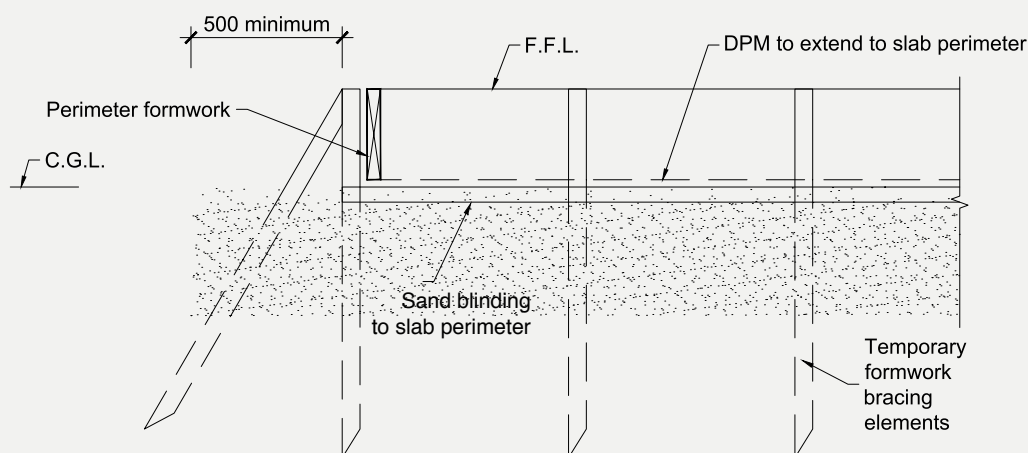
3.5 Sand Blinding

A layer of sand shall be placed, screeded and compacted over the building platform, extending to the outside edge of the perimeter foundation, refer Figure 5. The maximum thickness of this blinding layer shall be 50mm. The surface shall be level and a minimum of 305mm below finished floor level. A small plate compactor, vibrating roller or similar, should be used to compact the sand blinding layer. When the building platform is clay, it is essential that the blinding sand is compacted onto a clay surface that has not been softened by construction activities. If the clay has been softened (i.e. has a muddy surface layer due to construction activities), remove the softened material from under the RibRaft® ribs before placing the sand. If excavation lowers the clay surface to more than 50mm below the underside of the RibRaft®, fill shall be placed in accordance with Clause 7.5.3 of NZS 3604:2011 "Timber Framed Buildings". The sand is required to be level to ensure that pods remain stable throughout the installation of the system.

3.6 Damp Proof Membrane

The damp proof membrane (DPM) material shall be polyethylene sheet in accordance with NZS 3604:2011. The DPM shall be laid over the entire building platform directly on top of the sand blinding layer, extending to the outside of the edge beam – refer Figure 5 below. The joints shall be lapped not less than 150mm and sealed with pressure sensitive tape not less than 50mm wide. All penetrations of the DPM by plumbing and services or punctures during construction shall also be sealed with pressure sensitive tape. The DPM may extend beyond the edge of the slab i.e. underneath the formwork, or may be folded and stapled up the inside of the formwork. The minimum requirement is that the DPM extends to the outside of the edge beam. It is very important that the DPM is not bunched up at the formwork. The installer shall ensure a square and tidy finish at the underside and at all corners of the edge beam.

Figure 5 Sand blinding / DPM / Formwork Details



3.7 Edge Formwork

The edge formwork shall be constructed ensuring that the requirements of NZS 3109:1997 "Concrete Construction" are adhered to. The formwork shall be adequately supported and braced to prevent any buckling or warping. If the wall is to be constructed in masonry veneer, formwork for a masonry veneer rebate should be adequately fixed to the perimeter formwork.

Thorough cleaning of re-useable formwork and the use of release agents enhances the life and performance of formwork and maintains a quality surface finish.

3.8 Laying the Pods and Spacers

The Firth RibRaft® polystyrene pods shall be laid out over the DPM in a regular waffle pattern ensuring direct contact with the ground across the entire pod. The edge beam shall be formed using the Firth approved 300mm spacers (refer Figure 9). These shall be placed at a maximum of 1200mm centres along the perimeter of the slab and one per pod or part pod. Ribs supporting a load bearing wall shall be formed using a minimum of one Firth approved 300mm spacer along the edge of each pod or part pod.

Except where a 300mm wide rib is required, each pod or part pod shall always be separated by 100mm using a minimum of one Firth approved 100mm spacer along each edge of each pod or part pod. The ribs in both directions shall form a waffle pattern throughout the slab. It is essential that the ribs and edge beams are straight when the concrete is poured, i.e. the pods need to be lined up. Figure 6 shows a detailed layout of the pods and spacers.

Where the shape of the house plan dictates, it may be more practical to consider the floor to be made up of different segments. The pods in each segment shall be in a regular waffle pattern – refer right hand side of Figure 7. Where these segments meet, the pods shall be cut to suit and the ribs made to join. The non right-angle rib junctions created by this approach are acceptable.

Alternatively, it is also acceptable to keep the orientation of the pods constant throughout the plan and have non right-angle junctions between the ribs and edge beam – refer left hand side of Figure 7.

As can be seen from Figure 7, it is not necessary for the pods to line up perfectly with the edge beam. It is acceptable to cut the pods (i.e. use part pods).

Figure 6
Detailed layout
of Pods and
spacers (mesh
and top steel omitted
for clarity)

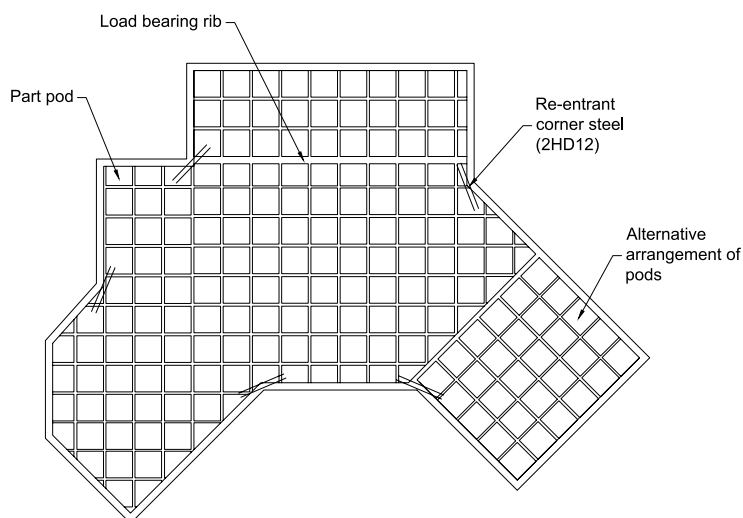
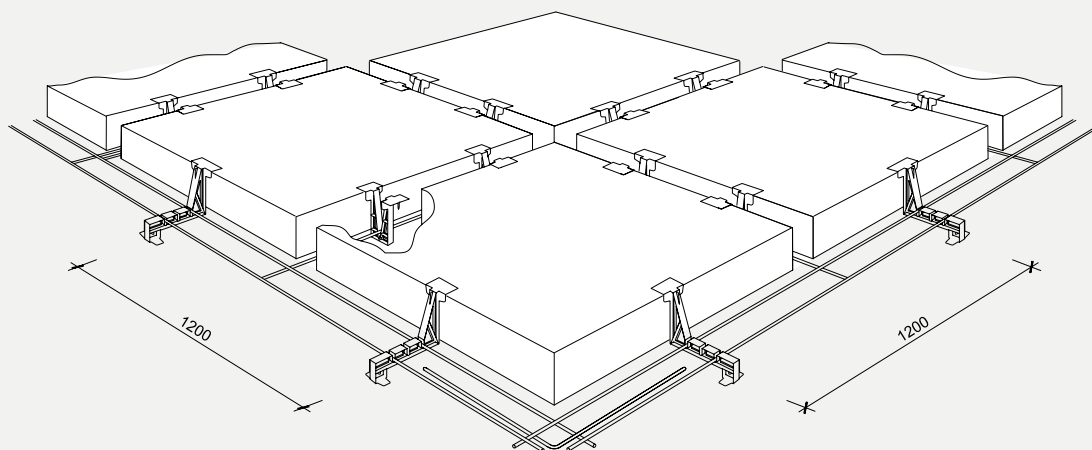


Figure 7 Typical Pod And Rib Layout

3.9 Reinforcing Steel

Reinforcing bars shall conform to NZS 4671:2001 “Steel Reinforcing Materials”. All bars shall be of deformed type (Grade 500E). All bends shall be made cold without fracture and in accordance with the bend diameters given in NZS 3109 “Concrete Construction”. Welded lap joints are not permitted.

Reinforcing steel in the slab shall consist of Welded Reinforcing Mesh complying with AS/NZS 4671:2001 with a minimum weight of 2.27kg/m, a lower characteristic stress of 500MPa, square configuration of orthogonal bars between 150 to 200mm centres, and ductility class L or E, hereafter referred to as “mesh”. The presence of Class E reinforcing bars in the ribs and beams provides adequate ductility of the system which allow the use of class L mesh. Typically the topping mesh reinforcement will be 665 mesh (class L) or SE62 ductile mesh, each being equally applicable

Figure 10 shows the detailed layout of the spacers and the steel in the edge beam and the standard ribs.

3.9.1 Edge Beam Steel

Two edge beam reinforcing bars shall be placed in the bottom of the edge beam and supported in the correct position by the Firth spacers, as shown in Figure 10. One edge beam bar shall be tied below the mesh at the perimeter of the area covered by the polystyrene pods as shown in Figure 10.

All steel shall be lapped a minimum of 60 bar diameters (720mm for 12mm steel). Tying of the edge beam steel is only required at corners. Figure 8 shows the layout for the edge beam bottom steel bars at the corner. The inner bottom bars and the top bars shall cross each other and extend to 75mm from the outside face of the edge beam as shown. These bars shall be tied together where they cross. For solutions using veneer rebates the top bars shall terminate 50mm from the inside face of the rebate and be tied where they cross.

3.9.2 Rib Steel

Rib reinforcing steel shall be placed in the bottom of the internal ribs and supported in the correct position by the Firth or Wilton Joubert spacers (WJ). Figure 9 shows the detail of the Firth and WJ spacers, and Figure 10 shows a detailed section identifying how the steel is located in the spacers. The 300mm spacer shall be used for the 300mm wide internal ribs. These spacers ensure that cover to DPM below the base is greater than 45mm and cover to the exterior perimeter is 75mm.

All steel shall be lapped a minimum of 60 bar diameters (720mm for 12mm steel). At junctions with the edge beam, each rib steel bar shall sit on top of the edge beam bars, and extend to the outermost bar. The 75mm cover to the edge of the beam shall still be allowed for. One HD12 bar (Grade 500E) shall be placed in the bottom of each 300mm wide rib. For perimeter 300mm ribs a HD12 bar is also required in the top at the beam.

3.9.3 Mesh Reinforcing

Mesh reinforcing shall be placed over the pods and supported on 40mm mesh chairs spaced at a minimum of 1200mm centres, with at least two mesh chairs placed per pod and at least one per part pod. At laps the overlap of the outermost cross wires of the sheets shall be the spacing of the wires plus 50mm.

3.9.4 Re-entrant Corner Steel

Two HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner as detailed in Figure 7 (this steel is to help reduce the width of cracks that may develop at this location)

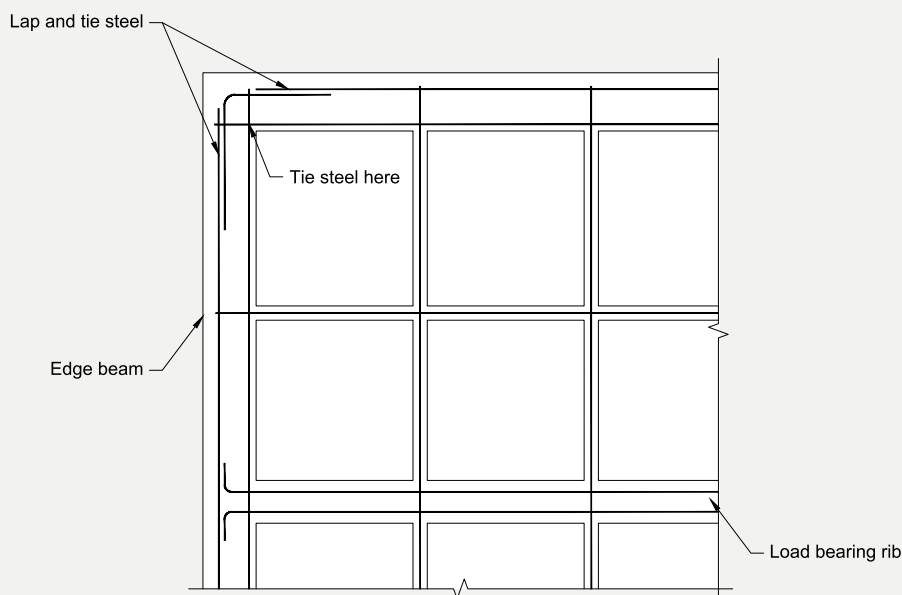


Figure 8 Corner steel layout

3.10 Concrete Installation

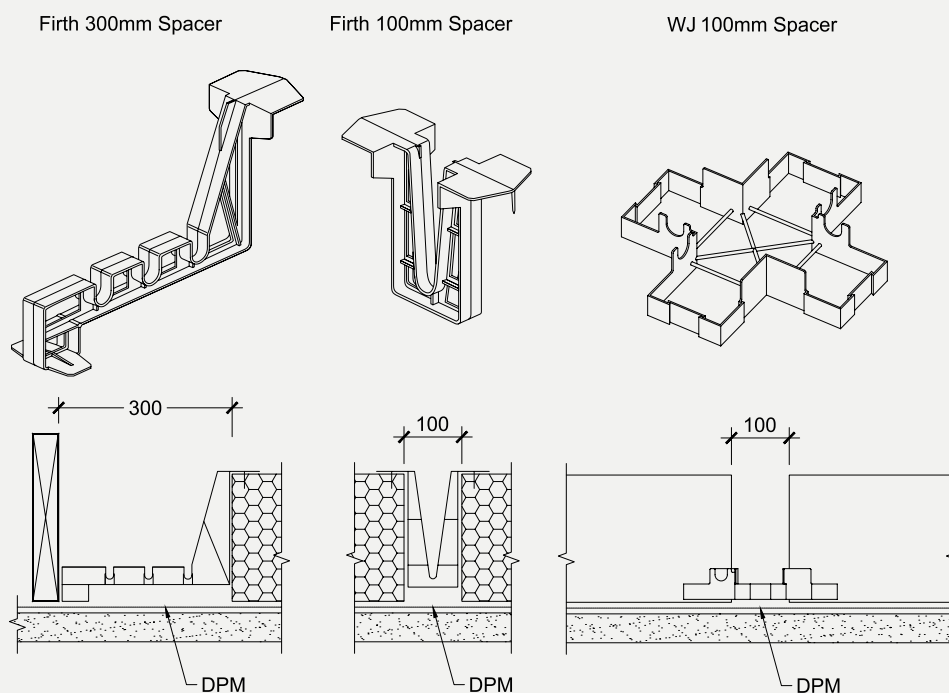
To comply with this manual, Firth Certified Concrete® must be used. Concrete placing, finishing and curing shall be in accordance with NZS 3109:1997, Clause 7.

3.10.1 Placing

Only Raftmix or Raftmix25 concrete supplied by Firth Industries, shall be used in the floor. These two different concrete mixes shall be used in the following instances:

- > Raftmix – a 20MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix
- > Raftmix25 – a 25MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix. This mix shall be specified for buildings constructed in the ‘sea spray zone’ (i.e. within 500m of the sea including harbors, within 100m of tidal estuaries or inlets, on offshore islands and elsewhere defined as exposure Zone D in 4.2.3.3 of NZS3604).

Figure 9
Spacer
Details



The concrete supplied by Firth shall be poured in such a way to ensure that the pods remain in position during placing (Firth recommends that small amounts of concrete be placed on top of the pods prior to the ribs being filled). The concrete shall be compacted with the use of an immersion vibrator around all steel and into all corners of the formwork.

3.10.2 Finishing

Screeding with the aid of a level shall commence immediately after compaction. Unless specifically installed as a screeding datum, the top of the formwork shall not be assumed as level and thus shall not be used for screeding purposes. Final finishing with a trowel shall take place after all the bleed water has evaporated. The edge of the slab and rebates shall be tooled to prevent chipping of the top of the slab.

Early age care of the slab shall be in accordance with good trade practice appropriate for the weather conditions – refer CCANZ website sections if further guidance is required:

www.ccanz.org.nz/page/Early-Age-Crack-Control.aspx

www.ccanz.org.nz/page/Hot-and-Cold-Weather-Concreting.aspx

Early Age Crack Control

Hot and Cold Weather Concreting

The surface shall be a blemish-free surface to class U3 finish (Refer NZS 3114:1987 “Specification for Concrete Finishes”).

3.10.3 Curing

Proper curing of the concrete must take place immediately after finishing the concrete. One of the following methods of curing is recommended:

- > Ponding or continuous sprinkling of water.
- > Placing a wet covering or plastic membrane over the slab.
- > The use of liquid membrane curing compounds. However if these are used, they must be compatible with any subsequent applied surfacing.

3.11 Shrinkage Control Joints

Shrinkage control joints reduce the risk of unwanted cracks, and their placement needs to be carefully considered where uncontrolled cracking could be unacceptable. Two types are described here: saw cut joints (which are tied joints), and free joints.

3.11.1 Saw Cut Joints

Saw cuts are located at positions in which the concrete is likely to crack due to stresses induced by restrained shrinkage. The aim of providing them is for the concrete to crack at the bottom of the saw cut thus minimizing the potential for a visible crack wandering over the surface. The level of reinforcement provided in a RibRaft® means that cracks have no structural implications being only an aesthetics issue. Factors to consider are the type of floor finish, the location of ribs and ground beams, underfloor heating and the effect of piles restraining shrinkage.

When warm sunny days are followed by cool nights, the change in temperature can cause cracking. Hence preference should be given to using early entry saws which are used immediately after finishing. Shrinkage control joints cut using diamond blades shall be cut as early as possible which is typically within 24 hours of hardening in summer, and 48 hours in winter. They shall be cut to a depth of 25mm. Shrinkage control joints do not guarantee to eliminate all visible or unwanted cracks.

Joints shall be positioned to coincide with major changes in floor plan. Where concrete is to be exposed, for example in a garage, or brittle covering placed over, the maximum intermediate bay sizes shall be limited to 5m. Bay dimensions formed by shrinkage control joints shall be limited to a maximum ratio of length:width of 1.5:1. Shrinkage control joints shall be placed over 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide load bearing rib, then the joint shall be located directly above one edge of that rib.

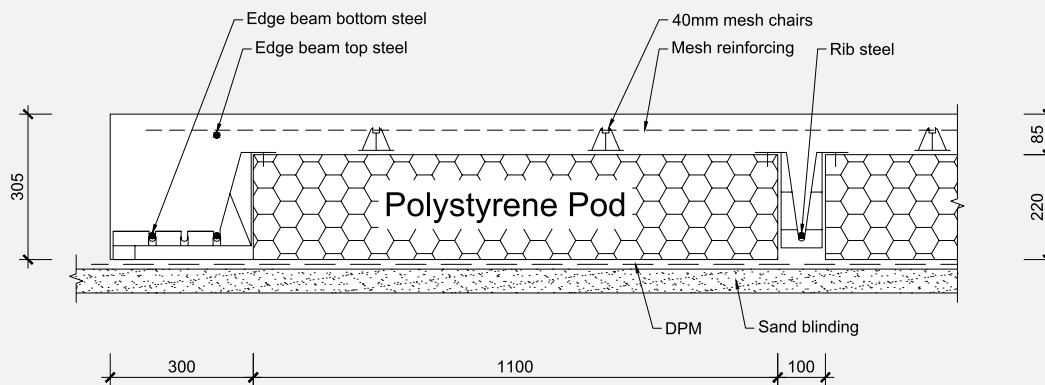
In order to limit the width of cracks at re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner – refer Figure 7.

3.11.2 Free Joints

Where the length of the floor exceeds 30m a free joint shall be provided as detailed in Section 1, Figure 12. Movement, shrinkage and thermal, will occur over this joint so it shall be positioned to minimize the impact of this movement on floor coverings and wall elements.

Where the bottom of the RibRaft® is not flat (for example the floor incorporates a step down), free joints shall be provided if the distance from the step down to edge of slab exceeds 15m.

Figure 10 Detailed Section



3.12 Removal of Formwork

The formwork shall not be removed prior to 12 hours after the slab has been finished. No installation loads are to be placed on the system before adequate curing has taken place.

3.14 Landscaping/Paving

Landscaping and/or paving adjacent to the slab shall be kept as a minimum the specified distance below finished floor level as required by NZS 3604:2011. The landscaping shall allow for large trees to be kept sufficiently away from the edge of the slab. This is to prevent the tree roots from disturbing the soil moisture conditions under the slab. As a guide, trees should be as far away from the edge of the slab as they are tall when fully grown.

3.13 Masonry Veneer

Where the building is to be clad with masonry veneer, the rebate in the edge beam shall be waterproofed with a bituminous sealer due to the possibility of ponding of water. Firth recommends a Flintcote® or equivalent coating on both the vertical and horizontal faces of the rebate.

3.15 Ongoing Maintenance

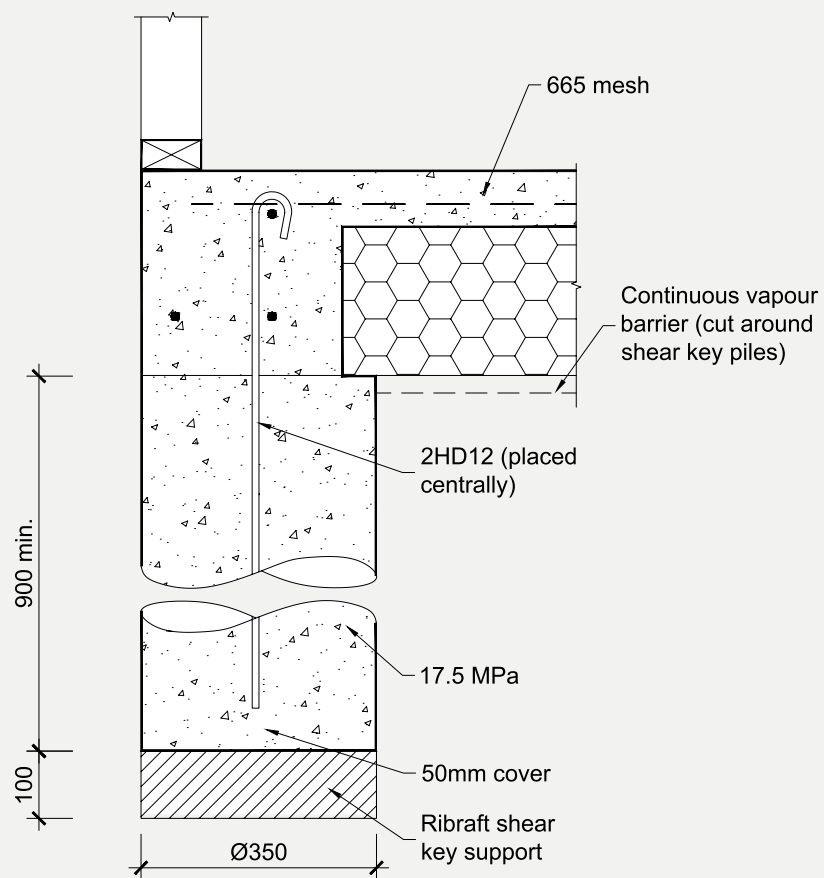
The building owner shall ensure that the ground surrounding the system be maintained so that the integrity of the system is not jeopardised. In other words, at no time shall the ground immediately adjacent to the system be allowed to settle away to expose the underside of the slab.

4.0 SHEAR KEYS

Shear keys, if required, shall be provided to conform to the requirements of Section 1 of this Manual. Holes for the shear keys shall be drilled at least 1000mm deep. Into the bottom of each hole a RibRaft® Shear Key Support shall be placed. Every precaution shall be taken to ensure that the shear key support is laid level and at the base of the hole. The minimum depth of concrete placed on the support shall be 900mm. Refer to Figure 11 for construction details.

The connection steel (2HD12 Grade 500E) shall be secured in place and held during pouring to ensure the bars are correctly located. The concrete for the shear keys can be placed separately to the rest of the floor and shall be finished level to the top of the sand blinding layer, or poured in one pour with the RibRaft® floor. If poured separately the top surface of the shear key shall be finished rough to ensure a good join to the Firth Raftmix concrete in the system and the DPM shall be neatly cut around the shear keys.

Figure 11 Shear Pile Construction Detail



3

1.0 DESIGN

Verification that the design complies with the structural limitation outlined in this Manual is the responsibility of the designer, and shall be confirmed by the Building Control Authority issuing the Building Consent. Solutions outside the limitations outlined in this Manual will require specific engineering design.

2.0 CONSTRUCTION

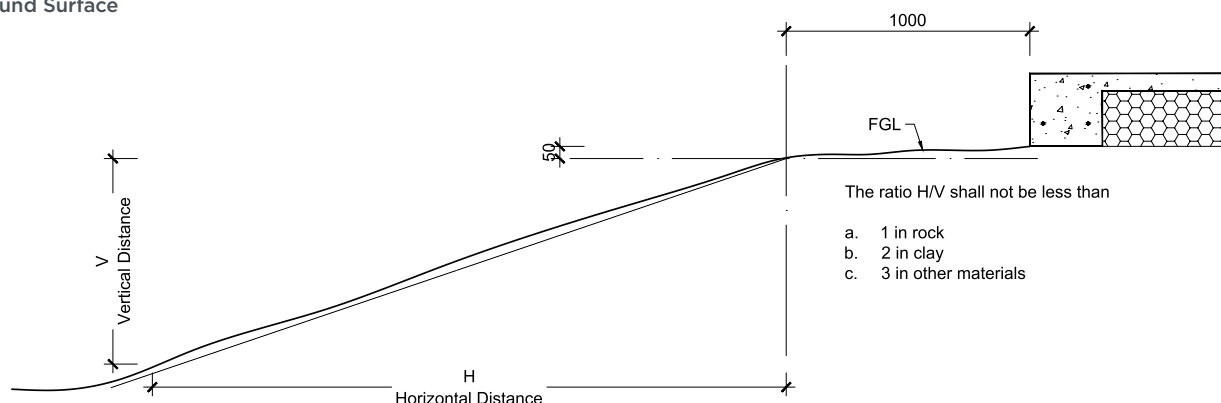
The RibRaft® foundation system has been designed to accommodate structures complying with the non specific design standards NZS3604 or NZS4229. With these types of structures the Building Control Authority specifies the inspections required and often conducts these. A similar construction verification process shall be applied to the RibRaft® system.

To assist inspection the following check list has been prepared for structures complying with the limitation:

PRE-POUR INSPECTION CHECK LIST

- ☐ GOOD GROUND CONFIRMED AS PER NZS3604, CLAUSE 3.1.3. OR SCALA OR SHEAR VANES TESTS CONFIRM ADEQUATE BEARING CAPACITY.
- ☐ VEGETATION, TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL REMOVED.
- ☐ PROXIMITY TO SLOPE-GROUND SURFACE IS ALWAYS ABOVE DASH LINE SHOWN IN FIGURE 1.
- ☐ SHEAR PILES (WHERE REQUIRED) IN PLACE AND REINFORCEMENT PROTRUDING.
- ☐ FORMATION AREA EXTENDS AT LEAST THE DEPTH OF GRANULAR FILL BEYOND BUILDING FOOTPRINT.
- ☐ STEPS IN THE FORMATION ARE DETAILED IN ACCORDANCE WITH THIS MANUAL.

Figure 1
Relationship of
RibRaft® To Sloping
Ground Surface



PRE-LAYOUT INSPECTION CHECK LIST: DAMP PROOF MEMBRANE IN PLACE

PERIMETER FOUNDATION	☐ WIDTH 300MM ⁽¹⁾ ☐ REINFORCEMENT 2 X HD12 BOTTOM, 1 X HD12 TOP ☐ FIRTH SUPPLIED SPACER USED AT 1.2M MAXIMUM CENTRES
INTERNAL RIBS	☐ WIDTH 100MM ☐ REINFORCEMENT 1 X HD12 ☐ FIRTH SUPPLIED SPACER, MAX SPACING OF ONE PER POD OR PART POD
LOAD BEARING RIBS	☐ WIDTH 300MM ☐ REINFORCEMENT 2 X HD12 BOTTOM ☐ FIRTH SUPPLIED SPACER, MAX SPACING OF ONE PER POD OR PART POD
PODS	☐ FIRTH SUPPLIED RIBRAFT® POD
MESH	☐ 40MM CHAIRS, 1.2M MAX CENTRES, MIN TWO PER POD OR ONE PER PART POD ☐ MESH IN PLACE AND 665 OR SE62 ☐ MESH LAPS OVERLAP OF OUTERMOST CROSSWIRE = MESH SPACING + 50MM
REINFORCEMENT	☐ 2 X HD12 BARS 1.2M LONG PROVIDED AT RE-ENTRANT CORNERS ☐ LAPS FOR 12MM REINFORCEMENT MINIMUM OF 720MM
CONCRETE	☐ COVER TO PODS MINIMUM OF 85MM OR 110MM IF INFLOOR HEATING USED. ☐ FIRTH RAFTMIX ORDERED
SERVICE PENETRATIONS	☐ NO REINFORCEMENT (WITH EXCEPTION OF MESH) CUT TO ALLOW PASSAGE OF SERVICE PIPES. REFER CLAUSE 6.3 OF SECTION 1 FOR EXCEPTIONS ☐ PIPES WRAPPED WITH MINIMUM 6MM THICKNESS OF IMPERMEABLE COMPRESSIBLE MATERIAL WHERE IN CONTACT WITH CONCRETE ☐ DIAMETER/SIZE OF PENETRATIONS AS PER TABLE 6, SECTION 1 OF THIS MANUAL

(1) At locations of service penetrations the width of the perimeter foundation maybe locally increased. Refer Figure 14 Section 1 for details.



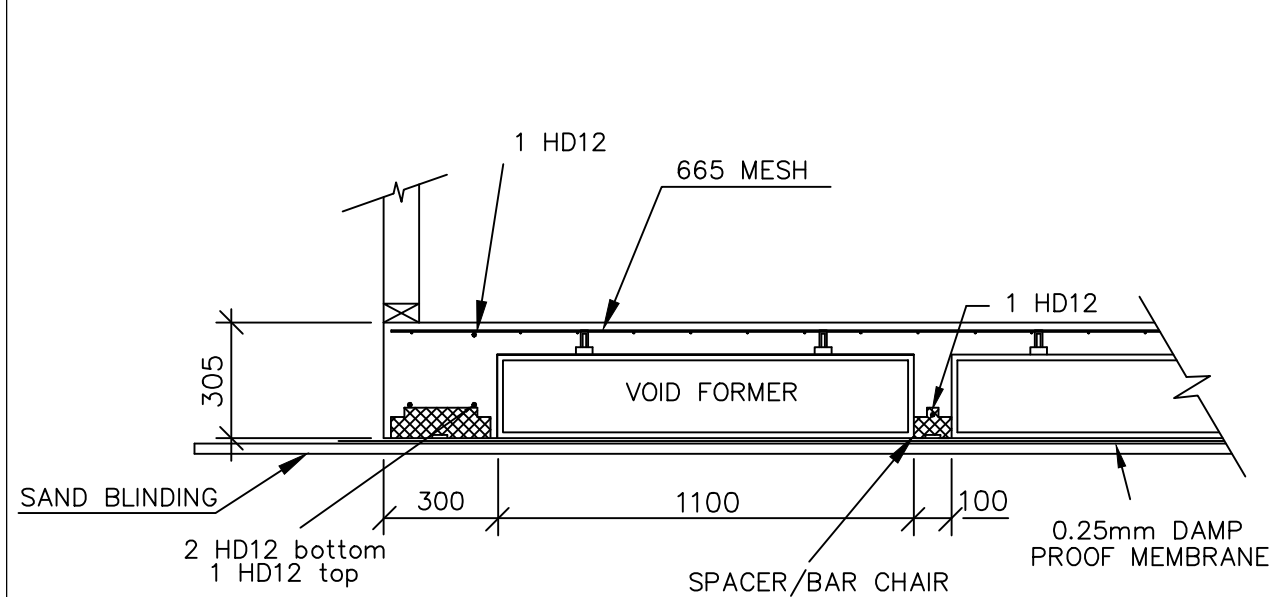
CONCRETE & MASONRY PRODUCTS: A SUSTAINABLE BUILDING OPTION & SOLUTION

- ✓ Environmentally compliant manufacturing plants
- ✓ Surplus water and some aggregates recycled
- ✓ Low transport impacts
- ✓ Leftover concrete returned from construction sites
- ✓ Passive solar heated thermal mass makes completed buildings more energy-efficient
- ✓ Most wash water returned from construction sites
- ✓ Highly durable, low maintenance buildings and no rot
- ✓ High degree of noise control
- ✓ Inherent fire resistance
- ✓ Overall longer effective building life
- ✓ Demolished concrete can be recycled as hard fill or aggregate

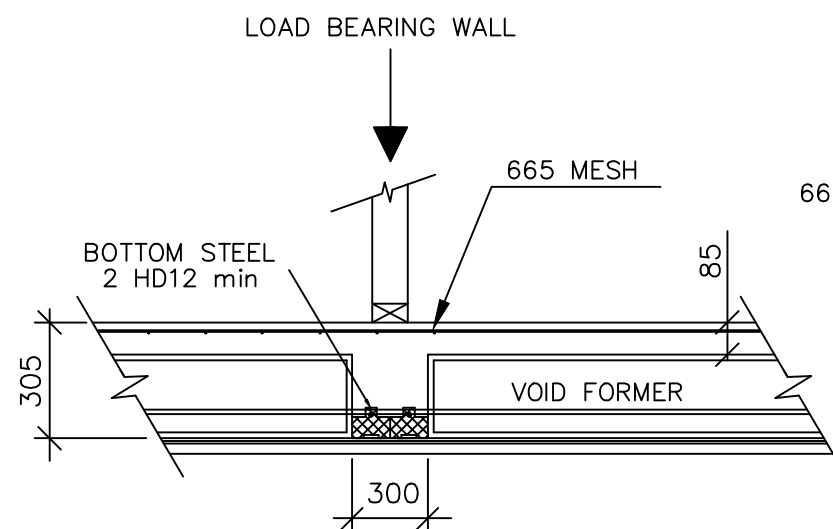
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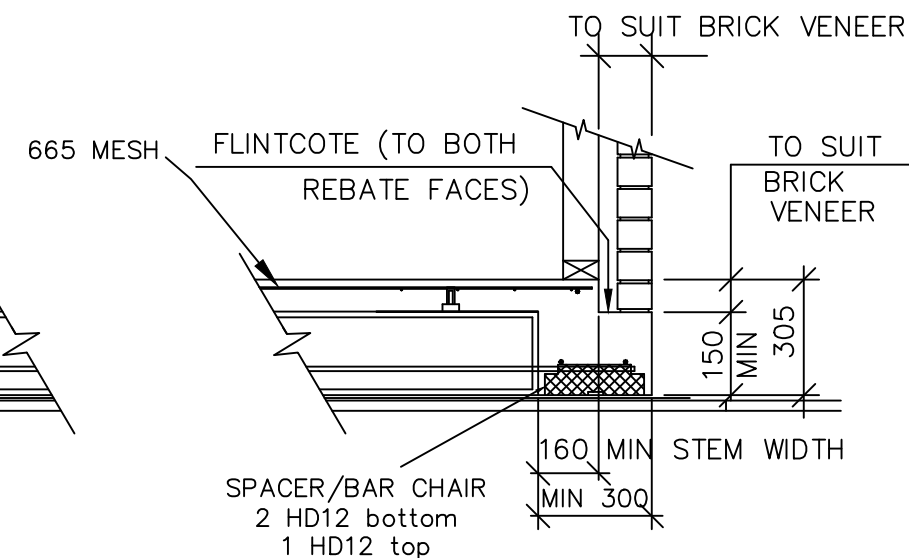
0800 FIRTH 1 (347841)
FIRTH.CO.NZ



1
S2 CLAD FRAME
CONSTRUCTION DETAIL
1: 20



2
S2 SECTION UNDER INTERNAL
LOAD-BEARING WALLS
1: 20



3
S2 BRICK VENEER
CONSTRUCTION DETAIL
1: 20

NOTE

REFER FIRTH RIBRAFT TECHNICAL MANUAL
JAN 2012 FOR BEARING REQUIREMENTS
AND TECHNICAL INFORMATION



Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it or use the [Design Navigator message board](#)

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel .

Floors ☐

Walls ☐

Roofs ☒

Roof

3.37 m²°C/W

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

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

external surface 0.03

Roofing : Metal tiles with building paper

R-value: 0.01

Insulation :

Timber Frame & Cavity :

90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0% Cavity Area: 95.0%

Roof space (still air) 0.11 Roof space (still air) 0.11

Framing : R-value: 0.75

Insulation : 3.6

Roof Lining : Gypsum plasterboard 13mm

R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 123 Number of downlights: Clearance from lamp holder side [m]:

[Print Page](#)

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid construction)

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8





Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it or use the [Design Navigator message board](#)

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel .

Floors ☐

Walls ☒

Roofs ☐

Internal Garage Wall

2.18 m²°C/W

Type: Wall: Timber Frame (direct fixed cladding)

Timber Frame (direct fixed Cladding)

external surface 0.03

Cladding : Gypsum plasterboard 10mm into still air (garage, etc.)

R-value: 0.10

Air Barrier : none

R-value: 0.00

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%

Cavity Area: 85.6%

Framing : R-value: 0.75

Insulation : 2.6

still Airgap: none

R-value: 0.00

Wall Lining : Gypsum plasterboard 10mm

R-value: 0.04

internal surface 0.09

Print Page

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid construction)

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8





Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

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Floors ☐

Walls ☒

Roofs ☐

70mm Brick Veneer	2.23	m ² °C/W
Type: Wall: Veneer Wall with Timber Framing and bulk Insulation (vented)		
Veneer Wall with Timber Framing and bulk Insulation (vented)		view detail
external surface 0.03		
Veneer : 70mm brick		
R-value: 0.06		
Air Barrier : Building paper		
R-value: 0.01		
Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm		
Wall Frame Area: 14.4%		Cavity Area: 85.6%
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08		15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : R-value: 0.75		Insulation : 2.6
still Airgap: none		R-value: 0.00
Wall Lining : Gypsum plasterboard 10mm		
R-value: 0.04		
internal surface 0.09		

[Print Page](#)

Current NZS4218:2009 Schedule Method minimum R-value Targets (non-solid construction)

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31

Australian Building Code Targets

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8



Chateau™

RESIDENTIAL ROOFING

DETAIL LIST

00 / 24	COVER SHEET
01 / 24	VALLEY FLASHING
02 / 24	BARREL RIDGE
03 / 24	ANGLE RIDGE
04 / 24	FOLDED RIDGE
05 / 24	BARREL BARGE
06 / 24	ANGLE BARGE
07 / 24	FOLDED BARGE
08 / 24	BARREL CAP BARGE
09 / 24	ANGLE CAP BARGE
10 / 24	FOLDED CAP BARGE
11 / 24	TILE BATTEN LAYOUT
12 / 24	TILE BATTEN LAYOUT
13 / 24	TILE BATTEN LAYOUT
14 / 24	CHIMNEY SIDE VIEW
15 / 24	HEAD APRON
16 / 24	SIDE FLASHING
17 / 24	SECRET GUTTER
18 / 24	3D RIDGE TO BARGE JUCTION
19 / 24	3D DUTCH GABLE
20 / 24	3D APRON
21 / 24	3D OVER 85mm DIAMETER PIPE PENETRATION
22 / 24	3D CHIMNEY PENETRATION
23 / 24	3D RIDGE/BARGE FLASHINGS
24 / 24	3D DUTCH GABLE FLASHINGS

RRT10

0800 ROOFNZ (0800 766 369)
www.metalcraftroofing.co.nz

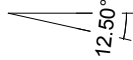
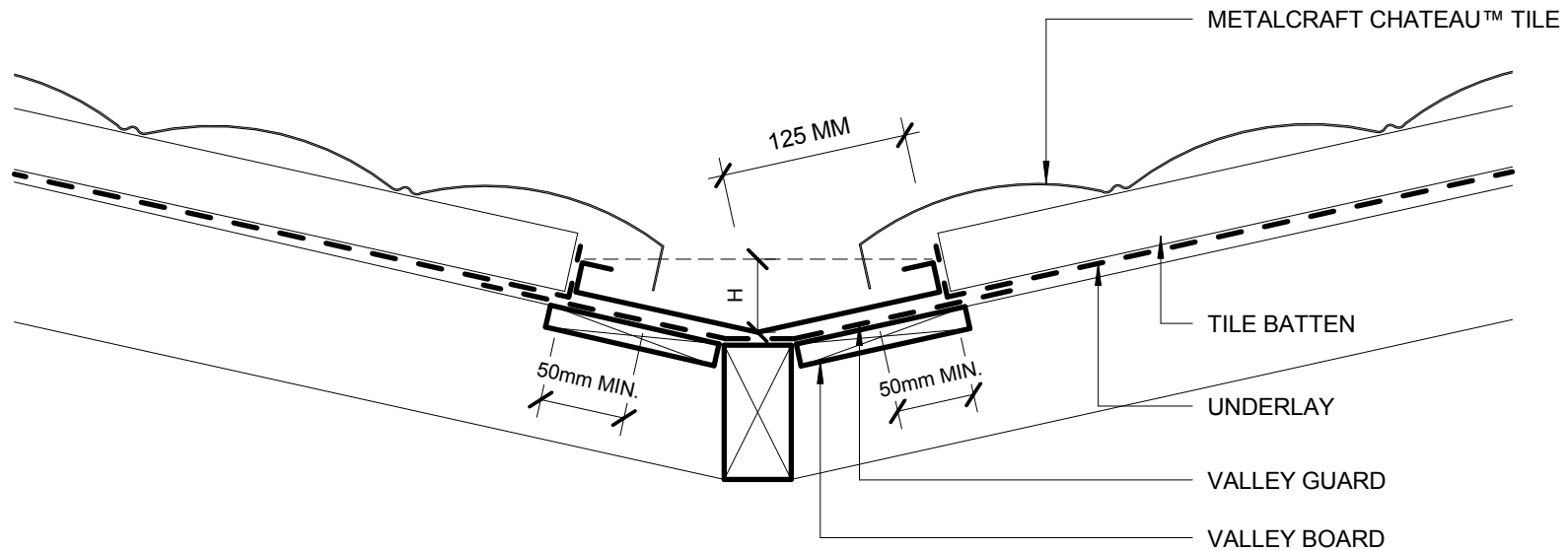
Architectural / Specification Enquiries

Ph: 09 274 0408
Mobile: 027 603 1096

Email: Frances.charles@unitedindustries.co.nz

Metalcraft
Roofing

* CHATEAU™
MIN. ROOF PITCH = 12.5°

CATEGORY A		CATEGORY B
1. NORMAL EXPOSURE 2. ROOF PITCH >10°		1. EXPOSED (HIGHER RISK) & WIND LOAD EXCEEDS 1.5 kPa. 2. ROOF PITCH <10°
X MIN. 130mm		MIN. 200mm
PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.		
SITUATION 1	SITUATION 2	SITUATION 3
1. LOW, MEDIUM, HIGH WIND ZONES 2. ROOF PITCH ≥ 10°	1. VERY HIGH WIND ZONE 2. ALL ROOF PITCHES	1. EXTRA HIGH WIND ZONE 2. ALL ROOF PITCHES
X MIN. 130mm (EXCLUDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)	MIN. 200mm (EXCLUDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)	MIN. 200mm
PLEASE REFER TO E2 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.		

- BUILDING PAPER IS THE COMMON GENERIC NAME FOR PERMEABLE ROOF AND WALL UNDERLAYS. PLEASE REFER TO NZBC E2/AS1 AND MRM CODE OF PRACTICE VERSION 2.2 /2012.

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Roofing

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VALLEY FLASHING
RESIDENTIAL ROOFING

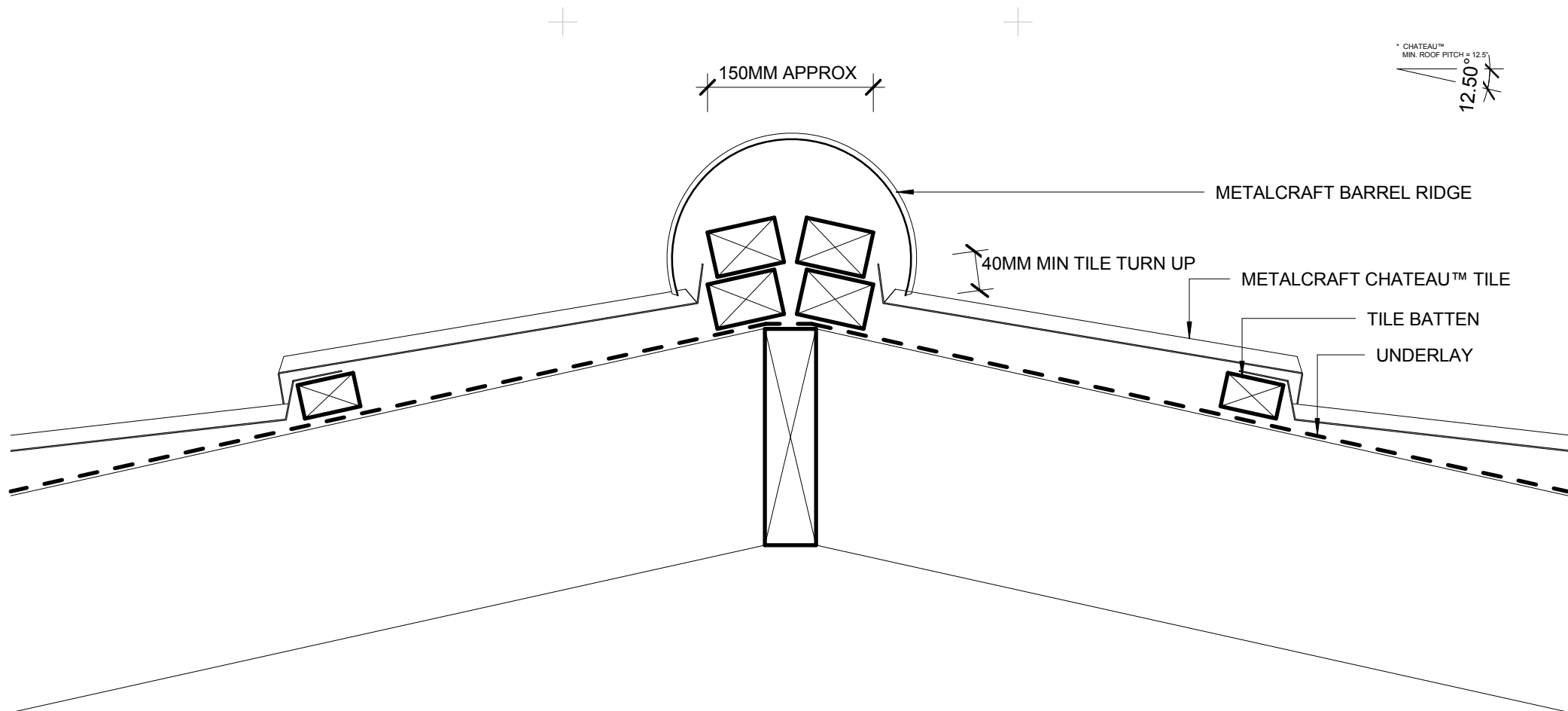
Reference RRT30

Date 2015

Scale 1 : 5

Sheet

01 / 24



L	REFER TO SHEET NO. 14/24 TRANSVERSE APRON
M	REFER TO SHEET NO. 16/24 PARALLEL APRON
X	REFER TO SHEET NO. 01/24 ROOF RIDGE

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Roofing

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Reference RRT30

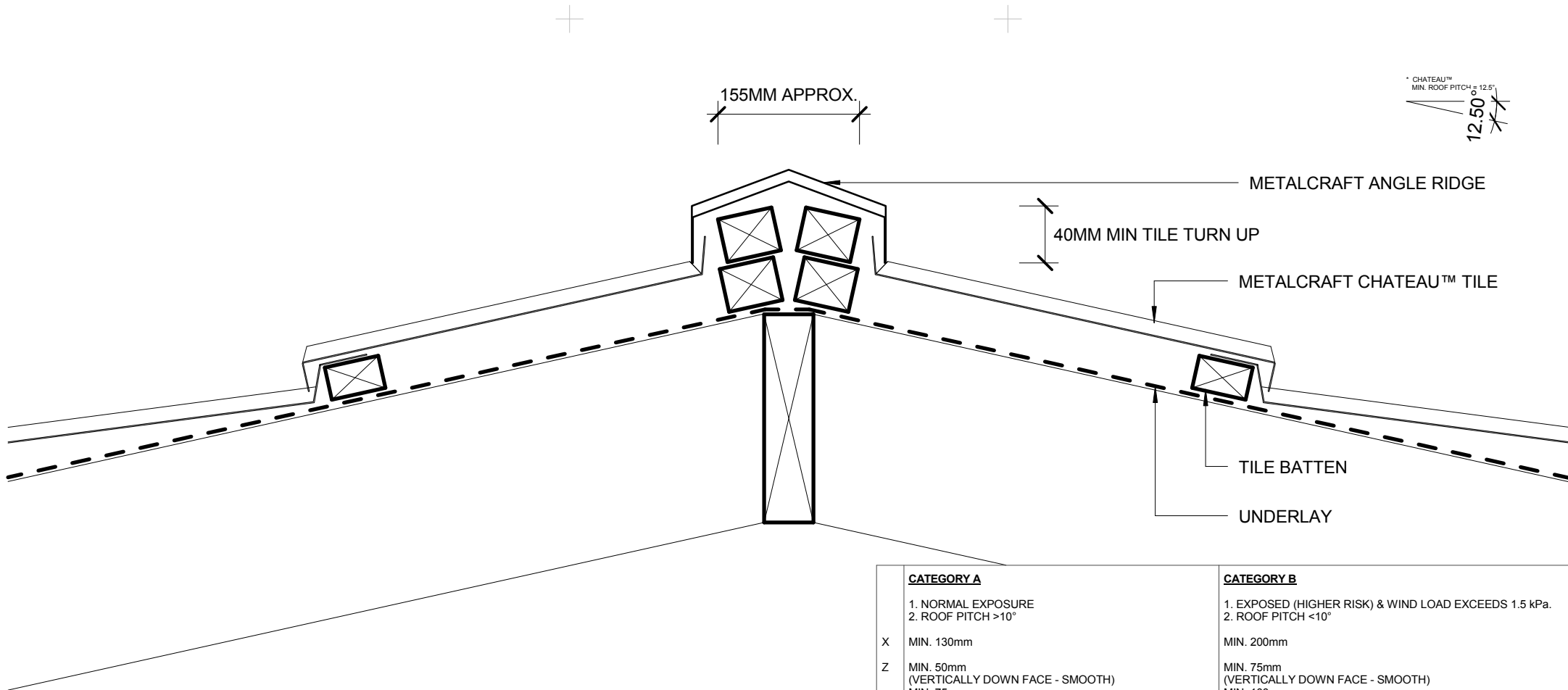
Date 2015

Scale 1 : 5

Sheet

02 / 24

BARREL RIDGE
RESIDENTIAL ROOFING



<u>CATEGORY A</u>		<u>CATEGORY B</u>	
1. NORMAL EXPOSURE 2. ROOF PITCH >10°		1. EXPOSED (HIGHER RISK) & WIND LOAD EXCEEDS 1.5 kPa. 2. ROOF PITCH <10°	
X	MIN. 130mm	MIN. 200mm	
Z	MIN. 50mm (VERTICALLY DOWN FACE - SMOOTH) MIN. 75mm (VERTICALLY DOWN FACE - PROFILED)	MIN. 75mm (VERTICALLY DOWN FACE - SMOOTH) MIN. 100mm (VERTICALLY DOWN FACE - PROFILED)	
PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS			
<u>SITUATION 1</u>		<u>SITUATION 2</u>	<u>SITUATION 3</u>
1. LOW, MEDIUM, HIGH WIND ZONES 2. ROOF PITCH ≥ 10°		1. VERY HIGH WIND ZONE 2. ALL ROOF PITCHES	1. EXTRA HIGH WIND ZONE 2. ALL ROOF PITCHES
X	MIN. 130mm (EXCLUDDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)	MIN. 200mm (EXCLUDDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)	MIN. 200mm
Z	MIN. 50mm	MIN. 70mm	MIN. 90mm
PLEASE REFER TO E2 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.			

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Roofing

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ANGLE RIDGE
RESIDENTIAL ROOFING

Reference RRT30

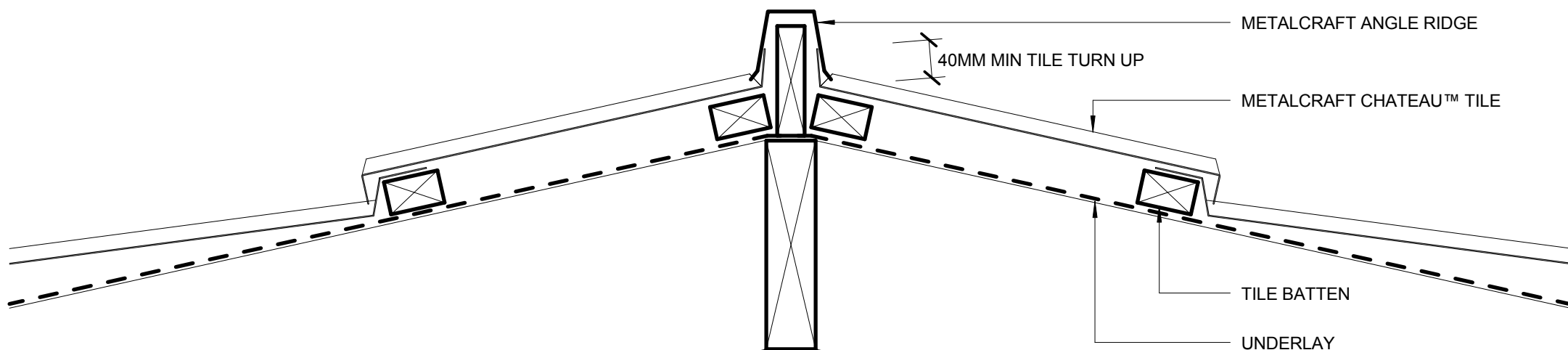
Date 2015

Scale 1 : 5

Sheet

03 / 24

* CHATEAU™
MIN. ROOF PITCH = 12.5°



<u>CATEGORY A</u>		<u>CATEGORY B</u>	
	1. NORMAL EXPOSURE 2. ROOF PITCH >10°		1. EXPOSED (HIGHER RISK) & WIND LOAD EXCEEDS 1.5 kPa. 2. ROOF PITCH <10°
X	MIN. 130mm		MIN. 200mm
Z	MIN. 50mm (VERTICALLY DOWN FACE - SMOOTH) MIN. 75mm (VERTICALLY DOWN FACE - PROFILED)		MIN. 75mm (VERTICALLY DOWN FACE - SMOOTH) MIN. 100mm (VERTICALLY DOWN FACE - PROFILED)
PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS			

<u>SITUATION 1</u>		<u>SITUATION 2</u>		<u>SITUATION 3</u>	
	1. LOW, MEDIUM, HIGH WIND ZONES 2. ROOF PITCH ≥ 10°		1. VERY HIGH WIND ZONE 2. ALL ROOF PITCHES		1. EXTRA HIGH WIND ZONE 2. ALL ROOF PITCHES
X	MIN. 130mm (EXCLUDDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)		MIN. 200mm (EXCLUDDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)		MIN. 200mm
Z	MIN. 50mm		MIN. 70mm		MIN. 90mm
PLEASE REFER TO E2 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.					

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Roofing

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FOLDED RIDGE
RESIDENTIAL ROOFING

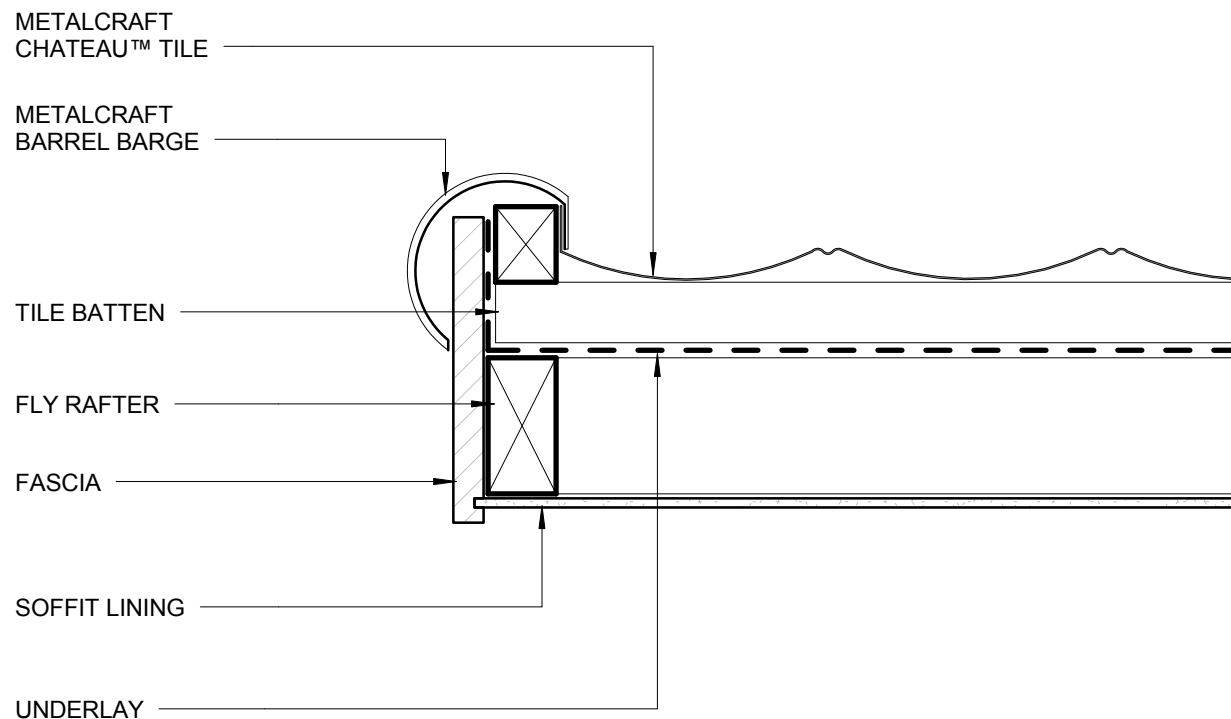
Reference RRT30

Date 2015

Scale 1 : 5

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* ROOF PITCH FOR VALLEYS AS PER E2.

	SITUATION 1	SITUATION 2
	MAX. CATCHMENT 25m ² MIN. ROOF PITCH 8°	MAX. CATCHMENT 16m ² MIN. ROOF PITCH 12.5°
A	MIN. 250mm	160mm - 249mm
B	MIN. 50mm	MIN. 40mm
C	MIN. 80mm	MIN. 60mm
PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 AND E2 FOR FURTHER INFORMATION.		

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Reference RRT30

Date 2015

Scale 1 : 5

Sheet

05 / 24

BARREL BARGE
RESIDENTIAL ROOFING

Metalcraft
Roofing

METALCRAFT
CHATEAU™ TILE

METALCRAFT ANGLE
BARGE

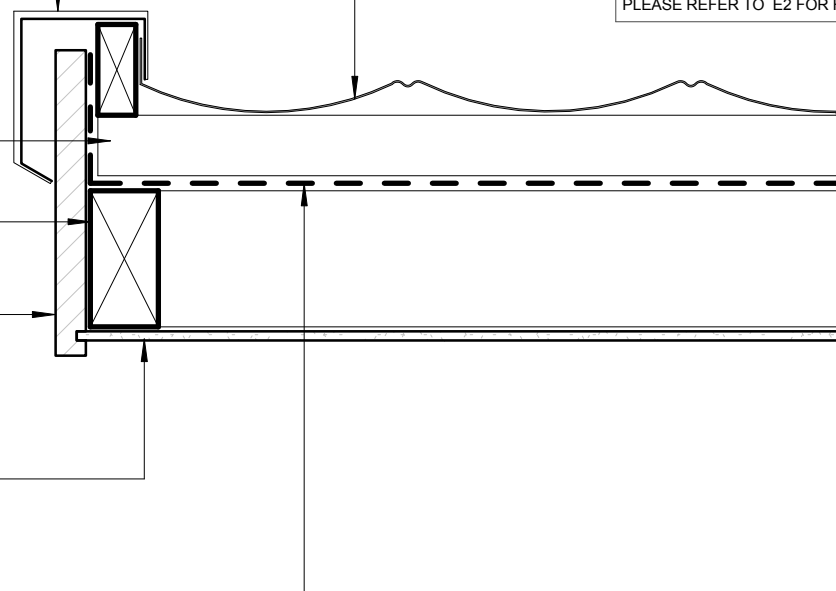
TILE BATTEN

FLY RAFTER

FASCIA

SOFFIT LINING

UNDERLAY



	<u>CATEGORY A</u> 1. NORMAL EXPOSURE 2. ROOF PITCH >10°	<u>CATEGORY B</u> 1. EXPOSED (HIGHER RISK) & WIND LOAD EXCEEDS 1.5 kPa. 2. ROOF PITCH <10°	
X	MIN. 130mm	MIN. 200mm	
PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.			
	<u>SITUATION 1</u> 1. LOW, MEDIUM, HIGH WIND ZONES 2. ROOF PITCH ≥ 10°	<u>SITUATION 2</u> 1. VERY HIGH WIND ZONE 2. ALL ROOF PITCHES	<u>SITUATION 3</u> 1. EXTRA HIGH WIND ZONE 2. ALL ROOF PITCHES
X	MIN. 130mm (EXCLUDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)	MIN. 200mm (EXCLUDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)	MIN. 200mm
PLEASE REFER TO E2 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.			

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Reference RRT30

Date 2015

Scale 1 : 5

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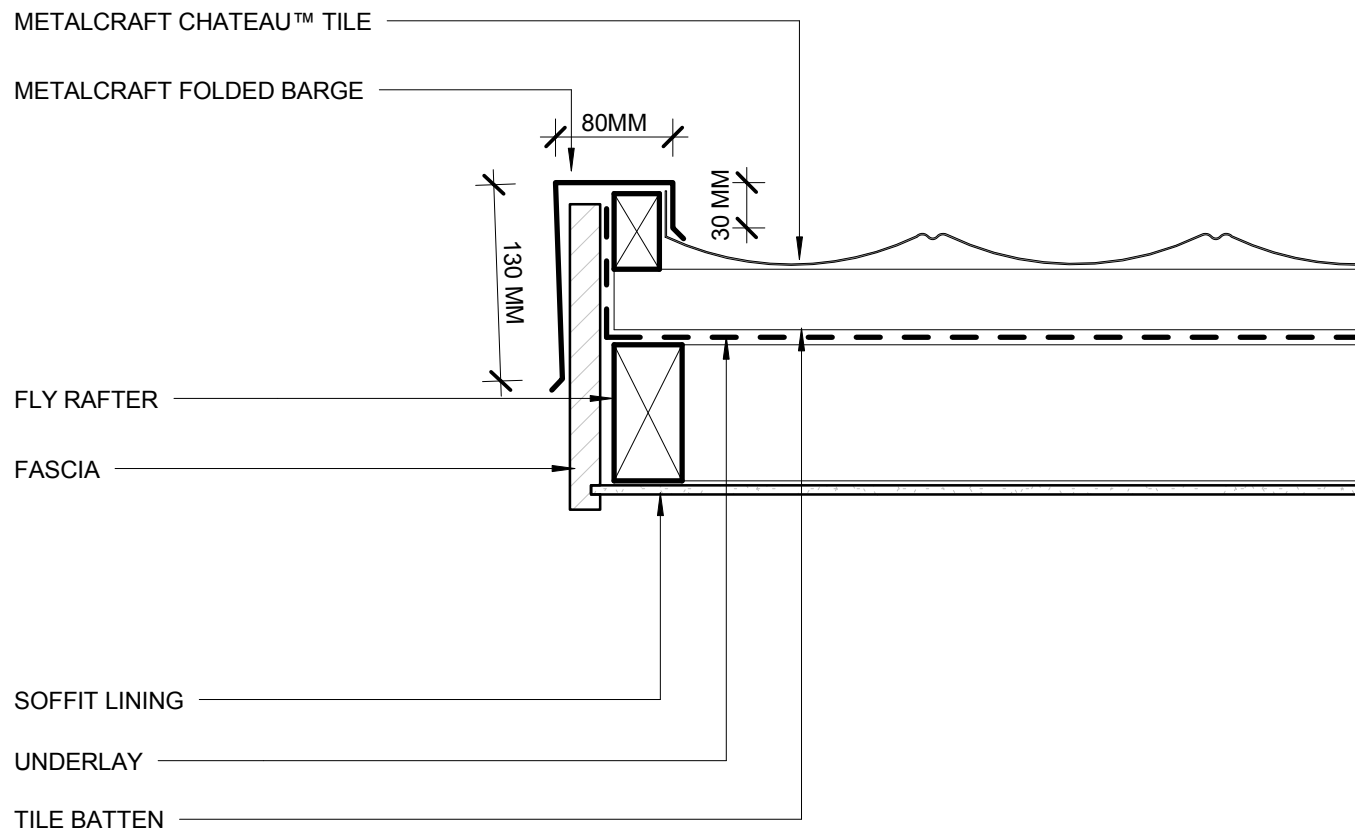
06 / 24

ANGLE BARGE
RESIDENTIAL ROOFING

Metalcraft
Roofing

EAVE FLASHING REQUIRED WHEN

- ROOF PITCH $\leq 10^\circ$, OR
- SOFFIT WIDTH $\leq 100\text{mm}$, OR
- WIND ZONES = VERY HIGH OR EXTRA HIGH OR
- ENGINEER SPECIFIC DESIGN



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Metalcraft
Roofing

Modena™

Reference RRT30

Date 2015

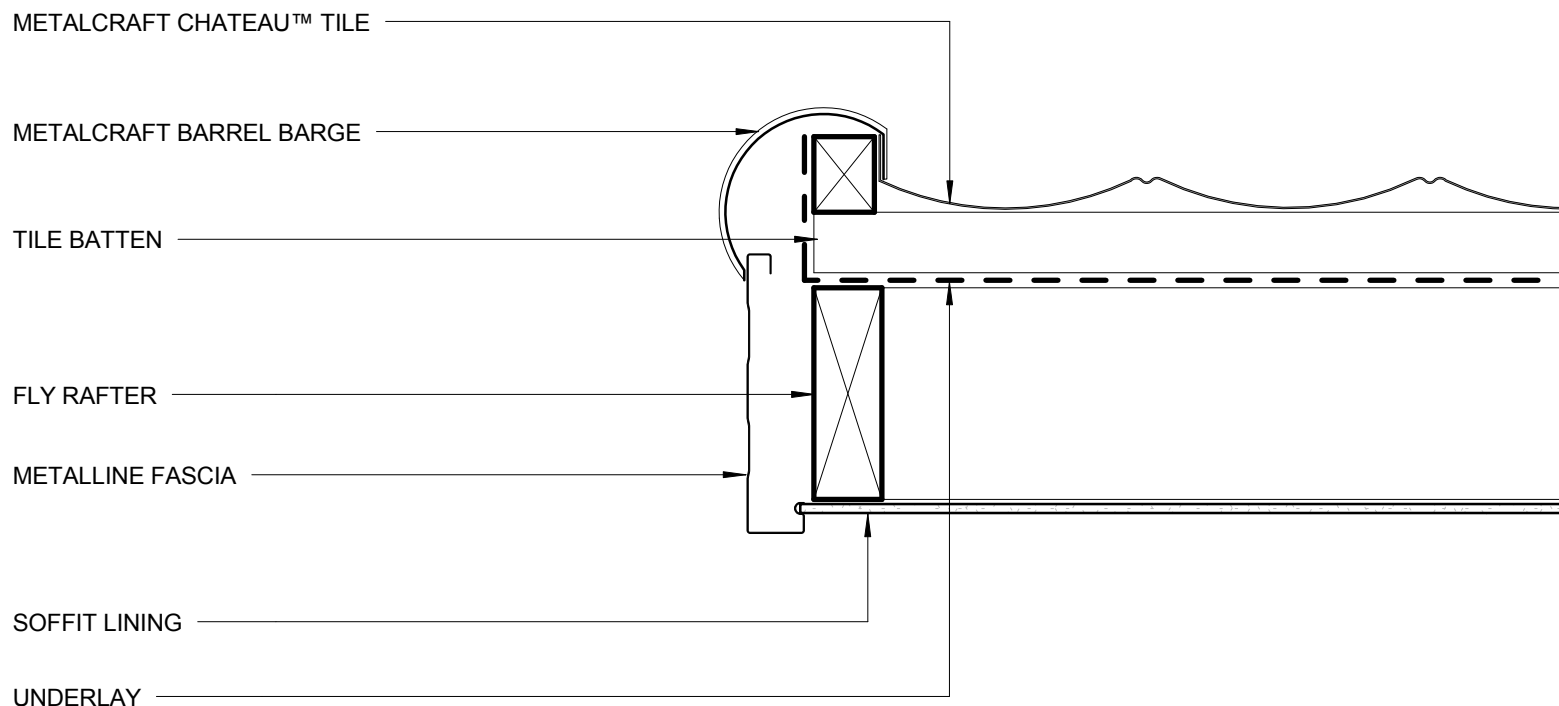
Scale 1 : 5

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07 / 24

FOLDED BARGE
RESIDENTIAL ROOFING

EAVE FLASHING REQUIRED WHEN
 - ROOF PITCH $\leq 10^\circ$, OR
 - SOFFIT WIDTH $\leq 100\text{mm}$, OR
 - WIND ZONES = VERY HIGH OR EXTRA HIGH OR
 - ENGINEER SPECIFIC DESIGN



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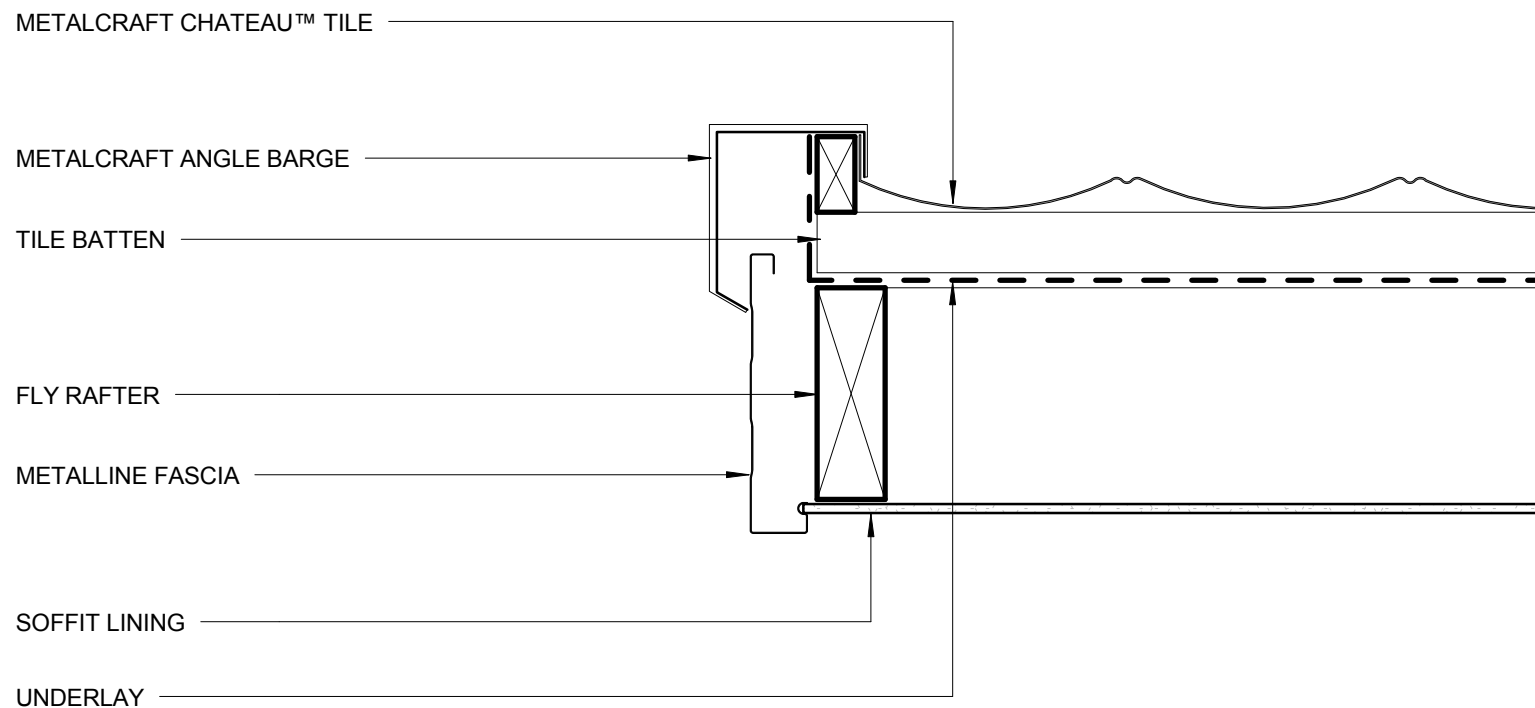
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BARREL CAP BARGE
 RESIDENTIAL ROOFING

08 / 24

Metalcraft
 Roofing

EAVE FLASHING REQUIRED WHEN
 - ROOF PITCH $\leq 10^\circ$, OR
 - SOFFIT WIDTH $\leq 100\text{mm}$, OR
 - WIND ZONES = VERY HIGH OR EXTRA HIGH OR
 - ENGINEER SPECIFIC DESIGN



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Modena™

Reference RRT30

Date 2015

Scale 1 : 5

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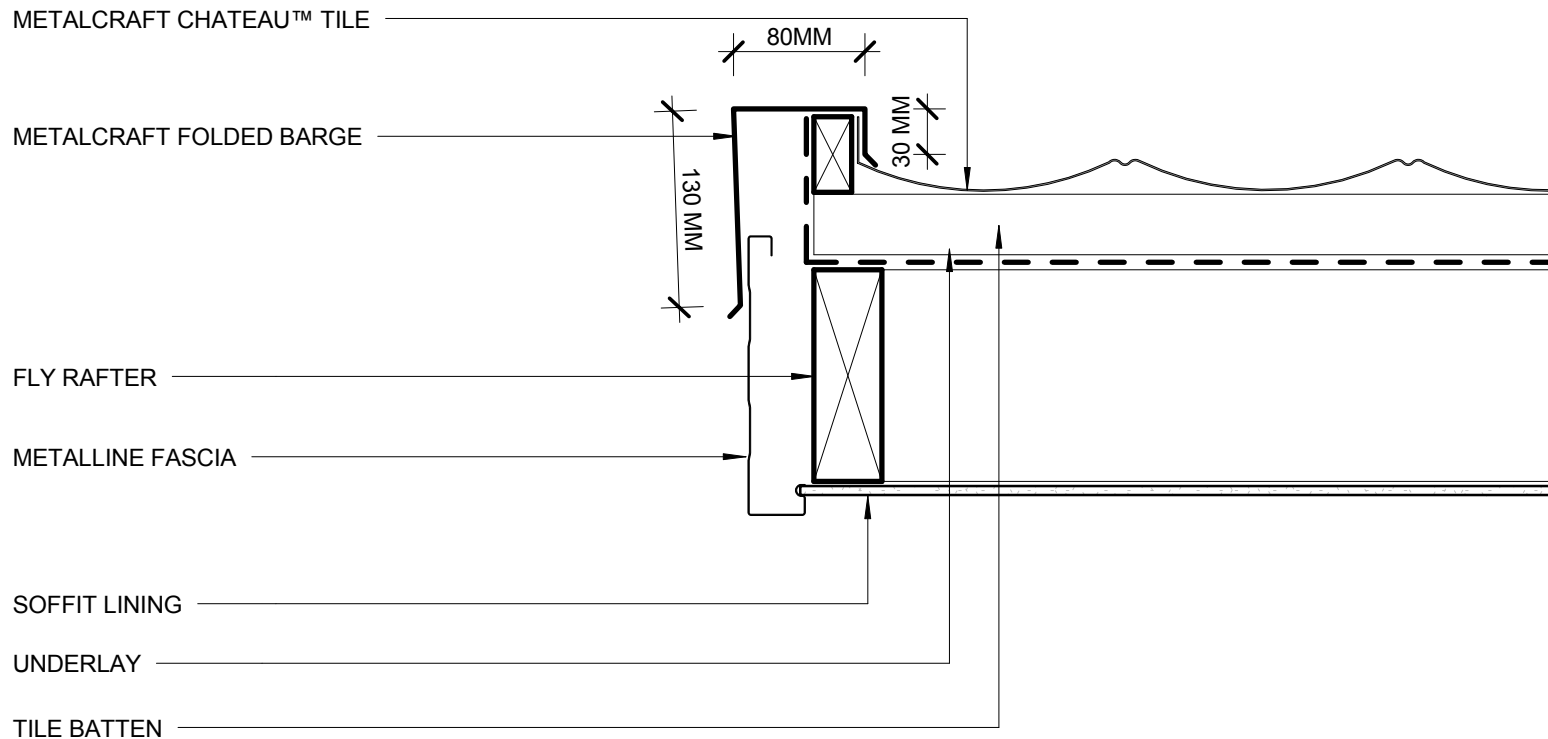
09 / 24

ANGLE CAP BARGE
 RESIDENTIAL ROOFING

Metalcraft
 Roofing

EAVE FLASHING REQUIRED WHEN

- ROOF PITCH $\leq 10^\circ$, OR
- SOFFIT WIDTH $\leq 100\text{mm}$, OR
- WIND ZONES = VERY HIGH OR EXTRA HIGH OR
- ENGINEER SPECIFIC DESIGN



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FOLDED CAP BARGE RESIDENTIAL ROOFING

Metalcraft
Roofing

Modena™

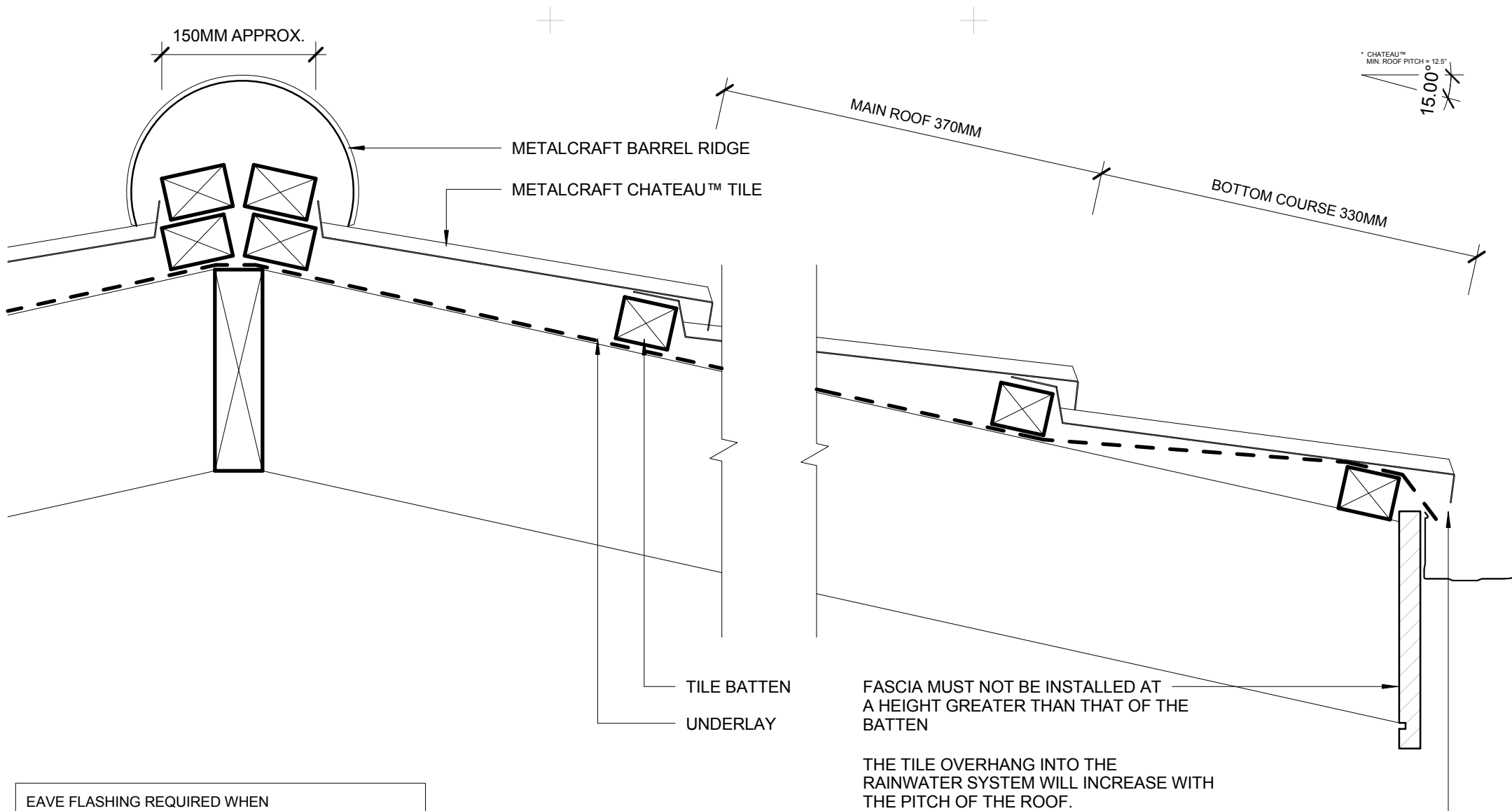
Reference RRT30

Date 2015

Scale 1 : 5

Sheet

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EAVE FLASHING REQUIRED WHEN

- ROOF PITCH $\leq 10^\circ$, OR
- SOFFIT WIDTH $\leq 100\text{mm}$, OR
- WIND ZONES = VERY HIGH OR EXTRA HIGH OR
- ENGINEER SPECIFIC DESIGN

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Metalcraft
Roofing

Modena™

Reference RRT30

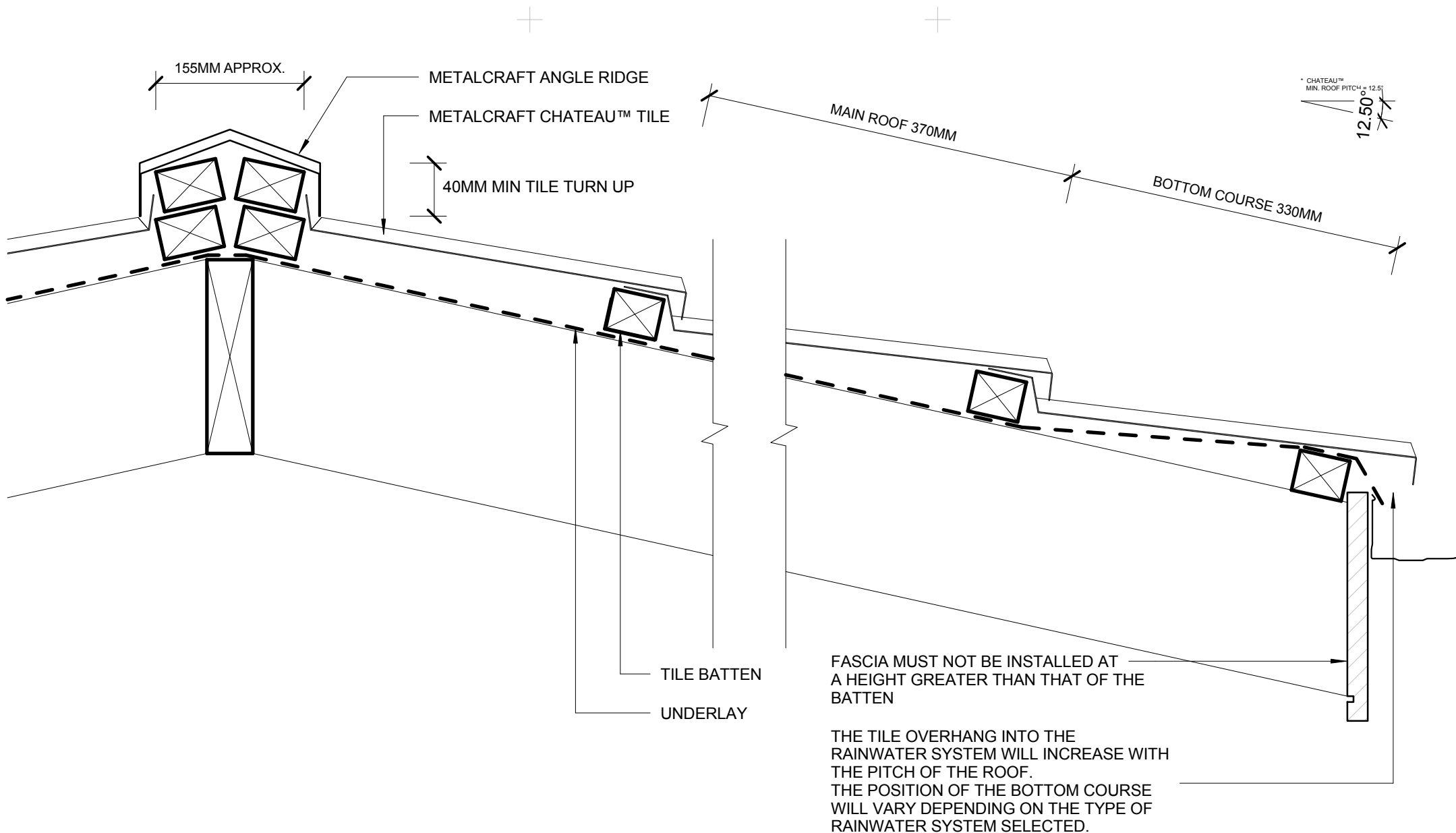
Date 2015

Scale 1 : 5

Sheet

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TILE BATTEN LAYOUT
RESIDENTIAL ROOFING



- BUILDING PAPER IS THE COMMON GENERIC NAME FOR PERMEABLE ROOF AND WALL UNDERLAYS. PLEASE REFER TO NZBC E2/AS1 AND MRM CODE OF PRACTICE VERSION 2.2 /2012.

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Metalcraft
Roofing

Modena™

Reference RRT30

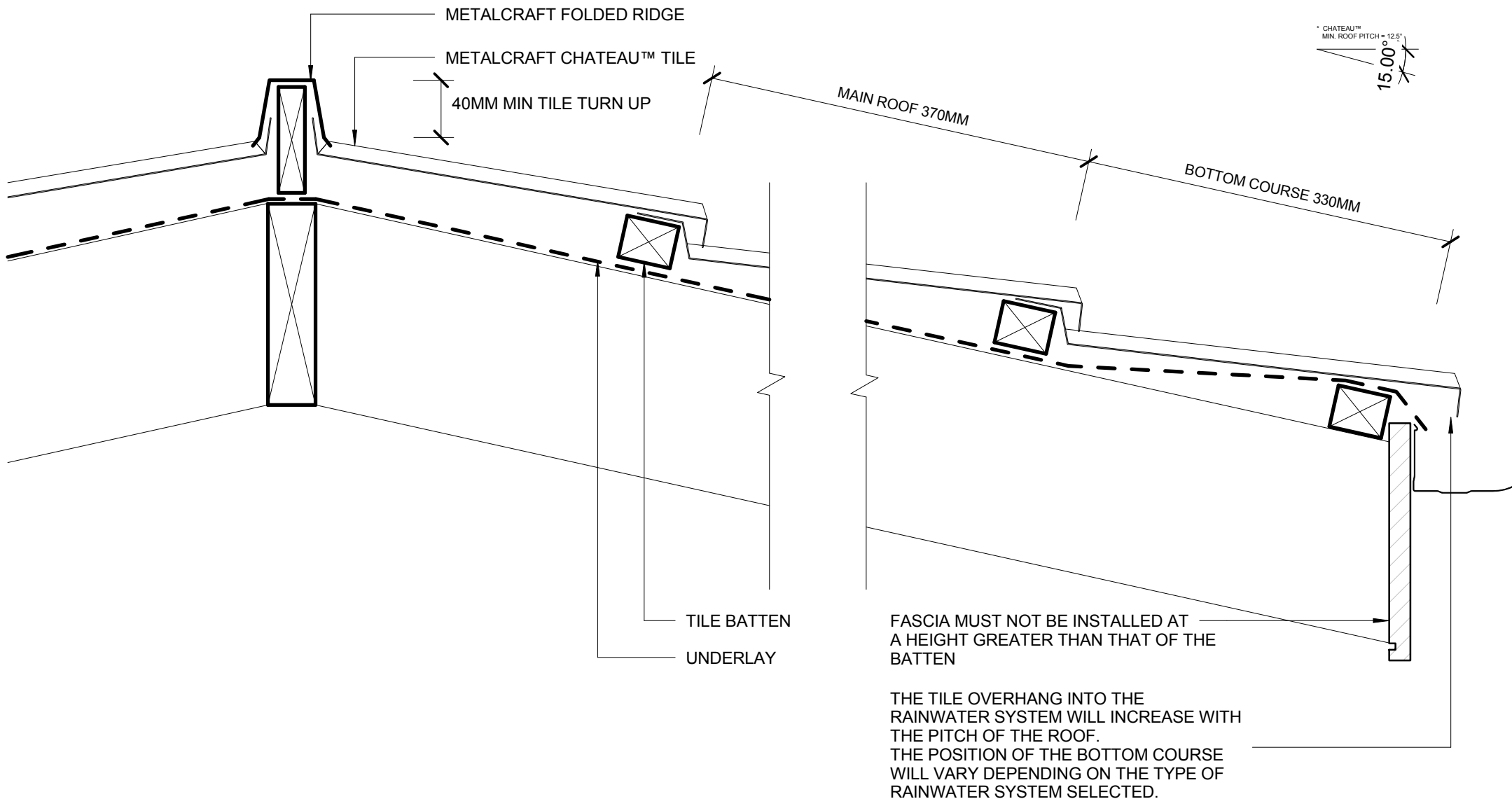
Date 2015

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TILE BATTEN LAYOUT
RESIDENTIAL ROOFING



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Reference RRT30

Date 2015

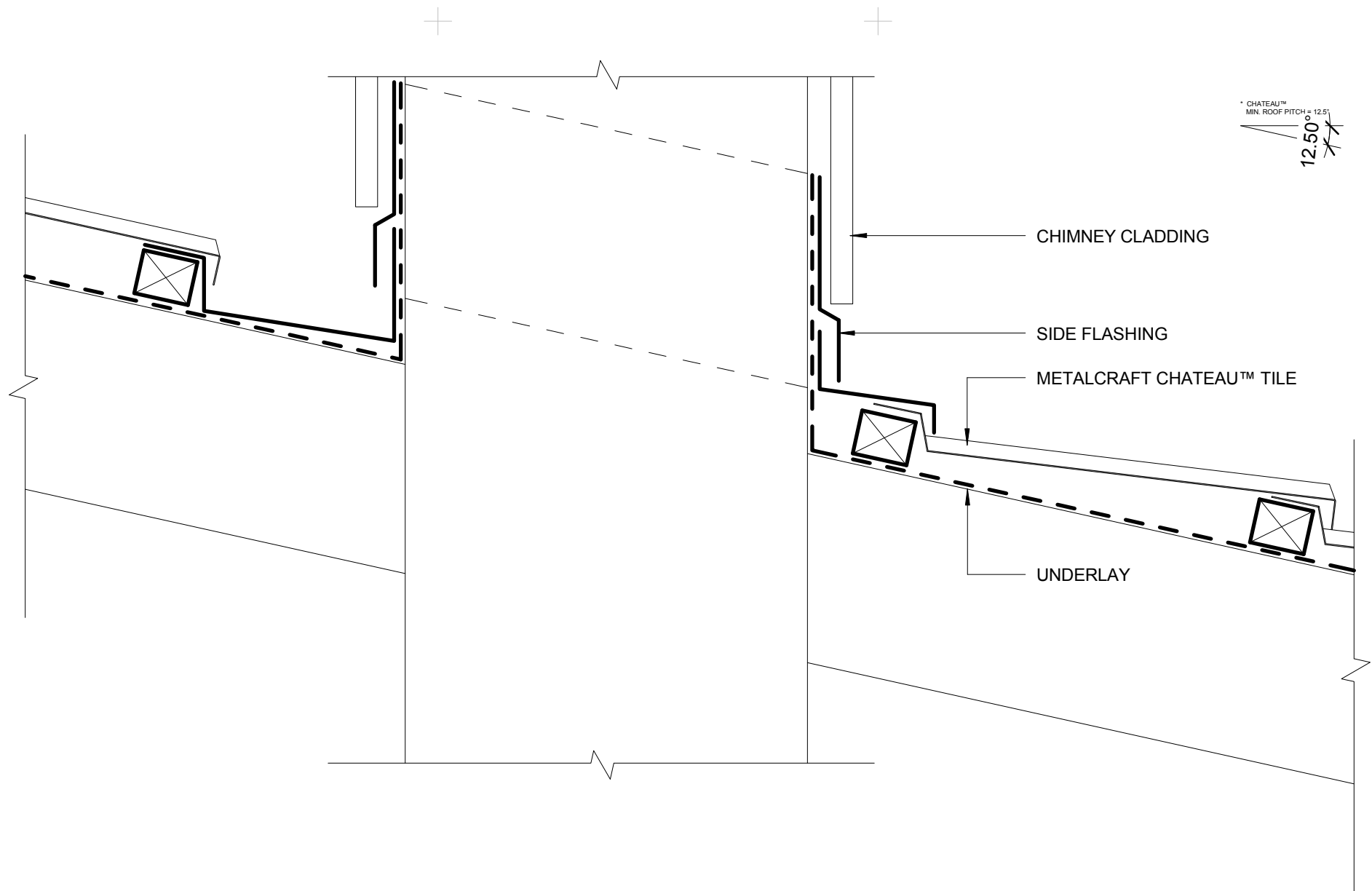
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TILE BATTEN LAYOUT
RESIDENTIAL ROOFING

Metalcraft
Roofing



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* - PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2 /2012 AS MINIMUM PITCH WILL INCREASE DEPENDING ON SHEET LENGTH.

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Metalcraft
Roofing

Modena™

Reference RRT30

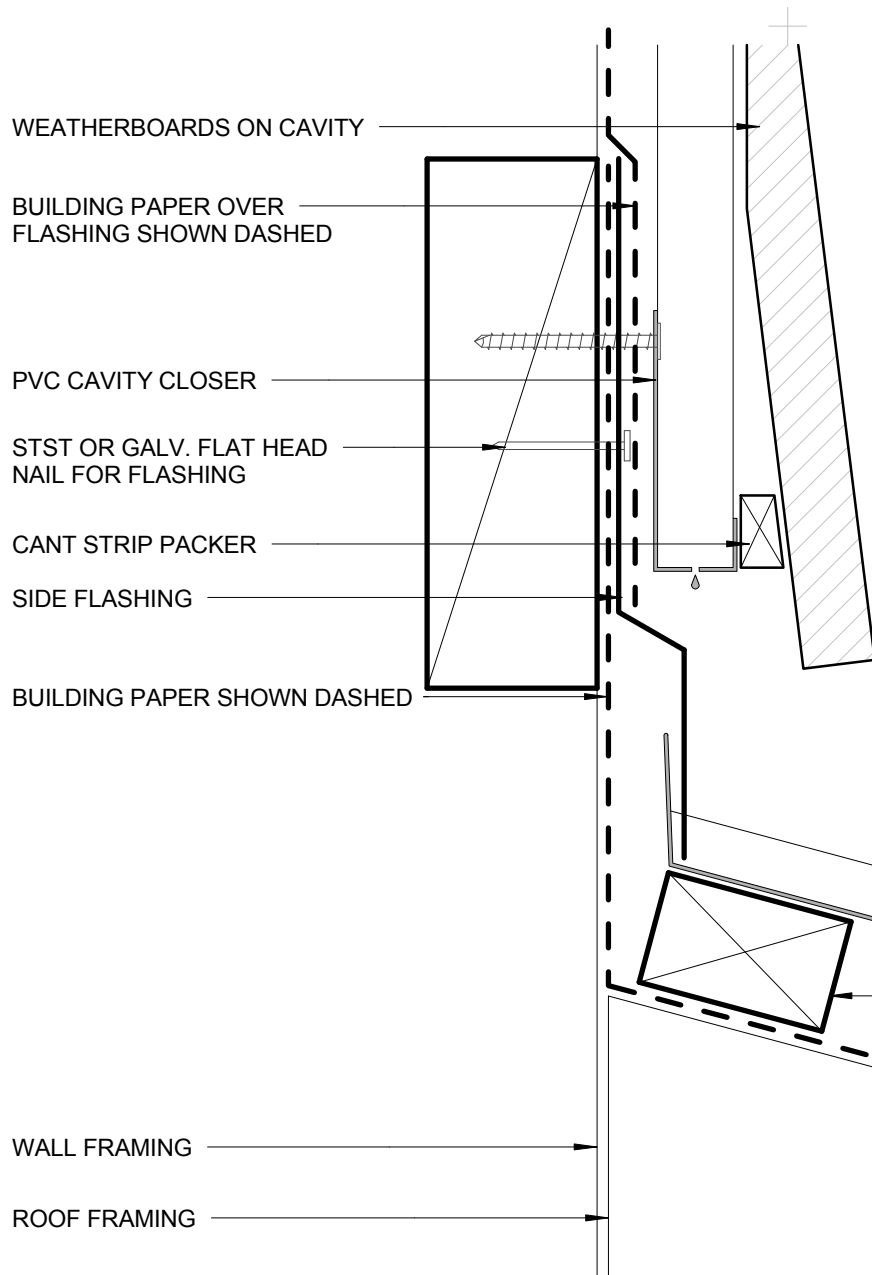
Date 2015

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CHIMNEY SIDE VIEW
RESIDENTIAL ROOFING

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	<u>CATEGORY A</u>	<u>CATEGORY B</u>
	1. NORMAL EXPOSURE 2. ROOF PITCH >10°	1. EXPOSED (HIGHER RISK) & WIND LOAD EXCEEDS 1.5 kPa. 2. ROOF PITCH <10°
G	25mm	25mm
N	MIN. 50mm + HEM <u>OR</u> 75mm (VERTICALLY UP FACE - SMOOTH) MIN. 75mm + HEM <u>OR</u> 100mm (VERTICALLY UP FACE - PROFILED)	MIN. 75mm + HEM <u>OR</u> 100mm (VERTICALLY UP FACE - SMOOTH) MIN. 100mm + HEM <u>OR</u> 125mm (VERTICALLY UP FACE - PROFILED)
L	MIN. 150mm	MIN. 200mm
PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.		

	<u>SITUATION 1</u>	<u>SITUATION 2</u>	<u>SITUATION 3</u>
	1. LOW, MEDIUM, HIGH WIND ZONES 2. ROOF PITCH ≥ 10°	1. VERY HIGH WIND ZONE 2. ALL ROOF PITCHES	1. EXTRA HIGH WIND ZONE 2. ALL ROOF PITCHES
G	MIN. 35mm	MIN. 35mm	MIN. 35mm
N	MIN. 75mm	MIN. 75mm	MIN. 75mm
L	MIN. 130mm (EXCLUDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)	MIN. 200mm (EXCLUDING ANY SOFT EDGE OR TURN-DOWN TO ROOFING)	MIN. 200mm
PLEASE REFER TO E2 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.			

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Modena™

Reference RRT30

Date 2015

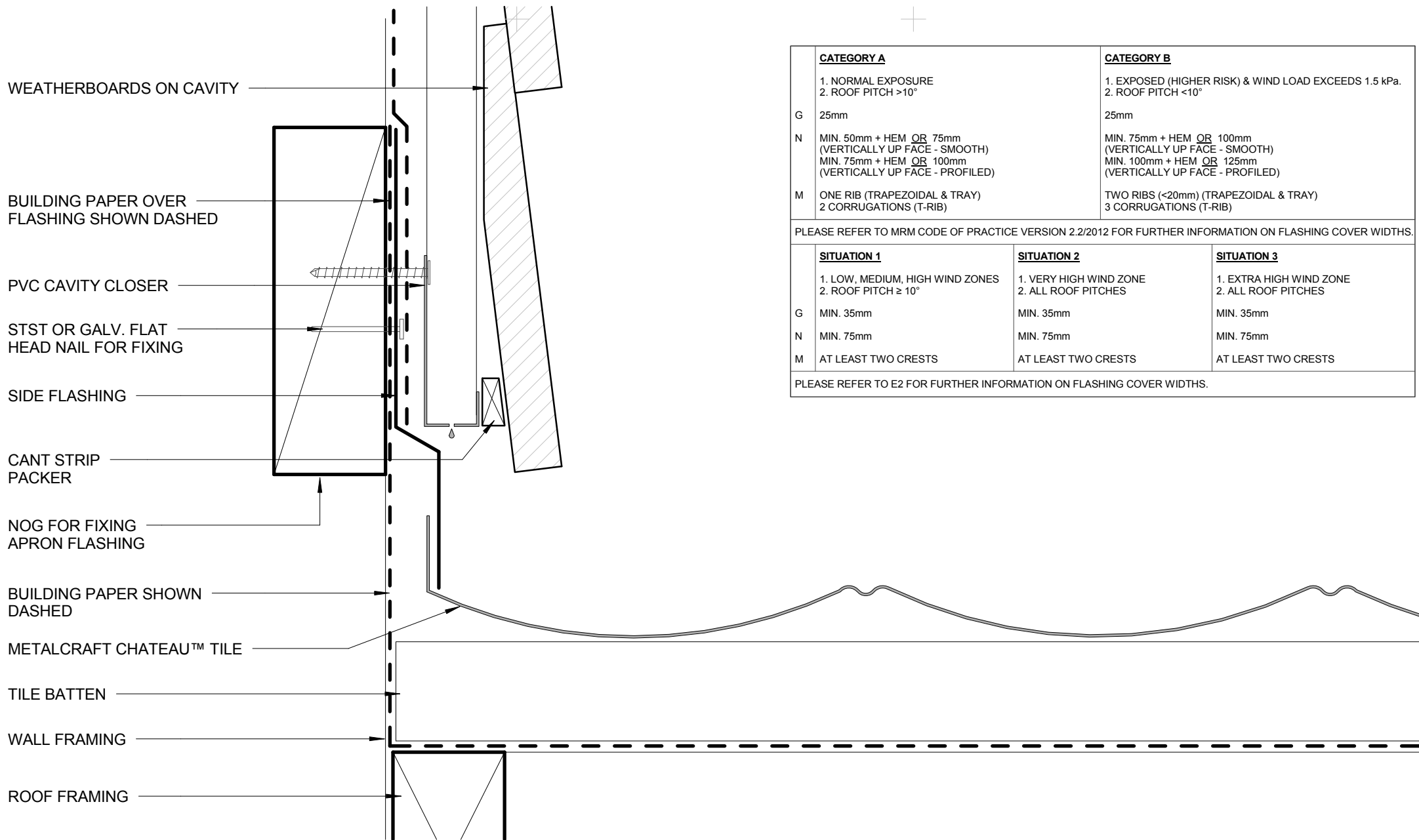
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HEAD APRON
RESIDENTIAL ROOFING

Metalcraft
Roofing



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<u>CATEGORY A</u>		<u>CATEGORY B</u>	
	1. NORMAL EXPOSURE 2. ROOF PITCH >10°	1. EXPOSED (HIGHER RISK) & WIND LOAD EXCEEDS 1.5 kPa. 2. ROOF PITCH <10°	
G	25mm	25mm	
N	MIN. 50mm + HEM <u>OR</u> 75mm (VERTICALLY UP FACE - SMOOTH) MIN. 75mm + HEM <u>OR</u> 100mm (VERTICALLY UP FACE - PROFILED)	MIN. 75mm + HEM <u>OR</u> 100mm (VERTICALLY UP FACE - SMOOTH) MIN. 100mm + HEM <u>OR</u> 125mm (VERTICALLY UP FACE - PROFILED)	
M	ONE RIB (TRAPEZOIDAL & TRAY) 2 CORRUGATIONS (T-RIB)	TWO RIBS (<20mm) (TRAPEZOIDAL & TRAY) 3 CORRUGATIONS (T-RIB)	
PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS			
<u>SITUATION 1</u>		<u>SITUATION 2</u>	<u>SITUATION 3</u>
	1. LOW, MEDIUM, HIGH WIND ZONES 2. ROOF PITCH ≥ 10°	1. VERY HIGH WIND ZONE 2. ALL ROOF PITCHES	1. EXTRA HIGH WIND ZONE 2. ALL ROOF PITCHES
G	MIN. 35mm	MIN. 35mm	MIN. 35mm
N	MIN. 75mm	MIN. 75mm	MIN. 75mm
M	AT LEAST TWO CRESTS	AT LEAST TWO CRESTS	AT LEAST TWO CRESTS
PLEASE REFER TO E2 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.			

Metalcraft
Roofing

Modena™

SIDE FLASHING
RESIDENTIAL ROOFING

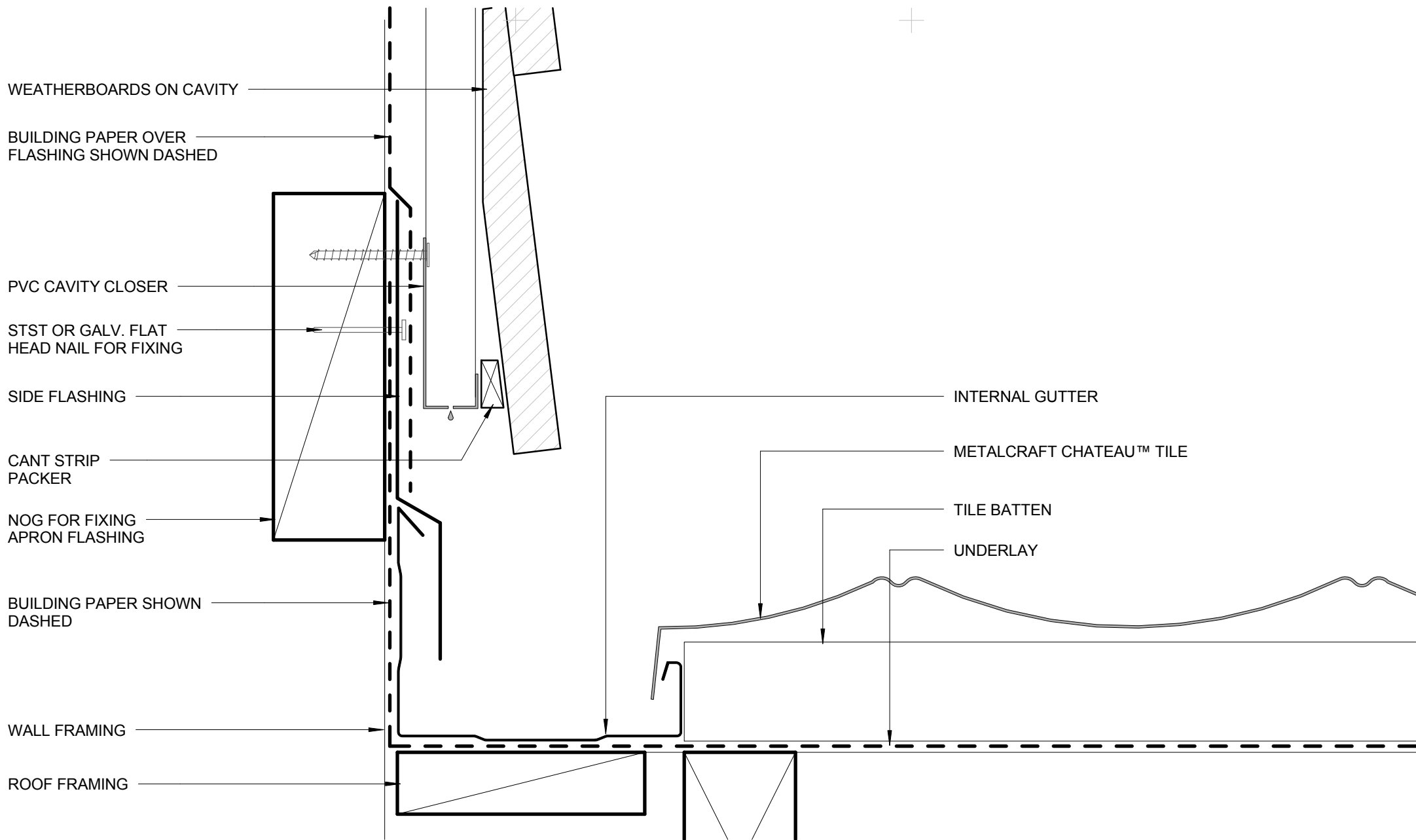
Reference RRT30

Date 2015

Scale 1 : 2

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- BUILDING PAPER IS THE COMMON GENERIC NAME FOR PERMEABLE ROOF AND WALL UNDERLAYS. PLEASE REFER TO NZBC E2/AS1 AND MRM CODE OF PRACTICE VERSION 2.2 /2012.

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SECRET GUTTER RESIDENTIAL ROOFING

Metalcraft
Roofing

Modena™

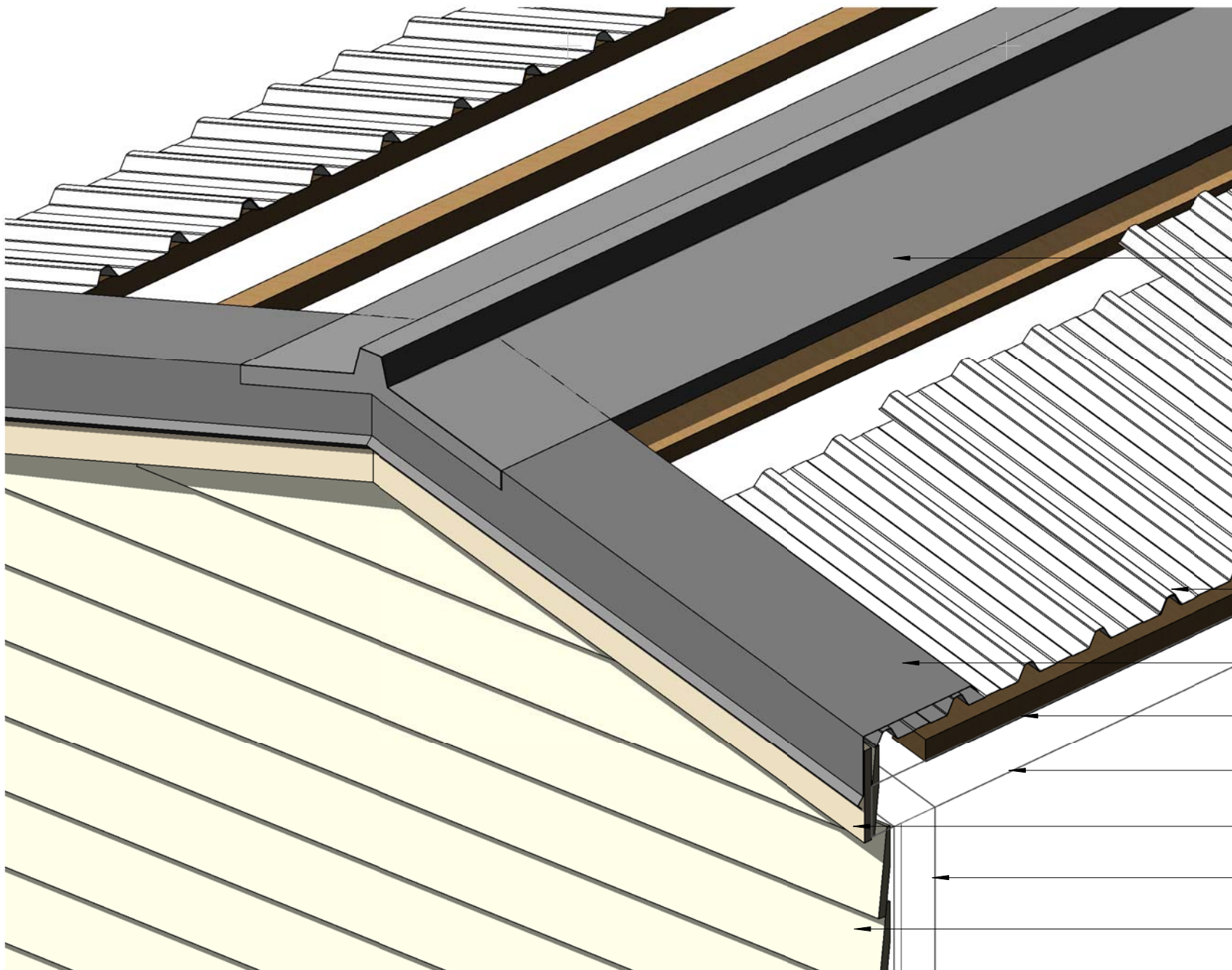
Reference RRT30

Date 2015

Scale 1 : 2

Sheet

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* PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 AND RANZ HOW TO ON-SITE GUIDE METAL ROOF FLASHINGS FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.

PRE-FINISHED RIDGE CAP FLASHING

METALCRAFT CHATEAU™ ROOFING

PRE-FINISHED BARGE FLASHING

PURLIN

ROOF FRAMING

FASCIA BOARD

WALL FRAMING

WALL CLADDING ON CAVITY

3D RIDGE TO BARGE JUCTION

RESIDENTIAL ROOFING

Metalcraft
Roofing

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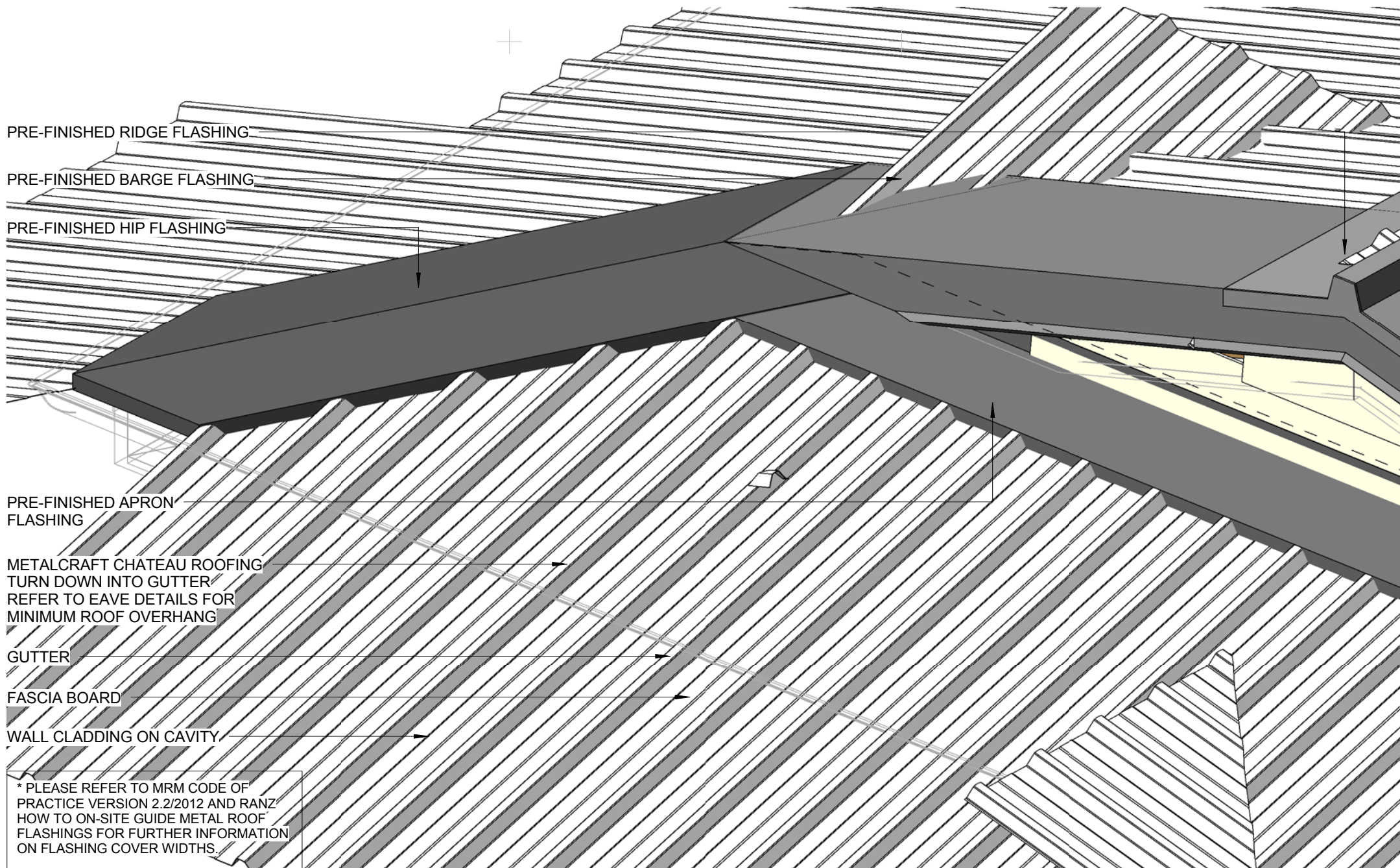
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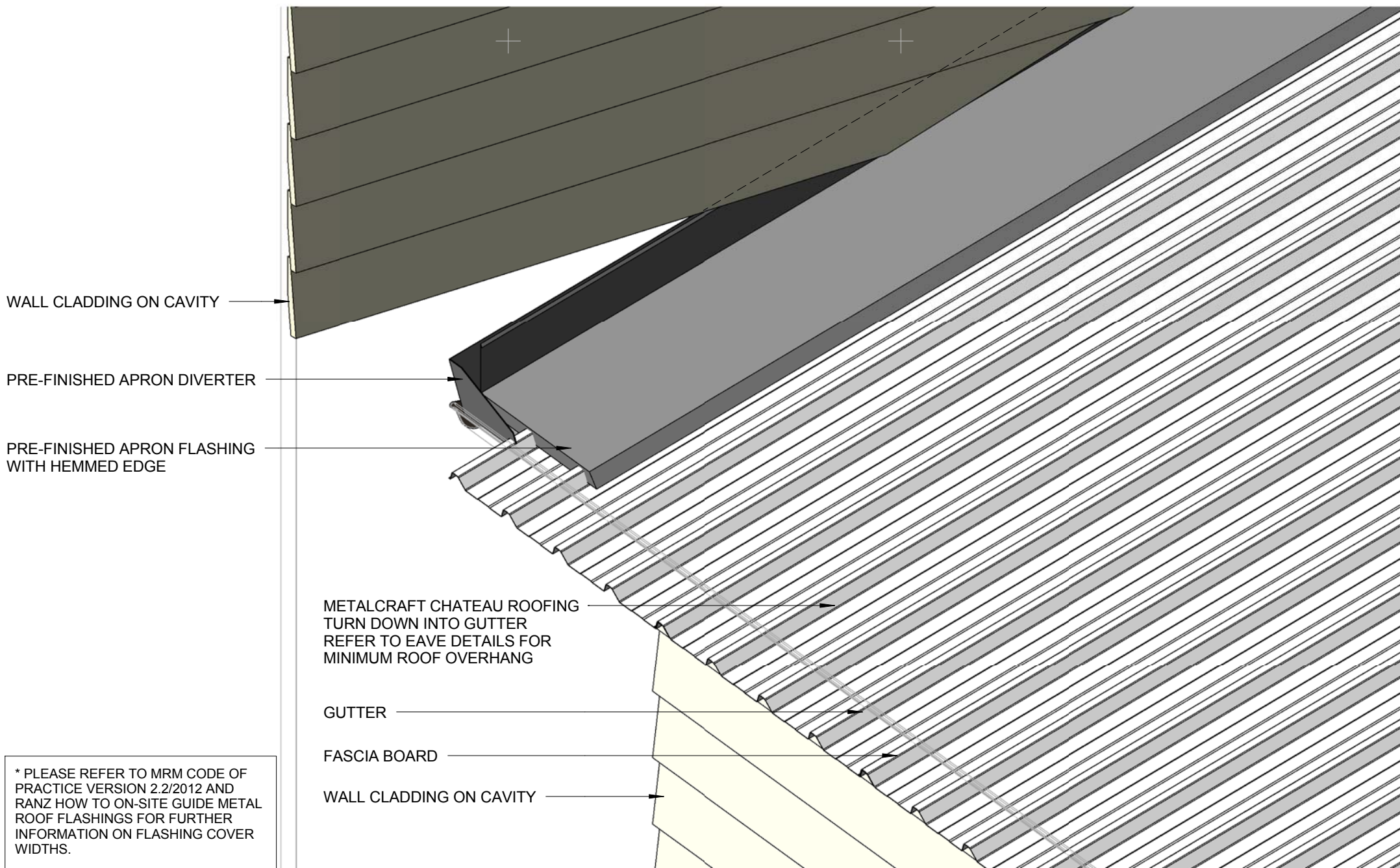
Date 2015

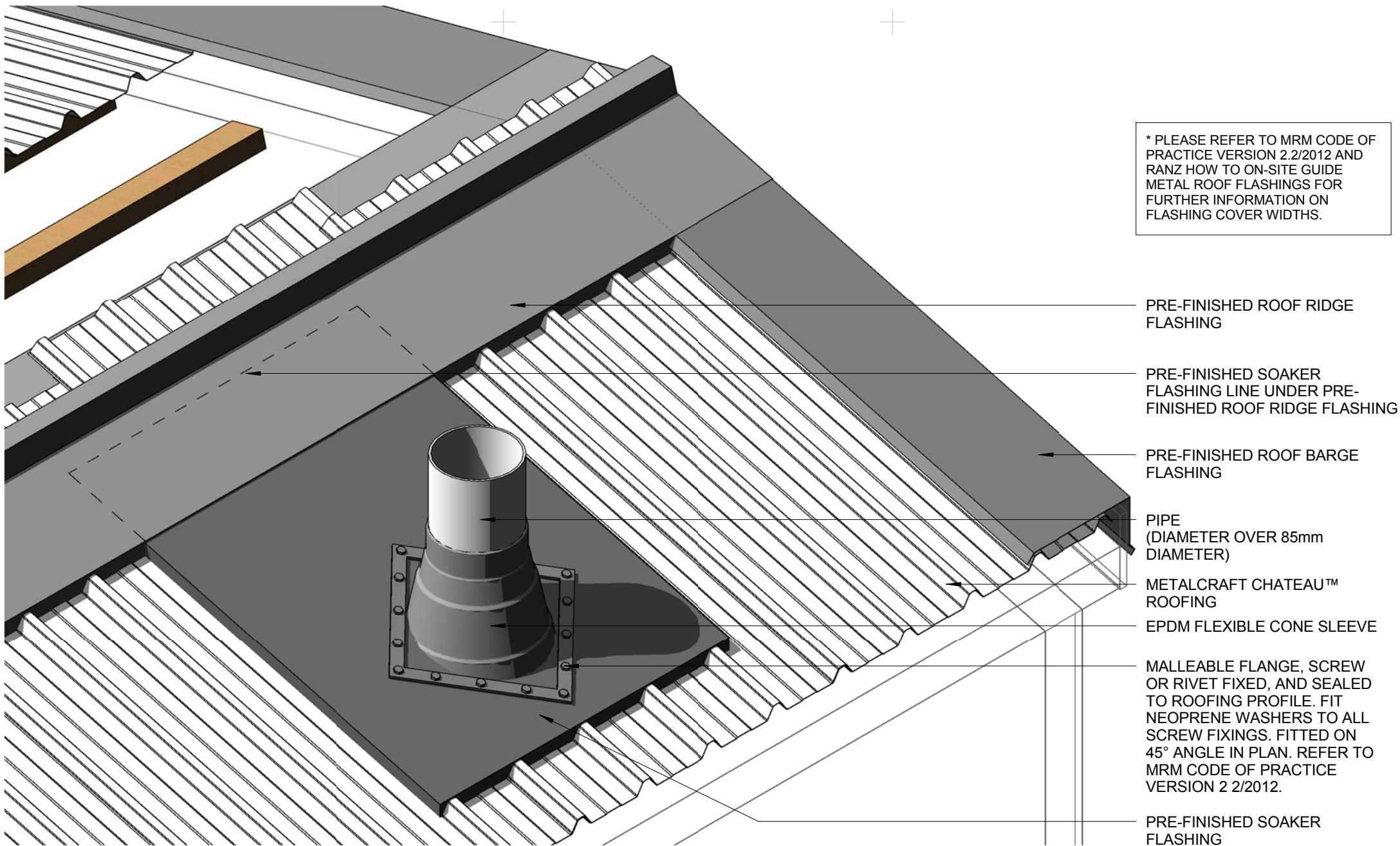
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3D OVER 85mm DIAMETER PIPE PENETRATION

RESIDENTIAL ROOFING

Metalcraft
Roofing

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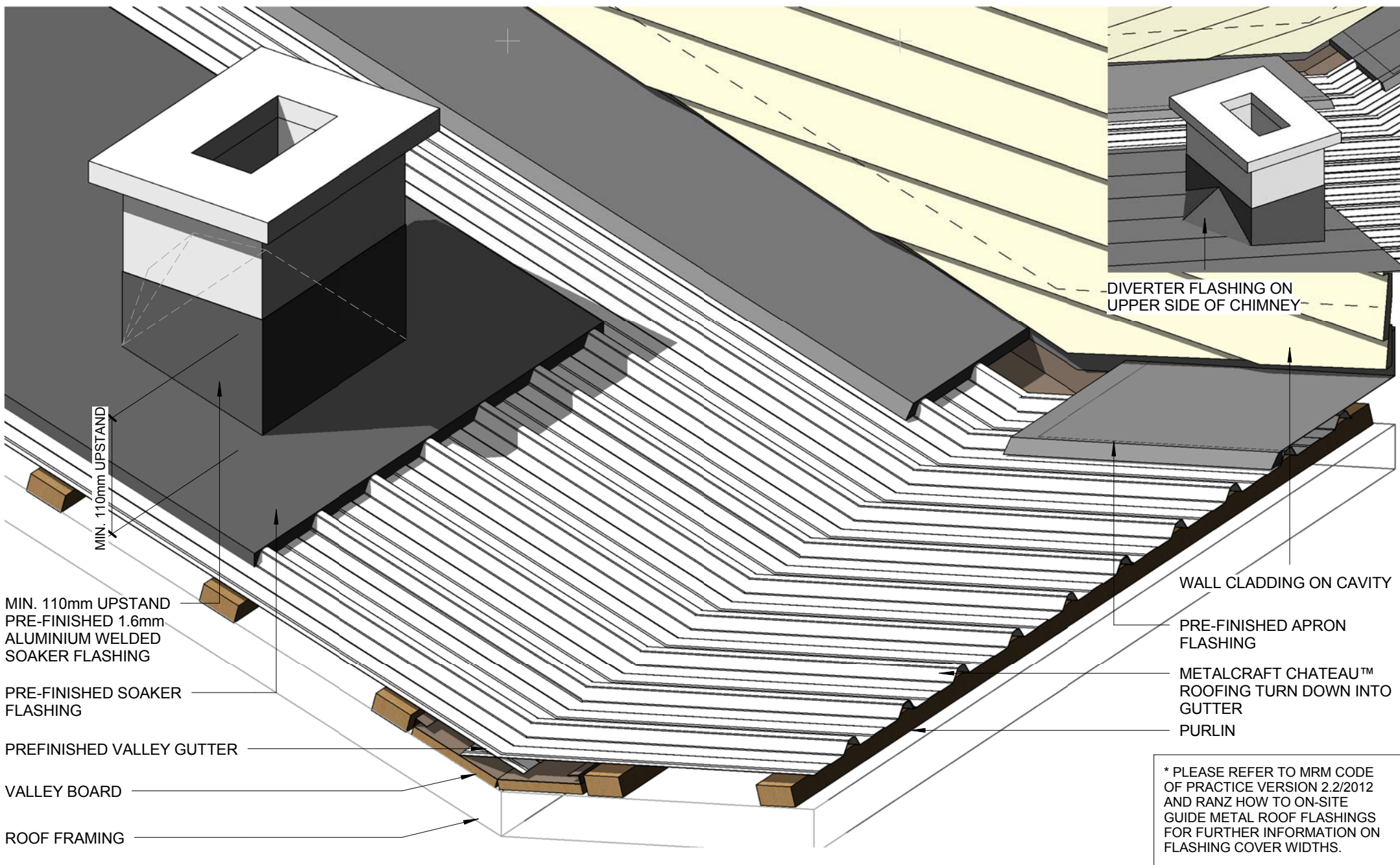
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Date 2015

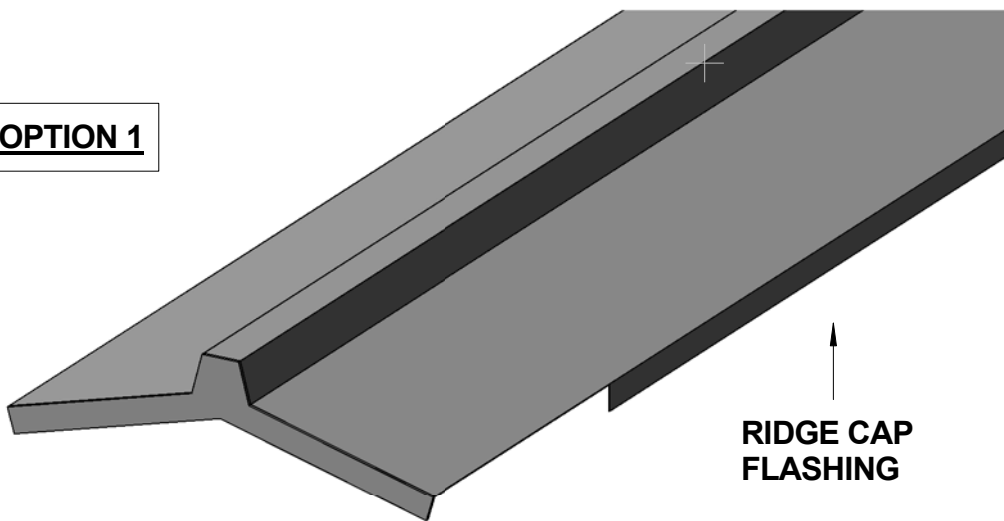
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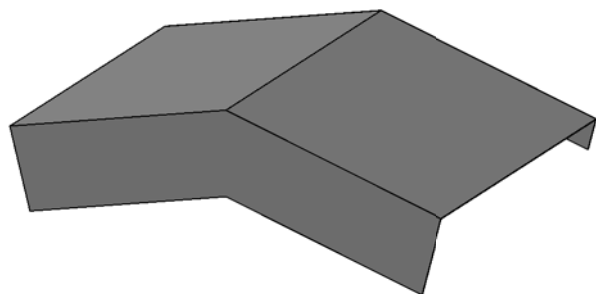
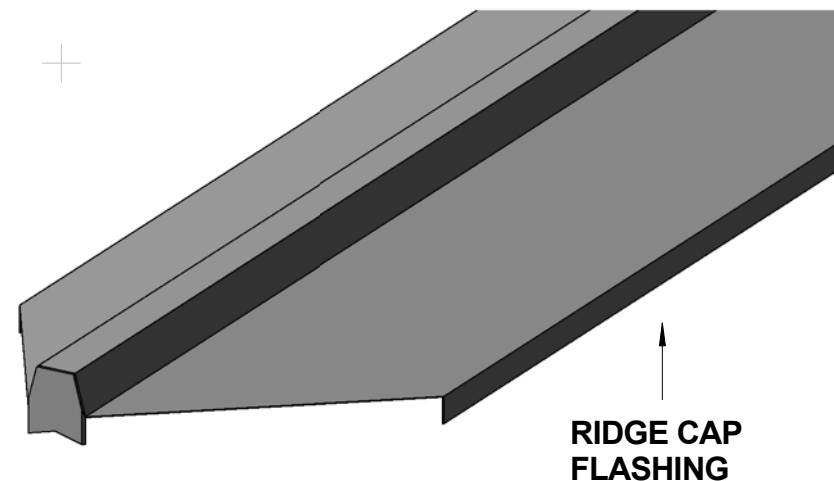
21 / 24



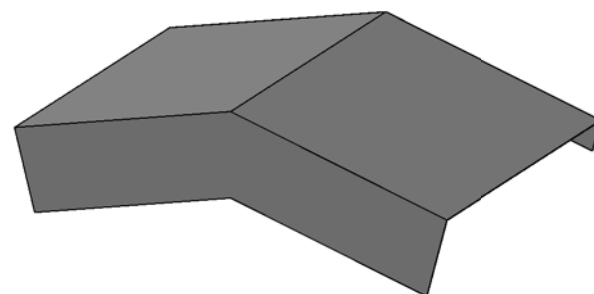
OPTION 1



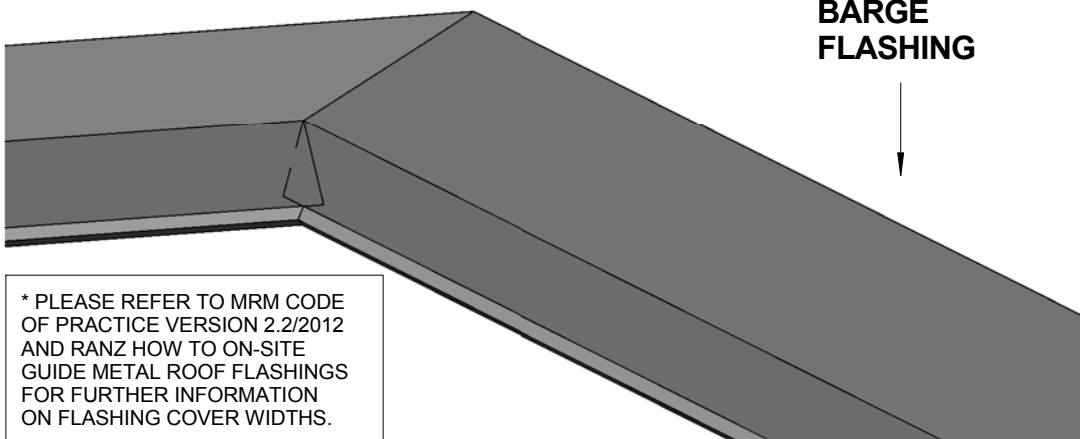
OPTION 2



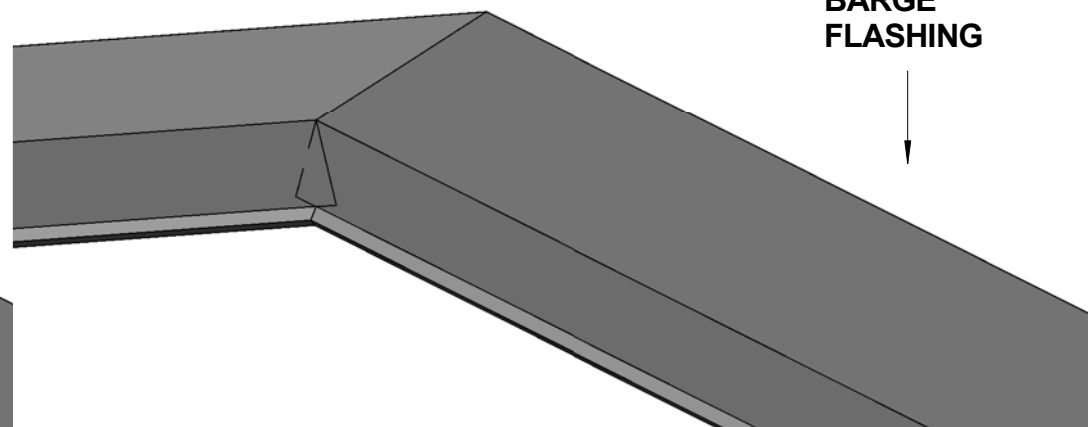
← **ADDITIONAL
SADDLE
FLASHING**



← **ADDITIONAL
SADDLE
FLASHING**



**BARGE
FLASHING**
↓



**BARGE
FLASHING**
↓

* PLEASE REFER TO MRM CODE
OF PRACTICE VERSION 2.2/2012
AND RANZ HOW TO ON-SITE
GUIDE METAL ROOF FLASHINGS
FOR FURTHER INFORMATION
ON FLASHING COVER WIDTHS.

Metalcraft
Roofing

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with underlay manufacturers recommendations and NZBC regulations.

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Reference RRT30

Date 2015

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3D RIDGE/BARGE FLASHINGS
RESIDENTIAL ROOFING

**(4) PRE-FINISHED
BARGE FLASHING**

**(3) PRE-FINISHED 3D
SADDLE FLASHING**

**(2) PRE-FINISHED
APRON FLASHING**

(1) PRE-FINISHED HIP FLASHING

* PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2/2012 AND RANZ HOW TO ON-SITE GUIDE METAL ROOF FLASHINGS FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.

3D DUTCH GABLE FLASHINGS RESIDENTIAL ROOFING

Metalcraft
Roofing

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Modena™

Reference RRT30

Date 2015

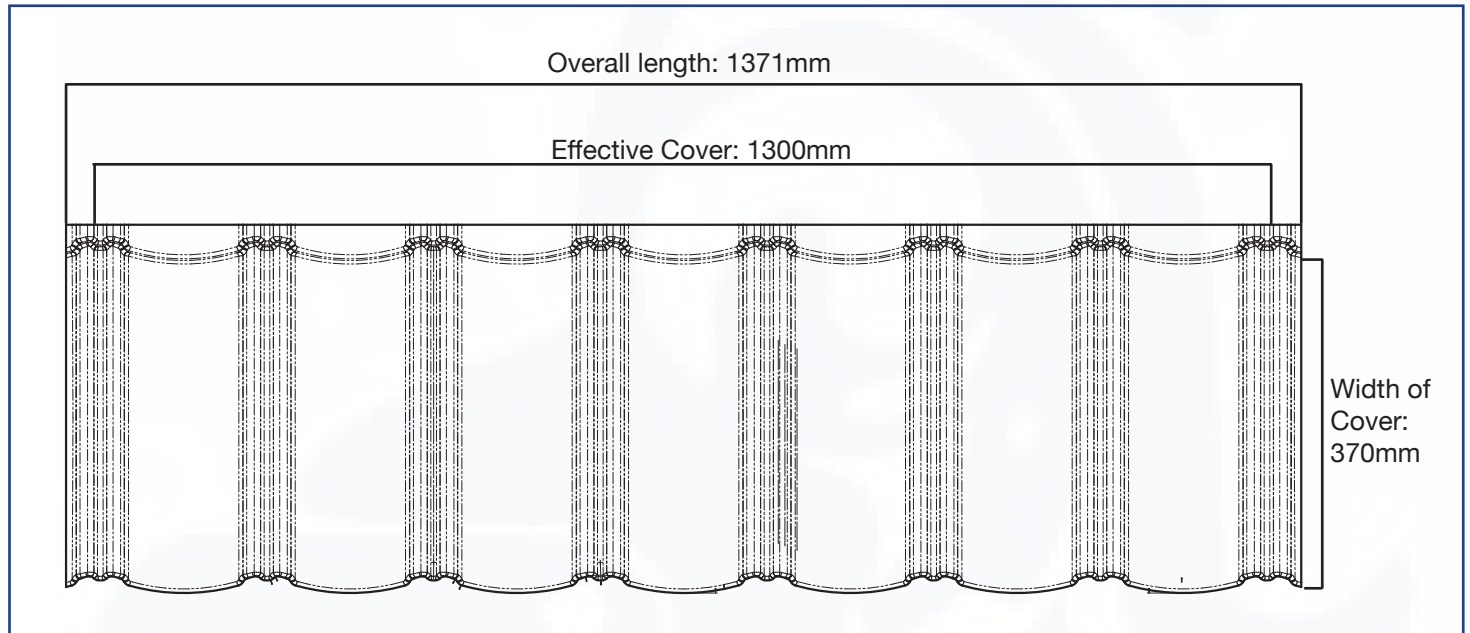
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Chateau Tile

Metalcraft Lightweight Chateau Metal Tiles provide an economical and durable roofing option. Metal Tiles provide a quality finish to any dwelling and offer a cost saving solution in comparison with heavier alternative roof tiles, as they require less reinforcing timber in the roof bracing. The Metalcraft Chateau Tile has a scalloped finish, which affords a timeless look to any style home.

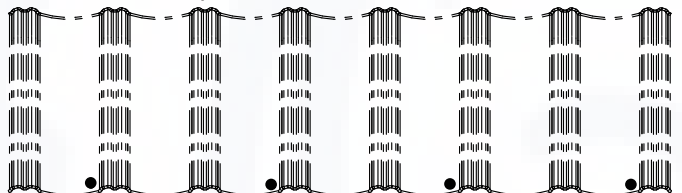


Minimum Pitch: 12.5 degrees Cover: 1300mm

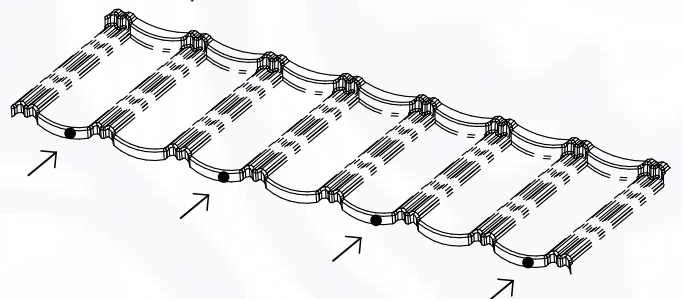


Chateau Tile Fixing Details

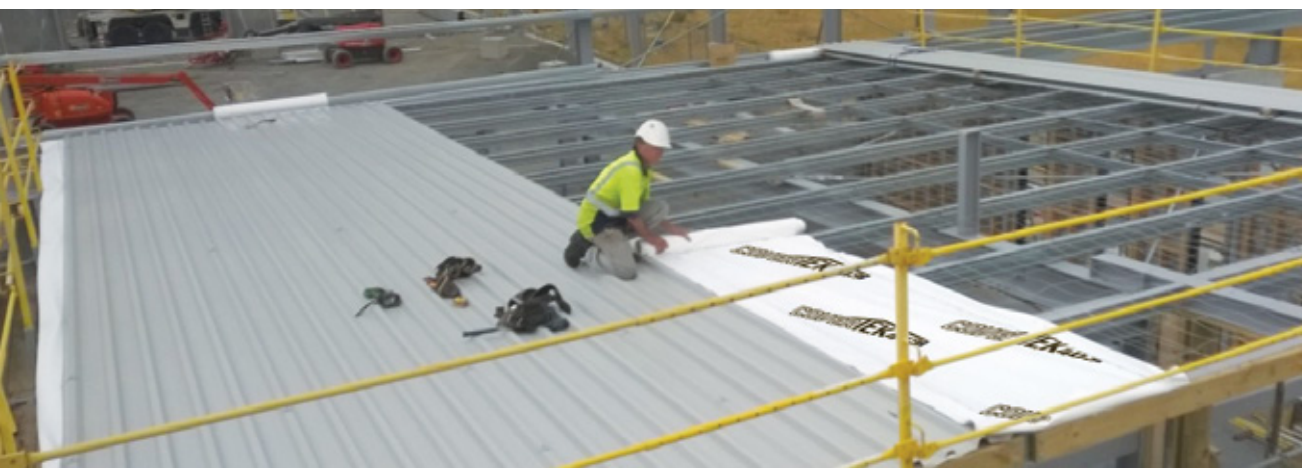
Bottom Course pattern - 50 x 2.8 coloured with washer seal



Main roof area pattern - 50 x 2.8 Black or Galv nails



- ★ Gauge: 0.39 G300
- ★ Tiles /m2: 2.1
- ★ Available in pre-painted Color Steel or Chip Coat Finish
- ★ Weight (painted): 2.1kg (chip coated): 3.0kg



SYNTHETIC ROOF & WALL UNDERLAY

For Timber and Steel framed buildings

Covertex 403 Plus is a fire retardant, absorbent and breathable synthetic roof and wall underlay, constructed using a microporous water resistant film sandwiched between two layers of spun-bonded polyolefin. Designed as a means of managing condensation, water vapour transfer and water ingress in roof and wall applications.

ADVANTAGES

Roof

- » Suitable with masonry tile roof cladding.
- » Suitable with metal tile and profiled metal roof cladding.
- » Can be used as a roof underlay on roofs of 10° pitch or greater. Requires support.
- » Will provide temporary weather protection during construction (roofs 7 days) same day coverage recommended.
- » May be installed in adverse conditions.
- » May be run to any length, including under dark coloured roofs.
- » Has a 150mm lap line printed on each edge.

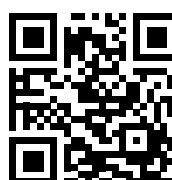
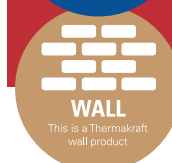
Wall

- » Can be used as a wall underlay on timber and steel framed buildings with absorbent wall and non-absorbent wall cladding direct fixed to framing.
- » Can be used as a wall underlay on timber and steel framed buildings with absorbent and non-absorbent wall cladding installed over an 18mm minimum drained cavity.
- » Is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High, when used as standalone flexible underlay, and Extra High when used as a flexible underlay over a rigid wall underlay.
- » Will provide temporary weather protection during construction. (Walls max 42 days).
- » Can be used as a non-rigid backing material for Stucco Plaster.*
- » May be used as a slip layer over rigid backing for Stucco Plaster.*

General

- » Is fire retardant*
- » Unaffected by LOSP treated timber.
- » Recyclable with no VOC's.
- » Tear resistant, light weight and strong.
- » Suitable as an air barrier in unlined walls.

* Refer technical specifications



For additional details and latest specifications www.thermakraft.co.nz or scan QR code.

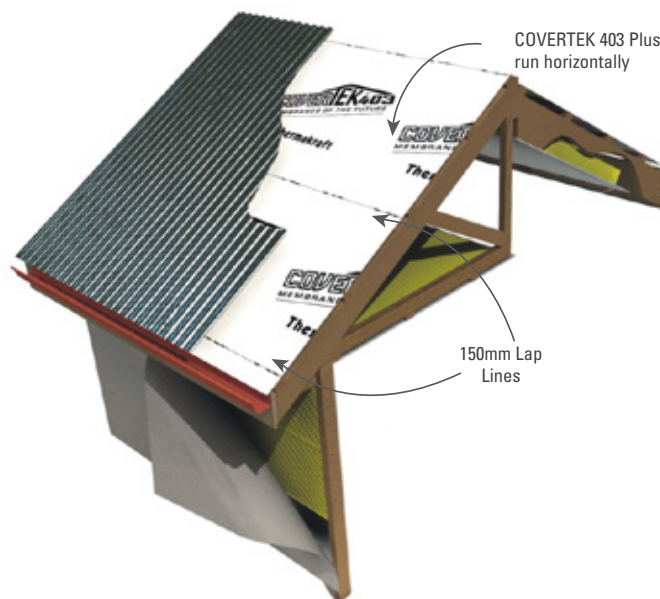
BRANZ Appraised
Appraisal No.918 [2016]

Thermakraft Roof Underlay

INSTALLATION PROCEDURES

DOMESTIC: LONG-RUN METAL ROOFING / VERTICAL OR HORIZONTAL INSTALLATION METHOD

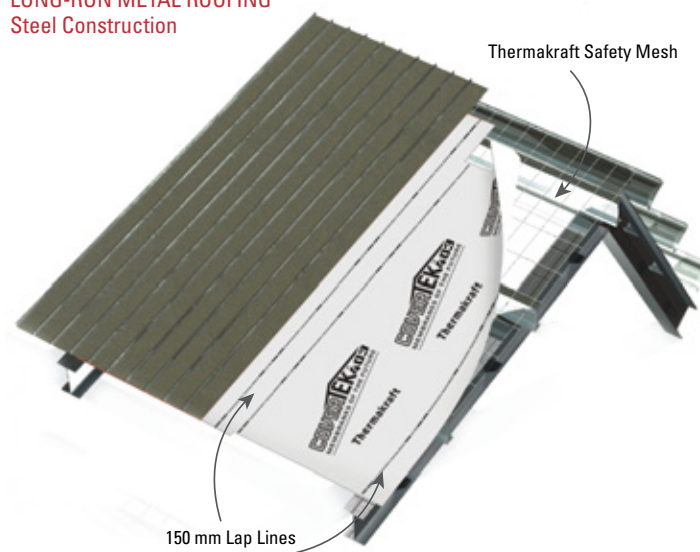
1. Covertex 403 Plus can be direct fix or cavity fix and must be installed in a manner that prevents ponding of water.
2. Covertex 403 Plus must be fully supported by Thermakraft Safety Mesh 300mm x 150mm, hexagonal netting 50mm or 75mm. Or suitable strapping, Thermastrap recommended under aluminum roofing.
3. For roof pitches below 10°, Covertex 405 or 407 recommended.
4. Must be laid firmly (tight) without creases. All laps either vertical or horizontal must be a minimum of 150mm lap.
5. Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings.



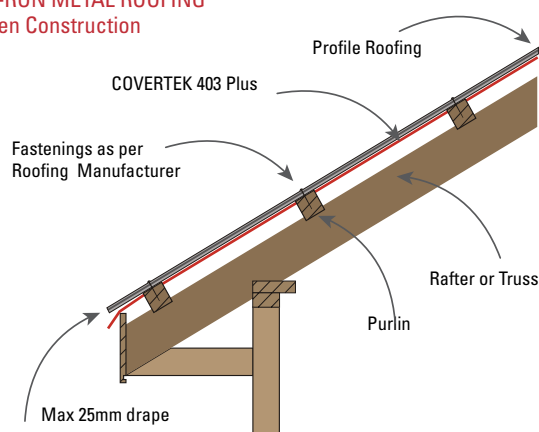
COMMERCIAL: LONG-RUN METAL ROOFING >10°

1. Covertex 403 Plus shall be installed in a manner that prevents ponding of water by full support using Thermakraft Safety Mesh 300mm x 150mm, or hexagonal netting 50mm or 75mm. Or suitable strapping, Thermastrap recommended under aluminium roofing.
2. May be installed either vertically (same direction as cladding) or horizontally shiplapped.
3. All laps either horizontally or vertically must be at a minimum of 150mm.
4. To be lapped into gutter 25mm and extended up to and over ridge.
5. May be unwound to the full length from the gutter to the ridge. However, when ridge ventilation is required must be terminated at the ridge purlin to allow a free passage of air.
6. Flue penetrations must have a minimum distance of 50mm from the underlay (refer to NZ Metal Roof and Wall Cladding Code of Practice 4.3.8).
7. Must be free of tears and punctures, fit tightly and be lap taped around all penetrations (except flue penetrations), to provide drainage for any condensation, or surface water from leaks.
NOTE: Penetrations where polybutylene water pipes have been installed. Refer Pipe Manufacturers for instructions on sealing penetrations.
8. Can be installed above the battens or purlins for profiled metal roof claddings and otherwise in accordance with NZBC E2/AS1.

LONG-RUN METAL ROOFING Steel Construction



LONG-RUN METAL ROOFING Wooden Construction



Thermakraft Wall Underlay

INSTALLATION PROCEDURES

-
- 25mm Thermakraft stud strap or Thermastrap horizontally at 300mm centers if required
- 150mm overlap at stud
- Cavity battens
- Wall framing shown as dashed lines

EXPOSURE TIME

Product	Watergate Plus 295	SteelWrap 290	Thermakraft 220	Thermakraft 213/215	Covertex 403 Plus	Covertex 407/405
Max Days exposure	60	42	42	Wall application 28 Roof application 7	Wall Application: 42 Roof application: 7	Wall Application: 14 Roof application: 7

HANDLING AND STORAGE

- » Due to the width of the sheets care should be taken when installing in windy conditions due to the large sail effect.
- » Store in clean dry conditions, not in direct sunlight.
- » Ensure rolls are not damaged.
- » There are no environmental issues associated with the use of Thermakraft underlays .

Covertex 403 Plus - Technical Specification

Fire Retardant | Breathable | Absorbent | Non Woven | Underlay

Wall: Thermakraft Covertex 403 Plus can be used as a wall underlay 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 directly fixed to timber and steel framing; and,
- » With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity;
- » With masonry veneer in accordance NZBC Acceptable Solution E2/AS1 for timber framed buildings, or to a specific design for steel framed buildings; and,
- » Situated in NZS3604 Wind Zones up to, and including 'Very High' when used as standalone flexible underlay, and
- » Extra High when used as a flexible underlay over a rigid wall underlay.
- » Can be used 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 75mm galvanized mesh, or Thermakraft Stud Strap or wire at 150mm centres run across cavity battens to limit deflection to a maximum of 5mm.
- » May also be used as a slip layer over rigid backing for Stucco Plaster in accordance with the requirements of NZBC E2/AS1 Paragraph 9.3.3.1(b).
- » Refer BRANZ Appraisal No 918 (2016) for full details.

Roof: Thermakraft Covertex 403 Plus can be used as a roof underlay 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 masonry tile roof cladding; and
- » With metal tile and profiled metal roof cladding; and,
- » Situated in NZS3604 Wind Zones up to, and including Extra High (ROOF ONLY).
- » Can be used as a Roof underlay on roofs of 10° pitch or greater. Requires support.
- » Refer BRANZ Appraisal No 917 (2016) for full details.

Flammability Index

Thermakraft Covertex 403 Plus Wall Underlay has an AS 1530 Part 2 Flammability Index of not greater than 5 and therefore meet 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.

Limitations

- » Is suitable as an air barrier in unlined wall spaces.

NZBC

Contributes to meeting the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 (a) 50 years, B2.3.1 (b) 15 years and B2.3.2), C3 Fire affecting areas beyond the fire source C3.4 (c) E2 External Moisture E2.3.2), and F2 Hazardous Building Materials F2.3.1, providing:

- » It is not damaged.
- » Is installed in accordance with instructions.
- » Is not left exposed for more than 42 days (wall), 7 days (roof), same day coverage recommended.
- » Is installed by or under guidance of Licensed Building Practitioners.
- » Is compatible with cladding system used.

Table 1: NZBC E2/AS1 (NZS2295) wall and roof underlay requirements

NZBC E2/AS1 TABLE 23 (NZS2295) WALL UNDERLAY PROPERTIES	PROPERTY PERFORMANCE REQUIREMENTS	PROPERTY PERFORMANCE
Absorbency	≥ 150gsm	Pass
Vapour Resistance	≤ 7 MN.s/g	Pass
pH of Extract	≥ 5.5 and ≤ 8	Pass
Shrinkage	≤ 0.5%	Pass
Water Resistance	≥ 100mm	Pass
Air Resistance	≥ 0.1 MN.s/m ³	403 Plus can be used as an air barrier

Roll Dimensions

WIDTH (MM)	LENGTH (M)	M ²
1350	18.6	25
1350	37.0	50
1350	55	75

Made to length also available.

M² is the roll size for actual coverage, allow for laps and joins.

Control of Condensation

In climatic regions where condensation risks are high, such as cold or high humidity areas, care needs to be taken in specifying the correct design and installation to prevent moisture build-up in the roof cavities.

Factors which adversely affect the condensation risk in roofing systems include;

- » Humid, and/or cold climatic regions.
- » Warm/Skillion roof construction.
- » Low roof cavity air volume and restricted air movement.
- » Omitting Vapour Control Layers.
- » Ceiling penetrations and entry of warm air into roof cavities.
- » Occupancy activities which have high moisture loading on conditioned spaces.
- » Low pitched roof.
- » Bulk insulation.
- » Building structures ability to naturally dry construction moisture.

Skillion and Warm Roof Construction are particularly sensitive to moisture accumulation and the design and installation of roof construction needs to take into account the higher condensation risks. Refer MRM Code of Practice for details.



For additional details and latest specifications www.thermakraft.co.nz



Thermakraft Ltd 11 Turin Place, East Tamaki, Auckland, New Zealand
P.O.Box 58-112, Botany, Auckland 2163 **Phone** 0800 806 595 or +64 9 273 3727
Fax +64 9 273 3726 **Email** info@thermakraft.co.nz **www.thermakraft.co.nz**

INTELLIGENT MEMBRANES FOR THE BUILDING INDUSTRY

The recommendations contained in Thermakraft's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Thermakraft (for example quality of workmanship and design), Thermakraft shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards. Literature subject to change without notification. Latest documentation can be found on the website.

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Thermakraft Covertex 403 Plus Roof Underlay



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Product Description

Thermakraft Covertex 403 Plus Roof Underlay is a synthetic, fire retardant, absorbent, breathable building underlay for use under roof claddings. The product consists of a micro-porous water resistant film ultrasonically bonded between two layers of non woven spun-bonded polyolefin. Thermakraft Covertex 403 Plus Roof Underlay is coloured white on the top and bottom faces.

Product purpose and use

Thermakraft Covertex 403 Plus Roof Underlay has been assessed for use as a 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 either
 - masonry tile roof cladding; or,
 - with metal tile roof cladding or
 - profiled metal roof cladding; and,
- situated in NZS 3604-2011 Wind Zones up to, and including Extra High.

Thermakraft Covertex 403 Plus Roof Underlay 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 used with Thermakraft Covertex 403 Plus 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.
- Roof underlay support - polypropylene strap, or minimum 0.9 mm diameter galvanised steel wire mesh where required to support the roof underlay in accordance with NZBC Acceptable Solution E2/AS1, (Amendment 7, 1 January 2017), Paragraph 8.1.5.1. (Note: The mesh must be galvanised in accordance with AS/NZS 4534-2006.).

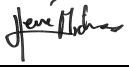
Certificate holder

Thermakraft Limited

11 Turin Place, East Tamaki Auckland, New Zealand

Tel: +64 9 2733727

www.thermakraft.co.nz

CodeMark Certification Body		29/9/2016	21/6/2017	29/9/2019	GM-CM30069-RevB
Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia Tel: +61 (0)2 9886 0222 www.Global-Mark.com.au	Herve Michoux Managing Director	Date of issue	Last update	Date of next re-certification	Certificate Number

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice 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 403 Plus Roof Underlay

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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. Thermakraft Covertex 403 Plus Roof Underlay meets these requirements.
- **Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:** Performance C3.4 (c) Thermakraft Covertex 403 Plus Roof Underlay meets this requirement.
- **Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the roof cladding system, Thermakraft Covertex 403 Plus Roof Underlay will contribute to meeting this requirement.
- **Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Thermakraft Covertex 403 Plus Roof Underlay meets this requirement and will not present a health hazard to people.

Subject to the following conditions and limitations:

1. Certificate holder will notify Global-Mark Pty Ltd in accordance with Regulation 15 of the Building (Product Certification) Regulations 2008.
2. Maintaining the validity of BRANZ Appraisal No. 917 (2016) Thermakraft Covertex 403 Plus Roof Underlay (refer to www.branz.co.nz).

Design and Installation Conditions:

1. General

Table 1: NZBC E2/AS1 (Amendment 7, 1 January 2017) Table 23 Requirements

Roof Underlay Properties	Property Performance Requirement	Results
Absorbency	$\geq 150 \text{ g/m}^2$	Pass
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 100 \text{ mm}$	Pass
pH of Extract	≥ 5.5 and ≤ 8	Pass
Shrinkage	$\leq 0.5\%$	Pass

Table 2: Mechanical Properties (Average)

Roof Underlay Properties	Machine direction	Cross direction
Edge tear	217 N	104N
Tensile strength	4.57 kN/m	2.63 kN/m



CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Thermakraft Covertex 403 Plus Roof Underlay

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Thermakraft Covertex 403 Plus 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.

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.

Thermakraft Covertex 403 Plus Roof Underlay must not be exposed to the weather or ultra violet light for a total of more than 7 days before being covered by the roof cladding.

Thermakraft Covertex 403 Plus Roof Underlay 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 and Table 2 for the material properties of Thermakraft Covertex 403 Plus Roof Underlay.

Thermakraft Covertex 403 Plus Roof Underlay is suitable for use at roof pitches 10° and above. At pitches 10° and above, Thermakraft Covertex 403 Plus Roof Underlay if supported by a corrosion resistant material can be installed vertically or horizontally and must span no greater than 300 mm in one direction. *(Note: For roof pitches less than 10°, Thermakraft recommends the use of Covertex 407 Roof Underlay.)*

2. 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.

3. Structure

Thermakraft Covertex 403 Plus Roof Underlay is suitable for use in all Wind Zones of NZS 3604-2011 up to, and including, Extra High.

4. Durability

Thermakraft Covertex 403 Plus 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.

5. 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, Thermakraft Covertex 403 Plus Roof Underlay is expected to have a serviceable life equal to that of the roof cladding.

6. Control of Internal Fire and Smoke Spread

Thermakraft Covertex 403 Plus Roof Underlay 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.

7. Prevention of Fire Occurring

Separation or protection must be provided to Thermakraft Covertex 403 Plus Roof Underlay 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) provide methods for separation and protection of combustible materials from heat sources.



CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Thermakraft Covertex 403 Plus Roof Underlay

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8. External Moisture

Thermakraft Covertex 403 Plus 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 (Amendment 7, 1 January 2017).

Thermakraft Covertex 403 Plus Roof Underlay, when installed in accordance with Thermakraft Covertex 403 Plus Synthetic Roof & Wall Underlay (J2902-04/16), will assist in the total cladding system's compliance with NZBC Clause E2 (Amendment 7, 1 January 2017).

9. Underlay Installation

Thermakraft Covertex 403 Plus 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.

Thermakraft Covertex 403 Plus Roof Underlay may be run vertically or horizontally at roof pitches greater than 10°. It 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, Thermakraft Covertex 403 Plus Roof Underlay 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 Thermakraft Covertex 403 Plus 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.

10. 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 Thermakraft Covertex 403 Plus Synthetic Roof & Wall Underlay (J2902-04/16) and the BRANZ Appraisal No. 917 (2016) Thermakraft Covertex 403 Plus Absorbent Breathable Roof Underlay (refer to www.branz.co.nz).

End of record

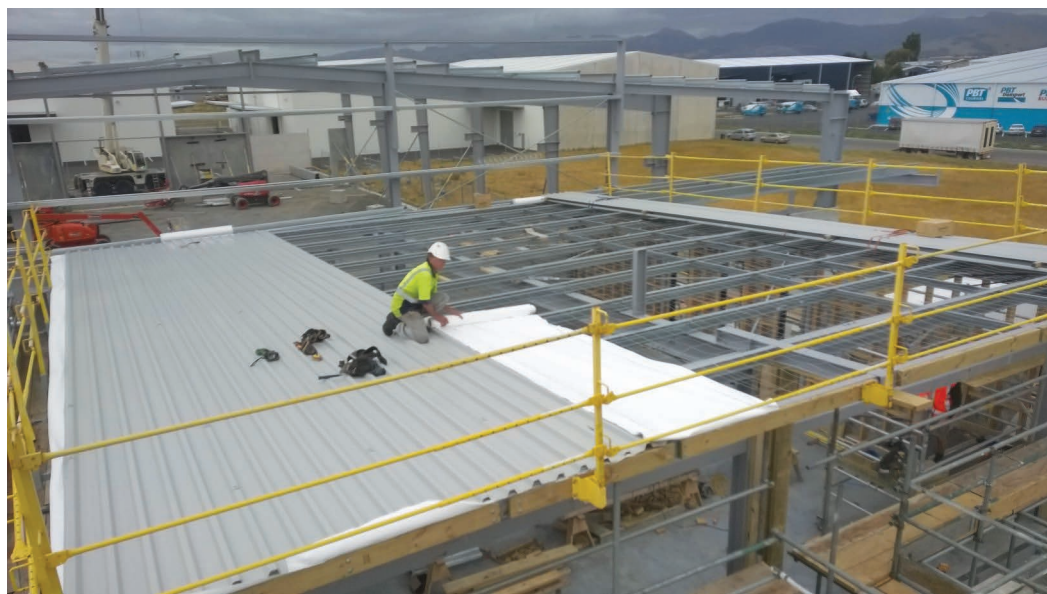


BRANZ Appraised
Appraisal No. 917 [2016]

THERMAKRAFT COVERTEK 403 PLUS ROOF UNDERLAY

Appraisal No. 917 [2016]

Amended 23 February 2017



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Thermakraft Limited

PO Box 58 112
Greenmount
Auckland

Tel: 09 273 3727

Fax: 09 273 3726

Free phone: 0800 806 595

www.thermakraft.co.nz



BRANZ

BRANZ

1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz



Product

- 1.1 Thermakraft Covertek 403 Plus Roof Underlay is a fire retardant synthetic building underlay for use under roof claddings. 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

- 2.1 Thermakraft Covertek 403 Plus Roof Underlay has been appraised for use as a 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 roof cladding; and,
 - with 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, Thermakraft Covertek 403 Plus 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. Thermakraft Covertek 403 Plus Roof 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 Covertek 403 Plus Roof Underlay meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the roof cladding system, Thermakraft Covertek 403 Plus Roof Underlay will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Thermakraft Covertek 403 Plus Roof Underlay meets this requirement and will not present a health hazard to people.

Technical Specification

- 4.1 Thermakraft Covertek 403 Plus Roof Underlay is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water resistant film ultrasonically bonded between two layers of non-woven spun-bonded polyolefin. Thermakraft Covertek 403 Plus Roof 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 Covertek 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 Covertek 403 Plus 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.
 - **Roof underlay support** - polypropylene strap, or minimum 0.9 mm diameter galvanised steel wire mesh where required to support the roof underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 8.1.5.1. *[Note: The mesh must be galvanised in accordance with AS/NZS 4534.]*

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 403 Plus 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

General

- 7.1 Thermakraft Covertek 403 Plus Roof Underlay is suitable for use at roof pitches 10° and above and must be fully supported with a corrosion resistant roof underlay support. At pitches 10° and above Thermakraft Covertek 403 Plus Roof Underlay can be installed vertically or horizontally and must span no greater than 300 mm in one direction. *[Note: For roof pitches less than 10°, Thermakraft Limited recommends the use of Covertek 407 Roof Underlay, refer to BRANZ Appraisal No. 651 [2009].]*
- 7.2 Thermakraft Covertek 403 Plus 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 403 Plus Roof Underlay must not be exposed to the weather or ultra violet light for a total of more than 7 days before being covered by the roof cladding.
- 7.5 Thermakraft Covertek 403 Plus 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 403 Plus Roof Underlay.

Table 1: NZBC E2/AS1, Table 23 Requirements

NZBC E2/AS1, Table 23 Roof Underlay Properties	Property Performance Requirement	Results
Absorbency	$\geq 150 \text{ g/m}^2$	Pass
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 100 \text{ mm}$	Pass
pH of Extract	≥ 5.5 and ≤ 8	Pass
Shrinkage	$\leq 0.5\%$	Pass
Mechanical	Edge tear and tensile strength	Edge tear [Average]: Machine direction = 217 N Cross direction = 104 N Tensile strength [Average]: Machine direction = 4.57 kN/m Cross direction = 2.63 kN/m

Structure

- 8.1 Thermakraft Covertek 403 Plus Roof Underlay is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High.

Durability

- 9.1 Thermakraft Covertek 403 Plus 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 403 Plus 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 403 Plus 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 403 Plus 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 403 Plus 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 403 Plus 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 403 Plus Roof 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 Covertek 403 Plus 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 underlay must be pulled taut over the framing before fixing.
- 14.2 Thermakraft Covertek 403 Plus Roof Underlay may be run vertically or horizontally at roof pitches 10° and above. It 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, Thermakraft Covertek 403 Plus Roof Underlay has a 150 mm lap line printed continuously along the top face.
- 14.3 When fixing the product in windy conditions, care must be taken due to the large sail area created.
- 14.4 Any damaged areas of Thermakraft Covertek 403 Plus 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

- 14.5 The Technical Literature must be referred to during the inspection of Thermakraft Covertek 403 Plus 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 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 Covertek 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 Covertek 403 Plus 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 403 Roof Underlay in direct contact with metal roof cladding has been completed by BRANZ.
- 16.3 The practicability of installation of Thermakraft Covertek 403 Plus 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 403 Plus 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.
- AS/NZS 4534:2006 Zinc and zinc/aluminium-alloy coatings on steel wire.
- 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.



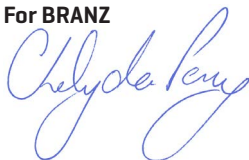
In the opinion of BRANZ, **Thermakraft Covertek 403 Plus Roof Underlay** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

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



Chelydra Percy

Chief Executive

Date of Issue:

14 June 2016



BRANZ Appraised

Appraisal No. 719 [2011]

TRADE-SEAL PIPE AND SERVICES PENETRATION SEAL

Appraisal No. 719 [2011]

Amended 16 June 2014



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Marshall Innovations Limited

PO Box 9411
Greerton
Tauranga
Tel: 07 543 0948
Fax: 07 541 1029
Web: www.mwnz.com



BRANZ

1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz



Product

- 1.1 TRADE-SEAL is a wall cladding pipe and service penetration seal consisting of an elastic EPDM sleeve fitted with a self adhesive flange.

Scope

- 2.1 TRADE-SEAL has been appraised for use as a pipe and service penetration seal for use where the pipes and service penetration penetrates the wall underlay on timber framed buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - with BRANZ Appraised flexible and rigid wall underlays; and,
 - situated in NZS 3604 Wind Zones up to, and including Extra High.
- 2.2 TRADE-SEAL has been appraised for use as a pipe and service penetration seal for use where the pipes and service penetration penetrates the wall underlay on steel framed buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, with regards to building height and floor plan area; and,
 - with BRANZ Appraised flexible and rigid wall underlays; and,
 - situated in NZS 3604 Wind Zones up to, and including Extra High.
- 2.3 TRADE-SEAL 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 TRADE-SEAL into their design in accordance with the declared properties and the instructions of Marshall Innovations Limited.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, TRADE-SEAL, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. The TRADE-SEAL meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the wall cladding system, TRADE-SEAL will contribute to meeting this requirement. See Paragraphs 7.1 - 7.4 and 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The TRADE-SEAL meets this requirement and will not present a health hazard to people.

- 3.2 This is an Appraisal of an **Alternative Solution** in terms of NZBC compliance.

Technical Specification

- 4.1 TRADE-SEAL is an EPDM sleeve bonded to a carrier material of spun-bonded high density polyethylene film 150 micron thick. The carrier material is backed with a self adhesive layer. The TRADE-SEAL is available with various diameter EPDM sleeve sizes to accommodate different size wall penetrations.

Handling and Storage

- 5.1 TRADE-SEAL must be protected from damage and weather. It must be stored under cover in clean, dry conditions away from direct exposure to sunlight, heat or flame. TRADE-SEALS should not be removed from the packaging until they are ready to use.
- 5.2 Handling and storage of the TRADE-SEAL, whether on-site or off-site, is the responsibility of the installer.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for TRADE-SEAL. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the scope of this Appraisal and the Technical Literature must be followed.

Design Information

General

- 7.1 TRADE-SEAL when used with BRANZ Appraised flexible and rigid wall underlays provides an Alternative Solution to the pipes and services penetrations specified in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.3 and Figure 68.
- 7.2 TRADE-SEAL is primarily designed to prevent moisture ingress at pipes and services penetrations through walls.
- 7.3 The performance of TRADE-SEAL is reliant on it being the correct size for the pipe or service penetration and being fully adhered to the flexible or rigid wall underlay. TRADE SEAL must be protected from UV light when installed.
- 7.4 TRADE-SEAL can be applied to either side of the flexible or rigid wall underlay to provide a seal for pipes and services penetrations.
- 7.5 Where a proprietary cladding system is used, all flashing details must be carried out in accordance with the specifications of the system. Flashing details which are outside the scope of the cladding system are the responsibility of the designer for compliance with the NZBC.

Durability

- 8.1 Assessment of durability to meet the NZBC is based on the difficulty of access and replacement, and the ability to detect failure of the TRADE-SEAL during both normal use and maintenance of the building.

Serviceable Life

- 8.2 Provided the selected flexible and rigid wall underlay is not exposed to the weather or ultra-violet light for longer than stated in the relevant Appraisal, [a maximum of 90 days applies to the TRADE-SEAL] and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, TRADE-SEAL is expected to have a serviceable life equal to that of the cladding.

Maintenance

- 9.1 No maintenance is required for TRADE-SEAL, however regular checks must be made of the cladding system to ensure it is sound and will not allow moisture penetration.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to TRADE-SEAL 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

- 11.1 TRADE-SEAL provides suitable flashing and sealing around pipe and service penetrations when used in conjunction with BRANZ Appraised wall underlays and will contribute to the wall cladding meeting code compliance with NZBC Clause E2.3.2.

Installation Information

Installation Skill Level Requirements

- 12.1 Installation of the product supplied by Marshall Innovations Limited must be completed by competent trades people in accordance with the Technical Literature and this Appraisal.

General

- 13.1 The appropriate diameter TRADE-SEAL must be used. There must be a tight fit around the pipe or service penetration, but TRADE-SEAL should not be forced over the pipe or service penetration.
- 13.2 The flexible and rigid wall underlays to receive the TRADE-SEAL must be clean and dry. TRADE-SEAL must be rotated a quarter turn so the point of the TRADE-SEAL flange is upwards before adhering it to the substrate. This will assist moisture run off. The flange is smoothed over to ensure a good bond to the flexible or rigid wall underlay.
- 13.3 The TRADE-SEAL collar extension can be trimmed to ensure the best fit to the penetration after application.
- 13.4 When the TRADE-SEAL is used in a retrofit installation, the collar extension is pushed through from the inside.

Health and Safety

- 14.1 Safe use and handling procedures for TRADE-SEAL is provided in the Technical Literature.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

- 15.1 Adhesion testing after various forms of accelerated aging has confirmed the adhesion of TRADE-SEAL to a range of flexible and rigid wall underlays. The results have been reviewed by BRANZ experts and found to be satisfactory.

Other Investigations

- 16.1 Assessment of the composition of the materials used to make TRADE-SEAL has been completed and a durability opinion has been provided by BRANZ experts.
- 16.2 The practicability of installation was assessed by BRANZ and found to be satisfactory.
- 16.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

Quality

- 17.1 The manufacture of TRADE-SEAL has not been examined by BRANZ but details of the quality and composition of the materials used were obtained and found to be satisfactory.
- 17.2 The quality of supply to the market is the responsibility of Marshall Waterproofing NZ /AUS Ltd.
- 17.3 The quality of installation on site is the responsibility of the installer.
- 17.4 Designers are responsible for the building design, and building contractors are responsible for the quality of the installation of the framing system, the wall underlay and cladding system.
- 17.5 Building owners are responsible for the maintenance of the cladding system over the TRADE-SEAL.

Sources of Information

- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 (including Amendment 6, 14 February 2014).
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 15 April 2013.

This Appraisal has been amended to update Appraisal Holder details.

Amendment No. 2, dated 30 October 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. 3, dated 16 June 2014.

This Appraisal has been amended to update installation options.



In the opinion of BRANZ, **TRADE-SEAL** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Marshall Innovations Limited**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Marshall Innovations Limited:**
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Marshall Innovations Limited**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Marshall Innovations Limited** or any third party.

For BRANZ



Pieter Burghout

Chief Executive

Date of Issue:

23 December 2011



PRODUCT WARRANTY TRADE-SEAL

Marshall Innovations Limited (**Marshalls**) warrants, subject to the conditions set out below, that Trade-Seal pipe and services penetration seal will:

- Be free from defects due to defective workmanship or materials; and
- Meet the specifications in the Trade-Seal BRANZ appraisal No. 719 for a period of 15 years from the date of purchase.

Conditions of Warranty

This product warranty will be void and inapplicable if:

1. The product is not installed, used and maintained in a residential home or building designed and constructed to meet the New Zealand Building Code.
2. The product is not installed, used and maintained in accordance with installation, use and maintenance information contained in:
 - the Trade-Seal Product Specification published on Marshalls' website (mwnz.com); and
 - BRANZ appraisal No. 719 published on Marshalls' website (mwnz.com).
3. The person claiming for breach of warranty (**claimant**) does not make a written claim:
 - if the defect was reasonably apparent prior to installation, prior to installation; or
 - if the defect was not reasonably apparent prior to installation, within 30 days after the defect became, or should have become, reasonably apparent.
4. The claimant does not provide proof of purchase and such details of installation (including date of installation and name of installer) as reasonably required by Marshalls.

Limitation of liability

The claimant's sole remedy for breach of this product warranty is, at Marshall's option, for Marshalls to supply replacement product, to repair the affected product, to pay the cost of replacing the affected product or to refund the cost of the products.

Notwithstanding any other provision of this product warranty, Marshalls will not be liable for indirect or consequential loss, special damages, economic loss or loss of profit, whether arising in contract or tort. In particular, Marshalls will not be liable for any claims, damages or defects arising from or attributable to poor workmanship, poor design or detailing, settlement or structural movement, normal wear and tear, or growth of mould, mildew, bacteria or any organism on any product.

This warranty may be transferred to each subsequent owner of the building in which the product is installed or used, provided that each subsequent owner must be notified in writing of, and at all times be subject to, these conditions of warranty. An owner will have no rights under this warranty following any such transfer.

Nothing in this product warranty excludes or modifies any legal rights an owner may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified by law. All warranties, liabilities and obligations, except as expressly set out in this product warranty, are excluded to the fullest extent permitted by law.

TRADE-SEAL



BRANZ Appraised
Appraisal No.719 [2011]

TRADE
Range

Sizes available to fit 8mm to 220mm diameter.



15
YEAR
WARRANTY

WE'VE GOT IT SEALED

Trade-Seals are a one piece self adhesive waterproofing collar used to seal penetrations in the building envelope. They are available in 10 sizes from 8mm - 220mm. Trade-Seals are BRANZ Appraised & can be used on all BRANZ Appraised building wraps & RAB systems in the New Zealand market.

They should be considered as a secondary flashing system & can be exposed to UV for up to 90 days. Trade-Seals are also a component of the Tekton Weatherization System BRANZ # 621. They are available from all good building, plumbing and electrical merchants. Please read the installation instructions carefully before installing.

Benefits of Trade-Seal

- **TRADE-SEAL** is a one piece self adhesive collar for sealing around pipe and conduit.
- **TRADE-SEAL** is a one component secondary flashing system.
- **TRADE-SEAL** can be used on all accepted wall underlays including bituminous paper.
- Can be installed on the inside of RAB systems & wall underlay's - retrofit installation.
- **TRADE-SEAL** requires no adhesives to hold in place.
- **TRADE-SEAL** can be left exposed to Weather and UV for up to 90 days.
- **TRADE-SEAL** will adhere to most clean and dry substrates including Fibre cement & Ply RAB board.



FREEPHONE: 0800 776 9727
www.mwnz.com



TRADE-SEAL is a one piece self adhesive collar for sealing around pipe and conduit.

Sizes available:

8-12 mm

15-22 mm

25-32 mm

42-55 mm

50-70 mm

75-90 mm

100-110 mm

125-135 mm

150-165 mm

200-220 mm



Installation Instructions:

- Step 1. Select the appropriate sized TRADE-SEAL from within the range to suit pipe or conduit diameter. TRADE-SEAL's should never be forced over pipes or conduit.
- Step 2. Ensure the surface to receive the TRADE-SEAL is clean and dry.
- Step 3. Slide the TRADE-SEAL over the pipe or conduit until the EPDM boot achieves a snug fit. Some TRADE-SEAL's may require trimming to ensure there isn't excessive tension on the boot. If trimming is required slide the TRADE-SEAL over the pipe or conduit until it becomes tight, mark this point of the boot. Remove the boot and trim the excess rubber then re-check for a snug fit.
- Step 4. Slide the TRADE-SEAL into place over the pipe/conduit & push firmly against the building underlay or RAB. Remove the backing release film & press firmly onto the underlay/RAB.
- Note: Make sure the TRADE-SEAL is placed in a diamond shape to ensure effective water run-off.**
- Step 5. Smooth the TRADE-SEAL onto the substrate to ensure adequate adhesion.
- Step 6. Push TRADE-SEAL collar back on to penetration to fit cavity width.

Note: Never force TRADE-SEAL's over pipes or conduit.



TRADE – SEAL SPECIFICATION

PRODUCT DESCRIPTION

TRADE-SEALS are BRANZ Appraised # 719 (2011)

TRADE-SEAL is also a component of the Branz Appraised TEKTON WEATHERIZATION SYSTEM # 621 (2014)

TRADE-SEAL - has been developed as a secondary water ingress protection system for sealing around penetrations through the building envelope.

TRADE –SEAL is a highly elastic EPDM sleeve fitted with a self adhesive flange that will adhere to most clean and dry substrates. TRADE-SEAL provides an air and moisture seal around pipe and conduit.

TRADE-SEAL must not be considered as a primary flashing.

TRADE-SEAL is covered on the underside by a backing paper that is removed before installation to expose a highly adhesive base.

TRADE-SEAL is available ranging in sizes to fit protrusions from 8mm to 220mm in diameter.

FEATURES AND BENEFITS

- It is a one piece self adhesive collar for sealing around pipe & conduit on the walls of a building, both commercial & residential.
- They can be used on all accepted building wraps including bituminous paper.
- Can be installed on the inside of RAB systems & wall underlay's – retrofit installation
- They will adhere to most clean and dry substrates including RAB boards- Fibre cement & ply
- They require no adhesives to hold in place.
- Can be left exposed to Weather and UV for up to 90 days.

INSTALLATION

Step 1. Select the appropriate sized TRADE-SEAL from within the range to suit pipe or Conduit diameter. TRADE-SEAL's should never be forced over pipes or conduit.

Step 2. Ensure the surface to receive the TRADE-SEAL is clean and dry.

Step 3. Slide the TRADE-SEAL over the pipe or conduit until the EPDM boot achieves a Snug fit. Some TRADE-SEAL's may require trimming to ensure there isn't excessive Tension on the boot. If trimming is required slide the TRADE-SEAL over the pipe or Conduit until it becomes tight, mark this point of the boot. Remove the boot and trim the excess rubber then re-check for a snug fit.

Step 4. Slide the TRADE-SEAL into place over the pipe/conduit & push firmly against the building underlay or RAB. Remove the backing release film & press firmly onto the underlay/RAB.

Note: Make sure the TRADE-SEAL is placed in a diamond shape to ensure effective water run-off.

Step 5. Smooth the TRADE-SEAL onto the substrate to ensure adequate adhesion.

Step 6. Push TRADE-SEAL collar back on to penetration to fit cavity width.

Note: Never force TRADE-SEAL's over pipes or conduit.

***Check with Sealant Manufacturer as to the compatibility with EPDM rubber boot**

STORAGE

Store all materials in a dry place at temperatures between 10° C and 32° C. Do not store in direct sunlight.

DURABILITY

Provided it is not exposed to the weather or ultra-violet light for more than 90 days TRADE-SEAL will be durable and serviceable for at least 15 years.

SHELF LIFE

The product has a recommended shelf life of two years from date of manufacture.