Horowhenua
DISTRICT COUNCIL

Property File Request



Property File Request

PFR/2026/4163

ISSUED UNDER SECTION 44A OF THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987

APPLICANT DETAILS	
Applicant:	Tim Alexander
Mailing Address:	8 Kilsby Place, Levin 5510
Phone:	027 269 9078
Email Address:	talexander@outlook.co.nz

LOCATION OF PROPERTY	
Site Address:	283A Kimberley Road, Levin Rural
Legal Description:	Lot: 3 DP: 351707
Current Owner:	Dylan James Hyde & Courtney Ivy Hyde
Valuation No:	1484020513
Area:	8403 square metres more or less
R/T/Identifier:	212276
R/T/Date Issued:	20 November 2007

BUILDING CONSENTS/PERMITS PREVIOUSLY ISSUED AND HELD IN HOROWHENUA DISTRICT COUNCIL RECORDS			
Building Consent and/or Permit	**Purpose of Works**	**Date Approved**	**Code Compliance Certificate Issued**
Building Consent 20200581	Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage	26/11/2020	25/06/2021
QV indicates a dwelling was built circa 2021. Please refer to the attached plans from Quotable Value New Zealand. Please Note: Horowhenua District Council accepts no responsibility for floor plans not held at Council.			

Note:
Code Compliance Certificate are not required for building permits issued prior to the Building Act 1991. Under the Act the owner is responsible for requesting final inspections and the issue of completed Code Compliance Certificates.

*the attached Report has been accepted by Horowhenua District Council (Council) as a record only. The contents of the report has not been validated or endorsed by Council. Receipt of the report by Council does not authorise or certify any building works undertaken without a building consent and Council is not obliged to make any decision or determination in relation to any unauthorised building work as a result of having received the report. Council does not accept any liability whatsoever for the content or accuracy of the report. No responsibility is accepted on behalf of any third party for the whole or any part of the contents of the report.

DISCLAIMER - The information supplied in a Property File Report represents information held by Horowhenua District Council (Council) and where supplied to Council by a third party, it may not have been independently verified.

Council does not warrant the accuracy of the information and shall not be held liable whatsoever for any error, inaccuracy or incompleteness of the information provided whether supplied by a third party or otherwise.

In the event that Council is held liable, liability shall be restricted to the cost of obtaining the Property File Report, if any. The applicant should not rely on any information without personally seeking appropriate independent and professional advice.

The information provided in this report does not constitute a Land Information Memorandum (LIM) or any similar document.

If you consider purchasing a property in the Horowhenua District, it is recommended that you obtain a LIM before finalising the purchase. You'll find a LIM useful in helping you decide whether the land is worth purchasing, free from any restrictions, and whether the intended use of the land is feasible.

http://www.horowhenua.govt.nz/Services/Building-Planning/Land-Information-Memorandum-LIM#Information-included-in-a-LIM-Report-2

Signed: _____

Kate Judd
Information Specialist
12 August 2026

Document held by Quotable Value New Zealand.

Horowhenua District Council

Form 5 - Building Consent
Section 51, Building Act 2004

Building Consent No: 20200581

The Building

Street Address: 283A Kimberley Road Levin Rural
Legal Description: Lot: 3 DP: 351707
Valuation Number: 1484020513

The Owner

Name: Dylan James Hyde & Courtney Ivy Hyde

Street Addess/Registered Office: 6 Queenwood Road, Levin, 5510, ,

Phone Number: Mobile: 021 605 460

Email: main.hyde@gmail.com

First Point of Contact

The first point of contact for communications with the building consent authority,

Name: G J Gardner Homes Manawatu/Horowhenua

Street Addess/Registered Office: PO Box 466, Palmerston North

Phone Number: Landline: 06 357 8020

Email: jonathan@plans.co.nz

Building Work

The following building work is authorised by this building consent:

Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage

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

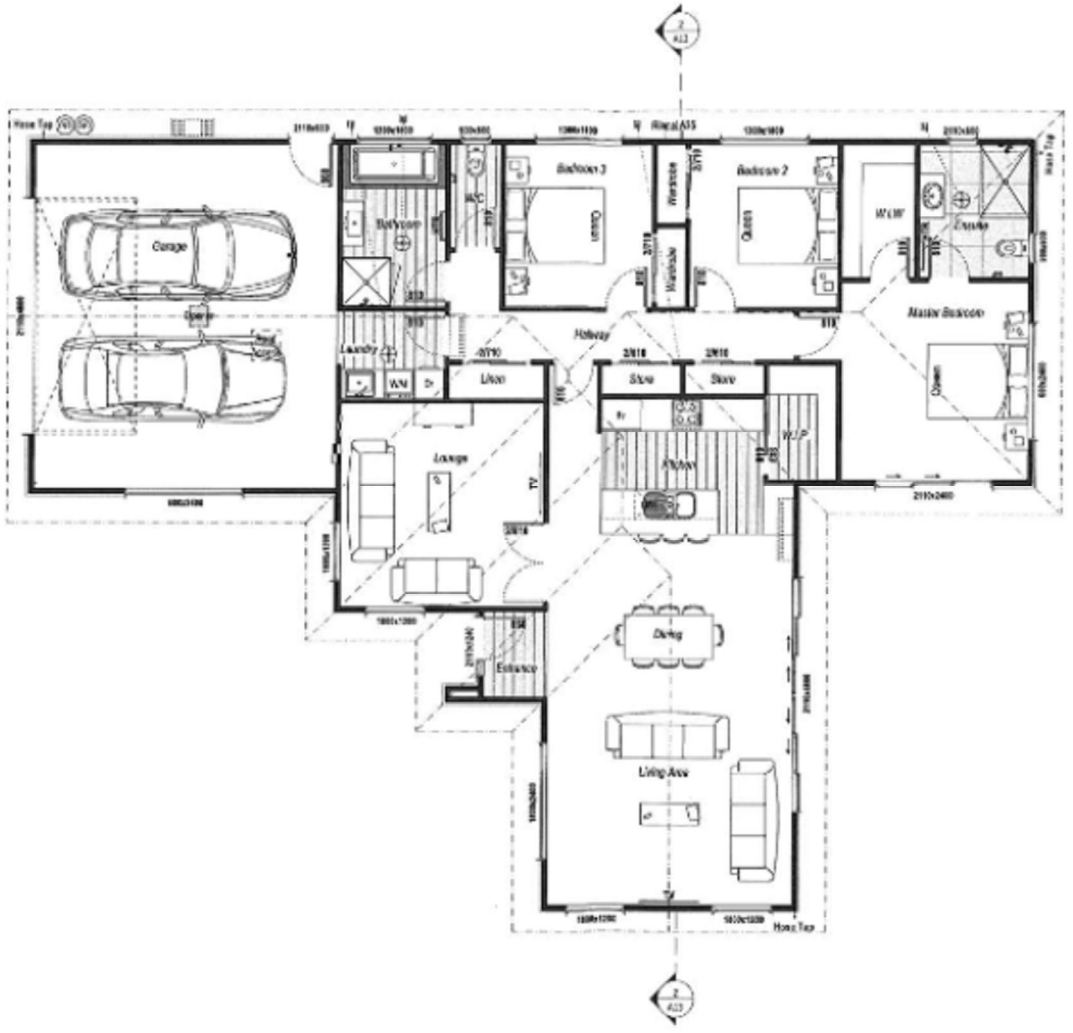
This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

This Building Consent is subject to the following conditions:

1. Section 90, Building Act 2004 – Agents authorised by the BCA are entitled, at all times to inspect :
   a) land on which building work is being or proposed to be carried out; and
   b) building work that has been or is being carried out; and
   c) any building.

Plan held by Quotable Value New Zealand.

APPROVED
24 Nov 2020



Notes:

Elevation Key.	North point.
	

Areas.	
Existing area:	0.00 m²
Proposed area (over frame):	203.56 m²
Proposed area (over foundation):	203.55 m²
Additional coverage area:	1.00 m²

Site conditions:	
Wind zone:	High
Earthquake zone:	3
Corrosion zone:	C
Snow loading:	N1
Site elevation:	< 400m

Building wrap to all exterior walls:
Marshall Tekton (or competitor's equivalent), openings to be trimmed with Marshall Protecto Tape flashing tape (or competitor's equivalent), refer details for further information.

Frame height: 2420mm

All walls lined internally with 10mm Gib board,stopped to a F4 paint quality finish:
Gib Standard to non wet areas.
Gib Aqualine to wet areas.
Gib Braceline as per bracing plan.
(exceptions - garage to be lined with 10mm Tricoard.)

Prenail manufacturer to allow for double studs on either side of doors, where practical, to accommodate 65mm architraves.

Any window size on this plan is unit size NOT the trim size and is in the format of: HEIGHT x WIDTH.
All door sizes on this plan are Door leaf sizes:
opening size = Door leaf size + 58mm

Bathroom shower:	Acrylic
Ensuite shower:	Tiled

Both with glass screens in accordance with NZS 4223. Floor linings to all wet areas to be tile unless otherwise stated.

Access routes:
Any intended access way to the building to be constructed of either profiled timber decking with the profile laid perpendicular to the access, or concrete with a broom finish (Class 5 -6) or wood float finish (Class U2). Alternatively, any other material with a tested wet slip co-efficient of not less than 0.4 when tested against D1/AS1 NZBC.

Issue: **Consent**

ONLY PLANS WITH COUNCIL CONSENT STAMP MAY BE USED FOR CONSTRUCTION OR PREFABRICATION

Legend:

"Roof Access"	Indicates roof space access hatch, 600x600mm min.
	Floor finished in ceramic tiles.
	Floor finished in 100% impervious type vinyl plank flooring.
	Indicates extractor fan vented to soffit or exterior.
	Indicates meter box.
	Indicates sub board & fibre / data board.
	Indicates wall with resene construction plaster refer to elevations for location
	Indicates wall with James Hardie Linea weatherboard cladding refer to elevations for location

These drawings are copyrighted.

Under no circumstances may these drawings be reproduced in any form without the written permission of:
G.J. Gardner HOMES
Manawākaitiritiri Hapū Whenua.

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 100

G.J. Gardner. HOMES
New Zealand's favourite home builders

G.J. Gardner HOMES
Phone: (06) 357 9020
Fax: (06) 357 9021
Email: Trevor.Low@gjgardner.co.nz
P.O. BOX 488 Palmerston North

Proposed Residence.
D Hyde & C Main.
283a Kimberley Road, Levin.

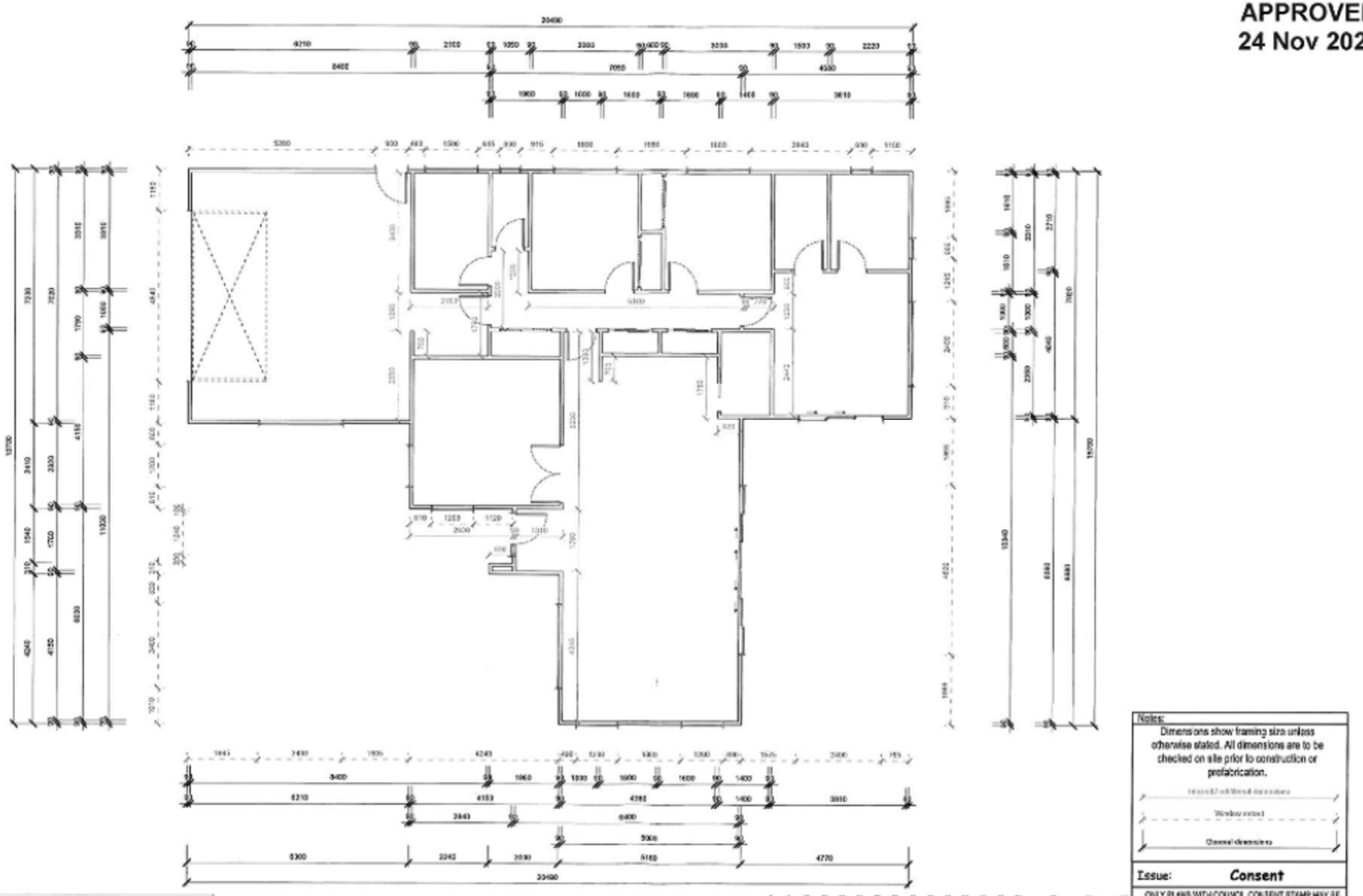
Layout plan

GENERATED: 20 / 11 / 2020 09:10:10 am		SCALE: A3	1:100 @ A1
DRAWN:	Jonathan Bailey	JOB:	1
CHECKED:	Jonathan Bailey	PLANS:	GJ 20-37
JOB: 03	ID: 351707	SHEET No:	A02

Last modified by: Jonathan Paper size: ISO full bleed A3 (420.00 x 297.00 MM) File Location: C:\Users\jonathan\AppData\Local\Temp\GJ0-37 - Main & Hyde - WC0.dwg

Plan held by Quotable Value New Zealand.

APPROVED
24 Nov 2020



Notes:
Dimensions show framing size unless otherwise stated. All dimensions are to be checked on site prior to construction or prefabrication.

Issue: **Consent**

ONLY PLANS WITH COUNCIL CONSENT STAMP MAY BE USED FOR CONSTRUCTION OR PREFABRICATION

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G.J. Gardner [illegible]
Manawatu-Kapiti-Horowhenua.

G.J. Gardner HOMES
New Zealand's favourite home builders

G.J. Gardner [illegible]
Phone: (06) 357 8020
Fax: (06) 357 8021
Email: Trevor.Love@gjgardner.co.nz
P.O. BOX 466 Palmerston North

Proposed Residence.
D Hyde & C Main.
283a Kimberley Road, Levin.

Dimension floor plan

DRAWN: 20 / 11 / 2020
CHECKED:
Job: 351707
Sheet: 1
Job No: GJ 20-37
Sheet No: A03

Original Scale (mm)

Last modified by: Jonathan Paper size: ISO full sheet A3 (420.00 x 297.00 MM) File Location: C:\Users\jonathan\Key\Debit\Local\Temp\20-37 - Main S Hyde - WD2.dwg

Form 7 – Code Compliance Certificate
Section 95, Building Act 2004

Building Consent No:	**20200581**
Description:	**New Residential Dwelling Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage**
Valuation No:	**1484020513**
Issued by:	**Horowhenua District Council**

The Building

Street Address:	283A Kimberley Road, Levin Rural
Legal Description:	Lot: 3 DP: 351707
Valuation Number:	1484020513
Level/Unit Number:	One
Current, lawfully established, use:	Detached Dwelling
Year first constructed:	2021

The Owner

Name:	Dylan James Hyde, Courtney Ivy Main
Street Address/Registered Office:	[redacted]
Mailing Address:	
Phone Number:	
Landline:	**Mobile:** [redacted]
Daytime:	**After Hours:**
Email:	[redacted]

First Point of Contact

The first point of contact for communications with the building consent authority:

Name:	G J Gardner Homes
Mailing Address:	PO Box 466, Palmerston North Central, Palmerston North 4440
Phone Number:	
Landline: 063578020	**Mobile:**
Daytime:	**After Hours:**
Email:	manawatu@gjgardner.co.nz

The building consent authority named above is satisfied, on reasonable grounds, that the building work complieswith the building consent.

H n Adams

Harley Adams
Building Advisory Officer
On Behalf Of: Horowhenua District Council
Date: 25 June 2021

24 November 2020

G J Gardner Homes
PO Box 466
Palmerston North Central
Palmerston North 4440

Dear Sir/Madam

Required Items for Building Consent
Building Consent No: 20200581
Project Location: 283A Kimberley Road, Levin Rural
Project Description: New Residential Dwelling

Before Council can issue a Code Compliance Certificate, you will need to ensure the following inspections are completed and that you have provided the paperwork requested.

Inspections Required

1	Sitings
1	Underslab Services
1	Pre-pour Slab
1	Truss roof & Cut roof
1	Pre-wrap
1	Post-wrap & Cavity system
1	Stucco/Eifs
1	Plumbing Pre-line
1	Pre-lining
1	Post lining
1	Waterproof Membrane
1	Drainage
1	Final Inspection
13	Total Inspections

Documentation Required

CCC application - Form 6

Roof Cladding Warranty

Wall Cladding Warranty

Exterior Joinery Warranty

Wet Area membrane Warranty

As built drainage plan

Wastewater Disposal System installers declaration/Service contract

Energy Works Certificate (Gas)

Energy Works Certificate (Electrical)

P.S.4 Construction Review/Site Notes Foundation

P.S.3 Construction

Memorandum

Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.

Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete

Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.

At least 24 hours' notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.

Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.

The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.

The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion

Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.

Licensed Building Practitioner Forms Required

Carpentry

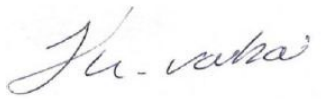
Foundations

External cladding

Roofing

Your application for Code Compliance Certificate and all requested documents will be required after a passed final inspection.

Yours sincerely



Junior Vaikai
Building Advisory Officer

Consent No: 20200581 Building Category: RES1

Site Address: 283A Kimberley Road, Levin Rural

Owner/Agent: Dylan James Hyde, Courtney Ivy Main

Inspections

The following inspections are required:

1 Sitings
1 Underslab Services
1 Pre-pour Slab
1 Truss roof & Cut roof
1 Pre-wrap
1 Post-wrap & Cavity system
1 Stucco/Eifs
1 Plumbing Pre-line
1 Pre-lining
1 Post lining
1 Waterproof Membrane
1 Drainage
1 Final Inspection
13 Total Inspections

Licensed Building Practitioners

Carpentry
Foundations
External cladding
Roofing

Documentation

The following documentation is required:

CCC application - Form 6	
Roof Cladding Warranty	
Wall Cladding Warranty	
Exterior Joinery Warranty	
Wet Area membrane Warranty	
As built drainage plan	
Wastewater Disposal System installers declaration/Service contract	
Energy Works Certificate (Gas)	
Energy Works Certificate (Electrical)	
P.S.4 Construction Review/Site Notes	Foundation
P.S.3 Construction	
Memorandum	
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	
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The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion

Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.

GoGet Processing Summary Report

Consent No: 20200581
Site Address: 283A Kimberley Road, Levin Rural
Description: New Residential Dwelling

Checklist/Elements	Status	Notes	Processed By
Vetting	Pass		Junior Vaikai
Application documentation	Pass		JV
Application type	Pass	The application is for a building consent.	JV
Application form signed	Pass	The application form is signed by an agent nominated by the owner. - Rebecca Wimms	JV
Proof of ownership	Pass	A certificate of title dated within the last three months. -23/10/20	JV
Drawings and plans	Pass	Detailed plans are provided that clearly show the proposed new build. *RFI - Please consider submitting a new set of plans as the colours used in the provided plans may prove difficult to read on site.	JV
Request for Further Information:			
Request: Please consider submitting a new set of plans as the colours used in the provided plans may prove difficult to read on site.			JV
Response: New set of plans have been provided.			JV
Site specific specifications	Pass	Specifications provided that are relevant to the proposed works. Specifications do not contradict the plans. Specifications clearly identity chosen products, and do not show a range of possible options.	JV
Compliance documentation	Pass	Relevant documentation is shown for: Producer Statements supplied: PS1 B1 - Structure B2 - Durability C - Protection from fire D1 - Access Routes E1 - Surface Water E2 - External Moisture E3 - Internal Moisture F2 - Hazardous Building Materials F5 - Site Safety F7 - Warning Systems G1 - Personal Hygiene G2 - Laundering G4 - Ventilation G7 - Natural Light G8 - Artificial Light G9 - Electricity G10 - Piped Services G11 - Gas As An Energy Source G12 - Water Supplies G13 - Foul Water H1 - Energy Efficiency	JV
Specific engineered design	Pass	The design involves specific engineering design and: - a PS1 has been provided. - the designer is a CPEng - 221906 - David LAu - In Ling Ng - 146585 The scope of the specific engineered design is such that the processing officer can risk assess the work.	JV
Warnings and Bans	Pass	No relevant warnings or bans.	JV
Building Act	Pass		JV

Checklist/Elements	Status	Notes	Processed By
S 84 - Restricted building work	Pass	A certificate of design work has been provided by each of the designers contributing to the restricted building work. - Jeff Twigge - 111561	JV
S 112 - Alterations to existing buildings	N/A		JV
S113 - Buildings With Specified Intended Life	N/A		JV
S 115 - Change of use	N/A		JV
S 118 - Access and facilities for persons with disabilities	N/A		JV
S 363 - Public use prior to issuing CCC	N/A		JV
Quick Consent	N/A		Junior Vaikai
Planning	N/A		Junior Vaikai
B1 - Structure	Pass		Junior Vaikai
Verification method	Pass		JV
Structural review	N/A		JV
Structural risk assessment	Pass	The building work contains SED. The engineering has been assessed against structural policy, and given the scope of the engineering and the evidence provided, the risk is not considered to be high enough to require structural review. Engineer is CPEng registered.	JV
Engineer	Pass	The engineer is working within their scope. The PS1 identifies the engineer, their CPEng number is: David Lau - 221906 In Ling Ng - 146585	JV
Scope	Pass	The code clauses covered are B1 The scope of the engineering is structural	JV
Monitoring requirements	Pass	Construction monitoring to: CM2	JV
Structural proprietary systems	Pass	The building work contains SED. The following elements are proprietary systems, and compliance with B1 requirements has been ascertained by manufacturer's tables / producer statements.	JV
NZS 3604	Pass		JV
Scope	Pass	The building is within the scope and limitations of NZS 3604.	JV
Good ground	Pass	Ground bearing has been investigated by the Engineer, specific design has been recommended by the engineer as the ground condition do not meet the requirements of "Good Ground"	JV
Liquifaction Assessment	N/A		JV
Site requirements	Pass	The requirements for site have been considered, including provisions for: bearing capacity; FFL complies with consent notice attached to title	JV
Deck structure	N/A		JV
Foundations and sub-floor framing	N/A		JV
Floors	Pass		JV
Suspended timber floors (ground)	N/A		JV
Suspended timber floors (first floor and above)	N/A		JV
Flooring	N/A		JV
Concrete slab	Pass	The foundation has been designed by the engineer and a PS1 has been provided for the design. A rib raft foundation design w/ driven piles has been	JV

Checklist/Elements	Status	Notes	Processed By
		specified by the engineer. - 85mm thick concrete slab with SE62 mesh over polystyrene pods and DPM has been proposed. - 2/HD12 additional steel has been specified for internal corners. - Sufficient details have been provided by the engineer showing how edgebeams, internal thickenings and internal ribs are to be constructed.	
Walls	Pass		JV
Studs	Pass	Studs in load and non-load bearing walls framing are sized appropriately given the wind zone, their loaded dimension, height and spacing. - 90x45 SG8 H1.2 studs are specified at 600crs w/ dwangs at 800crs Stud/top plate connection shown - Table 8.18 NZS 3604:2011	JV
Lintels	Pass	Lintels over openings in wall framing have been sized appropriately given the building elements they support, their loaded dimension, and their span. Lintel sizing complies with NZS 3604:2011 Table 8.9 Lintel fixing type shown on plan to be cross referenced with the fixing schedule supplied in A4 documentation. SED members have been specified for where girder trusses land on openings and a producer statement has been provided for their design.	JV
Plates	Pass	Top and bottom plates are sized appropriately, and have adequate strengthening where required. 90x45 SG8 H1.2 plates 90x35 SG8 H1.2 double top plate Appropriate bottom plate fixing shown on plan 120mm trubolts at 900crs w/ 50x50x3mm washers within 150mm of plate ends.	JV
Bracing	Pass	Correct parameters have been used for calculating wall bracing demand. This includes considerations around wind, earthquakes, cladding types, and building characteristics. Bracing calculations received and corresponding plan layout shown. Bracing clear of showers and baths. Bracing lines comply with NZS 3604 2011: 8.7.3.4 *RFI - Please revise bracing elements in bracing line E to coincide with what is shown in the bracing calculations. --- Response - JV 23 Nov 2020 1:26pm --- Revised bracing calculations have been provided coinciding with the bracing plan.	JV
Request for Further Information:			
Request: B1 - Please revise bracing elements in bracing line E to coincide with what is shown in the bracing calculations. Please revise and update architectural drawings.			JV
Response: Revised bracing calculations have been provided coinciding with the bracing plan.			JV
Posts	N/A		JV
Posts	N/A		JV
Footings	N/A		JV
Fixings	N/A		JV
Roof structure	Pass		JV
Framed roof	N/A		JV
Truss roof	Pass	The roof truss has been specifically designed according to B1/VM1. Refer to the Verification Method checklist item. Documentation of the trusses	JV

Checklist/Elements	Status	Notes	Processed By
		meets the requirements of 10.2.2.3. - 25 degree MiteK trusses have been specified at 900 crs and a PS1 has been provided for the design.	
Eaves and gable verges	Pass	Eaves are supported by outriggers that are sized appropriately given the permitted spans.	JV
Purlins / tile battens	Pass	Tile battens are adequately sized given the wind zone, their span and spacing. - 50x40 SG6 H1.2 tile battens @370crs w/2 90x3.15 dia power driven nails. Correct fixings are specified given the uplift loads expected.	JV
Bracing	Pass	Adequate bracing is provided for the roof given the roof pitch and area. Bracing is provided by: hip rafters, valley rafters, bracing straps and a timber plane brace	JV
Ceilings	Pass	Ceilings are supported by allowed members, with ceiling battens sized appropriately given their span and spacing. * GIB Rondo battens at 600crs supporting 13mm GIB lining.	JV
Verandah beams	N/A		JV
Snow loading	N/A		JV
External stairs	N/A		JV
3kPa floor loads	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
B2 - Durability	Pass		Junior Vaikai
B2 prompts	Pass		JV
Material compatibility	Pass	Adjoining materials are compatible.	JV
Concrete and concrete masonry	Pass	20MPa concrete strength and cover is appropriate for the exposure zone C	JV
Timber treatment	Pass	The wood-based building components required to achieve 50 year durability comply with table 1 NZS 3602 as modified by B2/AS1. H1.2 roof and wall framing timbers. H5 piles	JV
Steel fixings and fastenings	Pass	Steel fixings are specified where required to meet durability requirements.	JV
Engineered elements	Pass	The durability aspects of all of the elements designed by the client's structural engineer have been satisfactorily checked for compliance to B2 in respect to B1 structure.	JV
Plumbing materials	Pass	Given the water supply and drainage principles used in the plumbing design appropriate materials are used for water supply and drainage pipes.	JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
C1-6 - Protection From Fire	Pass		Junior Vaikai
C/AS1 - Residential and outbuildings	Pass		JV
Fire cells, systems, and resistance ratings	Pass	Type 1 smoke alarms are shown on the plans in accordance with the requirements of F7/AS1.	JV
Means of escape	Pass	Less than 25m travel distance	JV
Control of internal fire and smoke spread	Pass	Single firecell	JV
Control of external fire spread	Pass	Complies by separation.	JV
Firefighting	N/A		JV
Prevention of fire occurring	N/A		JV

Checklist/Elements	Status	Notes	Processed By
C/AS* - Large multi-residential, commercial, and vehicle storage	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
D1 - Access Routes	Pass		Junior Vaikai
Access routes	Pass		JV
Safety	N/A		JV
Activity space	N/A		JV
Slip resistance	Pass	Access routes have adequate slip resistant walking surfaces. Broom finished concrete 150mm below FFL at main accessways.	JV
Building access	N/A		JV
Ramps	N/A		JV
Stairs	N/A		JV
Handrails	N/A		JV
Accessible car parks	N/A		JV
Accessible building entries	N/A		JV
Accessible places of assembly	N/A		JV
Accessible accommodation units	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
D2 - Mechanical Installations For Access	N/A		Junior Vaikai
E1 - Surface Water	Pass		Junior Vaikai
Drainage design	Pass		JV
Compliance Path	Pass	E1 compliance path for the Stormwater system is clearly specified.	JV
Verification method	N/A		JV
Soak pits	Pass		JV
Field testing	N/A		JV
Soak pit design	Pass	The soak pit has an adequate volume, with appropriate filling and lining to the pit. - Soakpit sizing calculations have been provided in accordance with E1/VM1 9.0.5	JV
Acceptable solution	Pass		JV
Scope	Pass	The site is within the area, location, and site history requirements of E1/AS1.	JV
Floor level	Pass		JV
Minimum finished floor level	Pass	*RFI - Please specify the FFL as a minimum of 450mm above general ground level to comply with the consent notice. Please revise and update architectural drawings. --- Response - JV 24 Nov 2020 1:09pm --- Revised plan have been provided showing the proposed FFL will be 450mm above FGL to comply with the consent notice.	JV
Request for Further Information:			
Request: E1 - Please specify the FFL as a minimum of 450mm above general ground level to comply with the consent notice. Please revise and update architectural drawings.			JV
Response: now shown at 450mm height.			JV
Request for Further Information:			
Request: E1 - Please specify the FFL as a minimum of 450mm above general ground level to comply with the			JV

	consent notice. Please revise and update architectural drawings.		
Response:	*Revised plan have been provided showing the proposed FFL will be 450mm above FGL to comply with the consent notice.*		JV
Stormwater drainage	Pass		JV
Secondary flow path	Pass	A minimum FFL of 450mm above general ground has been required on the consent notice. This has been considered as sufficient to mitigate any potential flooding of the dwelling and an appropriate secondary flow path may be established on site.	JV
Size and gradient	Pass	The stormwater drains are adequately sized given their gradient and catchment area. The gradient meets or exceeds the minimum requirements. - 100mm SW pipe at 1:120	JV
Sumps	N/A		JV
Roof catchment	Pass		JV
Downpipes	Pass	The downpipe size is adequate given the roof pitch and plan area of the roof catchment area. - 5 x 80mm downpipes each servicing less than 85m2 of roof catchment area.	JV
Gutters	Pass	Gutters have an adequate cross sectional area given the rainfall intensity, plan area of the roof catchment area, and the pitch of the roof. - 1/4 round 6200mm2 gutters	JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
E2 - External moisture	Pass		Junior Vaikai
Acceptable solution	Pass		JV
Scope	Pass	The building work is within the scope of E2/AS1.	JV
Risk matrix	Pass		JV
Score	Pass	A risk matrix score of 5 has been calculated for the worst case elevation.	JV
Wall cladding	Pass	Given the risk matrix score it is appropriate to use Linea weatherboard over a drained cavity and resene construction plaster.	JV
Roof cladding	Pass		JV
General	Pass	An appropriate roofing underlay is used given the type roofing. - Thermakraft 215 self supporting roofing underlay	JV
Cladding junctions	N/A		JV
Masonry tiles	N/A		JV
Pressed metal tiles	Pass	The pitch of the metal tile roof is appropriate given the type of the metal profile and the rafter length. - Pressed metal shake tile roof cladding has been proposed. Penetrations through the metal tile roof are adequately detailed given the size of the penetration. All details relevant to the design and cladding type have been provided to demonstrate how weathertightness is to be achieved.	JV
Profiled metal	N/A		JV
Membrane roofs	N/A		JV
Other	N/A		JV
Wall cladding	Pass		JV
General	Pass	An appropriate wall underlay is shown. - Marshall Tekton Building wrap	JV

Checklist/Elements	Status	Notes	Processed By
		Flexible flashing tape compatible with the wrap is specified.	
Threshold junctions	N/A		JV
Cladding junctions	Pass	Where different claddings abut, adequate details are shown of the junction, with necessary building elements shown as required by the relevant technical information. - Junction adequately detailed with flexible sealant and 100x100mm back flashing.	JV
Masonry veneer	N/A		JV
Stucco	N/A		JV
Timber weatherboards	N/A		JV
Fibre cement weatherboards	Pass	Horzontal linea weatherboard has been proposed, fixed over 20mm drained ventilated cavity. Pipe penetrations through the fibre cement weather board cladding are detailed with a flange plate. Window and door head, jamb, and sill details are shown, with adequate consideration of the relevant building elements, including requirements for dimensioning, clearances and flashing's External and internal corners are detailed. Soffit junctions are shown. All details relevant to the design and cladding type have been provided to demonstrate how weathertightness is to be achieved.	JV
Profile metal wall cladding	N/A		JV
Fibre cement sheet	N/A		JV
Plywood sheet	N/A		JV
EIFS	Pass	Rockcote exterior cladding has been proposed. Adequate details have been provided to show how the proposed installation will meet the manufacturers requirements. The bottom of the EIFS cladding has adequate clearance to paved and unpaved surfaces. Window and door head, jamb, and sill details are shown, with adequate consideration of the relevant building elements, including requirements for dimensioning, clearances and flashigns External and internal corners are detailed. Soffit junctions are shown. All details relevant to the design and cladding type have been provided to demonstrate how weathertightness is to be achieved.	JV
Other	N/A		JV
Wall tanking	N/A		JV
Parapets	N/A		JV
Decks	N/A		JV
Manufacturer's details	N/A		JV
Re-cladding	N/A		JV
Timber joinery	N/A		JV
Skylights	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
E3 - Internal Moisture	Pass		Junior Vaikai
E3 prompts	Pass		JV
Moisture control	Pass	There is an adequate combination of thermal resistance, ventilation, and space temperature control.	JV

Checklist/Elements	Status	Notes	Processed By
Overflow	N/A		JV
Impervious surfaces	Pass	Details have been provided for surfaces to be impervious, easily cleaned, and for the prevention of water penetration into concealed spaces where the surface is adjacent to sanitary fixtures and appliances or likely to be splashed. - ceramic tiles to ensuite - vinyl plank flooring to remaining wet areas	JV
Proprietary shower tray/walls	Pass	A proprietary shower tray and/or walls is proposed with sufficient details to show impervious and easily cleaned surfaces. A proprietary shower tray and/or walls is proposed with sufficient details to show impervious and easily cleaned surfaces.	JV
Tiled shower	Pass	A tiled shower / wet area is proposed, and sufficent details of substrate, membrane, and details are provided.	JV
Level access shower	N/A		JV
Wet area membrane	Pass	Mapei Mapegum WPS membrane has been proposed	JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
F1 - Hazardous Agents On Site	N/A		Junior Vaikai
F2 - Hazardous Building Materials	Pass		Junior Vaikai
Asbestos	N/A		JV
Glazing	Pass		JV
Manifestation	N/A		JV
Glazing requirements	Pass	* RFI - Please specify adequate safety glazing to windows shown in 'Elevation A' in the living area. --- Response - JV 23 Nov 2020 1:26pm --- Safety glazing has been added to windows shown in 'Elevation A' in the living area.	JV
<u>Request for Further Information:</u>			
Request: F2 - Please specify adequate safety glazing to windows shown in 'Elevation A' in the living area. Please revise and update architectural drawings.			JV
Response: Safety glazing has been added to windows shown in 'Elevation A' in the living area.			JV
Bathrooms	Pass	Glazing in bathrooms, including glazing in the shower enclosure, is specified to be compliant with NZS 4223.3.	JV
Balustrades	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
F3 - Hazardous Substances And Processes	N/A		Junior Vaikai
F4 - Safety From Falling	N/A		Junior Vaikai
F5 - Construction and Demolition Hazards	Pass		Junior Vaikai
F5 prompts	Pass		JV
Consent addendum	Pass	Compliance with F5 Site Safety is to be noted in the consent addendum.	JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
F6 - Visibility In Escape Routes	N/A		Junior Vaikai
F7 - Warning Systems	Pass		Junior Vaikai
F7 prompts	Pass		JV
System type (excluding simple residential situations)	N/A		JV

Checklist/Elements	Status	Notes	Processed By
Domestic alarms	Pass	Domestic alarms are proposed, and are able to be tested and have a hush facility. Alarms are located: within 3.0m of each sleeping space; covering escape routes; - section 3.0 F7/AS1	JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
F8 - Signs	N/A		Junior Vaikai
F9 - Residential Pool Barriers	N/A		Junior Vaikai
G1 - Personal Hygiene	Pass		Junior Vaikai
Provision of sanitary fixtures	Pass		JV
General sanitary fixture requirements	Pass	Bathroom fixtures comply with NZBC G1/AS1	JV
Privacy	N/A		JV
Accessible toilets	N/A		JV
Accessible showers	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G2 - Laundering	Pass		Junior Vaikai
G2 prompts	Pass		JV
Provision of laundry spaces	Pass	Laundry design complies with NZBC G2/AS1	JV
Accessible laundries	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G3 - Food Preparation And Prevention Of Contamination	Pass		Junior Vaikai
Domestic kitchen facilities	Pass		JV
Activity space and functionality	Pass	Kitchen design complies with NZBC G3/AS1	JV
Interior linings	Pass	Interior linings and work surfaces shall be impervious and easily cleaned.	JV
Commercial facilities	N/A		JV
Accessible kitchen facilities	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G4 - Ventilation	Pass		Junior Vaikai
G4 prompts	Pass		JV
Natural ventilation	Pass	A schedule has been provided to demonstrate a 5% natural ventilation/floor area ratio has been achieved.	JV
Mechanical ventilation	Pass	Sufficient mechanical ventilation is provided to bathrooms, laundry and kitchen.	JV
Gas fuelled appliances	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G5 - Interior Environment	N/A		Junior Vaikai
G6 - Airborne And Impact Sound	N/A		Junior Vaikai
G7 - Natural Light	Pass		Junior Vaikai
G7 prompts	Pass		JV
Means of providing natural light	Pass	A schedule has been provided to demonstrate a 10% natural light/floor area ratio has been achieved.	JV
Visual awareness	Pass	At least 50% of the glazed area providing natural	JV

Checklist/Elements	Status	Notes	Processed By
		light is clear glazing falling within the visual awareness zone. Visual awareness from all habitable areas.	
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G8 - Artificial Light	Pass		Junior Vaikai
G8 prompts	Pass		JV
Artificial lighting	Pass	The plan demonstrates compliance with G8.2.	JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G9 - Electricity	Pass		Junior Vaikai
G9 prompts	Pass		JV
Energy works certificate	Pass	An energy works certificate will be required upon completion.	JV
Electrical switches and outlets	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G10 - Piped Services	Pass		Junior Vaikai
G10 prompts	Pass		JV
Energy works certificate	Pass	To be installed by a suitably qualified person to G10/AS1 or AS/NZS 5601.1 and AS/NZS 5601.2. An energy works certificate will be required upon completion.	JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G11 - Gas As An Energy Source	Pass		Junior Vaikai
G11 prompts	Pass		JV
Energy works certificate	Pass	The gas appliance is being installed and documentation nominates compliance with G10/AS1, G11/AS1 and NZS 5261. The LPG cylinder location complies with Appendix J, NZS 5601.1.	JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G12 - Water Supplies	Pass		Junior Vaikai
Water supply	Pass		JV
Potable water	Pass	Roof catchment water supply has been proposed w/ Pentek Big Blue UV filtration system.	JV
Backflow prevention	Pass	Backflow prevention by airgap at fixtures.	JV
Non-potable supply	N/A		JV
Freezing zones	N/A		JV
Water tanks	Pass		JV
Rural water supply	Pass	Water tanks are located on suitable foundations, as outlined in manufacturer's literature.	JV
Community care water supply	N/A		JV
Overflow	N/A		JV
Structural support	N/A		JV
Hot water	Pass		JV
Water heater type	Pass	Hot water is supplied via a gas instantaneous water heater.	JV
Installation	Pass	Rinnai Infinity specifications have been provided for the proposed installation.	JV

Checklist/Elements	Status	Notes	Processed By
Structural support	N/A		JV
Water temperature	Pass	Continuous flow water heater to be set at a maximum of 55 degrees C for hot water supply to sanitary fixtures.	JV
Solar hot water	N/A		JV
Wetback hot water	N/A		JV
Accessible water supply	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G13 - Foul Water	Pass		Junior Vaikai
Compliance Path	Pass		JV
Compliance path	Pass	Compliance path clearly demonstrated on plans.	JV
Connections	N/A		JV
Acceptable solution	Pass		JV
Sanitary plumbing	Pass	The discharge pipe layout, sizes, and falls are appropriate given types of sanitary fixtures, the fixture loading, and the developed lengths of pipe runs. - 40mm wastes @1:40 *RFI - G13 - Please show the 40mm waste to the laundry doesn't exceed the allowable lengths as per AS/NZS 3500.2 --- Response - JV 23 Nov 2020 1:27pm --- Laundry waste has been changed to a 65mm branch drain directly connected to the main drain.	JV
Request for Further Information:			
Request: G13 - Please show the 40mm waste to the laundry doesn't exceed the allowable lengths as per AS/NZS 3500.2. Please revise and update architectural drawings.			JV
Response: Laundry waste has been changed to a 65mm branch drain directly connected to the main drain.			JV
Drainage	Pass	The drainage pipe layout, sizes, and falls are appropriate given the fixture loadings. - 100mm main drain @1:60 The drainage system shows appropriate venting to ensure that the overall system is adequately vented. - 80mm TV wet serviced by ORG and WC Gully traps are shown where required, with two gully traps serving as an overflow relief gully. *RFI - G13 - Horizons Regional Council's approval of the onsite effluent disposal system has not yet been obtained. --- Response - JV 23 Nov 2020 1:30pm --- Horizons approval has been provided for the proposed effluent disposal system.	JV
Request for Further Information:			
Request: G13 - Horizons Regional Council's approval of the onsite effluent disposal system has not yet been obtained.			JV
Response: Horizons approval has been provided for the proposed effluent disposal system.			JV
Grease traps	N/A		JV
AS/NZS 3500.2	N/A		JV
AS/NZS 3500.5	N/A		JV
Hydraulic design	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
G14 - Industrial Liquid Waste	N/A		Junior Vaikai

Checklist/Elements	Status	Notes	Processed By
G15 - Solid Waste	N/A		Junior Vaikai
H1 - Energy Efficiency	Pass		Junior Vaikai
H1 prompts	Pass		JV
Small building envelope thermal performance	Pass	The building has been assessed as compliant with H1 using the: schedule method, as modified by H1/AS1. The proposed R values of building components exceed the minimum required. Wall insulation R 2.4 Ceiling Insulation R 3.2 Double Glazing R 0.26	JV
Large building envelope performance	N/A		JV
Hot water system efficiency	Pass	There is adequate thermal insulation to the hot water supply to the sink, with the pipe run not exceeding allowable limits, to comply with NZBC H1 3.4 and G12/AS1 6.12.	JV
Artificial lighting	N/A		JV
Other compliance paths	N/A		JV
Alternative solution	N/A		JV
S67 - Waivers And Modifications	N/A		Junior Vaikai
S71 - Natural Hazard Assessment	N/A		Junior Vaikai
S75 - Construction Over Two Or More Allotments	N/A		Junior Vaikai
S112 - Alterations To Existing Buildings	N/A		Junior Vaikai
S113 - Buildings With Specified Intended life	N/A		Junior Vaikai
S115 - Change Of Use	N/A		Junior Vaikai
S116 - Extension of life	N/A		Junior Vaikai
S116A - Subdivision Code Compliance Requirements	N/A		Junior Vaikai
S363 - Certificate For Public Use	N/A		Junior Vaikai
Restricted Building Work	Pass		Junior Vaikai
Primary structure	Pass		JV
Foundations and sub-floor framing	Pass	Design LBP : Jeff Twigge - 111561	JV
Walls	Pass	Design LBP : Jeff Twigge - 111561	JV
Roof	Pass	Design LBP : Jeff Twigge - 111561	JV
Columns and beams	N/A		JV
Bracing	Pass	Design LBP : Jeff Twigge - 111561	JV
Other	N/A		JV
External moisture	Pass		JV
Damp proofing	Pass	Design LBP : Jeff Twigge - 111561	JV
Roof cladding	Pass	Design LBP : Jeff Twigge - 111561	JV
Ventilation system	Pass	Design LBP : Jeff Twigge - 111561	JV
Wall cladding	Pass	Design LBP : Jeff Twigge - 111561	JV
Waterproofing	N/A		JV
Other	N/A		JV
Fire safety	N/A		JV
Reviews	Pass		Junior Vaikai
Tech Check	Pass		JV
Tech Check Complete	Yes	I am satisfied that all technical details have been checked and completed.	JV
Grant Consent	Pass		JV
Can this consent be granted?	Yes	Documentation demonstrates compliance with the	JV

Checklist/Elements	Status	Notes	Processed By
		Building Code and Building Act 2004. If there were any requests for further information, these have been addressed and the reasons for these have been recorded in each instance. Building Consent can now be granted and issued on payment of the appropriate fees and levies.	
Supervision review	N/A		JV
Quick consent scope	N/A		JV
Alternative solution	N/A		JV
S67 - Waivers or modifications	N/A		JV
S71 - Natural hazard assessment	N/A		JV
S112 - Alterations to existing buildings	N/A		JV
S113 - Buildings With Specified Intended Life	N/A		JV
S115 - Change of use	N/A		JV

I am satisfied on reasonable grounds that the provisions of the Building Code will be met if the building work in relation to the attached application is properly completed in accordance with the attached plans and specifications.

Signed: _____ Date: 24 November 2020 1:19 pm
Junior Vaikai

GoGet Consent Time Report

Consent No: 20200581

Date	Processing/Inspection Type	Status	Inspector	Time
Processing				
6 Nov 2020	Processing		Junior Vaikai	7
6 Nov 2020	Processing		Junior Vaikai	2
9 Nov 2020	Processing		Junior Vaikai	13
10 Nov 2020	Processing		Junior Vaikai	16
13 Nov 2020	Processing		Junior Vaikai	18
13 Nov 2020	Processing		Junior Vaikai	18
16 Nov 2020	Processing		Junior Vaikai	31
16 Nov 2020	Processing		Junior Vaikai	64
16 Nov 2020	Processing		Junior Vaikai	53
16 Nov 2020	Processing		Junior Vaikai	32
16 Nov 2020	Processing		Junior Vaikai	6
16 Nov 2020	Processing		Junior Vaikai	2
16 Nov 2020	Processing	On	Junior Vaikai	
23 Nov 2020	Processing	On	Junior Vaikai	
24 Nov 2020	Processing	Off	Junior Vaikai	
	SUBTOTAL:			4:22
	TOTALS:			4:22

Code Compliance Certificate - Form 6 - HORO059570

Submission Details

Submission Ref	HORO059570
Status	Accepted
Building Complexity	R1
Is Complete	Yes
Date Submitted	Wed 26 May 2021, 4:50 PM
Building Consent Authority	Horowhenua District Council
Site Address	283A Kimberley Road, Levin Rural
Parent Consent Number	20200581
Submitter	Palmer & low Construction (Brendan Paki)
Legal Description	Lot: 3 DP: 351707

Code Compliance Certificate - Form 6

Section 92, Building Act 2004

Building Consent Information

Building consent number *
20200581

Issued by *
Horowhenua District Council

All building work to be carried out under the building consent was completed on *
24/05/2021

Where Is The Building

What is the street address *
283A Kimberley Road, Levin Rural

Legal Description *
LOT 3

Deposited Plan
DP 351707

Building Name

Location of building within site/block including near street access

Who Owns The Building

Owner name *

Dylan Hyde & Courtney Main

Owner title

If the property is owned by an organisation, capture the organisation's name.

Owner's contact person

Owner email address *

[redacted]

Required if the owner is an organisation

Owner contact number: *

[redacted]

Owner mobile number

Owner's street address *

[redacted]

Owner mailing address

Who Is The Applicant

Is the application being made on behalf of the owner *

◉ Yes	○ No

Agent Contact Information

Please note that the nominated first point of contact must be in New Zealand.

Who is the first point of contact for further correspondence? *

○ Owner	◉ Agent	○ Other

Who is the first point of contact for invoicing *

○ Owner	◉ Agent	○ Other

Who should invoices be made out to? *

Palmer & Low Construction Ltd t/a GJ Gardner Homes
Manawatu/Horowhenua

The code compliance certificate should be sent to *

○ Owner - owner address as per section "Who Owns The Building"	◉ Agent - agent address as per section "Who Is The Applicant"

Agent name *

GJ Gardner Homes Manawatu/Horowhenua

Agent title

If the agent is an organisation, capture the organisation's name

Agent's Contact person

Brendan Paki

Agent's relationship to owner *

Project Manager

Required if the agent is an organisation

Agent email address *

brendan.paki@gjgardner.co.nz

Agent contact number *

063578020

Agent mobile number

Agent street address *

623 Main street Palmerston North

Agent mailing address

PO Box 466
Palmerston North

Who Completed The Building Work

Select who completed the building work

☑ Licensed Building Practitioner	☐ Other

If there are others who were involved in the build who aren't licensed building practitioners, please provide their details by selecting the other option.

The licensed building practitioner(s) (LBP) who carried out/supervised the restricted building work is/are

Name *

Shane MacKenzie

Company

Email address *

landmax@xtra.co.nz

Contact number *

0272225047

Street address *

18 Taranui Way, Paraparaumu

Mailing address

Licensed Building Practitioner *

Carpenter

Licence class *

- Brick and blocklaying
- Carpentry
- Design 1
- Design 2
- Design 3
- External plastering
- Foundations
- Site 1
- Site 2
- Site 3

LBP registration number *

BP102284

Work carried out or supervised *

◉ Work carried out ○ Supervised

Will a Record of Work (From 6A) from this LBP be attached to the CCC application? *

◉ Yes ○ No

The licensed building practitioner(s) (LBP) who carried out/supervised the restricted building work is/are

Name *

Jamie Perigo

Company

Email address *

matrixbuilding@gmail.com

Contact number *

0275022771

Street address *

5 Nelson street Feilding

Mailing address

Licensed Building Practitioner *

Carpenter

Licence class *

- Brick and blocklaying
- Carpentry
- Design 1
- Design 2
- Design 3
- External plastering
- Foundations
- Site 1
- Site 2
- Site 3

LBP registration number *

BP136785

Work carried out or supervised *

◉ Work carried out ○ Supervised

Will a Record of Work (From 6A) from this LBP be attached to the CCC application? *

◉ Yes ○ No

The licensed building practitioner(s) (LBP) who carried out/supervised the restricted building work is/are

Name *

Matt Williams

Company

Email address *

sunchaserroofandgarden@gmail.com

Contact number *

Street address *

Mailing address

Licensed Building Practitioner *

-- Please Select --

Licence class *

Brick and blocklaying
Carpentry
Design 1
Design 2
Design 3
External plastering
Foundations
Site 1
Site 2
Site 3

LBP registration number *

Work carried out or supervised *

- (•) Work carried out
- ( ) Supervised

Will a Record of Work (From 6A) from this LBP be attached to the CCC application? *

- (•) Yes
- ( ) No

What Specified Systems Are In The Building?

Are there any specified systems in the building? *

- ( ) Yes
- (•) No

Have You Attached All Required Documents

Document Upload Process

Only one document can be uploaded against each document category. You need to merge all documents into a single PDF per category (e.g. all architectural plans must be merged into a single document).

Several free online PDF merger tools are available on the internet one such tool is Smallpdf. With Smallpdf, you can merge documents into a single file.

For a full list of the document categories and what should be included in each category click **here.**

Click **here** for help and frequently asked questions.

A complete CCC application requires the information listed below:

- Memorandum of Licensed Building Practitioners Record of Work (for each type of building work completed)
- Certificates relating to energy work

Supporting information may also be required including (but is not limited to):

- Evidence that specified systems can perform to the performance standards set out in the building consent
- Other documents from personnel who carried out the work
- Refer to your building consent approval letter for a full list of documents required to support your CCC application.

If you have already uploaded documents to the building consent you do not need to upload it again.

Select the following option to attach a record of work *

☑ Attached a PDF to this application	☐ The LBP will complete the form online	☐ No records of work are required

Record Of Building Work

Record of Work (LBP) - ProRoofing_ROW_GJR3222_283A_Kimberley_Road_(1).pdf
Record of Work (LBP) - RFL_Memorandum_(20).pdf
Record of Work (LBP) - Buildersrow_(5).pdf
Record of Work (LBP) - Plasterrow_(1).pdf

CCC Documentation

CCC Documentation - RFL_Driven_Timber_Piles_PS4.pdf
CCC Documentation - Pinkfit_Guarantee_PDF_(7)_(1).pdf
CCC Documentation - Hyslop_Plumbing_As_Laid.pdf

Declaration

Privacy Information

The information you have provided on this form is required so that your application can be processed under the Building Act 2004. The Council, Territorial Authority (TA) or Building Consent Authority (BCA) collates statistics relating to building work and has a statutory obligation to provide information to third parties. The information is stored on a public register, which must be supplied to whoever requests the information. Under the Privacy Act 2020, you have the right to see, and correct personal information Councils, TAs and BCAs holds about you.

You can view the Simpli Privacy Statement here

In providing this information, you agree to your details being used for customer surveys carried out by the Council, BCA or TA.

Terms of Use

By making this submission you agree to the Simpli portal terms and conditions.

Your application fees

The Council, BCA or TA may charge fees for your application. These will include statutory levies to BRANZ and the Ministry of Business, Innovation & Employment.

A fee schedule can be found on the BCA's website, refer to the link in the details panel on the right. Your fees will be advised when the BCA accepts your submission.

Statutory declaration

I request that you issue a code compliance certificate for this work under section 95 of the Building Act 2004.

☑ ***I acknowledge and agree with the above statements.**

Name *

Brendan Paki

Date *

24/05/2021

Submitter Declaration

Submitter Name

Brendan Paki

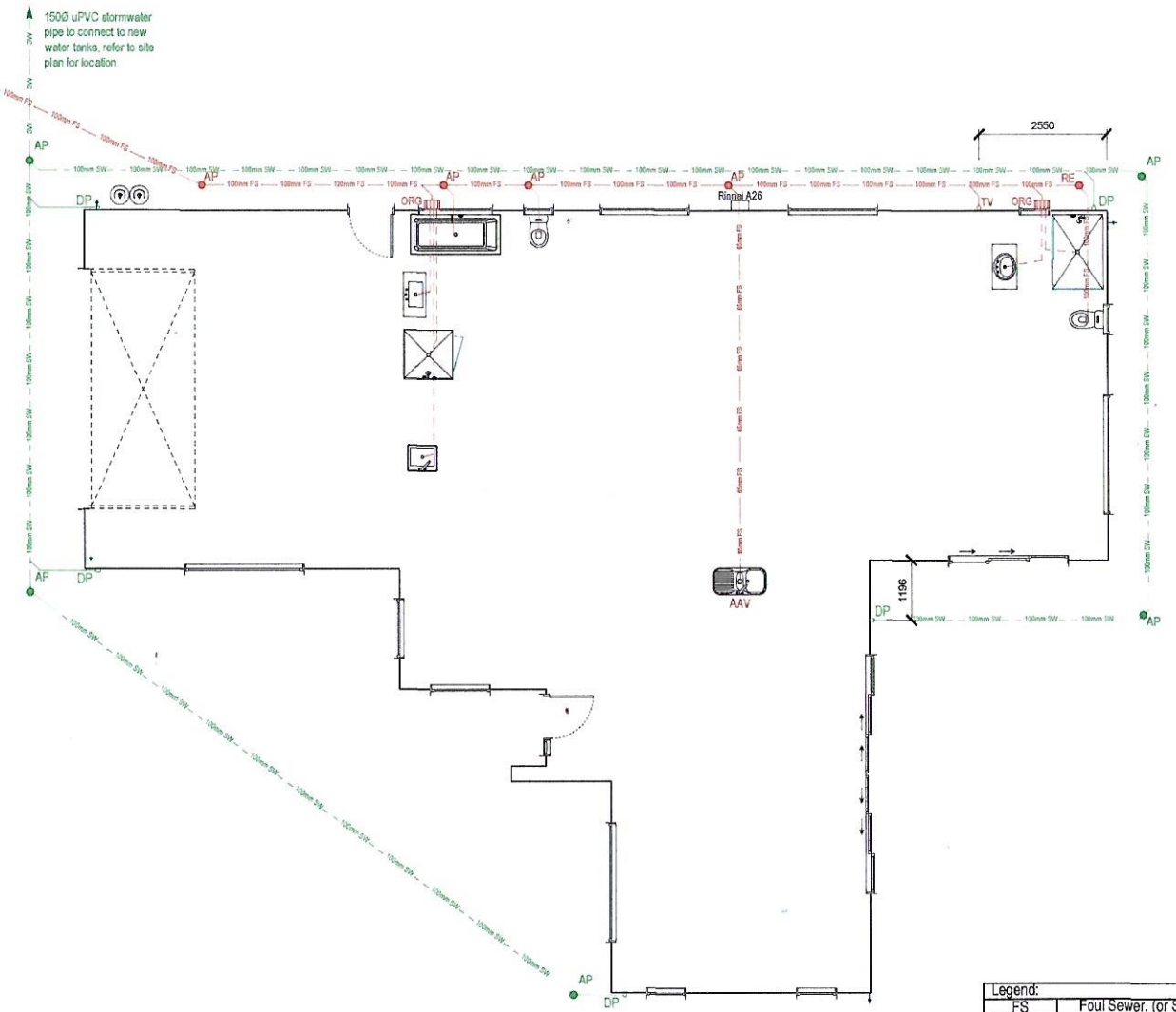
Date

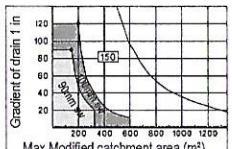
26/05/2021

I understand that by ticking the following boxes, I am agreeing to the following statements:

☑ ***As the agent I confirm that I am submitting this application on behalf of and with the authority of the owner and confirm that all the information within the application is, to the best of my knowledge, true and correct.**

☑ ***I request that you issue a code compliance certificate for this work under section 95 of the Building Act 2004.**





Sizing of surface water drains
90mm SW @ 1:90 min maximum modified catchment area = 155m²
100mm SW @ 1:120 min maximum modified catchment area = 200m²

Nominal potable water pipe diaMetres - Rinnai Infinity - Mains pressure

Notes:
(1) if supplied by seperate pipe from storage water heater to a single cut lot.
(2) This table is based on maximum pipe lengths of 20 Metres.
(3) 2m maximum length from water heater outlet to tempering valve.
(4) 15mm if dedicated line to shower.
(5) 10mm if dedicated line to shower.

	Mains Pressure
Pipes to Shower	20mm (5) (15mm Optional) (1)
Pipes to sink/laundry (2)	20mm
Pipes to bath (2)	15mm
Pipes to basins (2)	10mm

In a household unit the developed length of the pipe-run from the water heater to the kitchen sink outlet shall be minimized, to the sizes noted below.

Nominal Pipe size (mm)	10mm	15mm	20mm
length (m)	25m	12m	7m

These drawings are copyrighted.

Under no circumstances may these drawings be reproduced in any form without the written permission of:
G.J. Gardner Homes
Manawatu / Horowhenua.

Legend:	
FS	Foul Sewer. (or Sanitary Sewer)
SW	Storm Water.
DP	80mm Down Pipe.
AAV	Air Admittance Valve.
TV	Terminal Vent.
GT	Gully Trap.
ORG	Overflow Relief Gully.
AP	Access Point, inspection bend.
RE	Rodding eye brought to surface.

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

Notes:

Potable water supply: All potable water supply installed to G12 AS/1. Pipes to be polybutylene water supply pipe work outside the buildings th envelope and / or subject to UV light degradati to be insulated with closed cell foam tubing or another insulation product in accordance wi NZS 4305.

Water tank to house water supply pipe:	25MM
Potable water pump: (or competitor's equivale	DAB - Divertron 1200
Potable water Filter: (or competitor's equivale	Pentek - #20 Big Blue

Surface water: All surface water works to b conducted to E1/AS1

Hard stand areas (paving etc) to fall away fr building, direct to either noted sumps connecte on site storm water system. Or toward garde grassed areas for site soakage. Ensure surfa water is contained on site.

Gas fitting: All gas fitting works to G10/AS1 AS/NZS5601.1 & AS/NZS 5601.2 - Suitabl qualified gas fitter to complete works and pro energy works certificate on completion.

Rinnai Infinity continuous flow A26 water hea unit, installed in factory recess kit. To be set maximum temperature of 55°C to all sanita fixtures.

Plumbing & Drainage: All plumbing drainage v on this plan are to G13/AS3 via AS/NZS 350 suitably qualified drain layer to complete works provide as built plan on completion.

Plumbing fixture wastes: Plumber to confirm kitchen & bathroom fixture waste layout prio pre-pipe, confirm waste positions from kitch design & main contractor before commenci

All pipe sizes mentioned below are minimum sizes, they may be up sized for convenience economic reasons.

Pipe type:	Call size
Fixture to gully (PVC)	40mm
Gully to main drain (PVC)	100mm
WC to main drain (PVC)	100mm
Non soil fixture to main drain (PVC)	65mm
Main drain (PVC)	100mm
Terminal vent unless otherwise stated:	80mm

Where successive pipes pass though a found wall, (e.g. into a gully) pipes to be separated minimum of 25mm.

Provide a tap over any ORG or gully trap wit fixture waste pipes terminating over them

NOTE: All downpipes are to be located 25 from external corners unless otherwise st

Issue: **Consent**

ONLY PLANS WITH COUNCIL CONSENT STAMP MA USED FOR CONSTRUCTION OR PREFABRICATI

G.J. Gardner. HOMES
New Zealand's favourite home builders

G.J. Gardner HOMES
Phone: (06) 357 8020
Fax: (06) 357 8021
Email: Trevor.Low@gjgardner.co.nz
P.O. BOX 466 Palmerston North

Proposed Residence.
D Hyde & C Main.
283a Kimberley Road, Levin.

Drainage plan

GENERATED: 06 / 10 / 2020 9:28:53 am
SCALES: A3 1:100 A4
DRAWN: Jonathan Barlow
CHECKED: Jeff LBP-111561
REV 1
JOB No: GJ
LOT: 03
DP: 351707
SHEET No:

Last modified by: Jonathan Paper size: ISO full bleed A3 (420.00 x 297.00 MM) File Location: Z:\00 Jobs\20-37 Main & Hyde\20-37 - Main & Hyde - WD1.dwg

PREFERRED PINK® BATTS® INSTALLERS

Installation Guarantee

This is to certify

This home has been insulated by PinkFit®, the preferred installers of Pink® Batts® insulation.

The PinkFit® licensee guarantees that, at the time of installation the insulation was installed in accordance with New Zealand Standard Energy Efficiency - Installing Insulation in Residential Buildings NZS 4246:2016.

Proper installation is essential for insulation to meet the durability requirements of NZBC B2.3.1|a) of not less than 50 years.

This guarantee is transferable to subsequent owners of the home.

Please keep this document in a safe place.

Signature:  Chris Phillips

Date: 06/03/2021

PinkFit® Licensee Trading As : **PinkFit® Manawatu**

PinkFit® Licensee Company Name : **C and S Phillips Limited**

Registration Details

Compliance No.:	**M100090701**	Date Printed:	06/03/2021
Builder Details:	G.J. Gardner Homes	Install Date:	02/03/2021
Site Details:	283A Kimberley Road	Completion:	06/03/2021
	Levin	Building Consent No.:	

Product Details:

Ceiling insulation	Pink® Batts® Classic R3.2 Ceiling thickness 170mm
Wall insulation	Pink® Batts® Classic R2.4 Wall thickness 90mm

PinkFit® is a network of independent installers licensed by Tasman Insulation New Zealand Limited. PinkFit®, Pink® and the colour PINK are registered trade marks of Owens Corning used under license by Tasman Insulation. Batts® is the registered trade mark of Tasman Insulation New Zealand.

Post Installation Photos

PREFERRED PINK® BATTS® INSTALLERS

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COMPLETELY PLASTERED LTD
23 Rosebank Avenue
Palmerston North
plastered1@live.com

PS3 PRODUCER / CONSTRUCTION STATEMENT
EXTERNAL CLADDING

Job Number :	72483
Site Address :	283A Kimberley Road, , Levin
Consent No :	20200581
Building Owner :	Dylan Hyde & Courtney Main
Builder :	G J Gardner Manawatu
Registered Plasterer :	Completely Plastered Ltd
Systems Used :	Insulated Facade System - EPS
Substrates Used :	EPS 50mm
Textures Used :	Rockcote QuickSand
Paint System Used :	2 Coats of Resene X200
Colours Used :	Silver Chalice.
Installation/Application Start Date :	14-Feb-2021
Installation/Application End Date :	16-Mar-2021
Clauses and Further Information :	

We the above firm have completed the above work in accordance with NZBC E2/AS1, B1/AS1, B2/AS1 and the Resene Construction Systems Specifications.

Signed by Completely Plastered Ltd

License Number
BP117829

Form 6A

Memorandum from licensed building practitioner: Record of building work

Section 88, 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: 283A Kimberley Road	
Suburb:	
Town/City: Levin	Postcode: 5510

THE PROJECT
Building consent number: 20200581

THE OWNER(S)	
Name(s): Courtney Main & Dylan Hyde	
Mailing address: 173 Mako Mako Road	
Suburb:	PO Box/Private Bag:
Town/City: Levin	Postcode: 5510
Phone number:	Email address:

RECORD OF WORK THAT IS RESTRICTED BUILDING WORK

PRIMARY STRUCTURE

Work that is restricted building work	Description of restricted building work	Carried out or supervised
Tick ✓	If necessary, describe the restricted building work.	Tick ✓ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Foundations and subfloor framing ☐		○ Carried out ○ Supervised
Walls ☑	Pre Nail frames	✓ Carried out ○ Supervised
Roof ☑	Pre Nail Trusses	✓ Carried out ○ Supervised
Columns and beams ☐		○ Carried out ○ Supervised
Bracing ☑	Ply and Gib Bracing	✓ Carried out ○ Supervised
Other ☐		○ Carried out ○ Supervised

EXTERNAL MOISTURE MANAGEMENT SYSTEMS		
Work that is restricted building work	**Description of restricted building work**	**Carried out or supervised**
Tick ✓	If necessary, describe the restricted building work.	Tick ✓ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Damp proofing ☐		○ Carried out ○ Supervised
Roof cladding or roof cladding system ☐		○ Carried out ○ Supervised
Ventilation system (for example, subfloor or cavity) ☑	Cavity for Linea	○ Carried out ○ Supervised
Wall cladding or wall cladding system ☑	Linea weather board	○ Carried out ○ Supervised
Waterproofing ☐		○ Carried out ○ Supervised
Other ☐		○ Carried out ○ Supervised

ISSUED BY

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

Name: JAMIE PERIGO	LBP number: BP136785
Class(es) licensed in: CARPENTRY	
Plumbers, Gasfitters and Drainlayers registration number (if applicable):	
Mailing address (if different from below):	
Street address/Registered office: 5 NELSON STREET	
Suburb:	Town/City: FEILDING
PO Box/Private Bag	Postcode: 4702
Phone number:	Mobile: 027 5022771
After hours:	Fax:
Email address: MATRIXBUILDING19@GMAIL.COM	Website:

DECLARATION

I JAMIE PERIGO carried out or supervised the restricted building work recorded on this form.

Signature: _____

Date: 02/05/21

Memorandum from licensed building practitioner: Record of building work

Section 88, 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:	283a Kimberley Road	
Suburb:		
Town/City:	LEVIN	Postcode:

THE PROJECT	
Building consent number:	2020/0581

THE OWNER(S)		
Name(s):	GJ GARDNER MANAWATU	
Mailing address:		
Suburb:	PO Box/Private Bag:	
Town/City:		Postcode:
Phone number:	Email address:	

RECORD OF WORK THAT IS RESTRICTED BUILDING WORK

PRIMARY STRUCTURE

Work that is restricted building work	**Description of restricted building work**	**Carried out or supervised**
Tick ✓	If necessary, describe the restricted building work.	Tick ✓ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Foundations and subfloor framing ☑	Installed Ribraft Concrete Foundation to Engineers design and as per consented plans	✓ Carried out ○ Supervised
Walls ☐		○ Carried out ○ Supervised
Roof ☐		○ Carried out ○ Supervised
Columns and beams ☐		○ Carried out ○ Supervised
Bracing ☐		○ Carried out ○ Supervised
Other ☐		○ Carried out ○ Supervised

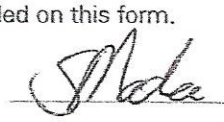
EXTERNAL MOISTURE MANAGEMENT SYSTEMS		
Work that is restricted building work	**Description of restricted building work**	**Carried out or supervised**
Tick ✓	If necessary, describe the restricted building work.	Tick ✓ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Damp proofing ☑	Installed Polythene to underside of concrete foundation as per Ribraft design shown in consented plans	✓ Carried out ○ Supervised
Roof cladding or roof cladding system ☐		○ Carried out ○ Supervised
Ventilation system (for example, subfloor or cavity) ☐		○ Carried out ○ Supervised
Wall cladding or wall cladding system ☐		○ Carried out ○ Supervised
Waterproofing ☐		○ Carried out ○ Supervised
Other ☐		○ Carried out ○ Supervised

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

Name: Shane MacKenzie	LBP number: 102284
Class(es) licensed in:	
Carpentry	
Plumbers, Gasfitters and Drainlayers registration number (if applicable):	
Mailing address (if different from below):	
Street address/Registered office: 18 Taranui Way	
Suburb: Paraparaumu Beach	Town/City: Paraparaumu
PO Box/Private Bag	Postcode: 5032
Phone number: 027 222 5047	Mobile:
After hours: 027 222 5047	Fax:
Email address: landmax@xtra.co.nz	Website:

DECLARATION

I Shane MacKenzie carried out or supervised the restricted building work recorded on this form.

Signature: 

Date: 14 December 2020

Form 6A

Memorandum from licensed building practitioner: Record of building work

Section 88, 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 page and attach the additional sheet(s) to this form.

THE BUILDING	
Street address of building: 283A Kimberley Road	
Suburb:	
Town / City: Levin	Postcode: 5571

THE PROJECT
Building consent number:

THE OWNER(S)	
Name(s): D Hyde & C Main	
Mailing address:	
Suburb:	PO Box / Private Bag:
Town / City:	Postcode:
Phone number:	Email address:

RECORD OF WORK THAT IS RESTRICTED BUILDING WORK

PRIMARY STRUCTURE

Work that is restricted building work	Description	Carried out or supervised
Tick ☑	If necessary, describe the restricted building work	Tick ☑ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work
Foundations and subfloor framing ☐		☐ Carried out ☐ Supervised
Walls ☐		☐ Carried out ☐ Supervised
Roof ☐		☐ Carried out ☐ Supervised
Columns and beams ☐		☐ Carried out ☐ Supervised
Bracing ☐		☐ Carried out ☐ Supervised
Other ☐		☐ Carried out ☐ Supervised

EXTERNAL MOISTURE MANAGEMENT SYSTEMS		
Work that is restricted building work	**Description of restricted building work**	**Carried out or supervised**
Tick ☑	If necessary, describe the restricted building work	Tick ☑ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work
Damp proofing ☐		☐ Carried out ☐ Supervised
Roof cladding or roof cladding system ☑	Installation of Gerard roofs pressed steel tiles and accessories as per E2/AS1 and the manufacturers specification. Scope of work as detailed in Gerard Roofs Ltd Quote #GJ17819.	☑ Carried out ☑ Supervised
Ventilation system (for example, subfloor or cavity) ☐		☐ Carried out ☐ Supervised
Wall cladding or wall cladding system ☐		☐ Carried out ☐ Supervised
Waterproofing ☐		☐ Carried out ☐ Supervised
Other ☐		☐ Carried out ☐ Supervised

Note: continue on another page if necessary.

ISSUED BY

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

Name: Matt Williams	LBP number: BP137576
Class(es) licensed in: Roofing	
Plumbers, Gasfitters and Drainlayers Board registration number (if applicable):	
Mailing address (if different from below):	
Street address / Registered office: 11 Menin Road, Raumati South, Paraparaumu 5032	
Phone number: Landline:	Mobile: 021 339 463
Daytime:	After hours:
Fax:	
Email address: sunchaserroofandgarden@gmail.com	Website:

DECLARATION

I, Matt Williams , [*name of practitioner*]

carried out or supervised the restricted building work recorded on this form.

Signature: _____

Date: 4 Feb 2021

Building Code Clause(s) B1 & B2

PRODUCER STATEMENT – PS4 – CONSTRUCTION REVIEW

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

ISSUED BY: Hamish Wells Engineer Limited
(Construction Review Firm)

TO: R.F.L.
(Owner/Developer)

TO BE SUPPLIED TO: Horowhenua District Council
(Building Consent Authority)

IN RESPECT OF: Driven Timber Piles
(Description of Building Work)

AT: 283a Kimberley Road, Levin
(Address)

LOT 3 **DP** ..... **SO** .....

.....has been engaged by Base Solutions
(Construction Review Firm)

To provide☐CM1☐CM2☑CM3☐CM4☐CM5*(Engineering Categories)* or ☐ observation as per agreement with owner/developer

or ☐other .....services
(Extent of Engagement)

in respect of clause(s) B1 and B2 of the Building Code for the building work described in documents relating to Building Consent No. 2020/0581 and those relating to Building Consent Amendment(s) Nos. None issued during the course of the works. We have sighted these Building Consents and the conditions of attached to them.

Authorised instructions / variations(s) No. None (copies attached) or by the attached Schedule ☐ have been issued during the course of the works.

On by the basis of ☐this ☑these review(s) and information supplied by the contractor during the course of the works and **on behalf of the firm** undertaking this Construction Review, **I believe on reasonable grounds** that ☐All ☑Part only of the building works have been completed in accordance with the relevant requirements of the Building Consent and Building Consent Amendments identified above, with respect to Clause(s) B1 & 2 of the Building Code. I also believe on reasonable grounds that the persons who have undertaken this construction review have the necessary competency to do so.

I, Hamish Tennent Wells am: ☑CPEng No. 186323
(Name of Construction Review Professional)

☐Reg Arch No. .....

I am a Member of : ☑IPENZ ☐NZIA and hold the following qualifications: NZCE Civil REA

The Construction Review Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $500,000 *.

The Construction Review Firm is a member of ACENZ : ☐

SIGNED BY Hamish Tennent Wells **ON BEHALF OF** Hamish Tennent Wells

Date: 01/12/2020 Signature: .....

*Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $500,000 *.*

This form is to accompany **Forms 6 or 8 of the Building (Form) Regulations 2004** for the issue of a Code Compliance Certificate.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, IPENZ AND NZIA

Hamish Wells Engineer Ltd
CIVIL
STRUCTURAL
INFRASTRUCTURE
LAND DEVELOPMENT
ENVIRONMENTAL

Hamish Wells
Consulting Engineer
CMEng NZ#186323

Mobile: 0274 459 757
202 Otaki Gorge Road,
PO Box 188, Otaki 5542
E: hamish@engenr.co.nz

Site Inspection / Report Form

No: 2821

Controlling Authority	HDC	Date	1/12	2020
BC/RC reference #	2020/0581	Job #	200466	
Site location (add UTM co-ords for rural sites)	283A KIMBERLEY RD LEVIN LOT 3			
Client & designer Phone # Email	R. F. L.			
Contractor Phone # Email	BASE SOLUTIONS			

Description of work being inspected:

DRIVEN TIMBER PILE SOLUTIONS

175 SED PILES

1.5, 1.8, 2.4 m LONG PILES

DRIVEN TO PRACTICAL RESISTANCE

SETS FROM 1 – 4mm

Signed

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **25 May 2021**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Valuation Ref: **1484020513**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage**

Inspection Type: **Final Inspection**

Inspection Status: **Pass**

Inspected By: **Harley Adams**

Inspection Date: **25 May 2021**

Inspected and passed as per the consented documents and New Zealand Building Code. OK to consider issue of Code Compliance Certificate (CCC) upon receipt of application.

You can apply for CCC on-line via the Simpli portal (www.simpli.govt.nz). Please ensure any required documents are included with the application.
Alternatively, manual application forms can be downloaded from: www.simpli.govt.nz/tool-box - Code Compliance Certificate (Form 6)

Completed manual applications (including any required documents) can be either:
1. Scanned and emailed to - recordsprocessing@horowhenua.govt.nz
2. Posted to - Horowhenua District Council, Private Bag 4002, Levin 5540
3. Handed in at the front desk - 126 Oxford St LEVIN

When building consents are issued an invoice is created with an estimated number of inspections required.
Now that the work is complete the number of inspections conducted will be reconciled with the number of inspections invoiced - the difference will be either refunded or invoiced.
Refunds will be returned in due course, invoices require payment prior to the issue of a CCC.

Passed Items

Interior	**All work inspected and passed in compliance with the building consent documentation and the New Zealand Building Code.** **Outcome - Pass**
Layout as per plans	**Layout as per plans**
Sinks drain	**Sinks drain properly without pulling Traps/seals**
Toilets	
Impervious floors to wet areas	**Impervious vinyl floors to wet areas**
Joinery	**Joinery installed and sealed to walls**
Windows	**Windows as per plans**
Ventilation	**Ventilation adequate to rooms**
Mechanical vents	**Mechanical vents fitted and ducted to exterior for kitchen, laundry and bathrooms**
Smoke detectors	**Smoke detectors fitted**
Safety glazing to shower doors and panels	**Safety glazing to shower doors and panels**
Safety glazing to windows and doors	**Safety glazing to windows and doors as per plans**
Waterproof seal	**Waterproof seal to shower and basin**
Water temperature checked	**Check water temp deg 50**
Gas hot water system	**Rinnai Gas hot water system**
Roof access	**Roof access available in garage**

Insulation away from downlights	**IC rated down lights**
Pipework	**Pipework lagged where required**
Cables	**Cables away from access**
Backflow prevention	**Backflow prevention achieve with air gaps**
Warnings and Bans	**No relevant warnings or bans identified.**
Exterior	**All work inspected and passed in compliance with the building consent documentation and the New Zealand Building Code.** **Outcome - Pass**
Cladding type	**Resene construction plaster over a 20mm drained cavity and** **James Hardie Linea weatherboard installed over a 20mm drained cavity.**
As per plans	**As per plans**
Roofing	**Roofing secure**
Roofing type	**Pressed metal Shake - Satin tile roofing**
Windows flashed/sealed to soffit	
Ground levels ok	**Ground levels ok**
Gas bottle	**Gas bottle location with hood over regulator is correct**
Stucco sealed and painted	**Resene plaster system sealed and painted**
Gully heights	**Gully heights ok**
Waste pipes sealed through Foundations	**Waste pipes sealed through Foundations**
Waste pipes sealed into gullies	**Waste pipes sealed into gullies**
Stormwater	**Stormwater system completed**
Terminal vents in place	**80mm Terminal vent in place**
Exterior weatherproof	**Exterior is weatherproof**
Driveway	**Gravel driveway**
Secondary flow path for excess stormwater	**Secondary flow path for excess stormwater to lowest point of boundary**
Landscaping completed?	**Landscaping ok**
Gutter/downpipe sizes	**Gutter/downpipe sizes ad per plan**
Warnings and Bans	**No relevant warnings or bans identified.**

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage**

Inspection Type: **Final Inspection**

Inspection Status: **Pass**

Inspected By: **Harley Adams**

Inspection Date: **25 May 2021 2:02 PM**

Duration: **15 minutes**

Inspected and passed as per the consented documents and New Zealand Building Code. OK to consider issue of Code Compliance Certificate (CCC) upon receipt of application.

You can apply for CCC on-line via the Simpli portal (www.simpli.govt.nz). Please ensure any required documents are included with the application.
Alternatively, manual application forms can be downloaded from: www.simpli.govt.nz/tool-box - Code Compliance Certificate (Form 6)

Completed manual applications (including any required documents) can be either:
1. Scanned and emailed to - recordsprocessing@horowhenua.govt.nz
2. Posted to - Horowhenua District Council, Private Bag 4002, Levin 5540
3. Handed in at the front desk - 126 Oxford St LEVIN

When building consents are issued an invoice is created with an estimated number of inspections required.
Now that the work is complete the number of inspections conducted will be reconciled with the number of inspections invoiced - the difference will be either refunded or invoiced.
Refunds will be returned in due course, invoices require payment prior to the issue of a CCC.

Inspection Element	Status
Interior	Pass
All work inspected and passed in compliance with the building consent documentation and the New Zealand Building Code. **Outcome - Pass**	
Layout as per plans	Pass
Layout as per plans	
Sinks drain	Pass
Sinks drain properly without pulling Traps/seals	
Toilets	Pass
Impervious floors to wet areas	Pass
Impervious vinyl floors to wet areas	
Air admittance valves	N/A
Joinery	Pass
Joinery installed and sealed to walls	
Windows	Pass
Windows as per plans	
Ventilation	Pass
Ventilation adequate to rooms	
Mechanical vents	Pass
Mechanical vents fitted and ducted to exterior for kitchen, laundry and bathrooms	
Smoke detectors	Pass
Smoke detectors fitted	
Safety barriers	N/A
Safety glazing to shower doors and panels	Pass
Safety glazing to shower doors and panels	

Safety glazing to windows and doors **Safety glazing to windows and doors as per plans**	Pass
Handrails	N/A
Restrictor stays	N/A
Waterproof seal **Waterproof seal to shower and basin**	Pass
Water temperature checked **Check water temp deg 50**	Pass
Hwc secure	N/A
Hwc relief pipe	N/A
Hwc high or low pressure	N/A
Hwc open or valve vented	N/A
Tempering valve	N/A
All valves accessible	N/A
Gas hot water system **Rinnai Gas hot water system**	Pass
Roof access **Roof access available in garage**	Pass
Insulation away from downlights **IC rated down lights**	Pass
Pipework **Pipework lagged where required**	Pass
1m of copper pipe from cylinder	N/A
Supply tank	N/A
Cables **Cables away from access**	Pass
Firewall sheets stopped	N/A
Backflow prevention **Backflow prevention achieve with air gaps**	Pass
Accessibility	N/A
Signage	N/A
Emergency lighting	N/A
Warnings and Bans **No relevant warnings or bans identified.**	Pass
Other	N/A
B/c memorandum check	N/A

Exterior — Pass

All work inspected and passed in compliance with the building consent documentation and the New Zealand Building Code.
Outcome - Pass

Cladding type **Resene construction plaster over a 20mm drained cavity and** **James Hardie Linea weatherboard installed over a 20mm drained cavity.**	Pass
As per plans **As per plans**	Pass
Roofing **Roofing secure**	Pass
Roofing type **Pressed metal Shake - Satin tile roofing**	Pass
Barrier heights	N/A
Overflows to enclosed decks	N/A
Windows flashed/sealed to soffit	Pass
Ground levels ok **Ground levels ok**	Pass

Gas bottle **Gas bottle location with hood over regulator is correct**	Pass
Subfloor insulation	N/A
Subfloor ventilation	N/A
Stucco sealed and painted **Resene plaster system sealed and painted**	Pass
Capillary break to stucco	N/A
Gully heights **Gully heights ok**	Pass
Waste pipes sealed through Foundations **Waste pipes sealed through Foundations**	Pass
Waste pipes sealed into gullies **Waste pipes sealed into gullies**	Pass
Stormwater **Stormwater system completed**	Pass
Retaining wall drainage	N/A
Retaining walls as per plans	N/A
Terminal vents in place **80mm Terminal vent in place**	Pass
Branch vents in place	N/A
Weep holes	N/A
Exterior weatherproof **Exterior is weatherproof**	Pass
Sumps	N/A
Driveway **Gravel driveway**	Pass
Secondary flow path for excess stormwater **Secondary flow path for excess stormwater to lowest point of boundary**	Pass
Landscaping completed? **Landscaping ok**	Pass
Gutter/downpipe sizes **Gutter/downpipe sizes ad per plan**	Pass
Warnings and Bans **No relevant warnings or bans identified.**	Pass
Other	N/A
Fire and Accessibilty	N/A
Pool & Spa Fencing	N/A



Joinery installed and sealed to walls
Taken at 1:27 PM on Tuesday 25/05/2021



Waterproof seal to shower and basin
Taken at 1:32 PM on Tuesday 25/05/2021



Rinnai
Taken at 1:46 PM on Tuesday 25/05/2021



Windows sealed to soffits
Taken at 1:52 PM on Tuesday 25/05/2021



Windows sealed to soffits
Taken at 1:52 PM on Tuesday 25/05/2021



Cladding and roof
Taken at 1:53 PM on Tuesday 25/05/2021



Cladding and roof
Taken at 1:54 PM on Tuesday 25/05/2021



Cladding and roof
Taken at 1:54 PM on Tuesday 25/05/2021



Gully heights
Taken at 1:57 PM on Tuesday 25/05/2021



80mm Terminal vent in place
Taken at 1:59 PM on Tuesday 25/05/2021

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **12 May 2021**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Valuation Ref: **1484020513**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage**

Inspection Type: **Drainage**

Inspection Status: **Pass**

Inspected By: **Russell Brook**

Inspection Date: **12 May 2021**

All work inspected and passed in compliance with the building consent documentation and NZ building code requirements. Okay to continue.

Passed Items

General

Name of Drainlayer	**Dave Hodges 16176**
Correct falls	**1 in 60 G13/AS3**
Terminal vent riser	**80mm external vent**
Test on	**Water holding and flowed freely on release.**
Drain inspection points	
Laid in bedding	**Pea metal compacted firmly under and around pipe work**
As built received	**To be supplied with CCC application.**
Soak pits	**Excavated as per dimensions in consented documentation.**
Correct stormwater pipe used	
Septic tank aerated system	
Effluent field location as per plan	
Horizons approval	
Dripper lines	

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage**

Inspection Type: **Drainage**

Inspection Status: **Pass**

Inspected By: **Russell Brook**

Inspection Date: **12 May 2021 8:40 AM**

Duration: **30 minutes**

All work inspected and passed in compliance with the building consent documentation and NZ building code requirements. Okay to continue.

Inspection Element	Status
General	Pass
Name of Drainlayer ***Dave Hodges 16176***	Pass
Correct falls **1 in 60 G13/AS3**	Pass
Terminal vent riser **80mm external vent**	Pass
Test on **Water holding and flowed freely on release.**	Pass
Drain inspection points	Pass
Laid in bedding **Pea metal compacted firmly under and around pipe work**	Pass
Sumps installed as per plan	N/A
As built received **To be supplied with CCC application.**	Pass
Soak pits **Excavated as per dimensions in consented documentation.**	Pass
Correct stormwater pipe used	Pass
Septic tank aerated system	Pass
Effluent field location as per plan	Pass
Horizons approval	Pass
Dripper lines	Pass
Downpipes **To be checked as part of final inspection.**	N/A
Warnings and Bans **No Warnings and Bans identified as part of this consent**	N/A
Other	N/A



Septic system Oasis
Taken at 8:39 AM on Wednesday 12/05/2021

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage**

Inspection Type: **Waterproof Membrane**

Inspection Status: **Pass**

Inspected By: **Junior Vaikai**

Inspection Date: **15 April 2021 9:15 AM**

Duration: **15 minutes**

All work inspected and passed in compliance with the building consent documentation and the New Zealand Building Code.
Outcome - Pass - OK to continue.

Inspection Element	Status
General	Pass
Restricted Building Work **Ben Macgregor.** **Mapei 403**	Pass
Type of membrane **Mapeigum WPS.**	Pass
Interior/exterior **Interior.**	Pass
Substrate **Villaboard.**	Pass
Fixing of substrate **150crs confirmed at post-line inspection.**	Pass
Moisture content **Confirmed at pre-line inspection.**	Pass
Warnings and Bans **Nil.**	Pass
Other	N/A

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **15 April 2021**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Valuation Ref: **1484020513**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage**

Inspection Type: **Waterproof Membrane**

Inspection Status: **Pass**

Inspected By: **Junior Vaikai**

Inspection Date: **15 April 2021**

All work inspected and passed in compliance with the building consent documentation and the New Zealand Building Code.
Outcome - Pass - OK to continue.

Passed Items

General

Restricted Building Work	**Ben Macgregor.** **Mapei 403**
Type of membrane	**Mapeigum WPS.**
Interior/exterior	**Interior.**
Substrate	**Villaboard.**
Fixing of substrate	**150crs confirmed at post-line inspection.**
Moisture content	**Confirmed at pre-line inspection.**
Warnings and Bans	**Nil.**

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required
External cladding	Required
Roofing	Required

Documentation	Status
Exterior Joinery Warranty	Accepted
Roof Cladding Warranty	Received
CCC application - Form 6	Required
Wall Cladding Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required
P.S.4 Construction Review/Site Notes **Foundation**	Required
P.S.3 Construction	Required
Other (specify) **Siting certificate to be supplied before issue of ccc**	Required

Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **18 March 2021**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Valuation Ref:

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Post lining**

Inspection Status: **Pass**

Inspected By: **Marcus Good**

Inspection Date: **18 March 2021**

Inspected and passed as per consented documents and NZBC. OK to continue

Next inspections: Drainage & Waterproof Membrane

Passed Items

Restricted Building Work	**Details previously recorded**
Brace panels	**Pass**
Fasteners used	**Pass**
As per plan	**Pass**
Bracing sheets	**As per plan**
Standard linings	**GIB standard linings**
Wet area substrate	**Villaboard fixed at 150mm crs**

GoGet Audit Report

Consent No: **20200581**
Applicant: **Dylan James Hyde, Courtney Ivy Main**
Site Address: **283A Kimberley Road, Levin Rural**
Work Type: **New Residential Dwelling**

Inspection Type: **Post lining**
Inspection Status: **Pass**
Inspected By: **Marcus Good**
Inspection Date: **18 March 2021 9:22 AM**
Duration: **30 minutes**

Inspected and passed as per consented documents and NZBC. OK to continue

Next inspections: Drainage & Waterproof Membrane

Inspection Element	Status
Restricted Building Work **Details previously recorded**	Pass
Brace panels **Pass**	Pass
Diaphragm Ceiling	N/A
Fasteners used **Pass**	Pass
As per plan **Pass**	Pass
Bracing sheets **As per plan**	Pass
Standard linings **GIB standard linings**	Pass
Aqualine tile shower	N/A
Wet area substrate **Villaboard fixed at 150mm crs**	Pass
Warnings and Bans	N/A
Other	N/A

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **11 March 2021**

Applicant: **Dylan James Hyde, Courtney Ivy Main**
Valuation Ref:
Site Address: **283A Kimberley Road, Levin Rural**
Work Type: **New Residential Dwelling**

Inspection Type: **Stucco/Eifs**
Inspection Status: **Pass**
Inspected By: **Marcus Good**
Inspection Date: **11 March 2021**

Inspected and passed as per consented documents and NZBC. OK to continue

Passed Items

Restricted Building Work	**Julian Osland** **Supervisor: Jeremy Braddock #121312**
Fixings correct	**Pass**
Eifs plaster nail/washer	**Eifs plaster nail/washer used correctly**

Inspection Type: **Pre-lining**
Inspection Status: **Pass**
Inspected By: **Marcus Good**
Inspection Date: **11 March 2021**

Re-inspected and passed as per consented documents and NZBC. OK to continue

Next inspection: Post-line

Passed Items

Other	**Exterior cladding now 100% complete**

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required
External cladding	Required
Roofing	Required

Documentation	Status
Exterior Joinery Warranty	Accepted
CCC application - Form 6	Required
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required
P.S.4 Construction Review/Site Notes	Required

Foundation

P.S.3 Construction	Required
Other (specify)	Required

Siting certificate to be supplied before issue of ccc

Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Pre-lining**

Inspection Status: **Pass**

Inspected By: **Marcus Good**

Inspection Date: **11 March 2021 11:21 AM**

Duration: **15 minutes**

Re-inspected and passed as per consented documents and NZBC. OK to continue

Next inspection: Post-line

Inspection Element	Status
Other	Pass

Exterior cladding now 100% complete

GoGet Audit Report

Consent No: **20200581**
Applicant: **Dylan James Hyde, Courtney Ivy Main**
Site Address: **283A Kimberley Road, Levin Rural**
Work Type: **New Residential Dwelling**

Inspection Type: **Stucco/Eifs**
Inspection Status: **Pass**
Inspected By: **Marcus Good**
Inspection Date: **11 March 2021 11:20 AM**
Duration: **30 minutes**

Inspected and passed as per consented documents and NZBC. OK to continue

Inspection Element	Status
Restricted Building Work ***Julian Osland*** **Supervisor: Jeremy Braddock #121312**	Pass
Netting	N/A
Fixings correct **Pass**	Pass
Eifs plaster nail/washer **Eifs plaster nail/washer used correctly**	Pass
Flashing mesh	N/A
Reinforcing mesh	N/A
Control joints	N/A
No lengths over 4m vertical & horizontal	N/A
Control break at first floor level	N/A
Warnings and Bans	N/A
Other	N/A

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Pre-lining**

Inspection Status: **Fail**

Inspected By: **Marcus Good**

Inspection Date: **4 March 2021 9:00 AM**

Duration: **30 minutes**

Outcome: Fail.
Re-check required once remedial action is complete

Inspection Element	Status
Restricted Building Work **Jamie Perigo #136785** **Carpentry** **LBP Reminded of requirement to provide copies of M.O.W. to owner and Territorial Authority: Yes**	Pass
Bracing **Bracing as per plan**	Pass
Straps **Handibracs as per plans**	Pass
Ceiling batten type ***Steel***	Pass
Ceiling batten spacings & fixings **Rondo @ 600mm crs, dircet fixed to trusses**	Pass
Post size & treatment & fixings	N/A
Safety glazing **Safety glazing installed**	Pass
Moisture content **12-15%**	Pass
Insulation to walls **R2.4**	Pass
Insulation to ceilings **R3.2**	Pass
Dragon ties **Installed as per plans**	Pass
Diaphragms	N/A
Solid blocking	N/A
Wet area corners **Metal angles installed**	Pass
Warnings and Bans	N/A
Other **Exterior cladding only 10% complete - building wrap is insufficient weathertight protection.** **Re-check required following a passed Stucco / EIFS inspection**	Fail



Metal angles installed
Taken at 8:51 AM on Thursday 4/03/2021



Taken at 8:53 AM on Thursday 4/03/2021



Exterior cladding not 100% weathertight
Taken at 8:57 AM on Thursday 4/03/2021



Exterior cladding only 10% complete
Taken at 9:00 AM on Thursday 4/03/2021

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **4 March 2021**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Valuation Ref:

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Pre-lining**

Inspection Status: **Fail**

Inspected By: **Marcus Good**

Inspection Date: **4 March 2021**

Outcome: Fail.
Re-check required once remedial action is complete

Failed Items

Other	**Exterior cladding only 10% complete - building wrap is insufficient weathertight protection.** **Re-check required following a passed Stucco / EIFS inspection**

Passed Items

Restricted Building Work	**Jamie Perigo #136785** **Carpentry** **LBP Reminded of requirement to provide copies of M.O.W. to owner and Territorial Authority:** **Yes**
Bracing	**Bracing as per plan**
Straps	**Handibracs as per plans**
Ceiling batten type	**Steel**
Ceiling batten spacings & fixings	**Rondo @ 600mm crs, dircet fixed to trusses**
Safety glazing	**Safety glazing installed**
Moisture content	**12-15%**
Insulation to walls	**R2.4**
Insulation to ceilings	**R3.2**
Dragon ties	**Installed as per plans**
Wet area corners	**Metal angles installed**

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required
External cladding	Required
Roofing	Required

Documentation	Status
Exterior Joinery Warranty	Accepted
CCC application - Form 6	Required
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Wet Area membrane Warranty	Required

As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required
P.S.4 Construction Review/Site Notes	Required
Foundation	
P.S.3 Construction	Required
Other (specify)	Required
Siting certificate to be supplied before issue of ccc	
Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581**

23 February 2021

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Valuation Ref:

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Post-wrap & Cavity system**

Inspection Status: **Pass**

Inspected By: **Junior Vaikai**

Inspection Date: **23 February 2021**

All work inspected and passed in compliance with the building consent documentation and the New Zealand building code.
Outcome - Pass - OK to continue.

Passed Items

Wrap type	**Tekton.**
Continuous from foundations to top plate	**Continuous from foundations to top plate.**
Laps	**Correct laps.**
Sill wraps	**Protectowrap in place.**
No holes or tears	**No holes or tears.**
Jam flashing	**Jam flashings in place for EPS plaster.**
Sill flashings	**Sill flashings in place for EPS plaster.**
Head flashings	**Head of windows sealed to soffit.** **Garage head flashing in place.**
On drained ventilated cavity	**On drained ventilated cavity as per specifications.**
Base flashing	**Base flashing strip in place.**
Batten type	**EPS battens in place.** **Other**
Penetrations	**Flashed with flang plate.**
Roof space	**Roof space closed off from cavity.**
Warnings and Bans	**Nil.**

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required
External cladding	Required
Roofing	Required

Documentation	Status
CCC application - Form 6	Required
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Exterior Joinery Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers	

declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required
P.S.4 Construction Review/Site Notes	Required
Foundation	
P.S.3 Construction	Required
Other (specify)	Required
Siting certificate to be supplied before issue of ccc	
Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Post-wrap & Cavity system**

Inspection Status: **Pass**

Inspected By: **Junior Vaikai**

Inspection Date: **23 February 2021 10:09 AM**

Duration: **15 minutes**

All work inspected and passed in compliance with the building consent documentation and the New Zealand building code.
Outcome - Pass - OK to continue.

Inspection Element	Status
Wrap type **Tekton.**	Pass
Continuous from foundations to top plate **Continuous from foundations to top plate.**	Pass
Laps **Correct laps.**	Pass
Sill wraps **Protectowrap in place.**	Pass
No holes or tears **No holes or tears.**	Pass
Jam flashing **Jam flashings in place for EPS plaster.**	Pass
Sill flashings **Sill flashings in place for EPS plaster.**	Pass
Head flashings **Head of windows sealed to soffit.** **Garage head flashing in place.**	Pass
On drained ventilated cavity **On drained ventilated cavity as per specifications.**	Pass
Base flashing **Base flashing strip in place.**	Pass
Batten type **EPS battens in place.** **Other**	Pass
Penetrations **Flashed with flang plate.**	Pass
Roof space **Roof space closed off from cavity.**	Pass
Warnings and Bans **Nil.**	Pass

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Plumbing Pre-line**

Inspection Status: **Pass**

Inspected By: **Marcus Good**

Inspection Date: **18 February 2021 8:58 AM**

Duration: **30 minutes**

Inspected and passed as per consented documents. OK to continue

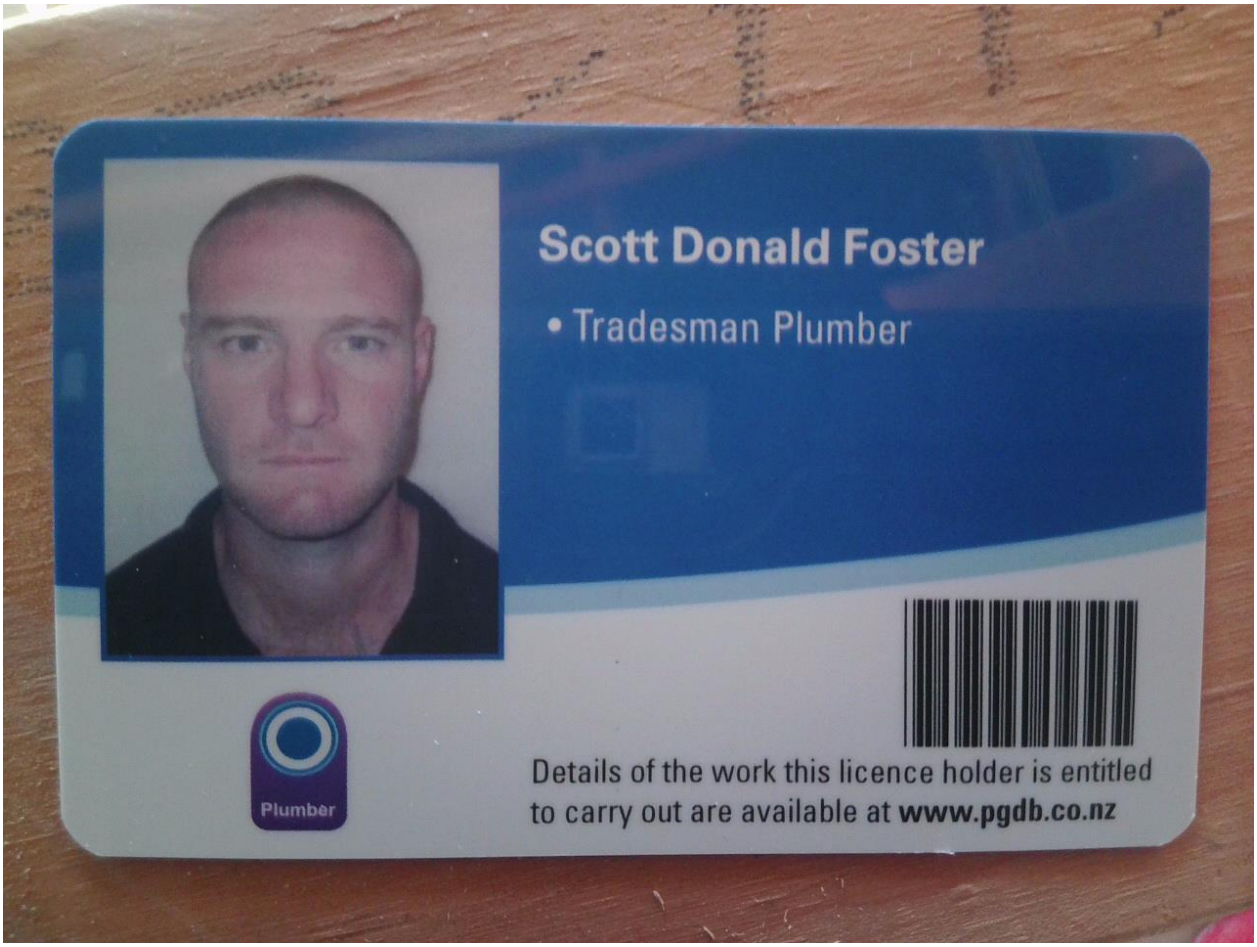
Memo added to check incomplete work at Pre-line inspection

Next inspection: Stucco / EIFS

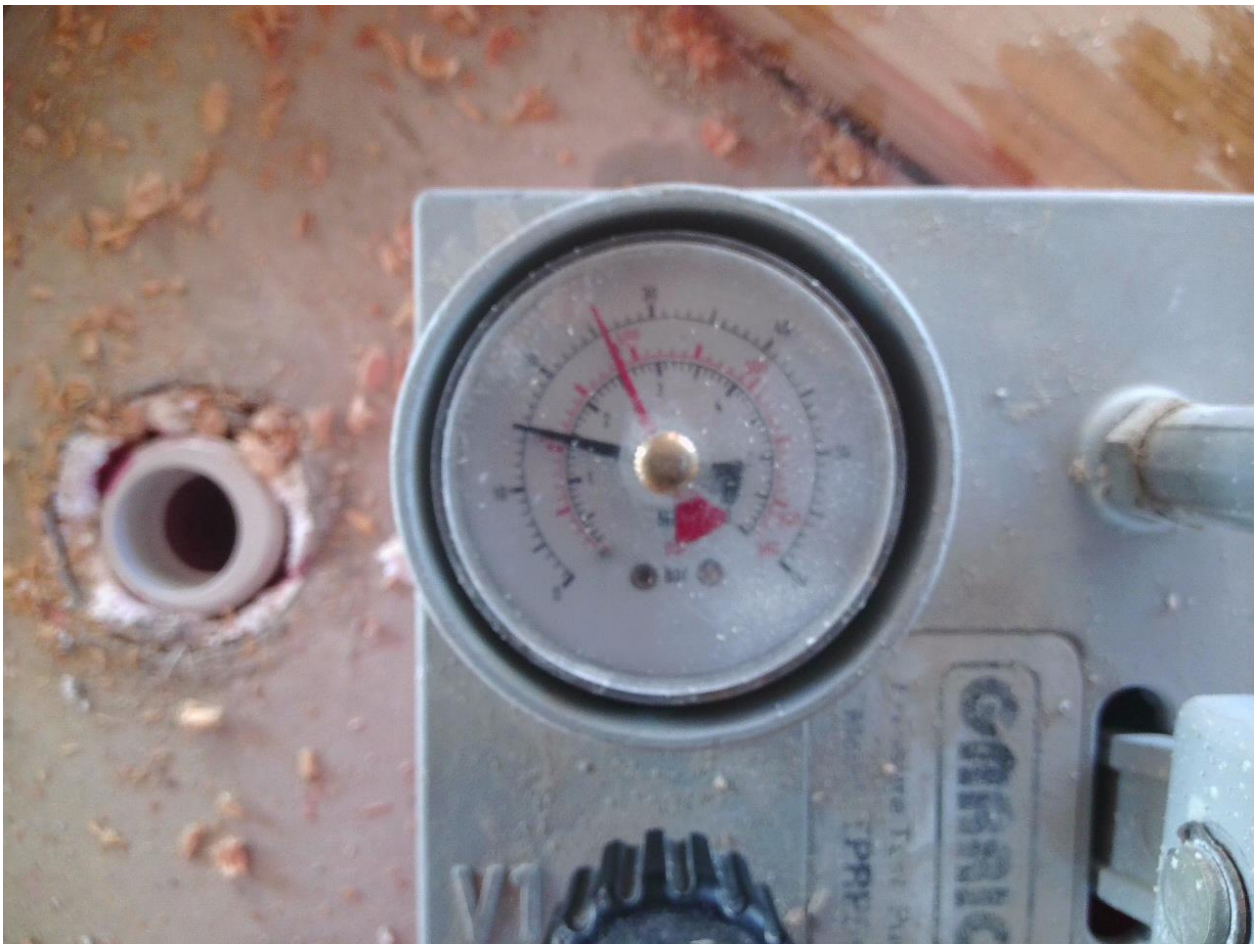
Inspection Element	Status
Plumber ***Scott Foster #28527 Tradesman*** **Supervisor: Brett Hyslop #16059**	Pass
Pipework brand **Buteline**	Pass
Under test **200psi and holding**	Pass
Lagged where required **Kitchen to infinity lagging incomplete (approx 1.5m from infinity still required). Check at next inspection - memo added**	Pass
Pipework supported **Well clipped to framing**	Pass
Waste pipes in & venting **1/80mm external TV**	Pass
Warnings and Bans	N/A
Other **Electrical penetrations and tears in wrap not sealed - garage West elevation.** **Photo taken and memo added to check at Pre-line inspection**	Pass



Electrical penetrations and tears in wrap not sealed - garage West elevation
Taken at 8:37 AM on Thursday 18/02/2021



Scott Foster #28527
Taken at 8:46 AM on Thursday 18/02/2021



200psi and holding
Taken at 8:53 AM on Thursday 18/02/2021

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581**

18 February 2021

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Valuation Ref:

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Plumbing Pre-line**

Inspection Status: **Pass**

Inspected By: **Marcus Good**

Inspection Date: **18 February 2021**

Inspected and passed as per consented documents. OK to continue

Memo added to check incomplete work at Pre-line inspection

Next inspection: Stucco / EIFS

Passed Items

Plumber	**Scott Foster #28527 Tradesman Supervisor: Brett Hyslop #16059**
Pipework brand	**Buteline**
Under test	**200psi and holding**
Lagged where required	**Kitchen to infinity lagging incomplete (approx 1.5m from infinity still required). Check at next inspection - memo added**
Pipework supported	**Well clipped to framing**
Waste pipes in & venting	**1/80mm external TV**
Other	**Electrical penetrations and tears in wrap not sealed - garage West elevation. Photo taken and memo added to check at Pre-line inspection**

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required
External cladding	Required
Roofing	Required

Documentation	Status
CCC application - Form 6	Required
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Exterior Joinery Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required

P.S.4 Construction Review/Site Notes **Foundation**	Required
P.S.3 Construction	Required
Other (specify) **Siting certificate to be supplied before issue of ccc**	Required
Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **16 February 2021**

Applicant: **Dylan James Hyde, Courtney Ivy Main**
Valuation Ref:
Site Address: **283A Kimberley Road, Levin Rural**
Work Type: **New Residential Dwelling**

Inspection Type: **Post-wrap & Cavity system**
Inspection Status: **Pass**
Inspected By: **Russell Brook**
Inspection Date: **16 February 2021**

All work inspected and passed in compliance with the building consent documentation. Okay to continue.

Passed Items

Restricted Building Work	
Wrap type	**Tekton**
Wrap Support	**Where studs spacing is in excess of 450mm is polypropylene fixed at 300mm centres horizontally.**
Continuous from foundations to top plate	
Laps	
Sill wraps	**Protectowrap**
No holes or tears	
Head flashings	
On drained ventilated cavity	
Base flashing	
Batten type	**Timber**
Penetrations	**Pipe penetration flashed as required with purpose made Marshall flashing flange**
Roof space	

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required
External cladding	Required
Roofing	Required

Documentation	Status
CCC application - Form 6	Required
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Exterior Joinery Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required

P.S.4 Construction Review/Site Notes **Foundation**	Required
P.S.3 Construction	Required
Other (specify) **Siting certificate to be supplied before issue of ccc**	Required
Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Post-wrap & Cavity system**

Inspection Status: **Pass**

Inspected By: **Russell Brook**

Inspection Date: **16 February 2021 9:16 AM**

Duration: **30 minutes**

All work inspected and passed in compliance with the building consent documentation. Okay to continue.

Inspection Element	Status
Restricted Building Work	Pass
Wrap type **Tekton**	Pass
Wrap Support **Where studs spacing is in excess of 450mm is polypropylene fixed at 300mm centres horizontally.**	Pass
Continuous from foundations to top plate	Pass
Laps	Pass
Sill wraps **Protectowrap**	Pass
No holes or tears	Pass
Meter box/gas unit flashings **No external boxes**	N/A
Jam flashing	N/A
Sill flashings	N/A
Head flashings	Pass
Apron flashings	N/A
Head & sill flashings	N/A
On drained ventilated cavity	Pass
Backing	N/A
Base flashing	Pass
Batten type **Timber**	Pass
Penetrations **Pipe penetration flashed as required with purpose made Marshall flashing flange**	Pass
Roof space	Pass
Base rebate	N/A
Warnings and Bans **No Warnings and Bans identified as part of this consent**	N/A
Other	N/A



Plumbing pipe penetrations sealed as required
Taken at 9:15 AM on Tuesday 16/02/2021

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581**

19 January 2021

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Valuation Ref:

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Truss roof & Cut roof**

Inspection Status: **Pass**

Inspected By: **John Tate**

Inspection Date: **18 January 2021**

Inspection outcome - Pass
Ok to continue

All work inspected and passed in compliance with the building consent documentation and building code.

Next Inspection - Post wrap cavity.

Passed Items

Restricted Building Work	**Record LBP Name and Reg# Jamie Perigo BP136785** **Card sighted - No** **LBP Class Carpentry** **Work Supervised - record supervisors reg # BP 136785** **Worker onsite reminded of requirement to provide copies of M.O.W. to owner and Territorial Authority: Yes**
Wind zone	**High**
Purlin fixings	**Tile roof - roofing contractor to install. 2 x 90 mm skew gun nails.**
Truss layout & fixings	**Truss layout and fixings as per the plans**
Girder truss supports & fixings	**Girder truss fixings in place as per the mitek plans**
Roof bracing	**Tension strap bracing and roof plane timber brace in place as per the plans**

Inspection Type: **Pre-wrap**

Inspection Status: **Pass**

Inspected By: **John Tate**

Inspection Date: **18 January 2021**

Inspection outcome - Pass
Ok to continue

All work inspected and passed in compliance with the building consent documentation and building code.

Next Inspection - Post wrap cavity.

Passed Items

Restricted Building Work	**Record LBP Name and Reg# Jamie Perigo BP136785** **Card sighted - No** **LBP Class Carpentry** **Work Supervised - record supervisors reg # BP 136785**

	Worker onsite reminded of requirement to provide copies of M.O.W. to owner and Territorial Authority: Yes
Walls	**Walls as per the plans**
Dpm	
Stud sizing & spacings	**90 x 45 mm SG8 H1.2 @ 600 mm centres**
Bottom plate fixings and treatment	**Mitek cast in strap and adjacent shot fired nail @ 900 mm centres. Handi bracs and additional screw bolts in place as required for bracing and load bearing hold downs.**
Lintel sizes	**Lintel sizing as per the consented plans**
Lintel & cantilevered beams	**Mitek lintel fixings in place as per the consented framing plan.**
Top plates to stud connections	**Mitek stud-lok @ 600 mm centres. Installed by pre-nailer.**
Timber grade	**SG8**
Timber treatment	**H1.2**
Studs	
Correct fasteners	

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required
External cladding	Required
Roofing	Required

Documentation	Status
CCC application - Form 6	Required
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Exterior Joinery Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required
P.S.4 Construction Review/Site Notes **Foundation**	Required
P.S.3 Construction	Required
Other (specify) **Siting certificate to be supplied before issue of ccc**	Required
Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No	

work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

GoGet Audit Report

Consent No: **20200581**
Applicant: **Dylan James Hyde, Courtney Ivy Main**
Site Address: **283A Kimberley Road, Levin Rural**
Work Type: **New Residential Dwelling**

Inspection Type: **Pre-wrap**
Inspection Status: **Pass**
Inspected By: **John Tate**
Inspection Date: **18 January 2021 2:55 PM**
Duration: **30 minutes**

Inspection outcome - Pass
Ok to continue

All work inspected and passed in compliance with the building consent documentation and building code.

Next Inspection - Post wrap cavity.

Inspection Element	Status
Restricted Building Work **Record LBP Name and Reg# Jamie Perigo BP136785** **Card sighted - No** **LBP Class Carpentry** **Work Supervised - record supervisors reg # BP 136785** **Worker onsite reminded of requirement to provide copies of M.O.W. to owner and Territorial Authority: Yes**	Pass
Walls **Walls as per the plans**	Pass
Dpm	Pass
Stud sizing & spacings **90 x 45 mm SG8 H1.2 @ 600 mm centres**	Pass
Bottom plate fixings and treatment **Mitek cast in strap and adjacent shot fired nail @ 900 mm centres. Handi bracs and additional screw bolts in place as required for bracing and load bearing hold downs.**	Pass
Exterior braces **All internal**	N/A
Lintel sizes **Lintel sizing as per the consented plans**	Pass
Lintel & cantilevered beams **Mitek lintel fixings in place as per the consented framing plan.**	Pass
Top plates to stud connections **Mitek stud-lok @ 600 mm centres. Installed by pre-nailer.**	Pass
Timber grade **SG8**	Pass
Timber treatment **H1.2**	Pass
Firewalls	N/A
Studs	Pass
Correct fasteners	Pass
Engineer inspection required?	N/A
Warnings and Bans **Nil identified.**	N/A
Other	N/A



Stud to top plate fixings
Taken at 3:02 PM on Monday 18/01/2021

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Truss roof & Cut roof**

Inspection Status: **Pass**

Inspected By: **John Tate**

Inspection Date: **18 January 2021 2:52 PM**

Duration: **30 minutes**

Inspection outcome - Pass
Ok to continue

All work inspected and passed in compliance with the building consent documentation and building code.

Next Inspection - Post wrap cavity.

Inspection Element	Status
Restricted Building Work **Record LBP Name and Reg# Jamie Perigo BP136785** **Card sighted - No** **LBP Class Carpentry** **Work Supervised - record supervisors reg # BP 136785** **Worker onsite reminded of requirement to provide copies of M.O.W. to owner and Territorial Authority: Yes**	Pass
Wind zone **High**	Pass
Purlin fixings **Tile roof - roofing contractor to install. 2 x 90 mm skew gun nails.**	Pass
Truss layout & fixings **Truss layout and fixings as per the plans**	Pass
Girder truss supports & fixings **Girder truss fixings in place as per the mitek plans**	Pass
Roof bracing **Tension strap bracing and roof plane timber brace in place as per the plans**	Pass
Cut roof & skillon hold downs	N/A
Warnings and Bans **Nil identified.**	N/A
Other	N/A

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **9 December 2020**

Applicant: **Dylan James Hyde, Courtney Ivy Main**
Valuation Ref:
Site Address: **283A Kimberley Road, Levin Rural**
Work Type: **New Residential Dwelling**

Inspection Type: **Sitings**
Inspection Status: **Pass**
Inspected By: **Harley Adams**
Inspection Date: **9 December 2020**

All work inspected and passed in compliance with the building consent documentation
Outcome - Pass - OK to continue.

Siting certificate to be supplied before issue of ccc

Passed Items

Boundary pegs & datum	**Location sited by surveyor.**
Distance to boundary	**Siting certificate to be supplied before issue of ccc**
Finished floor levels	**Finished floor levels as per plan**
Warnings and Bans	**No relevant warnings or bans identified.**

Inspection Type: **Pre-pour Slab**
Inspection Status: **Pass**
Inspected By: **Harley Adams**
Inspection Date: **9 December 2020**

All work inspected and passed in compliance with the building consent documentation
Outcome - Pass - OK to continue.

Ok to pour concrete once the engineer has passed their inspection.

Passed Items

Restricted Building Work	**Record LBP Name and Reg# BP102284 Card sighted**
Hardfill/sandblinding	**Hardfill/sandblinding**
Dpm	**Dpm in place**
Foundation	**As per engineered rib raft foundation design**
Mesh	**SE62 mesh in place and supported on bar chairs with required laps**
Additional steel	**Additional steel to internal corners**
Insulation	**Insulation acheived with polystyrene pods**
Slab thickenings	**Thickenings inplacevand reinforced as per plan**
Engineer inspection required?	**Engineer has not yet inspected obce oassed by engineer ok to pour concrete**
Warnings and Bans	**No relevant warnings or bans identified.**

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required

External cladding	Required
Roofing	Required

Documentation	Status
CCC application - Form 6	Required
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Exterior Joinery Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required
P.S.4 Construction Review/Site Notes	Required
Foundation	
P.S.3 Construction	Required
Other (specify)	Required
Siting certificate to be supplied before issue of ccc	
Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Pre-pour Slab**

Inspection Status: **Pass**

Inspected By: **Harley Adams**

Inspection Date: **9 December 2020 2:58 p.m.**

Duration: **30 minutes**

All work inspected and passed in compliance with the building consent documentation
Outcome - Pass - OK to continue.

Ok to pour concrete once the engineer has passed their inspection.

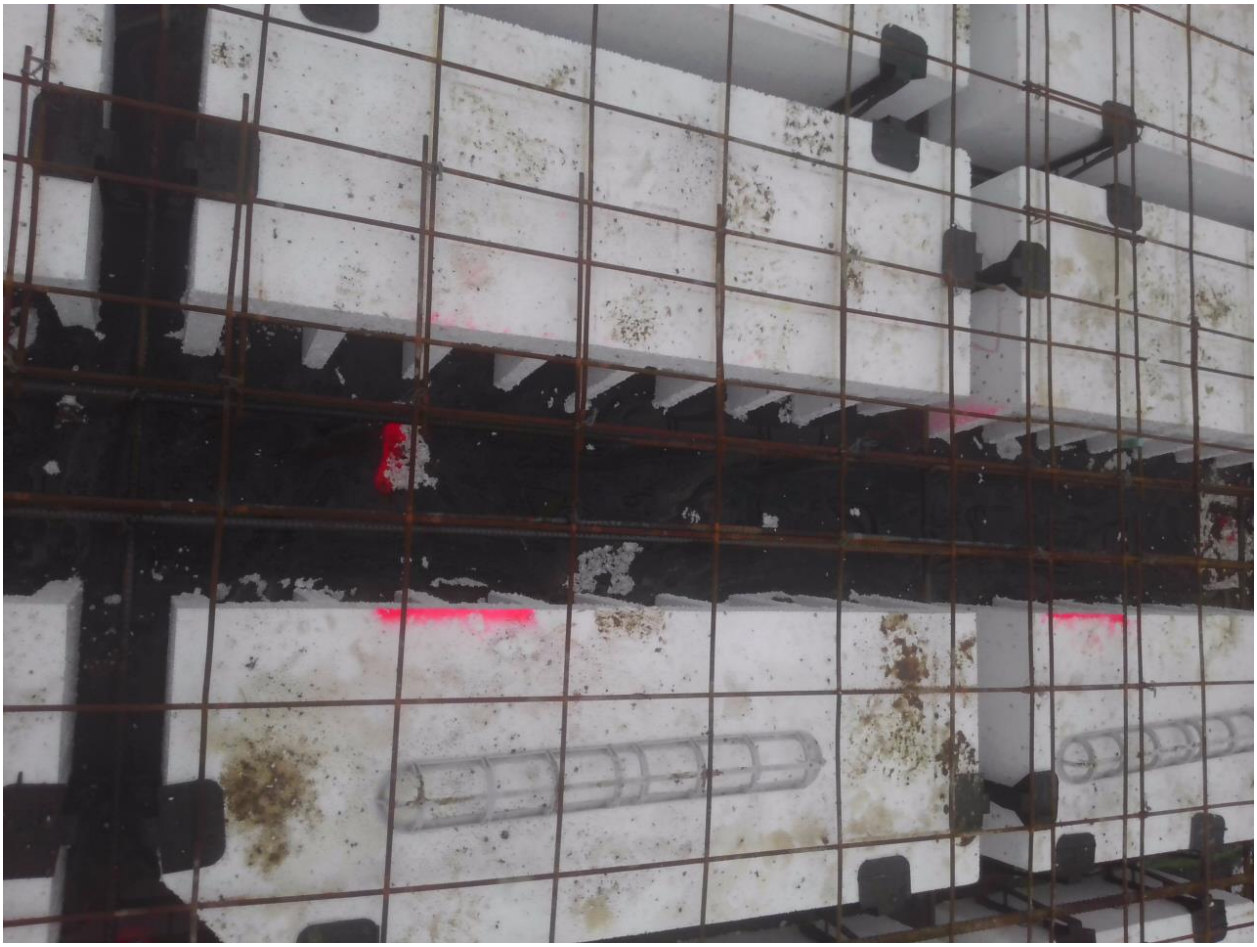
Inspection Element	Status
Restricted Building Work **Record LBP Name and Reg# BP102284** **Card sighted**	Pass
Hardfill/sandblinding **Hardfill/sandblinding**	Pass
Dpm **Dpm in place**	Pass
Foundation **As per engineered rib raft foundation design**	Pass
Mesh **SE62 mesh in place and supported on bar chairs with required laps**	Pass
Free joints	N/A
Additional steel **Additional steel to internal corners**	Pass
Insulation **Insulation acheived with polystyrene pods**	Pass
Slab thickenings **Thickenings inplacevand reinforced as per plan**	Pass
Engineer inspection required? **Engineer has not yet inspected obce oassed by engineer ok to pour concrete**	Pass
Warnings and Bans **No relevant warnings or bans identified.**	Pass
Other	N/A

Documentation

Other (specify) **Siting certificate to be supplied before issue of ccc**	Required



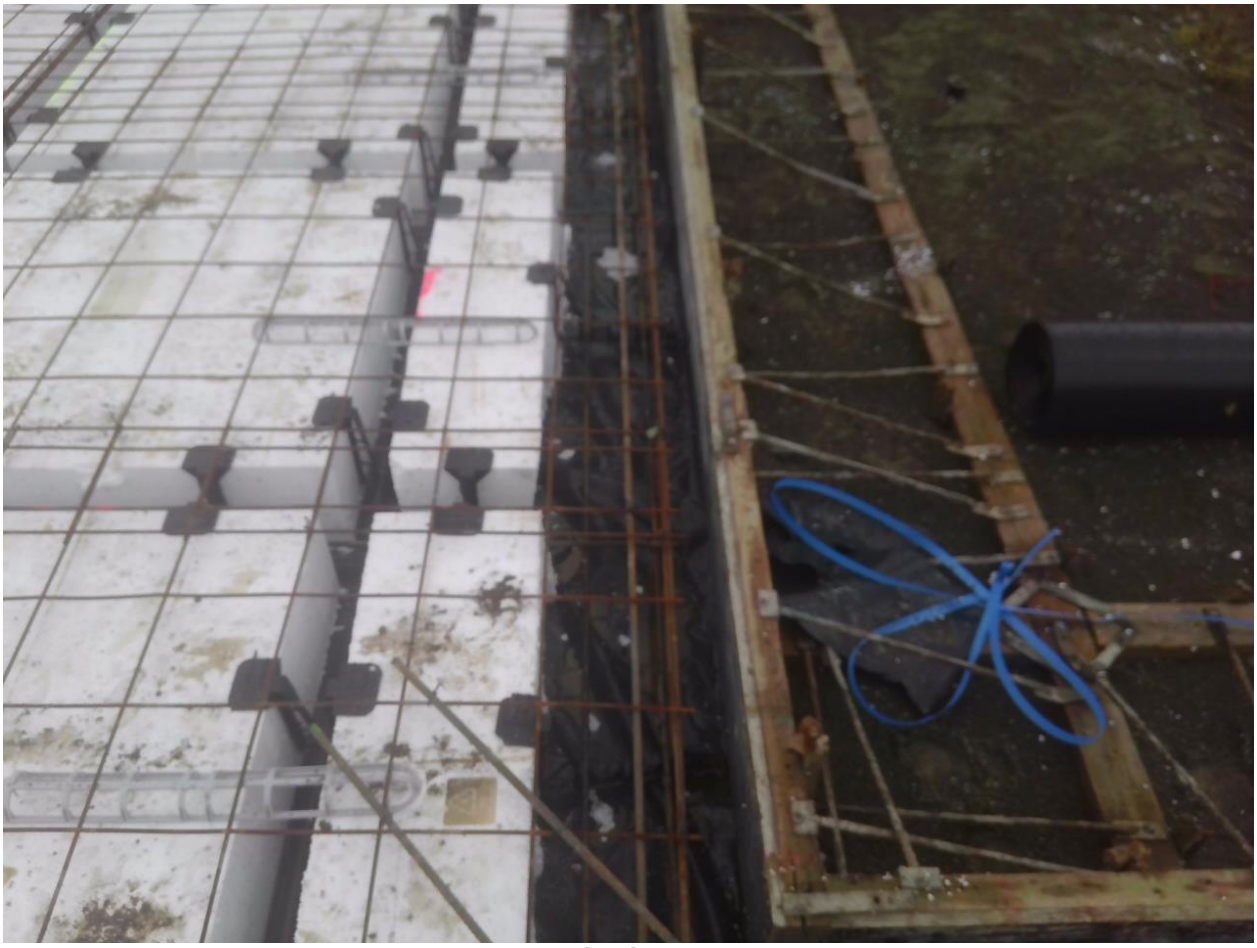
Mesh tag
Taken at 2:48 PM on Wednesday 9/12/2020



Thickening
Taken at 2:51 PM on Wednesday 9/12/2020



Additional steel
Taken at 2:51 PM on Wednesday 9/12/2020



Edge beam
Taken at 2:52 PM on Wednesday 9/12/2020



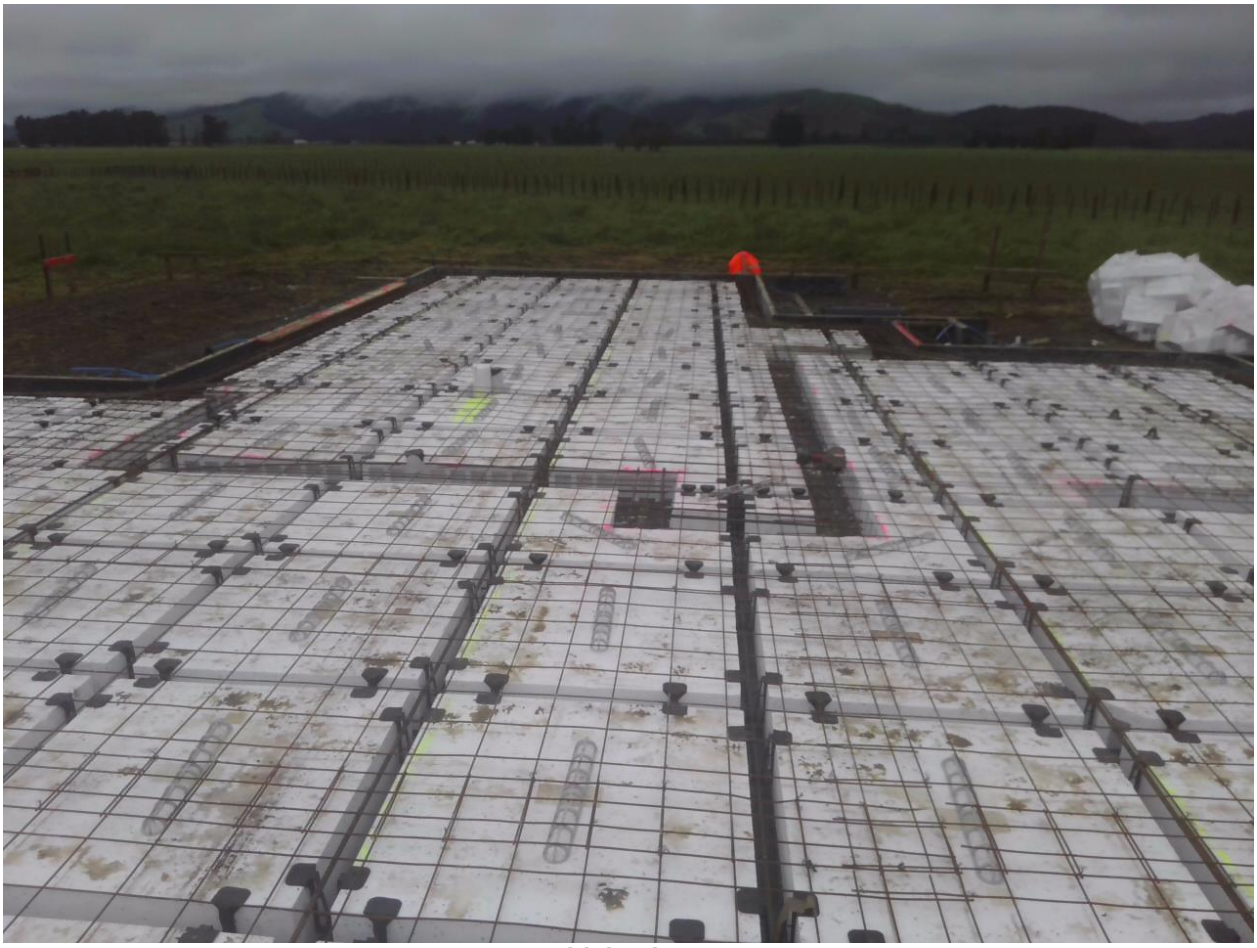
D16
Taken at 2:52 PM on Wednesday 9/12/2020



Foundation
Taken at 2:55 PM on Wednesday 9/12/2020



Foundation
Taken at 2:56 PM on Wednesday 9/12/2020



Thickenings
Taken at 2:57 PM on Wednesday 9/12/2020

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Sitings**

Inspection Status: **Pass**

Inspected By: **Harley Adams**

Inspection Date: **9 December 2020 2:42 p.m.**

Duration: **15 minutes**

All work inspected and passed in compliance with the building consent documentation
Outcome - Pass - OK to continue.

Siting certificate to be supplied before issue of ccc

Inspection Element	Status
Boundary pegs & datum **Location sited by surveyor.**	Pass
Distance to boundary **Siting certificate to be supplied before issue of ccc**	Pass
Finished floor levels **Finished floor levels as per plan**	Pass
Warnings and Bans **No relevant warnings or bans identified.**	Pass
Other	N/A

Documentation

Other (specify) **Siting certificate to be supplied before issue of ccc**	Required

Horowhenua District Council
124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20200581** **8 December 2020**

Applicant: **Dylan James Hyde, Courtney Ivy Main**
Valuation Ref:
Site Address: **283A Kimberley Road, Levin Rural**
Work Type: **New Residential Dwelling**

Inspection Type: **Underslab Services**
Inspection Status: **Pass**
Inspected By: **Harley Adams**
Inspection Date: **8 December 2020**

All work inspected and passed in compliance with the building consent documentation
Outcome - Pass - OK to continue.

Passed Items

Plumber	**16059** **Hyslop Plumbing**
Drain gradiants	**Laid to a 1:40 minimum gradient**
T.v. Riser	**Terminal vent to be installed with drains**
Cover to slab	**Cover to slab is correct**
Seismic clearances (ribraft)	**Seismic clearances (ribraft) installed to waste pipes**
Warnings and Bans	**No relevant warnings or bans identified.**

Licensed Building Practitioners	Status
Carpentry	Required
Foundations	Required
External cladding	Required
Roofing	Required

Documentation	Status
CCC application - Form 6	Required
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Exterior Joinery Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Gas)	Required
Energy Works Certificate (Electrical)	Required
P.S.4 Construction Review/Site Notes **Foundation**	Required
P.S.3 Construction	Required
Memorandum	Required
Section 52, Building Act 2004 - Work is to commence within 12 months of issuance.	Required
Section 92, Building Act 2004 - Owner must apply for Code Compliance Certificate as soon as building work is	

complete	Required
Section 93, Building Act 2004 - Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:- a) Receipt of CCC application or b) 24 months from date of issue if no application is received.	Required
At least 24 hours notice shall be given for inspections. No work shall commence or continue without the approval of a Building Control Officer.	Required
Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position.	Required
The Engineer shall supervise the specific engineering design and submit a PS4 with site notes on completion before issue of the Code Compliance Certificate.	Required
The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion	Required
Site Compliance with NZBC F5 is to be undertaken. In particular Clause 1.0.2 - how the property will prevent the access of unauthorized access of children when the site is not in use.	Required

GoGet Audit Report

Consent No: **20200581**

Applicant: **Dylan James Hyde, Courtney Ivy Main**

Site Address: **283A Kimberley Road, Levin Rural**

Work Type: **New Residential Dwelling**

Inspection Type: **Underslab Services**

Inspection Status: **Pass**

Inspected By: **Harley Adams**

Inspection Date: **8 December 2020 2:11 p.m.**

Duration: **30 minutes**

All work inspected and passed in compliance with the building consent documentation
Outcome - Pass - OK to continue.

Inspection Element	Status
Plumber ***16059*** **Hyslop Plumbing**	Pass
Under test	N/A
Drain gradiants **Laid to a 1:40 minimum gradient**	Pass
Protected through slab	N/A
T.v. Riser **Terminal vent to be installed with drains**	Pass
Cover to slab **Cover to slab is correct**	Pass
Seismic clearances (ribraft) **Seismic clearances (ribraft) installed to waste pipes**	Pass
Warnings and Bans **No relevant warnings or bans identified.**	Pass
Other	N/A

WILTON JOUBERT
Consulting Engineers

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SOUTHERN LAKES
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Wanaka 9343
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CANTERBURY
T: +64 21 824 063

Structural Design Calculations for:

Lot 3

283A Kimberley Road

Levin

APPROVED
24 Nov 2020

HOROWHENUA DISTRICT COUNCIL
APPROVED
SUBJECT TO COMPLIANCE WITH THE BUILDING CONSENT DOCUMENTATION

JOB COPY

THESE PLANS MUST BE RETAINED ON SITE

Job #: 101096

October 2020

APPROVED
24 Nov 2020

Building Code Clause(s) B1

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance on use of Producer Statements (formerly page 2) is available at www.engineeringnz.org)

ISSUED BY: Wilton Joubert Ltd.
(Design Firm)

TO: Reliable Foundations Lower North
(Owner/Developer)

TO BE SUPPLIED TO: Horowhenua District Council
(Building Consent Authority)

IN RESPECT OF: structural design services
(Description of Building Work)

AT: Lot 3, 283A Kimberley Road
(Address)

Town/City: Levin (Address) **LOT** 3 **DP** ..... **SO** .....

We have been engaged by the owner/developer referred to above to provide:

raftfloor slab, driven piles

(Extent of Engagement)

services in respect of the requirements of Clause(s) B1 of the Building Code for:

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

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

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

☐ Alternative solution as per the attached schedule

The proposed building work covered by this producer statement is described on the drawings titled:

Lot 3, 283A Kimberley Road, Levin and numbered S0-S2, D1
together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:
(i) Site verification of the following design assumptions Soil report by: Hamish Wells Engineer Ltd. Dated: 3/7/2020
(ii) All proprietary products meeting their performance specification requirements;

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

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

I, David Lau (Name of Design Professional) am: ■ CPEng 221906 # ☐ Reg Arch ..... #

I am a member of: ☑ Engineering New Zealand ☐ NZIA and hold the following qualifications: BE(Hons),PhD,CMEngNZ,CPEng,IntPE
The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.
The Design Firm is a member of ACENZ: ☐

SIGNED BY David Lau (Name of Design Professional) (Signature) 

ON BEHALF OF Wilton Joubert Ltd. (Design Firm) Date 14/10/2020

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

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

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, ENGINEERING NEW ZEALAND AND NZIA

APPROVED
24 Nov 2020

Site address: Lot 3, 283A Kimberley Road

Re: B2 (Durability) Compliance

To whom it may concern,

We have provided a Producer Statement for Design (PS1) for clause B1 of the Building Act - Structure. Our PS1 does not cover clause B2 of the Building Act – Durability because there is no effective means of compliance for structural durability in the Building Code. However, we can confirm that the structural elements shown in our documentation have been treated as noted below:

Timber

The timber has been specified in accordance with NZS3640:2003. The quality of timber treatment is dependent on the QA systems of manufacturers, suppliers and the onsite contractors and sub-contractors. Refer to the contractor's PS3 and QA records where available.

Concrete

Compliance with cover and concrete quality requirements for B1/VM1 are in accordance with NZS3101:2006 Section 3.

Reinforced Concrete Masonry

Compliance with cover and concrete quality requirements for B1/VM1 are in accordance with NZS4230:2004 Section 4.

Mild Steel

Protective coatings as specified in building consent documentation (may be by others) in accordance with AS/NZS 2312:2014 and SNZ TS 3404:2018 on a life to first major maintenance basis.

The quality of mild steel protective coatings is dependent on:

- Steel preparation
- Quality and production consistency of the coating products
- QA of the application and curing
- QA of the handling, protection and repair

Refer to:

- Contractor's and sub-contractor's PS3s and QA records where available
- Third-party inspection and test results

On-going maintenance plan (attached)

Yours faithfully

David Lau, Wilton Joubert Ltd.

Dated: 14/10/2020

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24 Nov 2020

STRUCTURAL MAINTENANCE SCHEDULE

This schedule of ongoing inspection and maintenance of structural elements shall be included with the O&M manuals and provided to the Owner/Body Corporate and building managers.

Inspection/Maintenance timeframe and item	
(a) Half-yearly	Wash down all exposed steelwork that is not in a fully interior environment including: • Veranda steelwork • Steel carpark structure (beams, columns, braces etc) • Deck and balcony steelwork • Exposed façade steelwork, both primary and secondary structure • Sub-ground floor mild-steel structures such as beams.
(b) 5-yearly	Inspect and repair sealant that encloses structural mild-steel components and/or timber with mild-steel fixings.
(c) 10-yearly	Check exposed timber fixings for corrosion, repair as required.
	Inspect/replace sealant that encloses structural mild-steel components and/or timber with mild-steel fixings. This will typically include sealants around the perimeter of precast panels. **Note that 10 years is the expected useful life for many sealants.**
	Check all exposed steelwork that is not in a fully interior environment for signs of corrosion. Repair protective coatings as required.
(d) 25-yearly	Inspect samples of structural steel that is hidden from view but not enclosed within a vapour barrier, and repair protective coatings as necessary. A typical example is a veranda with built-in steelwork (Such steelwork should typically have duplex protective coatings). Inspection may typically require removal of claddings and/or the drilling of holes for borescope access. Repair as required.
	Inspect all exposed, external timber. Repair as required.
	Inspect all exposed, external reinforced concrete for signs of spalling. Repair as required.
Following seismic shaking > SLS1 event	Inspections and repair as per b), c) and d) above.

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PRODUCER STATEMENTS – Advisory Note

Producer Statements shall be submitted to territorial authorities or building consent authority in order for Code of Compliance Certificates to be issued. The requirement for consultants to issue the related Producer Statements may appear as a condition under the building consent documents or as a separate letter from the territorial authority or building certifier. **It is the owner's (or consent applicant) responsibility to check the building consent documentation and notify Wilton Joubert Ltd. in relation to the requirement for construction inspections required (and the subsequent PS4: Producer Statement for Construction Review) as stated on the consent documents. Please note, we cannot issue PS4 if we did not carry out the inspection.**

In order to secure our inspection services, it is strongly recommended that Wilton Joubert Ltd. be given at least 48 hours notice prior to time of inspection. Our inspections are limited to items that have been designed and detailed by us. We are also unable to inspect non-consented or unauthorised work. Building consented, stamped plans with consent numbers (or legible copy of the same) including amendments where applicable shall be made available on site during inspections.

In some cases due to the distance of the job from our offices, it may be more practical and cost effective to contact a local professional engineer to carry out the inspection, who may contact us with any questions that may arise. The engineer who carried out the inspection would subsequently be responsible for the issue of the producer statement for construction review.

The costs associated with site inspections and issuing of Producer Statements are separate from any previous work that we have been engaged for, such as engineering design of works. The costs for carrying out the inspections and related work are based on time spent travelling to site, time on site and other associated costs. Please contact us for an estimate of costs. Our assumptions are that the person(s) who arranged the inspection is responsible for payment of the fees, unless otherwise stated at time of engagement.

CERTIFICATE OF DESIGN WORK
MEMORANDUM FROM LICENSED BUILDING PRACTITIONER

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24 Nov 2020

Section 30C and Section 45, Building Act 2004

The Building

Street address	Lot 3, 283A Kimberley Road		
Suburb		**Town/city**	Levin
Postcode		**Building consent no.**	

The Owner

Name(s)			
Email		**Phone**	
Address			

Basis for providing this memorandum

I am providing this memorandum in my role as the **specialist** designer who carried out or supervised specific Primary structure elements of restricted building work (RBW) design work as described in this memorandum. Other designers will provide memoranda covering the remaining RBW design work. Refer also to the attached PS1.

Identification of restricted building work (RBW) design work

I, David Lau carried out or supervised the following RBW design work:

Primary structure: B1

Design work that is RBW		Description (as required) and reference to plans and specifications	Carried out or supervised
Foundations and subfloor framing	✓	SED Foundations as per S0-S2, D1	Supervised
Retaining walls	✗		
Beams	✗		
Portal	✗		
Bracing	✗		
Other (primary)	✗		

Note: SED = Elements subject to Specific Engineering Design outside of the scope of NZS3604:2011, unless otherwise noted.

Initial _____ **Date** 14/10/2020

Waivers and modifications

Are waivers or modifications of the Building Code required? No

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If yes, please provide details of the waivers or modifications:

Building Code clause	Waiver/modification required
N/A	N/A

Issued by

Name	David Lau	**Design entity/company**	Wilton Joubert Ltd.
Chartered status	CPEng	**Chartered no.**	221906
Email	david@wjl.co.nz	**Website**	www.wiltonjoubert.co.nz
Phone (daytime)	09 527 0196	**Phone (after hours)**	
Mobile			
Postal address	PO Box 11381 Ellerslie, Auckland 1542		
Physical address	108 Lunn Avenue, Mt. Wellington, Auckland 1072		

Declaration

I, David Lau, LBP state that I have applied the skills and care reasonably required of a competent design professional in carrying out or supervising the RBW described in this memorandum and that based on this, I certify that the RBW described in this memorandum:

- complies with the Building Code; or
- complies with the Building Code subject to any waiver or modification of the Building Code described in this memorandum.

Signature  **Date** 14/10/2020

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Job Number:	101096	Date:	14/10/2020
Job Title:	Lot 3, 283A Kimberley Road	Designer:	BL
Beam Description:	Bearing piles capping beam	Checker:	DL

Beam Loadings: Primary Beam

roof span:	4.623	m	Beam Span =	2.4	
roof weight:	0.46	kPa	floor A span:		m
roof live load (Q):		kPa	floor A weight:		kPa
roof live load (Su or Wu):		kPa	floor A live load:		kPa
wall A height:	2.5	m	floor B span:	1.2	m
wall A mass:	60	kg/m^2	floor B weight:	2.5	kPa
wall B height:		m	floor B live load:	1.5	kPa
wall B mass:		kg/m^2	self weight:	2.24175	kN/m

Beam Loadings: Secondary Beam

roof span:		m	Beam Span =		
roof weight:		kPa	floor A span:		m
roof live load (Q):		kPa	floor A weight:		kPa
roof live load (Su or Wu):		kPa	floor A live load:		kPa
wall A height:		m	floor B span:		m
wall A mass:		kg/m^2	floor B weight:		kPa
wall B height:		m	floor B live load:		kPa
wall B mass:		kg/m^2	2 self weight:		kN/m

Beam Loadings: Additional Point Load b (PL b)

G:		kN
Q:		kN
Su or Wu:		kN

Beam Loadings: Additional Point Load c (PL c)

G:		kN
Q:		kN
Su or Wu:		kN

Loadings Summary

UDL G:	8.83983	kN/m		Point Load, G:	0	kN	
Q:	1.8	kN/m		Q:	0	kN	
Wu or Su:	0	kN/m		Wu or Su:	0	kN	
Consider Load Combination:			1.2 G	and	1.5 Q		Su or Wu
		UDL:	13.307796	kN/m			
		Point Load:	0	kN	at		m from support 1
		Additional Point Load (PL b):	0	kN	at		m from support 1
		Additional Point Load (PL c):	0	kN	at		m from support 1

Beam end support condition: simply supported

Try: **300x305deep**

Beam Type: concrete

for timber &	b =	300	mm
flitched beams	d =	305	mm
	I =	709315625	mm^4
for other beams	I =	709315625	mm^4
	E =	21747	MPa

M* =	**9.6**	**kNm**
V* =	**16.0**	**kN**
support 1 reaction:	16.0	kN
support 2 reaction:	16.0	kN
max. long term deflection:	**0.5**	**mm**
max. short term deflection:	**0.6**	**mm**
allowable defn (functionality), L/400 =	6.0	mm
	OK	

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Southern Lakes: 03 4436209

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CONCRETE BEAM DESIGN

<Job No.>:	**101096**	Date:	14/10/2020
<Job Title>:	**Lot 3, 283A Kimberley Road**	Designer:	
<Description>:	**Bearing piles capping beam**	Checker:	**DL**

Geometry and Lintel info.

L =	**2.4**	**m**	Reinforced Concre
b =	**300**	**mm**	
h =	**305**	**mm**	
d =	**255**	**mm**	

Design Parameters

ø =	**0.85**	
E_c or E_m =	**20**	**GPa**
E_s =	**200**	**GPa**
f'_c or f'_m =	**20.0**	**MPa**
f'_c or f'_m =	**20.0**	**MPa**

Design Bending Moment
Ultimate Moment Capacity
(As per Beam Loadings Spreadsheet)

Beam Type: Simply Supported **wl²/ 8**

M* **=** **9.58** **kNm**

$øA_sf_y(d-a/2)$ **=** **øMu** **kNm**

(Grade/size/No. of bars in *TENSION*)

2 HD12 **A_s =** **226** **mm^2**

f_y = **500** **MPa**

d = **255** **mm**

ø = **0.85**

a = $\frac{A_sf_y}{0.85bf'_c}$ **where f'_c is either f'_c or f'_m**

b = **300** **mm**

f'_c or f'_m = **20.0** **MPa**

a = **22** **mm**

c = **a/0.85** **mm**

= **26** **mm**

øMu = **23.4** **kNm** **OK**

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CONCRETE BEAM DESIGN

Bearing piles capping beam *Job Number* **101096** *Title:* **Lot 3, 283A Kimberley Road**

Yield check:

ϵ_s = f_y/E_s = 0.0025 (Yield Strain)

$\epsilon_c(d-c)/c$ = 0.0219 (Act. Strain @ Mu)

(ϵ_c assumed as 0.0025)

$\epsilon_c(d-c)/c - \epsilon_s$ = 0.0194 OK

Shear check:

ϕ =	0.75	(Reinforced Concrete)	
V_{max} =	16.0	kN	wl/2
V* =	12.6	kN	$V_{max}(l/2-d)/(l/2)$
v_n =	0.22	MPa	$(V^*/\phi)/(bd)$
'b' =	-1231.8		M* = T (d-c/3)
c =	186.65	mm	T = $\varepsilon_s E_s A_s$, & solve for c
ε_s =	0.0011		strain at M*
s_x =	205	mm	distance btw steel centres
			n/a at M*
β =	0.189		$= V_c/\sqrt{f'c}\,b_v s_x$
ϕV_c =	38.89	kN	OK
ϕV_s >		kN	
d_b	6	mm	
No. Legs	2		
A_v	56.5	mm^2	
Spacing, s =		mm	$A_v f_y/V_s b$

Shear strength without stirrups based on research report by P. Adebar & M.P. Collins "Shear strength of members without transverse reinforcement", Canadian Journal of Civil Engineering, v.23, n.1, 1996, pg.30-41.

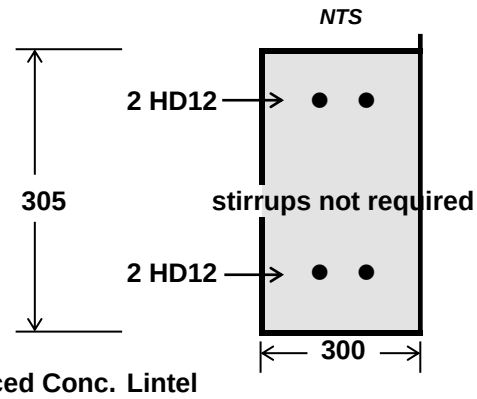
Note: minimum 4 bar longitudinal reinforcement required if width of beam > 100

The prescribed lintel design is:

Location on plan: (i.e. Bedroom window etc.)

Bearing piles capping beam

NTS



Reinforced Conc. Lintel

Stirrup requirements: **not required** (d/2)

Stirrup Layout:

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Job Number:	101096	Date:	14/10/2020
Job Title:	Lot 3, 283A Kimberley Road	Designer:	BL
Beam Description:	Suspended House Rib	Checker:	DL

Beam Loadings: Primary Beam

roof span:		m	Beam Span =	2.4		
roof weight:		kPa	floor A span:	2.4	m	
roof live load (Q):		kPa	floor A weight:	2.5	kPa	
roof live load (Su or Wu):		kPa	floor A live load:	1.5	kPa	
wall A height:		m	floor B span:		m	
wall A mass:		kg/m^2	floor B weight:		kPa	
wall B height:		m	floor B live load:		kPa	
wall B mass:		kg/m^2	self weight:	0.74725	kN/m	

Beam Loadings: Secondary Beam

roof span:		m	Beam Span =			
roof weight:		kPa	floor A span:		m	
roof live load (Q):		kPa	floor A weight:		kPa	
roof live load (Su or Wu):		kPa	floor A live load:		kPa	
wall A height:		m	floor B span:		m	
wall A mass:		kg/m^2	floor B weight:		kPa	
wall B height:		m	floor B live load:		kPa	
wall B mass:		kg/m^2	2 self weight:		kN/m	

Beam Loadings: Additional Point Load b (PL b)

G:		kN
Q:		kN
Su or Wu:		kN

Beam Loadings: Additional Point Load c (PL c)

G:		kN
Q:		kN
Su or Wu:		kN

Loadings Summary

UDL G:	6.74725	kN/m	Point Load, G:	0	kN	
Q:	3.6	kN/m	Q:	0	kN	
Wu or Su:	0	kN/m	Wu or Su:	0	kN	
Consider Load Combination:		1.2	G and	1.5	Q	Su or Wu
UDL:	13.4967	kN/m				
Point Load:	0	kN	at		m from support 1	
Additional Point Load (PL b):	0	kN	at		m from support 1	
Additional Point Load (PL c):	0	kN	at		m from support 1	

Beam end support condition: fixed ends

Try: **100x305 Deep**

Beam Type: concrete

for timber &	b =	100	mm	
flitched beams	d =	305	mm	
	I =	236438542	mm^4	
for other beams	I =	236438542	mm^4	
	E =	21747	MPa	

M* =	**6.5**	**kNm**
V* =	**16.2**	**kN**
support 1 reaction:	16.2	kN
support 2 reaction:	16.2	kN
max. long term deflection:	**0.3**	**mm**
max. short term deflection:	**0.3**	**mm**
allowable defn (functionality), L/400 =	6.0	mm
	OK	

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BRIDGING BEAM DESIGN

<Job No.>:	**101096**	Date:	14/10/2020
<Job Title>:	**Lot 3, 283A Kimberley Road**	Designer:	**BL**
<Description>:	**Suspended House Rib**	Checker:	**DL**

Geometry and Lintel info.

Reinforced Concret

L =	2.4	m
b =	100	mm
h =	305	mm
d =	255	mm

Design Parameters

ø =	0.85	
E_c or E_m =	20	GPa
E_s =	200	GPa
f'_c or f'_m =	20.0	MPa
f'_c or f'_m =	20.0	MPa

Design Bending Moment
Ultimate Moment Capacity
(As per Beam Loadings Spreadsheet)

Beam Type: Fixed Ends $wl^2/12$

M* = 6.48 kNm

$øA_sf_y(d-a/2)$ = øMu kNm

(Grade/size/No. of bars in *TENSION*)

1 D16

A_s =	201	mm^2
f_y =	300	MPa
d =	255	mm
ø =	0.85	

$$a = \frac{A_s f_y}{0.85 b f'_c}$$

where f'_c is either f'_c or f'_m

b =	100	mm
f'_c or f'_m =	20.0	MPa

a =	35	mm
c =	a/0.85	mm
=	42	mm

øMu = 12.2 kNm OK

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BRIDGING BEAM DESIGN

Suspended House Rib *Job Number* **101096** *Title:* **Lot 3, 283A Kimberley Road**

Yield check:

ϵ_s = f_y/E_s = 0.0015 (Yield Strain)

$\epsilon_c(d-c)/c$ = 0.0128 (Act. Strain @ Mu)

(ϵ_c assumed as 0.0025)

$\epsilon_c(d-c)/c - \epsilon_s$ = 0.0113 OK

Shear check:

Shear strength without stirrups based on research report by P. Adebar & M.P. Collins "Shear strength of members without transverse reinforcement", Canadian Journal of Civil Engineering, v.23, n.1, 1996, pg.30-41.

Note: minimum 4 bar longitudinal reinforcement required if width of beam > 100

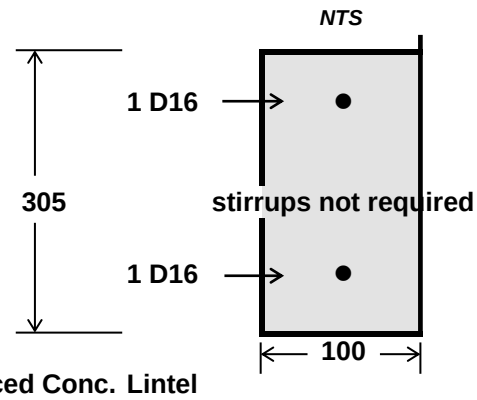
ϕ =	0.75	(Reinforced Concrete)	
V_{max} =	16.2	kN	wl/2
V* =	12.8	kN	$V_{max}(l/2-d)/(l/2)$
v_n =	0.67	MPa	$(V^*/\phi)/(bd)$
'b' =	-1181.1		M* = T (d-c/3)
c =	198.54	mm	T = ε_s E_s A_s, & solve for c
ε_s =	0.0009		strain at M*
s_x =	205	mm	distance btw steel centres
β =	0.209		n/a at M*
ϕV_c =	14.38	kN OK	$= V_c/\sqrt{f'c}\,b_v s_x$
ϕV_s >		kN	
d_b	6	mm	
No. Legs	1		
A_v	28.3	mm^2	
Spacing, s =		mm	$A_v f_y/V_s b$

The prescribed lintel design is:

Location on plan: (i.e. Bedroom window etc.)

Suspended House Rib

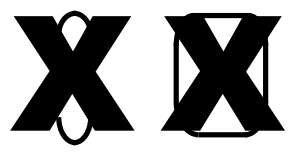
NTS



Reinforced Conc. Lintel

Stirrup requirements: **not required** (d/2)

Stirrup Layout:



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Job Number:	101096	Date:	14/10/2020
Job Title:	Lot 3, 283A Kimberley Road	Designer:	BL
Beam Description:	Suspended Garage Rib	Checker:	DL

Beam Loadings: Primary Beam

roof span:		m	Beam Span =	2.4	
roof weight:		kPa	floor A span:	1.2	m
roof live load (Q):		kPa	floor A weight:	2.5	kPa
roof live load (Su or Wu):		kPa	floor A live load:	2.5	kPa
wall A height:		m	floor B span:		m
wall A mass:		kg/m^2	floor B weight:		kPa
wall B height:		m	floor B live load:		kPa
wall B mass:		kg/m^2	self weight:	0.74725	kN/m

Beam Loadings: Secondary Beam

roof span:		m	Beam Span =		
roof weight:		kPa	floor A span:		m
roof live load (Q):		kPa	floor A weight:		kPa
roof live load (Su or Wu):		kPa	floor A live load:		kPa
wall A height:		m	floor B span:		m
wall A mass:		kg/m^2	floor B weight:		kPa
wall B height:		m	floor B live load:		kPa
wall B mass:		kg/m^2	2 self weight:		kN/m

Beam Loadings: Additional Point Load b (PL b)

G:		kN
Q:		kN
Su or Wu:		kN

Beam Loadings: Additional Point Load c (PL c)

G:		kN
Q:		kN
Su or Wu:		kN

Loadings Summary

UDL G:	3.74725	kN/m	Point Load, G:	0	kN
Q:	3	kN/m	Q:	0	kN
Wu or Su:	0	kN/m	Wu or Su:	0	kN

Consider Load Combination: 1.2 G and 1.5 Q Su or Wu

UDL:	8.9967	kN/m		
Point Load:	0	kN	at	m from support 1
Additional Point Load (PL b):	0	kN	at	m from support 1
Additional Point Load (PL c):	0	kN	at	m from support 1

Beam end support condition: fixed ends

Try: **100x305 Deep**

Beam Type: concrete

for timber &	b =	100	mm	
flitched beams	d =	305	mm	
	I =	236438542	mm^4	
for other beams	I =	236438542	mm^4	
	E =	21747	MPa	

M* =	**4.3**	**kNm**
V* =	**10.8**	**kN**
support 1 reaction:	10.8	kN
support 2 reaction:	10.8	kN
max. long term deflection:	**0.2**	**mm**
max. short term deflection:	**0.2**	**mm**
allowable defn (functionality), L/400 =	6.0	mm
	OK	

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BRIDGING BEAM DESIGN

<Job No.>:	**101096**	Date:	14/10/2020
<Job Title>:	**Lot 3, 283A Kimberley Road**	Designer:	**BL**
<Description>:	**Suspended Garage Rib**	Checker:	**DL**

Geometry and Lintel info.

Reinforced Concre

L =	2.4	m
b =	100	mm
h =	305	mm
d =	255	mm

Design Parameters

ø =	0.85	
E_c or E_m =	20	GPa
E_s =	200	GPa
f'_c or f'_m =	20.0	MPa
f'_c or f'_m =	20.0	MPa

Design Bending Moment
Ultimate Moment Capacity
(As per Beam Loadings Spreadsheet)

Beam Type: Fixed Ends $wl^2/12$

M* = 4.32 kNm

$øA_sf_y(d-a/2)$ = øMu kNm

(Grade/size/No. of bars in *TENSION*)

1 HD12

A_s =	113	mm^2
f_y =	500	MPa
d =	255	mm
ø =	0.85	

$$a = \frac{A_s f_y}{0.85 b f'_c}$$

where f'_c is either f'_c or f'_m

b =	100	mm
f'_c or f'_m =	20.0	MPa

a =	33	mm
c =	a/0.85	mm
=	39	mm

øMu = 11.5 kNm OK

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24 Nov 2020

WILTON JOUBERT
Consulting Engineers

Northland: 09 9454188
Auckland: 09 XXX196
Canterbury: 021 824063
Southern Lakes: 03 4436209

www.wiltonjoubert.co.nz
email: jobs@wjl.co.nz

BRIDGING BEAM DESIGN

Suspended Garage Rib *Job Number* **101096** *Title:* **Lot 3, 283A Kimberley Road**

Yield check:

ϵ_s = f_y/E_s = 0.0025 (Yield Strain)

$\epsilon_c(d-c)/c$ = 0.0138 (Act. Strain @ Mu)

(ϵ_c assumed as 0.0025)

$\epsilon_c(d-c)/c - \epsilon_s$ = 0.0113 OK

Shear check:

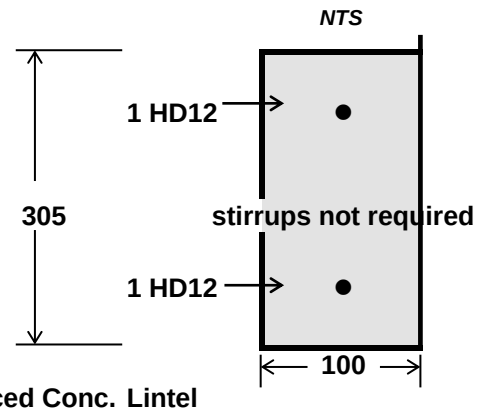
ϕ =	0.75	(Reinforced Concrete)	
V_{max} =	10.8	kN	wl/2
V* =	8.5	kN	$V_{max}(l/2-d)/(l/2)$
v_n =	0.44	MPa	$(V^*/\phi)/(bd)$
'b' =	-1210.9		M* = T (d-c/3)
c =	191.33	mm	T = $\varepsilon_s E_s A_s$, & solve for c
ε_s =	0.0010		strain at M*
s_x =	205	mm	distance btw steel centres
			n/a at M*
β =	0.194		$= V_c/sqrt(f'c)b_v s_x$
ϕV_c =	13.36	kN	OK
ϕV_s >		kN	
d_b	6	mm	
No. Legs	1		
A_v	28.3	mm^2	
Spacing, s =		mm	$A_v f_y/V_s b$

Shear strength without stirrups based on research report by P. Adebar & M.P. Collins "Shear strength of members without transverse reinforcement", Canadian Journal of Civil Engineering, v.23, n.1, 1996, pg.30-41.

Note: minimum 4 bar longitudinal reinforcement required if width of beam > 100

The prescribed lintel design is:

NTS



Location on plan: (i.e. Bedroom window etc.)

Suspended Garage Rib

Reinforced Conc. Lintel

Stirrup requirements: **not required** (d/2)

Stirrup Layout:

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Job Number:	101096	Date:	14/10/2020
Job Title:	Lot 3, 283A Kimberley Road	Designer:	BL
Beam Description:	Suspended Thickening	Checker:	DL

Beam Loadings: Primary Beam

roof span:	3.09	m	Beam Span =	2.4	
roof weight:	0.46	kPa	floor A span:	2.4	m
roof live load (Q):		kPa	floor A weight:	2.5	kPa
roof live load (Su or Wu):		kPa	floor A live load:	1.5	kPa
wall A height:	2.5	m	floor B span:		m
wall A mass:	30	kg/m^2	floor B weight:		kPa
wall B height:		m	floor B live load:		kPa
wall B mass:		kg/m^2	self weight:	2.24175	kN/m

Beam Loadings: Secondary Beam

roof span:		m	Beam Span =		
roof weight:		kPa	floor A span:		m
roof live load (Q):		kPa	floor A weight:		kPa
roof live load (Su or Wu):		kPa	floor A live load:		kPa
wall A height:		m	floor B span:		m
wall A mass:		kg/m^2	floor B weight:		kPa
wall B height:		m	floor B live load:		kPa
wall B mass:		kg/m^2	2 self weight:		kN/m

Beam Loadings: Additional Point Load b (PL b)

G:		kN
Q:		kN
Su or Wu:		kN

Beam Loadings: Additional Point Load c (PL c)

G:		kN
Q:		kN
Su or Wu:		kN

Loadings Summary

UDL G:	10.3989	kN/m		Point Load, G:	0	kN		
Q:	3.6	kN/m		Q:	0	kN		
Wu or Su:	0	kN/m		Wu or Su:	0	kN		
Consider Load Combination:			1.2	G and	1.5	Q		Su or Wu
UDL:			17.87868	kN/m				
Point Load:			0	kN	at		m from support 1	
Additional Point Load (PL b):			0	kN	at		m from support 1	
Additional Point Load (PL c):			0	kN	at		m from support 1	

Beam end support condition: simply supported

Try: **300x305deep**

Beam Type: concrete

for timber &	b =	300	mm
flitched beams	d =	305	mm
	I =	709315625	mm^4
for other beams	I =	709315625	mm^4
	E =	21747	MPa

M* =	**12.9**	**kNm**
V* =	**21.5**	**kN**
support 1 reaction:	21.5	kN
support 2 reaction:	21.5	kN
max. long term deflection:	**0.7**	**mm**
max. short term deflection:	**0.7**	**mm**
allowable defn (functionality), L/400 =	6.0	mm
	OK	

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BRIDGING BEAM DESIGN

<Job No.>:	**101096**	Date:	14/10/2020
<Job Title>:	**Lot 3, 283A Kimberley Road**	Designer:	**BL**
<Description>:	**Suspended Thickening**	Checker:	**DL**

Geometry and Lintel info.

Reinforced Concre

L =	2.4	m
b =	300	mm
h =	305	mm
d =	255	mm

Design Parameters

ø =	0.85	
E_c or E_m =	20	GPa
E_s =	200	GPa
f'_c or f'_m =	20.0	MPa
f'_c or f'_m =	20.0	MPa

Design Bending Moment
Ultimate Moment Capacity
(As per Beam Loadings Spreadsheet)

Beam Type: Simply Supported $wl^2/8$

M* = 12.87 kNm

$øA_sf_y(d-a/2)$ = øMu kNm

(Grade/size/No. of bars in *TENSION*)

2 HD12

A_s =	226	mm^2
f_y =	500	MPa
d =	255	mm
ø =	0.85	

$$a = \frac{A_s f_y}{0.85 b f'_c}$$

where f'_c is either f'_c or f'_m

b =	300	mm
f'_c or f'_m =	20.0	MPa

a =	22	mm
c =	a/0.85	mm
=	26	mm

øMu = 23.4 kNm OK

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BRIDGING BEAM DESIGN

Suspended Thickening *Job Number* **101096** *Title:* **Lot 3, 283A Kimberley Road**

Yield check:

ϵ_s = f_y/E_s = 0.0025 (Yield Strain)

$\epsilon_c(d-c)/c$ = 0.0219 (Act. Strain @ Mu)

(ϵ_c assumed as 0.0025)

$\epsilon_c(d-c)/c - \epsilon_s$ = 0.0194 OK

Shear check:

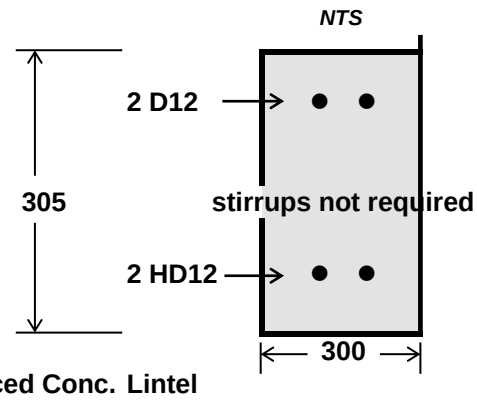
ϕ =	0.75	(Reinforced Concrete)	
V_{max} =	21.5	kN	wl/2
V* =	16.9	kN	$V_{max}(l/2-d)/(l/2)$
v_n =	0.29	MPa	$(V^*/\phi)/(bd)$
'b' =	-1304.5		M* = T (d-c/3)
c =	172.29	mm	$T = \varepsilon_s E_s A_s$, & solve for c
ε_s =	0.0014		strain at M*
s_x =	205	mm	distance btw steel centres
β =	0.169		n/a at M*
ϕV_c =	34.89	kN OK	$= V_c/\sqrt{f'c}\,b_v s_x$
ϕV_s >		kN	
d_b	6	mm	
No. Legs	2		
A_v	56.5	mm^2	
Spacing, s =		mm	$A_v f_y/V_s b$

Shear strength without stirrups based on research report by P. Adebar & M.P. Collins "Shear strength of members without transverse reinforcement", Canadian Journal of Civil Engineering, v.23, n.1, 1996, pg.30-41.

Note: minimum 4 bar longitudinal reinforcement required if width of beam > 100

The prescribed lintel design is:

NTS



Location on plan: (i.e. Bedroom window etc.)

Suspended Thickening

Reinforced Conc. Lintel

Stirrup requirements: **not required** (d/2)

Stirrup Layout:

Date :	14/10/2020
Designer :	BL
Checker :	DL
Job Number :	101096

Driven Timber Piles

WILTON JOUBERT Consulting Engineers

APPROVED 24 Nov 2020

Site Address :	Lot 3, 283A Kimberley Road
Description :	Pile A

Load per metre on footing	43	kN/m
Pile spacing	1	m
Fill depth:	0.8	m
Down-drag force from fill:	4.40	kN
P =	4832	kg

Hiley Formula

$$P = \left[\frac{eW_r h}{s + \frac{c}{2}}\right] \times \frac{\left(W_r + n^2 W_p\right)}{\left(W_r + W_p\right)}$$

W_r =	310	kg
W_p =	58	kg
n (coefficient of restitution) =	0.25	
e (rated efficiency) =	0.8	
c =	7.18	
FS =	4.5	

Drop of 1600 mm with 310 kg hammer

Set = 12 mm

Date :	14/10/2020
Designer :	BL
Checker :	DL
Job Number :	101096

Driven Timber Piles

WILTON JOUBERT Consulting Engineers

APPROVED 24 NOV 2020

Site Address :	Lot 3, 283A Kimberley Road
Description :	Pile B

Load per metre on footing	32.4	kN/m
Pile spacing	1	m
Fill depth:	0.8	m
Down-drag force from fill:	4.40	kN
P =	3751	kg

Hiley Formula

$$P = \left[\frac{eW_r h}{s + \frac{c}{2}}\right] \times \frac{\left(W_r + n^2 W_p\right)}{\left(W_r + W_p\right)}$$

W_r =	310	kg
W_p =	58	kg
n (coefficient of restitution) =	0.25	
e (rated efficiency) =	0.8	
c =	7.18	
FS =	4.5	

Drop of 1600 mm with 310 kg hammer

Set = 16 mm

Date :	14/10/2020
Designer :	BL
Checker :	DL
Job Number :	101096

Driven Timber Piles

WILTON JOUBERT Consulting Engineers

APPROVED 24 NOV 2020

Site Address :	Lot 3, 283A Kimberley Road
Description :	Pile C

Load per metre on footing	21.6	kN/m
Pile spacing	1	m
Fill depth:	0.8	m
Down-drag force from fill:	4.40	kN
P =	2650	kg

Hiley Formula

$$P = \left[\frac{eW_r h}{s + \frac{c}{2}}\right] \times \frac{\left(W_r + n^2 W_p\right)}{\left(W_r + W_p\right)}$$

W_r =	310	kg
W_p =	58	kg
n (coefficient of restitution) =	0.25	
e (rated efficiency) =	0.8	
c =	7.18	
FS =	4.5	

Drop of 1600 mm with 310 kg hammer

Set = 25 mm

2) **Analysis of the scala for each lot in term of paragraph 4 above (NZS 3604:2011 compliance):**

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a) If site test comply with the requirements of NZS 3604:2011 section 3 "site requirements" and it is reasonable to assume,Not gauranteed, that based on the test carried out, are suitable for standard foundation designs in accordance with NZS 3604 or non specific Rib raft slab on ground foundation systems.

b) If tests do not comply with NZS 3604:2011 section 3 "site requirements" and specifically designed foundations (typically driven timber piles) or ground improvement of the existing site soils (which are readily compacted) to provide a complying building platfform will be required.

3) **Ribraft foundation system: Ribraft** Ribraft systems are being increasingly specified for domenstic construction and nonspecific design Ribraft foundations (ie in compliance with firth Ribraft manual 2012) have a **lower soil soil bearing requirement** than standard slab on ground system in compliance with NZS 3604:2011 (note: all other aspects of the requirements. Section 3 must be complyed with). This lower soil bearing strength requirements is based on building type and the Ribraft ability to better distribute load to the ground than conventional 3604 foundation solutions. There are four building types identified in the Ribraft design manual and their relative minimum foundation soil requirements are as below:

Building identifier

Building Type	Description	Ground Floor External walls	Second Story External walls
A	Single Story	Light	
B	Single Story	Heavy	
C	Two Story	Light	Light
D	Two Story	Heavy	Light

Scala Penetrometer Blows Required For Determining Ultimate Bearing Capacity

Building type	Min. blows per 300mm depth
A	6
B	7
C	8
D	9

In blows/100mm consistent with the appended Scala tests

a) For type A 2 blows/100mm minimum
b) For type B 2.33 blows/100mm minimum
c) For type C 2.67 blows/100mm minimum
D) For type D 3 blows/100mm minimum

This report is provided solely for the use of District Council and the consent holder.
Should you require any further information please contact us directly.

GENERAL

1. Do not scale from drawings. These drawings are to be read in conjunction with the architectural drawings and all other related documents. Refer to architectural drawings for dimensions, rebates & recesses.

2. Contact the architect/engineer if any discrepancies are found.

3. Under no circumstances shall polystyrene spacers be used. Use recommended spacers as per details provided.

4. DPM shall be in accordance with NZS3604 (polyethylene sheet, min. 0.25mm). Do not use multiple layers. All penetrations through the DPM shall be sealed.

5. A layer of sand blinding or granular fines (GAP7) shall be placed, screeded and compacted over the building platform. The maximum thickness of this layer shall be no more than 50mm.

6. All service trenches shall be properly backfilled and compacted.

7. Where underfloor heating is installed, floor topping shall be increased to 110mm.

8. Where concrete polishing and/or architectural cuts are made to the floor, the floor thickness shall be increased such that the final topping depth is no less than that specified on the plans after all polishing/cuts.

9. Polystyrene pods shall be 1100 x 1100 x 220mm.

CONCRETE

1. All concrete work and materials shall conform to NZS3109 and applicable building consent authority regulations.

2. No cuts shall be made to the floor other than those shown on the drawings.

3. Unless otherwise noted, concrete shall be:

Raftfloor: Raftmix 20MPa minimum or 25MPa minimum within 'exposure zone D' (if in doubt, confirm with local BCA)

REINFORCEMENT

1. Unless otherwise specified, all reinforcement shall be Ductility Class E, in accordance with NZS 4671.

2. All bend diameters shall comply with NZS 3109. Re-bending of reinforcement is not permitted. 'Spot' welding of reinforcement is not permitted.

3. All mesh reinforcement shall be Ductility Class E as per NZS4671

4. Unless otherwise specified by proprietary product specifications, mesh shall be lapped a minimum of 250mm or by a grid plus 50mm, whichever is greater.

5. Unless otherwise specified on plans, minimum covers are:
   exposed to earth: 75mm
   exposed to edge: 50mm
   protected by damp proofing: 50mm

6. Unless otherwise specified, reinforcement laps are:

Reinforcement Grade	Nomination	min. lap when less than 300mm of concrete below steel	min. lap when more than 300mm of concrete below steel	concrete strength (MPa)
300	'D'	40Ø or min. 600mm (whichever is greater)	52Ø or min. 600mm (whichever is greater)	all blockfill, 20 and 25
500	'HD'	70Ø	91Ø	all blockfill
500	'HD'	56Ø	73Ø	20
500	'HD'	50Ø	65Ø	25

*Note: for lap of vertical bars, use values for "when less than 300mm of concrete below steel"

SITE CONDITIONS

SITING TO BE CONFIRMED BY SURVEY PEGS

1. Design based on soils report/assessment
By: Hamish Wells Engineer Ltd. Dated: 3/7/2020

Assume existing soft soil is no more than 700mm deep, and additional fill is no more than 100mm deep.

Raftfloor fully suspended over driven timber piles, subject to test pile confirmation

APPROVED 24 Nov 2020

THE ENGINEER SHALL SUPERVISE THE SPECIFIC ENGINEERING DESIGN SUBMIT A PS4 SITE NOTES ON COMPLETION BEFORE ISSUANCE OF THE CODE COMPLIANCE CERTIFICATE

Ensure FFL is 450mm above FGL

INSPECTIONS

1. Check the BUILDING CONSENT CONDITIONS for any inspections that are required by the Building Consent Authority (BCA).

2. If BCA requires PS4 to be issued for inspections, a local engineer may be engaged to carry out such inspections and issue a PS4 accordingly.

HOROWHENUA DISTRICT COUNCIL APPROVED SUBJECT TO COMPLIANCE WITH THE BUILDING CONSENT DOCUMENTATION

JOB COPY

THESE PLANS MUST BE RETAINED ON SITE

Designed for:

RFL

North Island: Simon
027 205 9118 simon@rfl.co.nz

South Island: Dayle
027 692 1624 southisland@rfl.co.nz

NOTES:

Do not scale from Drawings.
Refer Architectural Drawings for overall dimensions. To be read in conjunction with all other related documents.

Prior to any works, the position & depth of all public pipes on the site shall be confirmed by authorized/qualified personnel.
If different to the plans provided, Wilton Joubert Ltd. shall be contacted for possible redesigns.

Revision	Description	Date

WILTON JOUBERT
Consulting Engineers

Northland: 09 945 4188
Auckland-Waikato: 09 527 0196
Canterbury: 021 824 063
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www.wiltonjoubert.co.nz

Job Title:

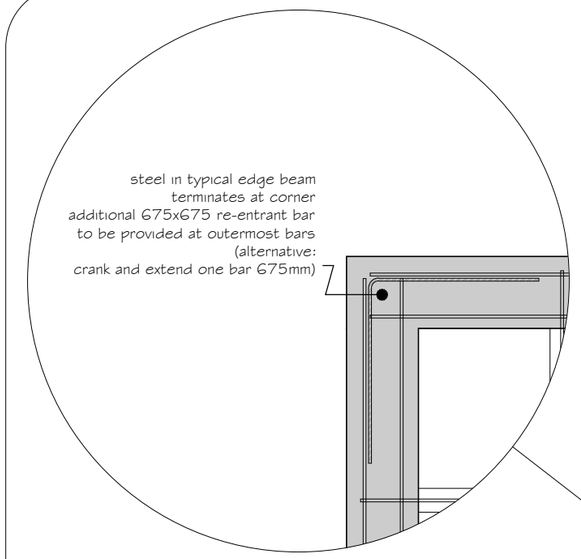
Proposed Residence
283a Kimberley Road
Levin

Sheet Title:

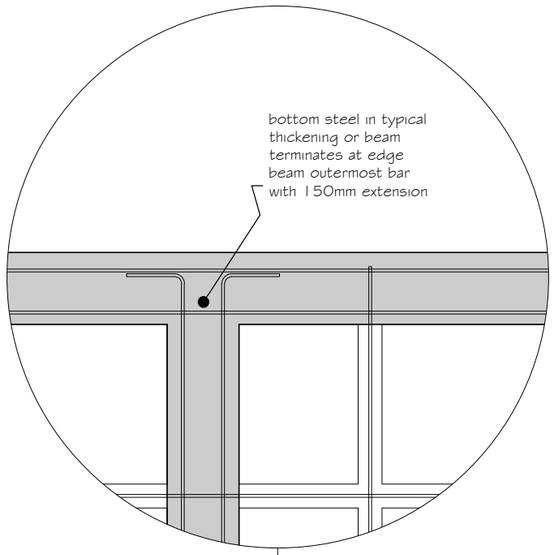
General Notes

Designed:	BL	Drawn:	TE
Checked:	DL	Revised:	...
Scales:		Date:	14-10-20

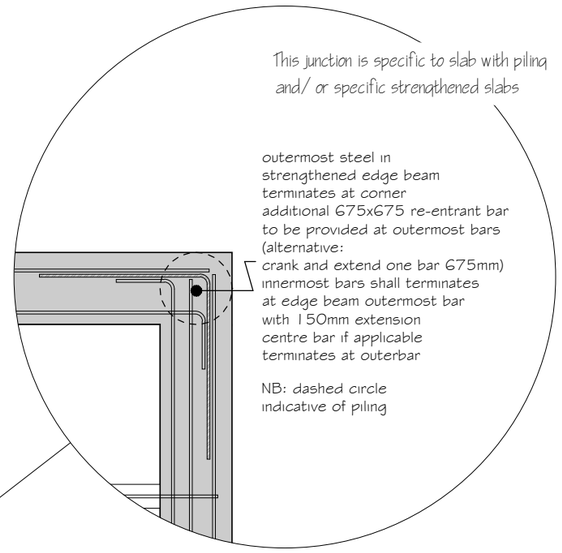
Job # 101096 — Drwg No: S0



steel in typical edge beam terminates at corner additional 675x675 re-entrant bar to be provided at outermost bars (alternative: crank and extend one bar 675mm)



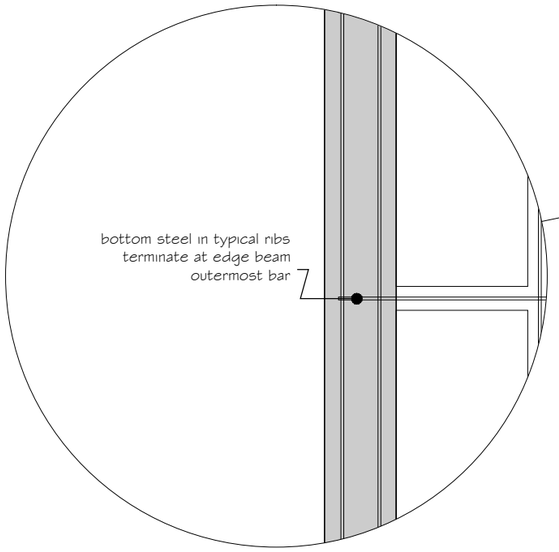
bottom steel in typical thickening or beam terminates at edge beam outermost bar with 150mm extension



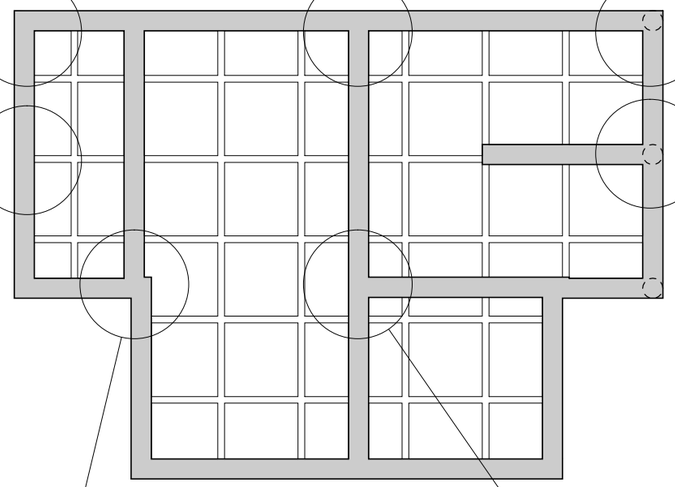
This junction is specific to slab with piling and/ or specific strengthened slabs

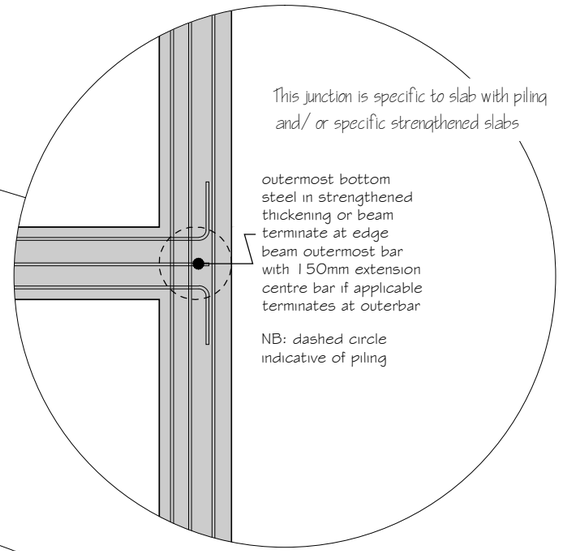
outermost steel in strengthened edge beam terminates at corner additional 675x675 re-entrant bar to be provided at outermost bars (alternative: crank and extend one bar 675mm) innermost bars shall terminates at edge beam outermost bar with 150mm extension centre bar if applicable terminates at outerbar

NB: dashed circle indicative of piling



bottom steel in typical ribs terminate at edge beam outermost bar

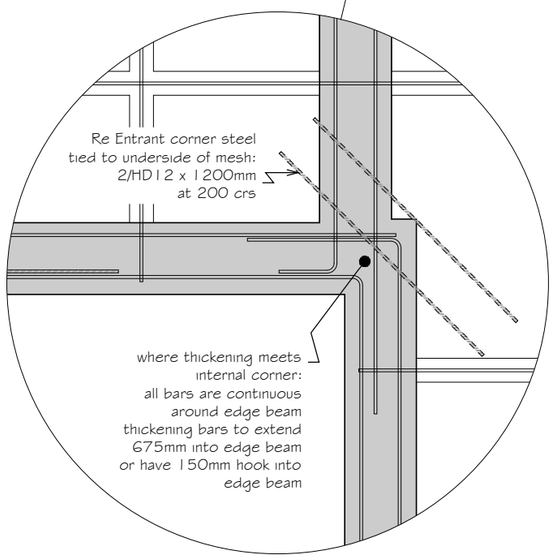




This junction is specific to slab with piling and/ or specific strengthened slabs

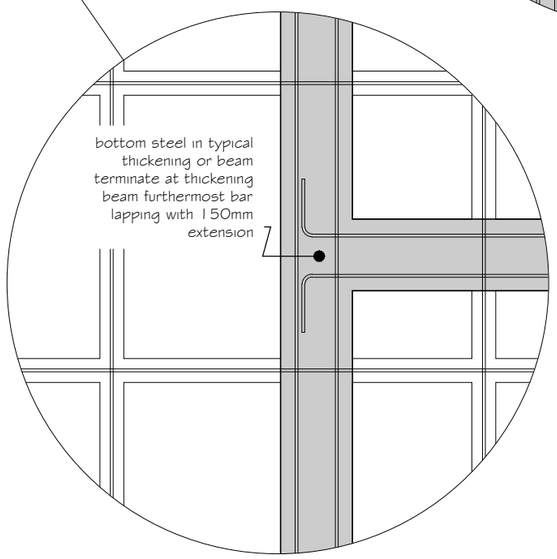
outermost bottom steel in strengthened thickening or beam terminate at edge beam outermost bar with 150mm extension centre bar if applicable terminates at outerbar

NB: dashed circle indicative of piling



Re Entrant corner steel tied to underside of mesh: 2/HD12 x 1200mm at 200 crs

where thickening meets internal corner: all bars are continuous around edge beam thickening bars to extend 675mm into edge beam or have 150mm hook into edge beam



bottom steel in typical thickening or beam terminate at thickening beam furthermost bar lapping with 150mm extension

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24 Nov 2020

Designed for:

RFL

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027 205 9118 simon@rfl.co.nz

South Island: Dayle
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NOTES:

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Refer Architectural Drawings for overall dimensions. To be read in conjunction with all other related documents.

Prior to any works, the position & depth of all public pipes on the site shall be confirmed by authorized/qualified personnel.
If different to the plans provided, Wilton Joubert Ltd. shall be contacted for possible redesigns.

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Job Title:

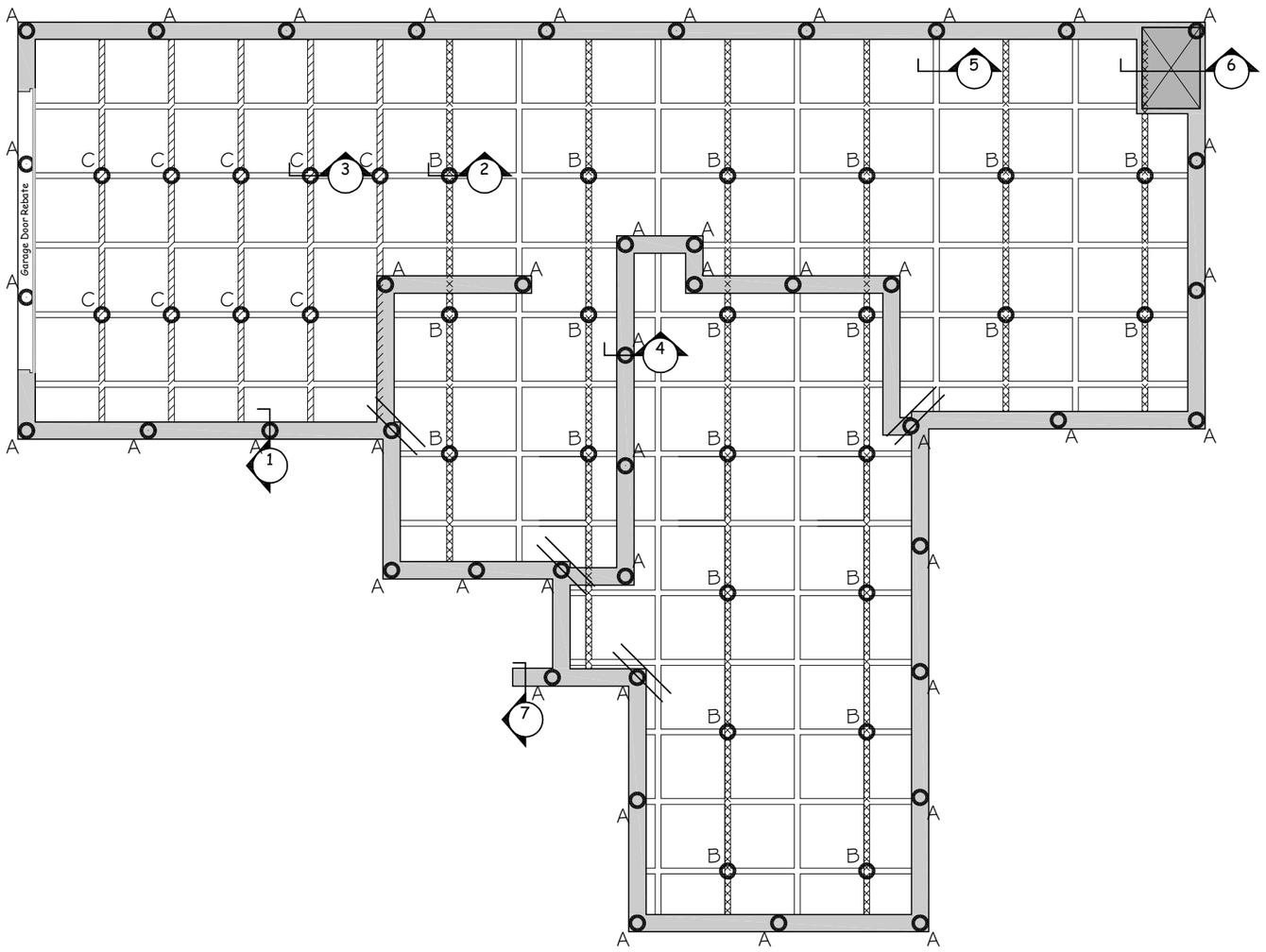
Proposed Residence
283a Kimberley Road
Levin

Sheet Title:

Typical Steel Detailing

Designed:	BL	Drawn:	TE
Checked:	DL	Revised:	- - -
Scales:		Date:	14-10-20

Job # 101096 Drwg No: S0.1



Raft Floor Plan

Scale 1:100

Sets for Driven Timber Piles

Type	S.E.D. mm	Set mm	Hammer kg	Drop mm
A	175	12	310	1600
B	175	16	310	1600
C	175	25	310	1600

NOTE:
Driven timber piles shall be placed at all point loads as shown, corners and evenly spaced in between, as shown on the drawings. They shall also be arrayed
at 1200 x 2400 (aligned with ribs), in garage area and
at 2400 x 2400 (aligned with ribs), in house area.
TEST PILE IS HIGHLY RECOMMENDED

Legend:

Re Entrant corner steel
2/HD12 x 1200mm
at 200 crs

\# — pile designation

175 SED Pile
driven to set as shown
with 310kg hammer
dropped through 1.6m

Shower setdown:
Solid pour under shower
D10 @ 300c/c both ways
cranked 600mm into topping.
Steel in ribs, thickenings and
edge beams continuous through

Standard Rib
100Wx305D
1/HD12 along

Bridging Rib
100Wx305D
2/HD12 along

Bridging Rib
100Wx305D
2/D16 along

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24 Nov 2020

Designed for:

RFL

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Quantities of Spacers

(Quantities are approximate and to be used as a guide only)

Item	Qty.
WJ100 Centre Spacer	211
WJ101 Clip-on Spacer	97

NOTES:
Do not scale from Drawings.
Refer Architectural Drawings for overall dimensions. To be read in conjunction with all other related documents.

Prior to any works, the position & depth of all public pipes
on the site shall be confirmed by authorized/qualified personnel.
If different to the plans provided,
Wilton Joubert Ltd. shall be contacted for possible redesigns.

Revision	Description	Date

WILTON JOUBERT
Consulting Engineers

Northland: 09 945 4188
Auckland-Waikato: 09 527 0196
Canterbury: 021 824 063
Southern Lakes: 03 443 6209
www.wiltonjoubert.co.nz

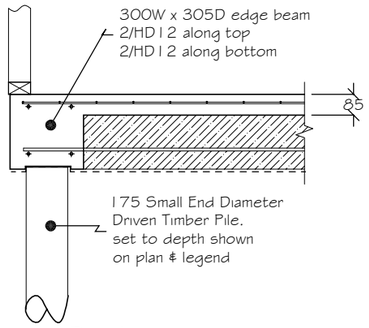
Job Title:

Proposed Residence
283a Kimberley Road
Levin

Sheet Title:

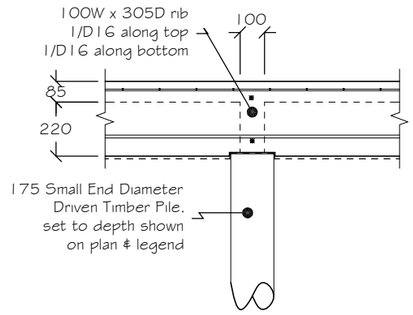
Ribraft Floor Plan

Designed:	BL	Drawn:	TE
Checked:	DL	Revised:	- - -
Scales:	1:100	Date:	14-10-20
Job No:	**Job # 101096**	Dwg No:	**S1**



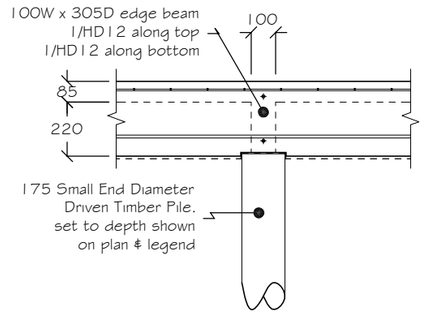
1 Detail

Raftfloor Edge Beam - 300
on 175 SED Pile
Scale 1:25



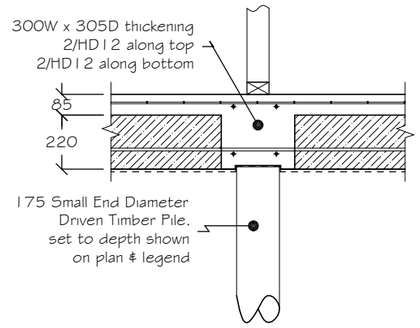
2 Detail

Raftfloor Internal Rib - 100
on 175SED DTP
Scale 1:25



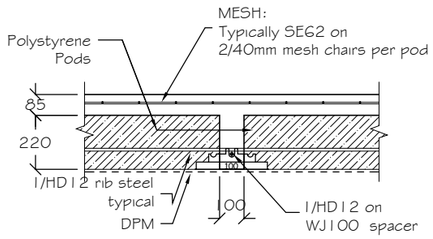
3 Detail

Raftfloor Internal Rib - 100
on 175SED DTP
Scale 1:25



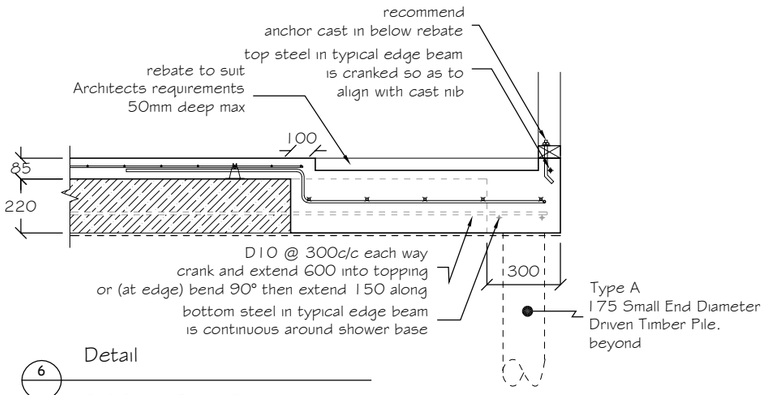
4 Detail

Raftfloor Internal Rib - 300
on 175SED DTP
Scale 1:25



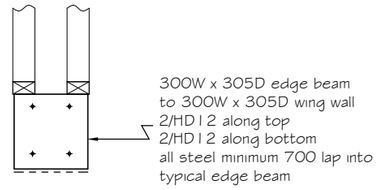
5 Detail

Raftfloor Internal Rib - 100
Scale 1:25



6 Detail

Raftfloor Solid Pour
Shower Setdown at
Edge Beam - 300
Scale 1:25



7 Detail

Raftfloor Edge Beam - 300
At Wing Wall - 300
Scale 1:25

Sets for Driven Timber Piles				
Type	S.E.D. mm	Set mm	Hammer kg	Drop mm
A	175	12	310	1600
B	175	16	310	1600
C	175	25	310	1600

NOTE:
Driven timber piles shall be placed at all point loads as shown, corners and evenly spaced in between, as shown on the drawings. They shall also be arrayed
at 1200 x 2400 (aligned with ribs), in garage area and
at 2400 x 2400 (aligned with ribs), in house area.
TEST PILE IS HIGHLY RECOMMENDED

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Designed for:

RFL

North Island: Simon
027 205 9118 simon@rfl.co.nz

South Island: Dayle
027 692 1624 southisland@rfl.co.nz

NOTES:

Do not scale from Drawings.
Refer Architectural Drawings for overall dimensions. To be read in conjunction with all other related documents.

Prior to any works, the position & depth of all public pipes on the site shall be confirmed by authorized/qualified personnel.
If different to the plans provided, Wilton Joubert Ltd. shall be contacted for possible redesigns.

Revision	Description	Date

WILTON JOUBERT
Consulting Engineers

Northland: 09 945 4188
Auckland-Waikato: 09 527 0196
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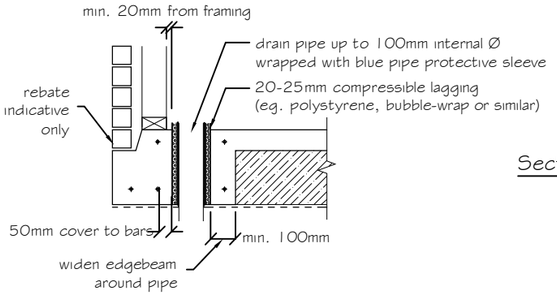
Job Title:

Proposed Residence
283a Kimberley Road
Levin

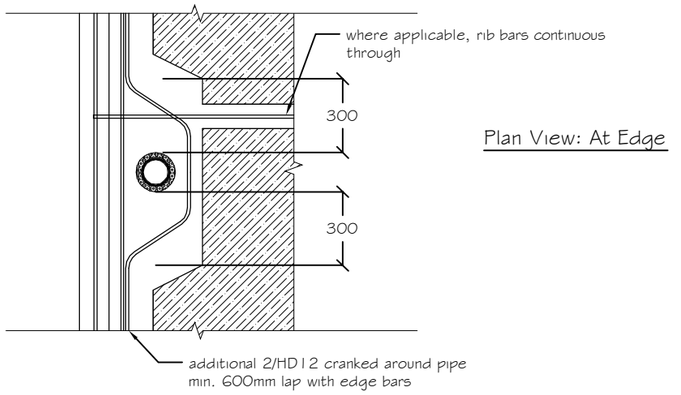
Sheet Title:

Ribraft Floor
Details

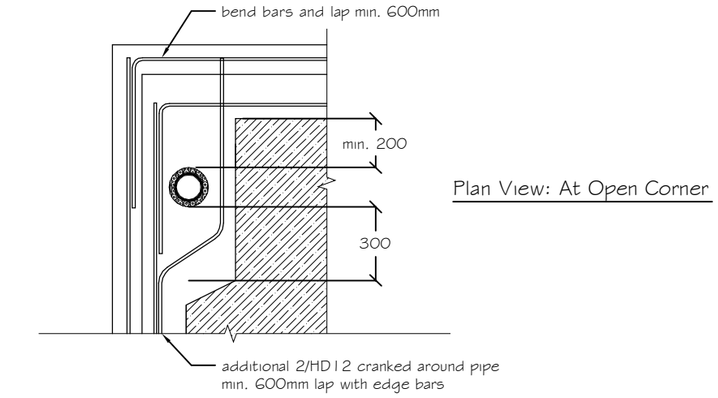
Designed:	BL	Drawn:	TE
Checked:	DL	Revised:	- - -
Scales:	1:25	Date:	14-10-20
Job No:	Job # 101096	Drwg No:	S2



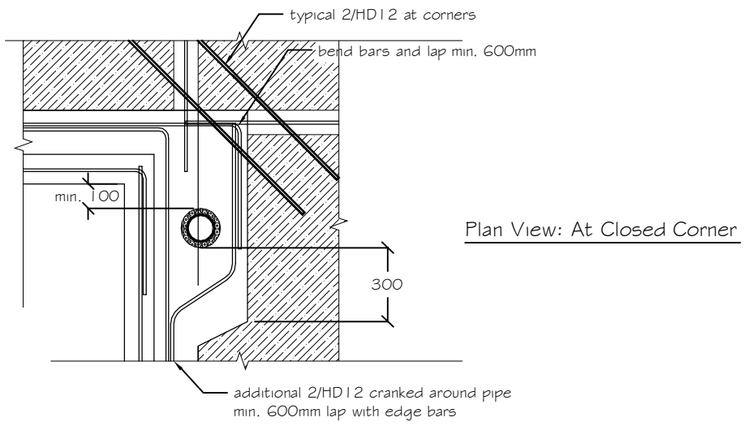
Section View: At Edge



Plan View: At Edge



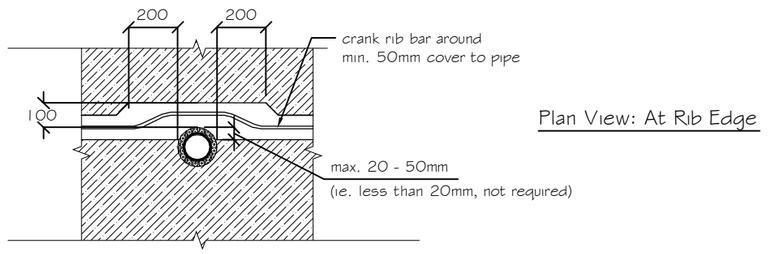
Plan View: At Open Corner



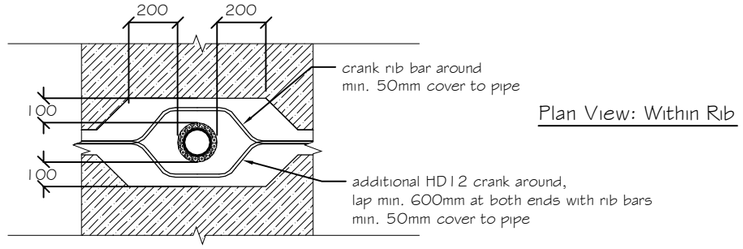
Plan View: At Closed Corner

Typical Detail Around Pipes

Raftfloor Edge Beam



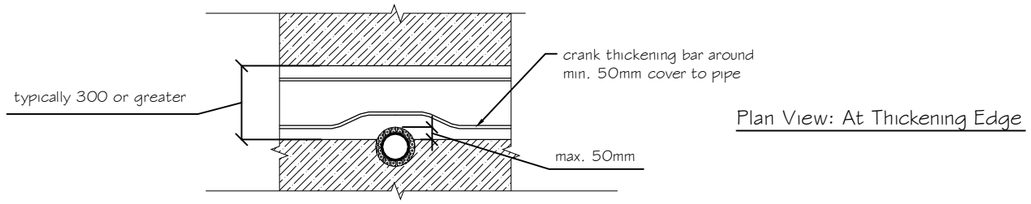
Plan View: At Rib Edge



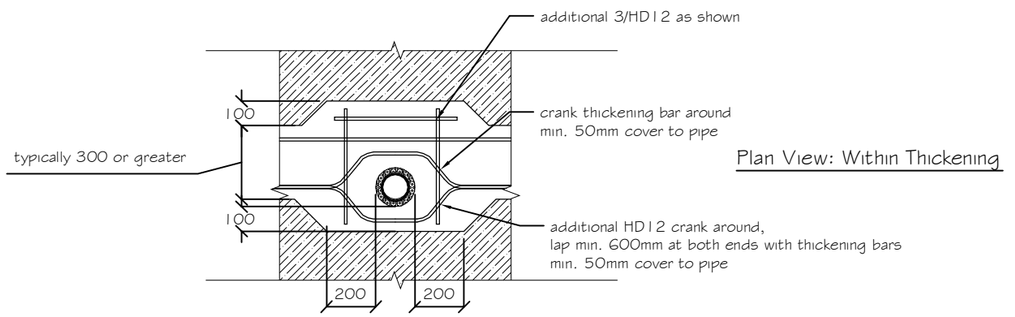
Plan View: Within Rib

Typical Detail Around Pipes

Raftfloor Internal Ribs



Plan View: At Thickening Edge



Plan View: Within Thickening

Typical Detail Around Pipes

Raftfloor Internal Thickenings

NOTES:

These details are applicable where plumbing/services are conveyed underground. Services are to be taken through polystyrene pods as much as possible. If this is unavoidable, it may be taken through ribs/thickenings, provided the details (or similar in principle) on this sheet are used.

All service trench backfill shall be properly compacted.

Member sizes and reinforcing shown are indicative only, details shown on raft slab plan & details shall take precedence over the details shown here.

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NOTES:

Revision	Description	Date

WILTON JOUBERT
Consulting Engineers

Northland: 09 945 4188
Auckland-Waikato: 09 527 0196
Canterbury: 021 824 063
Southern Lakes: 03 443 6209
www.wiltonjoubert.co.nz

Job Title:

Sheet Title:

Typical Pipe Details

Designed:	--	Drawn:	DL
Checked:	DL	Checked:	--
Scale:	1:25	Date:	2015
Job No:		Dwg No:	D1
Revision No:			

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Little Buildings Ltd t/a plans.co.nz

SPECIFICATION
of work to be done and materials to be used in carrying out the works shown on the accompanying drawings

Main & Hyde Residence

Project Specification
283a Kimberley Road, Levin, New Zealand
Project Ref: GJ 20-37

Printed: 01 October 2020

JOB COPY

THESE PLANS MUST BE RETAINED ON SITE

HOROWHENUA DISTRICT COUNCIL
APPROVED
SUBJECT TO COMPLIANCE WITH THE BUILDING CONSENT DOCUMENTATION

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Specification built using Masterspec software
Project ID: 206737 - 185770

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MEMORANDUM FROM LICENSED BUILDING PRACTITIONER: CERTIFICATE OF DESIGN WORK

1. Where is the building? *Complete this field*

Street address of building:	283a Kimberley Road, Levin
Building consent number:	

2. Who owns the building? *Complete all fields, using N/A if a field is not applicable*

Owner name:	D Hyde & C Main	Title: e.g. Mr, Mrs, Ms, Dr	
Owner email address:	Trevor.low@gjgardner.co.nz		
Owner contact number:	06-357-8020		
Owner mailing address:	C/O PO Box 466 PN		

3. What work have you carried out/supervised? *Complete as appropriate*

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

	Design Work that is restricted building work *Tick as applicable or enter N/A*				Description of restricted building work	Carried out/ supervised	Reference to plans/ specifications
					Complete these fields if the previous column is ticked Yes		
Primary structure	☑	Yes	☐	N/A			
Foundations/ subfloor framing	☑	Yes	☐	N/A	Engineered concrete foundation	Supervised	A06
Walls	☑	Yes	☐	N/A	Timber frames and lintels	Supervised	A10
Roof	☑	Yes	☐	N/A	Timber Trusses	Supervised	A11
Columns/beams	☐	Yes	☑	N/A			A10
Bracing	☑	Yes	☐	N/A	Gib Ezy Brace	Supervised	A08
Other	☐	Yes	☑	N/A			
External moisture management systems	☑	Yes	☐	N/A		Supervised	
Damp proofing	☑	Yes	☐	N/A	DPM under slab	Supervised	A06
Roof cladding or roof cladding system	☑	Yes	☐	N/A	Metal tile	Supervised	A11

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Ventilation system (for example, subfloor or cavity)	☑	Yes	☐	N/A	20mm drained cavity	Supervised	A17-A27
Wall cladding or wall cladding system	☑	Yes	☐	N/A	Resene construction & JH Linea	Supervised	A17-A27
Waterproofing	☐	Yes	☑	N/A			
Other	☐	Yes	☑	N/A			
Fire safety systems	☐	Yes	☑	N/A			
Emergency warning systems, evacuation and fire service operation systems, suppression, control systems, or other	☐	Yes	☑	N/A			

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.

Are waivers or modifications of the building code required?	☐	Yes	☑	No

If Yes, please provide details including relevant code clauses

4. What are your details? *Complete all fields, using N/A if a field is not applicable*

Licensed Building Practitioner name:	Jeff Twigge	Licensed Building Practitioner number:	111561
Registered Architect number		Chartered Professional Engineer number:	

Mailing address:	43 Walding Street.
Street address or registered office:	43 Walding Street.
Contact number:	06-359-2844
Email address:	Jonathan@plans.co.nz

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5. Declaration

I, Jeff Twigge *(name of Licensed Building Practitioner)* certify that the design work that is restricted building work recorded on this form—

(a) complies with the building code; or
(b) complies with the building code subject to any waiver or modification of the building code recorded on this form

Signature:	
Date:	2/10/2020.

You can add a digital signature to this document, either using Adobe or your existing digital signature.

Once you have filled out the form, including signatures, please save the application to your computer. You can then submit the application with supporting documentation to your local council.

If you are unsure about what information to include in your application, a guidance document is available (click here).

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Verified spec ID: **215341-185770**

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Scan to verify or go to masterspec.co.nz/verify

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1220 PROJECT

1 GENERAL

This general section describes the project including:

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

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

Description of the work

1.2 SCOPE OF THE WORK

Construct a new residential 4 bedroom house on site with attached double garaging.

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Site

Site environment - Wind

1.4 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

The design wind pressures are to NZS 3604, Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.
Building wind zone High 44 M/S

Site environment - Durability

1.5 EXPOSURE ZONE

The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.
The site zone is: Zone B (LOW Risk)

Site environment - Seismic

1.6 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

The zone is to NZS 3604, Section 5 Bracing design, 5.3 Earthquake bracing demand.
The earthquake zone is: Zone 3

Archaeological discovery

1.7 ANTIQUITIES AND ITEMS OF VALUE

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

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

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

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1232 INTERPRETATION & DEFINITIONS

1 GENERAL

This general section relates to definitions and interpretation that are used in this specification.

Definitions

1.1 DEFINITIONS

Required:	Required by the documents, the New Zealand Building Code or by a statutory authority.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Provide and fix:	"Provide" or "fix" or "supply" or "fix" if used separately mean provide and fix unless explicitly stated otherwise.
Review:	Review by the contract administrator is for general compliance only. Review does not remove the need for the contractor to comply with the stated requirements, details and specifications of the manufacturers and suppliers of individual components, materials and finishes. Neither can the review be construed as authorising departures from the contract documents.
Working day:	Working day means a calendar day other than any Saturday, Sunday, public holiday or any day falling within the period from 24 December to 5 January, both days inclusive, irrespective of the days on which work is actually carried out.
Workplace:	Workplace means the place where work is being carried out, or is customarily carried out, for a business or undertaking including any place where a worker goes, or is likely to be, while at work (under Health and Safety at Work Act 2015).

1.2 PERSONNEL

Owner:	The person defined as "owner" in the New Zealand Building Code.
Principal:	The person defined as "principal" in the conditions of contract.
Contractor:	The person contracted by the principal to carry out the contract.
Contract administrator:	The person appointed by the principal to administer the contract on the principal's behalf. Where no person has been appointed by the Principal, it means the Principal or the Principal's representative.

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1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMA	American Architectural Manufacturers Association
AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
ASTM	American Society for Testing and Materials
AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc.
BCA	Building Consent Authority
BRANZ	Building Research Association of New Zealand
BS	British Standard
COP	Code of practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HERA	Heavy Engineering Research Association
LBP	Licensed Building Practitioner
MBIE	Ministry of Business, Innovation and Employment
MPNZA	Master Painters New Zealand Association Inc
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NZTA	New Zealand Transport Agency
NUO	Network Utility Operator
PCBU	Person Conducting a Business or Undertaking (under Health and Safety at Work Act 2015)
OSH	Occupational Safety and Health
TA	Territorial Authority
TNZ	Transit New Zealand (Transit New Zealand is now New Zealand Transport Agency NZTA - some specifications are still prefixed TNZ)
RBW	Restricted Building Work
SARNZ	Scaffolding and Rigging New Zealand Inc
SED	Specific Engineering Design

1.4 DEFINED WORDS

Words defined in the conditions of contract, New Zealand Standards, or other reference documents, to have the same interpretation and meaning when used in their lower case, title case or upper case form in the specification text.

1.5 WORDS IMPORTING PLURAL AND SINGULAR

Where the context requires, words importing singular only, also include plural and vice versa.

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1233 REFERENCED DOCUMENTS

1 GENERAL

1.1 REFERENCED DOCUMENTS

Throughout this specification, reference is made to various New Zealand Building Code Compliance Documents (NZBC __), acceptable solutions (__ AS_) and verification methods (__ VM_) for criteria and/or methods used to establish compliance with the New Zealand Building Code.

Reference is also made to various standards produced by Standards New Zealand (NZS, AS/NZS, NZS/AS), overseas standards and to listed Acts, Regulations and various industry codes of practice and practice guides. The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise.

It is the responsibility of the contractor to be familiar with the materials and expert in the techniques quoted in these publications.

Documents cited both directly and within other cited publications are deemed to form part of this specification. However, this specification takes precedence in the event of it being at variance with the cited documents.

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

NZBC F4/AS1	Safety from falling
NZBC F5/AS1	Construction and demolition hazards
AS/NZS 1170.2	Structural design actions - Wind loads
AS/NZS 3012	Electrical installations - Construction and demolition sites
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3404:1997	Steel structures standard
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 6803	Acoustics - Construction Noise

Building Act 2004
Building Regulations 1992
Health and Safety at Work Act 2015
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
Health and Safety in Employment Regulations 1995 (reprint 4 April 2016)
New Zealand Building Code
Heritage New Zealand Pouhere Taonga Act 2014
Resource Management Act 1991
Smoke-free Environments Act 1990

WorkSafe NZ	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe NZ	Good Practice Guidelines - Excavation Safety
WorkSafe NZ	Scaffolding in New Zealand - Good Practice Guidelines
SARNZ	Best practice guideline for scaffolding in New Zealand

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1234 DOCUMENTATION

1 GENERAL

This general section relates to documentation required by the Territorial Authority/Building Consent Authority for compliance with the New Zealand Building Code. It also includes documentation relating to:

- Substitutions
- Manufacturers documents

Building Consent Authority documentation

1.1 BUILDING CONSENT

Obtain the building consent forms and documents from the owner and keep them on site. Liaise with the BCA for all notices to be given and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

1.2 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004

- to carry out any work not in accordance with the building consent.
- to carry out Restricted Building Work by anyone other than a Licensed Building Practitioner licensed for that type of work.

The resolution of matters concerning building code compliance to be referred to the contract administrator for a direction and then if required to the BCA for consent.

Where any alteration is requested by the territorial authority or any other authority, do not undertake such alteration until the matter has been referred to the contract administrator for direction.

1.3 PROJECT PERSONNEL

Provide names and contact details of the contractor's key personnel and tradespersons who are involved with the project. Review the list once a month and reissue it if changes have been made.

Licensed Building Practitioner documentation

1.4 LICENSED BUILDING PRACTITIONERS

Provide LBP details. Provide names, LBP numbers, areas of practice and contact information. Provide this information to the BCA before commencing work on the Restricted Building Work in the form required by the BCA. Advise the BCA of any change to an LPB previously advised.

Include the following as applicable

- Site LBP
- Carpenter
- Foundations 1 Concrete foundation walls and concrete slab-on-ground constructor
- Bricklaying and block laying 1 Brick / masonry veneer

Also provide names and contact details of the following

- Registered drainlayer
- Registered plumber
- Registered Gas fitter
- Registered electrician

1.5 PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the Building Consent Authority and the Contract Administrator. Provide producer statements in the form required by the BCA.

1.6 RECORD OF WORK

Where Restricted Building Work is carried out by a LBP, on completion provide a Record of Work. Provide copies to both the BCA and the Contract Administrator.

Compliance information

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1.7 DOCUMENTATION REQUIRED FOR CODE COMPLIANCE

Information may be required either as a condition of the contract documents or as a condition of the building consent. It may include the following:

- Applicators approval certificate from the manufacturer / supplier
- Manufacturer's / supplier's warranty
- Installer / applicator's warranty
- Producer Statement - Construction from the applicator / installer
- Producer Statement - Construction review from an acceptable suitably qualified person

Refer to the general sections for the requirements for compliance information to be provided by the contractor.

Refer to the building consent for the requirements for compliance information to be provided by the contractor.

Obtain required documents from the relevant parties for delivery to the contract administrator after the final inspection has been carried out by the BCA.

1.8 DOCUMENTATION REQUIRED ON COMPLETION

As soon as practicable after completion of the building work, provide in writing the following information and documentation to the client and the relevant territorial authority.

Information and documentation relating to:

- The identity of the building contractor and the subcontractors who carried out the work.
- Maintenance requirements for any products incorporated in the building.

If applicable also provide any guarantee or insurance obtained by the building contractor in relation to the building work.

Substitutions

1.9 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.10 NO SUBSTITUTIONS

Where specifically stated in a section, substitutions are not permitted to any of the specified systems, components and associated products listed in that section.

1.11 PROPOSED SUBSTITUTIONS

A substitution may be proposed where specified products are not reasonably available. A substitution may also be proposed by the contractor where the contractor considers a proposed substitution to be an alternative to the specified product. Except where a specified product is not available, the contract administrator is not bound to accept any substitutions. Where branded work sections are included in this specification, substitution of those products or systems will not be allowed.

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1.12 NOTIFICATION OF SUBSTITUTIONS

Notify proposed substitution of specified products. Notification to include but not be limited to:

- Product identification
- Manufacturer's name, address, telephone number, website and email address
- Detailed comparison between the properties and characteristics of the specified product and the proposed substitution
- Statement of NZBC compliance including durability
- Details of manufacturer warranties

Plus an assessment of:

- Any changes required to the programme including any extension of time required
- Any consequential effects of the proposed substitution
- Any effect the substitution may have on Health & Safety requirements
- Allowance for time and cost for re-design and documentation (if applicable)
- Allowance for time and cost for obtaining an amendment to the Building Consent (if applicable)
- Any change in cost associated with the proposed substitution

and if requested:

- All current manufacturer's literature on the product
- Accreditations and appraisals available
- Reference standards
- Product limitations
- Samples
- List of existing installations in the vicinity of the project

1.13 ACCEPTANCE OF SUBSTITUTIONS

The Contract administrator must advise of acceptance of substitutions in writing.

Variations to issued Building Consent

1.14 CONTRACTOR VARIATION TO BUILDING CONSENT

Where the contractor has sought acceptance of a substitution or a variation which is for the contractor's own convenience and the substitution or variation requires an amendment to the Building Consent, the contractor must apply for and obtain the required amendment.

The contractor must:

- Obtain approval for substitutions from the contract administrator.
- Prepare and provide to the BCA all documentation required for the variation.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

1.15 PRINCIPALS VARIATION TO BUILDING CONSENT

Where the principal is proposing a substitution or a variation which requires an amendment to the Building Consent, the contractor must provide to the principal information that the contractor has that is required for the amendment.

The principal will:

- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

Manufacturer's documents

1.16 MANUFACTURER’S AND SUPPLIER’S INSTALLATION REQUIREMENTS

Manufacturers and supplier’s requirements, instructions, specifications or details means those issued by them for their particular material, product or component and are the latest edition.

1.17 CONTRACTOR TO OBTAIN CURRENT DOCUMENTATION

Where manufacturer’s installation, application and execution requirements are referred to in this specification, the Contractor must ensure they are fully aware of this documentation. Whenever necessary obtain and keep on site the relevant latest version of such documentation and make it available to workers carrying out that part of the work.

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1.18 DOCUMENTATION PROVIDED FOR BUILDING CONSENT

Documentation including manufacturer's installation instructions, specification data sheets, producer statements, BRANZ and similar appraisals may be included in the issued Building Consent. These documents have been provided only to demonstrate compliance with the NZBC.

Branded work sections

1.19 BRANDED WORK SECTIONS

Branded sections may be included in this specification relating to specific products and systems to be installed as part of the contract works. Where branded sections are included, substitutions to the branded products and systems will not be allowed.

1.20 CROSS REFERENCED WORK SECTIONS

If any related work is cross referenced to a generic work section, but only the equivalent branded section is included in the specification, use that branded section. Confirm with the contract administrator if there is any doubt.

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1237 WARRANTIES

1 GENERAL

Warranties

1.1 PROVIDE WARRANTIES

Provide executed warranties in favour of the principal in respect of, but not limited to, materials, components, service, application, installation and finishing called for in that specified section of work. The terms and conditions of the warranty in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability under the terms of the warranty called for in that specified section of work.

- Commence warranties from the date of practical completion of the contract works (unless otherwise stated).
- Maintain their effectiveness for the times stated.
- Provide executed warranties prior to practical completion.

1.2 WARRANTIES - INSTALLER/APPLICATOR

Where installer/applicator warranties are offered covering execution and materials of proprietary products or complete installations, provide such warranties to the contract administrator. These warranties may be provided in lieu of the warranties that are otherwise required provided that these warranties are subject to similar conditions and periods.

Provide warranties in favour of the principal. The terms and conditions of such warranties in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

1.3 WARRANTIES - MANUFACTURER/SUPPLIER

Where warranties are offered covering materials, equipment, appliances or proprietary products, provide all such warranties to the contract administrator.

Provide warranties in favour of the principal. The terms and conditions of such warranties in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

Submission

1.4 REVIEW BY CONTRACTOR

Obtain the warranties from the installers, applicators, manufacturers and suppliers at the earliest possible date and review to ensure that they are correctly filled out and executed. Where warranties are executed as a deed, ensure that a duplicate copy is provided for execution by the owner/principal. Keep safe and secure until required for submission.

1.5 WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY

Obtain copies of warranties required as a condition of the building consent in the form required for submission to the BCA. Keep safe and secure until required at the time of the BCA final inspection and Code Compliance Certificate.

1.6 WARRANTIES - REQUIRED BY CONTRACT

Obtain copies of warranties listed in the contract documents. Provide all warranties at the same time. If the project has an operations and maintenance documentation provision, present the warranties with the operations and maintenance information. If no operations and maintenance documentation provision exists, present the warranties to the contract administrator in a loose-leaf binder with a contents index suitably labelled and including the project name and details. Provide a title on the binder edge "Warranties for (project name)"

1.7 WARRANTIES - SUBMISSION NZIA SCC CONTRACT

Refer to the contract conditions for any requirement relating to the time for submission for warranties and guarantees. Submit all warranties to the architect no later than the date of the contractor's advice of achieving practical completion.

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1.8 WEATHERTIGHTNESS AND WATERTIGHTNESS WARRANTY

A warranty is required from the contractor for a minimum period of 2 years, covering the weathertightness of the complete building envelope and the watertightness of all liquid supply and disposal systems and fittings. This general warranty is in addition to any specific warranties required.

Provide this warranty in favour of the principal. The terms and conditions of this warranty in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

- Commence the warranty from the date of Practical Completion.
- Maintain its effectiveness for the time stated.

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1270 CONSTRUCTION

1 GENERAL

This GENERAL section relates to common requirements for construction issues including: -

- Quality assurance
- Noise and nuisance
- Set out
- Common execution requirements
- Common materials requirements
- Supply of spare materials
- Common requirements for samples and tests
- Final presentation and cleaning
- Commissioning

Quality control and assurance

1.1 QUALITY ASSURANCE

Carry out and record regular checks of material quality and accuracy, including:

- Concrete quality and finish.
- Dimensional accuracy of structural column locations (following completion of foundations).
- All perimeter columns and frames for plumb.
- Levels of all floors relative to the site datum.
- Framing timber moisture content.

Where any material, quality or dimension falls outside specified or required tolerances, obtain written direction from the contract administrator. Where building consent approval is affected, confirm remedial action with the Building Consent Authority.

Provide all materials, plant, attendances, supervision, inspections and programming to ensure the required quality standards are met by all project personnel.

Noise and nuisance

1.2 LIMIT CONSTRUCTION NOISE

Minimise the effects of noise generation by including in the planning of the work such factors as placing of plant, programming the sequence of operations and other management functions. Limit construction noise to comply with the requirements of NZS 6803, the requirements of the Resource Management Act sections 326, 327 and 328 and the Health and Safety in Employment Regulations clause 11.

1.3 ACCEPTABLE NOISE LEVELS

Refer to NZS 6803 Tables 2 and NZS 6803, tables 3 for the upper limits of construction work noise in residential and industrial areas over the various time periods, particularly 0730 to 1800 hours. Note also the allowed adjustments and exemptions in NZS 6803, 6. Do not exceed these limits.

1.4 PROVIDE INFORMATION TO NEIGHBOURS

Provide information to neighbours of any noise generation from the site liable to constitute a problem. Explain to them the means being used to minimise excessive noise and establish with them the timings most suitable for the noise generating work to be carried on.

Discuss with any complainant the measures being used to minimise noise. Where possible modify these measures to accommodate particular circumstances. Finally, determine the sound level at the location under discussion using methods and observation reporting as laid down in NZS 6803. If the noise level is above the upper limits of NZS 6803, tables 2 and NZS 6803, tables 3, cease the noise generating operation and remedy the problem.

1.5 DIRT AND DROPPINGS

Remove dirt and droppings deposited on public or private thoroughfares from vehicles servicing the site to the satisfaction of the appropriate authorities and the contract administrator.

1.6 DAMAGE AND NUISANCE

Take all precautions to prevent damage and nuisance from water, fire, smoke, dust, rubbish and all other causes resulting from the construction works.

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Set-out and tolerances

1.7 SURVEY INFORMATION

Locate and verify survey marks and datum points required to set out the works. Record and maintain their position. Re-establish and replace disturbed or obliterated marks.

1.8 SET-OUT AND DATUM

Set out the work to conform with the drawings. Establish a permanent site datum to confirm the proposed building ground floor level and its relationship to all other existing and new building levels.

1.9 SET-OUT BY LICENSED CADASTRAL SURVEYOR

Before commencing construction provide the contract administrator with a certificate prepared by a licensed cadastral surveyor that the set-out is complete and that the building is accurately placed on the site.

During construction provide the contract administrator with a certificate, prepared by the same licensed cadastral surveyor confirming the set-out of the foundations and grid lines. Necessary adjustments are to be determined and agreed to by the contract administrator before proceeding further.

1.10 CONFIRM HEIGHT IN RELATION TO BOUNDARY

Provide a certificate prepared by a licensed cadastral surveyor that the building has been constructed within the allowed height in relation to boundary. Provide the certificate to the local authority. Provide a copy of the certificate to the contract administrator

1.11 USE OF SET-OUT INSTRUMENTS

Permit without charge, the use of instruments already on site for checking, setting out and levels.

1.12 CHECK DIMENSIONS

Check all dimensions both on drawings and site, particularly the correlation between components and work in place. Take all dimensions on drawings to be between structural elements before linings or finishes, unless clearly stated otherwise.

1.13 TOLERANCES

All work to be level, plumb, and true to line and face. Unless otherwise specified in specific work sections of this specification, tolerances for structural work shall comply with the following:

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes
Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

Execution

1.14 EXAMINE PREVIOUS WORK

Before commencing any part of the work carefully examine the previous work on which it may depend. Report in writing to the contract administrator defects that may affect the quality of the proposed work and obtain instructions. Commencing work on any part means that previous work is accepted as being satisfactory for work of the required standard.

1.15 WORKER QUALIFICATIONS

All work to be level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

1.16 MINIMISE DELAYS DUE TO WEATHER

Use appropriate techniques and methods to prevent damage and minimise delays due to weather.

Materials

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1.17 NEW PRODUCTS AND MATERIALS

Materials and products to be new unless stated otherwise, of the specified standard, and complying with all cited documents.

1.18 COMPATIBILITY OF MATERIALS AND FINISHES

Ensure all parts of a construction or finish are compatible and their individual use approved by the manufacturers and suppliers of other parts of the system. Source all parts of a system from a single manufacturer or supplier.

1.19 STORING PRODUCTS AND MATERIALS

Take delivery of and store products, materials and components in accordance with codes of practice and the product manufacturer's or supplier's stated requirements. Maintain the proper condition of any protective packaging, wrappings or supports during delivery, unloading and storage.

1.20 HANDLING PRODUCTS AND MATERIALS

Handle products, materials and components in accordance with codes of practice and the manufacturer's or supplier's stated guidelines. Avoid distortion and any contact with potentially damaging surfaces or conditions.

1.21 SUBSTRATE CONDITIONS

Ensure substrate conditions are within the manufacturer's or supplier's stated guidelines both before and during the installation of any material, product or system. Obtain written instructions on the necessary action to rectify unsatisfactory conditions.

1.22 INSTALLING PRODUCTS AND MATERIALS

Install in accordance with the manufacturer's or supplier's technical literature. Ensure that all installers are familiar with the required substrate conditions and the manufacturer's or supplier's specified preparation, fixing and finishing techniques.

1.23 COMPLY WITH STANDARDS

Comply with the relevant and/or cited Standard for any material or component. Obtain certificates of compliance when requested by the contract administrator.

1.24 CONDITION OF MATERIALS AND COMPONENTS

To be in perfect condition when incorporated into the work.

1.25 INCOMPATIBLE MATERIALS AND METALS

Separate incompatible materials and metals with separation layers, sleeves or gaskets of plastic film, bituminous felt or mastic or paint coatings, installed so that none are visible on exposed surfaces.

Spares

1.26 SPARES

Collect, protect and store safely all spare materials required under the contract. Give the contract administrator an inventory of all spares.

Final presentation and cleaning

1.27 REMOVE TEMPORARY PROTECTION

Remove all temporary markings, coverings, labels and protective wrappings unless instructed otherwise.

1.28 REPLACE DAMAGED MATERIALS

Replace all materials or component damaged during the works to the standard of and integral with the original.

1.29 COMPLETE ALL SERVICES

Ensure all services are complete and operational, with all temporary labelling removed, required labelling fixed and service instructions provided.

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1.30 CLEANING BY CONTRACTOR

Clear the contract works of all construction materials, waste, dirt and debris. Clean the contract works including:

- Wipe all surfaces to remove construction dust
- Clean out service ducts and accessible concealed spaces
- Clean out all gutters and rainwater heads
- Wipe dust from both sides of glass. Take particular care when removing paint or cementitious materials to not damage the glass.
- Remove adhesive residue left by labels and other temporary protection/markings
- Clean out the interior of all cabinetry
- Wash down external concrete including driveways and concrete masonry. Take care when waterblasting to not cause damage to the surface or allow water to enter the building.
- Remove rubbish and building material from the area immediately adjacent to the contract works

Commissioning

1.31 MOVING PARTS

Adjust, ease and lubricate all doors, windows, drawers, hardware, appliances, controls and all moving parts to give easy and efficient operation.

1.32 SECURITY AT COMPLETION

Remove any temporary lock cylinders and complete final keying prior to handing over keys to the principal on completion of the works. Leave the works secure with all accesses locked. Account for all keys/cards/codes and hand to the principal along with an itemised schedule, retaining a duplicate schedule signed by the principal as a receipt.

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3820 CARPENTRY

1 GENERAL

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

1.1 DOCUMENTS

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

NZBC B2/AS1	Durability
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1604.5	Specification for preservative treatment - Glue laminated timber products
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

***A copy of** NZS 3604 **Timber-framed buildings, must be held on site.**

1.2 QUALIFICATIONS

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

1.3 DIMENSIONS

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

2 PRODUCTS

2.1 TIMBER FRAMING, TREATED

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

Components

2.2 NAILS

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

2.3 BOLTS AND SCREWS

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

2.4 NAIL PLATES

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

2.5 CONNECTORS

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

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2.6 CORROSION RISKS

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

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

2.7 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3 EXECUTION

3.1 EXECUTION GENERALLY

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

3.2 SEPARATION

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

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

3.3 ATTENDANCE

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

3.4 MOISTURE CONTENT

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

Framing at erection:	24% maximum
Framing at enclosure:	20% maximum
Framing at lining:	18% maximum

3.5 SET-OUT

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

3.6 FRAMING WALLS

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

3.7 INSTALLING WALL UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.8 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.9 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

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4161 UNDERLAYS, FOIL AND DPC

1 GENERAL

This section relates to the application of:

- DPC/DPM
- underfloor foil insulation
- wall underlays includes Kraft based and synthetic wall underlays
- roofing underlays includes kraft based and synthetic roof underlays
- foils
- vapour barriers
- accessories

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

NZMRM	New Zealand Metal Roofing Manufacturers Inc.

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZS/AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays
AS/NZS 4347.0	Damp-proof courses and flashings - Methods of test - General introduction, list of methods and test specimen requirements
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

Requirements

1.3 INSTALLATION SKILL LEVELS

Installers to be familiar with the manufacturer's technical literature and the NZMRM CoP NZ metal roof and wall cladding Code of Practice.

2 PRODUCTS

Materials

DPC

2.1 POLYETHYLENE DPC

Polyethylene film to AS/NZS 2904 and to the appropriate test methods set out in AS/NZS 4347.0. Thickness 500 microns minimum, manufactured for use as a damp-proof course and concealed flashings to doors and windows.

DPM

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2.2 DAMP PROOF MEMBRANE - CONCRETE FLOOR

Polyethylene sheet with minimum thickness of 0.25mm to NZS 3604, 7.5.6, **Polyethelene (polythene) sheet damp-proof membranes**.

Wall Underlays

Roofing Underlay

2.3 BITUMINOUS SELF-SUPPORTING ROOFING UNDERLAY

Self supporting roofing underlay tested to NZS 2295.

Accessories

2.4 WINDOW DOOR SEALING SYSTEM

Proprietary window and door flashing tape and accessories to E2/AS1, paragraph 4.3.11, **Flexible flashing tape**, paragraph 9.1.5, **Wall underlays to wall openings**.

2.5 STUD STRAPS

19mm wide polyethylene straps, for cavity construction with framing centres greater than 450mm.

2.6 GUTTER AND UNDER FLASHINGS

Bituminous breather type underlay cut to width by manufacturer for use under valley, apron flashing and internal gutters. Soffit liner cut to width from bituminous breather type underlay.

2.7 ADHESIVE TAPE

Adhesive tapes to compliment the underlay. Pressure sensitive tapes for joining foil insulation and vapour barriers.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZBC E2/AS1 Table 23 Properties of Roof Underlays and Wall Underlays; and manufacturers technical literature.
Note: Care should be taken not to expose the underlay to continuous wet and windy conditions.

3.2 STORAGE

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

3.3 INSPECTION

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

Application - DPC

3.4 POLYETHYLENE DPC TO TIMBER

Lay polyethylene DPC under treated and untreated timber, including LOSP treated timber, of all timber framed walls on concrete and concrete masonry, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

3.5 DPC TO MASONRY AND BRICK VENEER

Lay DPC along base of cavity and fix top edge to studs with galvanized clouts. Turn DPC out over concrete rebate under bottom course of veneer.

3.6 DPC BETWEEN DISSIMILAR MATERIALS

Lay DPC between dissimilar materials where required.

Application - DPM

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3.7 DPM TO CONCRETE FLOOR

Lay DPM under concrete floor substrate over sand binding, in a single layer with 150mm overlaps at joints to provide a waterproof barrier.

Application - Wall Underlay

3.8 WALL UNDERLAY

Fix horizontally to outside face of substrate in true alignment, with succeeding sheets overlapping 150mm to NZBC E2/AS1, clause 9.1.7, **Wall underlay** and refer to manufacturer for requirement for fastenings. Fix tomanufacturers requirements. Scribe neatly around penetrations and openings to leave no gaps. Tape all penetrations. Keep clean, undamaged and without visible weather deterioration until closed in.

3.9 INSTALL STUD STRAPS

Over underlay, install 19mm wide polyethylene straps horizontally at 300mm centres, draw taut and fix to studs with stainless steel staples.

Application - Roofing Underlay

3.10 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixing clips. Lay underlay to avoid excessive dishing between purlins. When used vertically limit individual runs to 10 metres for bituminous based roofing underlays, 7 metres for fire retardant underlays and 20 metres for synthetic roofing underlays. Do not lay vertically on roof pitches under 10°.

3.11 GUTTER AND UNDER FLASHINGS

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

Completion

3.12 CLEAN UP

Clean up as the work proceeds.

3.13 LEAVE

Leave work to the standard required by following procedures.

3.14 REMOVE

Remove debris, unused materials and elements from the site.

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4231HL JAMES HARDIE® LINEA™ CLADDING

1 GENERAL

This section relates to the supply and fixing of the following fibre cement products:

- James Hardie® Linea™ Weatherboard cladding

Documents

1.1 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC E2/VM1	Weathertightness
AS/NZS 1170.2	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:
Linea™ Weatherboard Technical Specification
James Hardie® Technical Supplement - James Hardie® Claddings Installation to Steel Framing
BRANZ Appraisal 447 - Linea™ Weatherboard Cavity Cladding

Manufacturer/supplier contact details

Company:	James Hardie® New Zealand
Web:	www.jameshardie.co.nz
Email:	info@jameshardie.co.nz
Telephone:	Ask James Hardie™ on 0800 808 868

BRANZ appraisal is available at www.branz.co.nz.
CodeMark™ Certificate is available atwww.building.govt.nz

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER - LINEA™ WEATHERBOARD

Provide a material manufacturer/supplier warranty:

25 years:	For Linea™ Weatherboard product (refer to James Hardie® product warranty)
15 year:	For accessories supplied by James Hardie® (refer to James Hardie® product warranty)
From:	Date of purchase

- Provide this warranty on the manufacturer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS - NON-CODEMARK INSTALLATION

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

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

1.6 SAFE WORKING

To James Hardie® requirements for safe working practices with James Hardie® products, particularly with regards to cutting and drilling.

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1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Provide relevant James Hardie® maintenance requirements at completion of the work. Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the information.

Requirements - Linea™ Weatherboard

1.8 LINEA™ WEATHERBOARD INSTALLATION INFORMATION

Installer to comply with all the relevant information in;

- Linea™ Weatherboard Technical Specification.

1.9 PERFORMANCE, WIND

The design wind zones are to NZS 3604, up to and including Extra High Wind Zone. James Hardie® Technical Specifications are suitable for these conditions.

2 PRODUCTS

Materials

2.1 LINEA™ WEATHERBOARDS

James Hardie® Linea™ Weatherboards, bevel back, 16mm thick, pre-primed, manufactured from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving, manufactured to AS/NZS 2908.2, tested to NZBC E2/VM1 for weathertightness and complying with the NZBC.

2.2 WALL UNDERLAY

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

2.3 EXTERIOR CAVITY BATTENS

Radiata pine battens, minimum 45mm wide x 18mm thick, H3.1 treated, height to match timber framing studs. To NZS 3602, Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

Components - Linea™ Weatherboards

2.4 SOAKERS

External metal corner soaker. Refer to SELECTIONS.

2.5 INTERNAL "W" MOULD 90

Etched primed aluminium extrusion.

2.6 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated PVC, with upstands.

2.7 JH CORNER UNDER FLASHING

50 x 50mm PVC moulding.

2.8 CANT STRIP

Cant strip, uPVC profiled strip.

2.9 FILL

ADOS CRC Builders fill, two part exterior grade fill to finish over jolt head nails.

2.10 FLEXIBLE SEALANT

Bostik Seal N Flex-1 or Sikaflex AT Facade or Sikaflex MS sealant for tongue and groove joint at ends of Linea™ Weatherboards.

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2.11 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to NZS 3604, section 4, **Durability**, for requirements for fixing's material to be used in relation to the exposure conditions.

Refer to NZBC E2/AS1, Table 20, Material selection, and NZBC E2/AS1, Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Zone	Fixings Material
Zone B, Zone C	Hot-dipped galvanized

Check against SED (specific engineering design) requirements for microclimate conditions. For fastener type refer to following clause(s).

2.12 GALVANIZED STEEL CONCEALED NAILING OVER FLEXIBLE UNDERLAY

Hot-dipped galvanized, 40 x 2.8mm HardieFlex™ nails for Linea™ Weatherboard concealed nailing over flexible underlay into timber stud.

3 EXECUTION

Conditions

3.1 STORAGE

Take delivery of products dry and undamaged on pallets, and keep on pallet. Protect edges and corners from damage and cover to keep dry until fixed.

3.2 HANDLING

Avoid distortion and contact with potentially damaging surfaces. Carry weatherboards on edge. Do not drag weatherboards across each other, or across other materials. Protect edges, corners and surface finish from damage.

3.3 SUBSTRATE - TIMBER FRAMING

Do not commence work until the substrate is of the standard required by James Hardie® for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by NZS 3602 to minimise shrinkage and movement after sheets are fixed.

Application - generally

3.4 INSTALL CAVITY BATTENS

Install 18mm minimum thick cavity battens to NZBC E2/AS1: 9.0 **Wall claddings**, where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

3.5 PENETRATIONS AND FLASHINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- Wall underlay appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the wall underlay.
- Wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations.
- Required holes in cladding accurately formed and cut to James Hardie® requirements, ensure (if required) services penetration grommets/sleeves/seals/tapes are in place prior to cladding installation.
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

3.6 INSTALL LINEA™ WEATHERBOARDS

Cut weatherboards to required lengths and fit joints off-stud using tongue and groove ends. Fit internal corners and fix weatherboards as per Linea™ Weatherboard technical specifications. Fit and fix external corners and flexible sealant to tongue and groove joints as required.

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3.7 INSTALL FLASHINGS

Install flashings at all wall openings, penetrations, junctions, connections, window sills, heads and jambs to NZBC E2/AS1.

Completion

3.8 REPLACE

Replace all damaged or marked elements.

3.9 LEAVE

Leave work to the standard required for following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

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4284RE RCS INSULATED FACADE SYSTEM

1 GENERAL

This section relates to the supply and fixing of **Resene Construction Systems** Insulated Facade cavity based exterior wall cladding system based on styrene fixed over a drained cavity to timber or steel framing and with an applied textured surface finish.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

EPS	Expanded polystyrene
XPS	Extruded polystyrene
PPCS	Proprietary Plaster Cladding Standard
MPNZA	Master Painters NZ Association
LRV	Light Reflectance Value

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 1170.2	Structural design actions - Wind actions
AS 1366.3	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS 1366.4	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Extruded (RC/PS-E)
AS 3566	Self-drilling screws for the building and construction industries
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
WorkSafe NZ:	Guidelines for the provision of facilities and general safety in the construction industry

Health and Safety at Work Act 2015

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

- Resene Construction Systems Technical Manual
- Resene Construction Systems Trade Spec™
- Resene Construction Systems Project Guide
- Resene Total Colour System
- BRANZ Appraisal 476 - Rockcote Insulated Façade System

Materials and execution to Resene Constructions Systems specification except where varied by this specification and supported by architectural detailing.

Manufacturer/supplier contact details

Company:	**Resene Construction Systems**
Web:	www.reseneconstruction.co.nz
Email:	info@reseneconstruction.co.nz
Telephone:	0800 50 70 40

Contact details for Resene literature is 0800 RESENE (0800 737 363) or web site www.resene.co.nz.

Warranties

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1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
15 years: For materials by Resene Construction Systems

- Provide this warranty on the Resene Construction Systems standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
5 years: For execution/workmanship - by Registered Plasterer

- Provide this warranty on the Resene Construction Systems standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

Use only PPCS (Proprietary Plaster Cladding Standard) registered applicators licensed to apply the Resene Construction Systemsexterior render systems.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Resene Construction Systems Insulated Facade System.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide Resene Construction Systems Maintenance Guide on or before practical completion of the contract for issuing to the building owner. Resene Construction Systems Maintenance Guide to be provided on request.

1.9 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry.
If the elimination or isolation of potential hazards and risks is not possible then minimise hazards and risks in this work on site by using the proper equipment and techniques as required in the MPNZA Painters hazard handbook. Supply protective clothing and equipment. Inform employees and others on site of the hazards and risks, and put into place procedures for dealing with emergencies. Obtain from Resene Construction Systems the material safety data sheets for each product. Keep sheets on site and comply with the required safety procedures.

1.10 PRODUCER STATEMENT

Provide the producer statement compiled by the licensed applicator in the form as required by the Building Consent Authority.

Compliance information

1.11 DURABILITY

The work covered by this part of the specification has been designed and constructed to achieve a durability of 15 years. Refer to the following;
BRANZ Appraisal 476 - Rockcote Insulated Façade System
BRANZ Appraisal 633 - Graphex Insulated Façade System

1.12 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's, importers or distributors warranty
- Installer's / applicator's warranty
- Producer Statement - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Performance

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1.13 PERFORMANCE

Accept responsibility for the structural and weather-tight performance of the cladding installation.

1.14 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone and topographical classification (T) of this site and building height; as required by NZS 3604 and the wind loads on various wall areas as given by AS/NZS 1170.2.

1.15 INSPECTIONS

Allow to inspect the whole of the work at each stage. Determine a programme for inspections including notification when each part and stage of the work is ready for inspection prior to the work commencing. Permit representatives of Resene Construction Systems to inspect the work in progress and to take samples of their products from site if requested, refer to Resene Construction Systems Project Guide.

2 PRODUCTS

Materials

2.1 ROCKCOTE PM100 QUICK RENDER

Polymer modified cement-based dry plaster mix.

2.2 RESENE LIMELOCK

Water-based 100% acrylic sealer.

2.3 ACRYLIC TEXTURE

Waterborne mineral filled acrylic polymer-based high build coating with fungicide colour tinted.

2.4 RESENE X-200

Resene X-200 waterproof membrane, colour selection from Resene Total Colour System.

Components

2.5 POLYSTYRENE SHEET FOR EIFS CLADDING - EPS / XPS INSULATION

Rigid cellular polystyrene made from fire-retardant virgin beads. 40mm, 50mm or 60mm thick polystyrene sheet, either EPS to AS1366.3 class H or XPS to AS1366.4.

2.6 EXTERIOR CAVITY WALL BATTENS

40mm x 20mm polystyrene battens to AS 1366.3, class H with fire retardant, width and height to match timber framing studs to NZS 3602, table 1, reference 1D.10.

2.7 FIXINGS, TIMBER

40mm system:	90mm x 4.00mm hot-dipped galvanized flat head nails with 40mm diameter plastic washers.

2.8 REINFORCING MESH

Resene Construction Systems alkali-resistant fibreglass woven mesh.

Accessories

2.9 EXTERIOR CAVITY BASE VENTED STARTER STRIP

Resene Construction Systems perforated uPVC ventilated starter strip bottom channel with upstands for base of walls, open horizontal (or raking) junctions, over openings (windows, meters, etc. Length and width to suit cavity.

2.10 FLASHINGS AND ACCESSORIES

Resene Construction Systems proprietary profiles made from rigid uPVC for head, sill, jamb, starter strips (vermin proofing), expansion and control joints, head jamb soakers, corner and base exterior applications.

2.11 FIXING BLOCKS

H3.2 timber blocks to match polystyrene thickness, for the fixing of outside fittings (e.g. downpipes, hose taps, lights, etc)

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2.12 SEALANT

BRANZ appraised modified silicon (MS) sealant.

2.13 ADHESION PRIMER (UPVC)

Rockcote MultiStop bedding compound.

2.14 ADHESIVE

Liquid non solvent polymer based construction adhesive to the Resene Constructions Systems requirements.

3 EXECUTION

Conditions

3.1 DELIVERY

Keep plaster products dry in transit. Take delivery of plaster products dry and undamaged. Reject all damaged materials.

3.2 STORAGE

Deliver all materials in original unopened packaging with labels intact. Provide dry storage on site, stack carefully, protect from mechanical damage. Do not store PVC corner beads in direct sunlight.

3.3 PLASTERING CONDITIONS

Carry out plastering to Resene Construction Systems specification under conditions which will not adversely affect the finished work.

3.4 PROTECT

Before application of plaster, apply masking film and tape to all joinery, pipes, roofs and all areas likely to be marked by the plaster. Use drop cloths and ground covers to keep the working areas clean. Clean off droppings onto finished work immediately.

3.5 SUBSTRATE

Do not begin the application until required openings and apertures have been cut, pipes, fixtures, fixing pads and plugs have been fixed and flashings and other preparation are complete. Do not commence plastering until substrate is of the required standard. All defects in substrate must be rectified prior to application of plaster coatings commencing.

3.6 FLASHING AND DETAILING

Comply with the Resene Construction Systems penetration flashing guidelines. Carry out to the required standard of execution to ensure water does not penetrate.

3.7 ALIGNMENT OF FRAMING

To the standard required by the Resene Construction Systems, plumb, level and in true alignment.

3.8 CONFIRM LAYOUT

Before commencing work confirm the layout of expansion joints and other visual detailing of the finished work.

Application

3.9 CAVITY BATTENS

Temporary fix EPS battens full length to studs to achieve a 20mm minimum thickness drained cavity to NZBC E2/AS1: 9.0 Wall claddings. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the wall underlay. Seal the top of the cavity. Install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Horizontal cavity battens must be no longer than 100mm. Use cavity spacers where fixing is required between cavity battens. Fix additional battens to internal and external corners and around openings to Resene Construction Systems standard details.

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3.10 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).
- where electrical cables pass through cladding, ensure that there is no direct contact with the polystyrene, conduit required to be installed by electrician.
- Slope down to outside, pipes and conduits etc.

3.11 PENETRATION FLASHINGS

Fix in place required uPVC trims, profiles flashings and control joints. Service penetrations such as piping and light fittings to be sealed by specific trade.

3.12 POLYSTYRENE SUBSTRATE BOARD

Butt-joint, continuously support all edges and nail/screw with heads flush, the polystyrene board to the Resene Construction Systems details. Install timber fixing blocks where required and apply a patch over to NZBC E2/AS1, 9.9.4.4 or manufacturer's requirements.

3.13 MOVEMENT CONTROL JOINTS

Provide movement control joints in the plaster to coincide with movement joints in the background and/or junctions between dissimilar backgrounds in the same plane and/or where shown on the drawings and to Resene Construction Systems requirements. Reinforcing mesh is not continuous across control joints. Exposed control joints to be reflected through final coatings from substrate. Confirm locations in writing to the owner before work commences.

3.14 FIT FLASHINGS AND ACCESSORIES

Check and ensure head flashings have been installed. Fit flashings to jambs and sill on recessed joinery using Resene Construction Systems proprietary flashings. Reinforce external corners and bottom edges of polystyrene sheets with uPVC angles and channel extrusions to Resene Construction Systems technical and installation manual.

Resene Construction Systems - EPS / Graphex Insulated Facade Systems

3.15 BASE AND MESH COAT

Apply base plaster coat 5mm thickness maximum based on Rockcote PM100 Quick Render. Embed fibreglass mesh into the wet plaster. Overlap each successive length by 100mm minimum. Apply sticky mesh around all external corners and into all window reveals. Apply diagonal reinforcement strips at all corners of windows, doors and other exterior openings.

3.16 LEVELLING COAT

Apply by trowel or pump second coat of Rockcote PM 100 Quick Render 1-2mm thickness. Trowel flat and leave to touch dry before floating off with a large plastic float and water, to remove any imperfections and leave a level surface.

Application - acrylic selection

3.17 SEAL COAT ACRYLIC TEXTURE FINISH

For texture finish seal the base coats with one coat of Resene Limelock within 14 days of applying the second base coat.

3.18 ACRYLIC TEXTURED FINISH COAT

Apply texture coat 1mm thickness minimum to achieve the specified finish and colour (optional) to Resene Construction Systems requirements.

3.19 PROTECTIVE FINISH COAT

Apply two coats of Resene X-200 reinforced waterproof membrane to achieve a protective acrylic based finish.

3.20 FINISHING

Refer to SELECTIONS for system texture and colour.

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Completion

3.21 CLEANING

Remove debris, unused materials and elements from the site relating to the plaster system application. Replace damaged, cracked or marked elements. Leave the whole of this work to the required standard.

3.22 FINAL INSPECTION

A final inspection by Resene Constructions Systems applicator and project assessor of the entire finished cladding to take place immediately after completion of the wall cladding work and any defects or subsequent damage made good immediately.

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4323G STEEL TILE ROOFING

1 GENERAL

1.1 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification:

NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
NZS 3602	Timber and wood based products for use in building
NZS 3604	Timber-framed buildings
NZS 4217	Pressed metal tile roofs
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

Requirements

1.3 QUALIFICATIONS

Carry out the roofing work with trained, experienced, competent installers familiar with the products being used.

Performance

1.4 FIXINGS, WIND

Design and use the fixings appropriate to the manufacturers requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT. To NZS 3604 table 10.12 **Tile Battens for all wind zones**.

1.5 CO-ORDINATE

Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof.

1.6 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets. Comply with the NZMRM CoP NZ metal roof and wall cladding Code of Practice, sections 2 to 7 (Performance, Loadings, Design, Flashings, Penetrations and Installation), and section 10, Pressed metal Tiles.

2 PRODUCTS

Materials

2.1 UNDERLAY

Breather type roof underlay.

2.2 BATTENS

To NZS 3604, 10.2.1.16 **Purlins and tile battens**. Radiata Pine or Douglas Fir, SG6, treated H1.2. Moisture content to NZS 3602, size, spacing and fixing to NZS 3604 table 10.12 **Tile Battens for all wind zones**.

2.3 PRESSED METAL TILES

To NZS 4217, and NZBC E2/AS1, 8.3 Pressed metal tiles. Refer to SELECTIONS for type.

Components

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2.4 NAILS

Hot-dipped galvanized steel flat head 50mm x 2.8mm nails to GERARD® Roofs specification.

2.5 FLASHINGS, CAPPINGS AND COVERS

To NZS E2/AS1, 4.0 **Flashings**. Use ridge and hip caps, barge covers, general purpose malleable-edged flashings and side flashings supplied by the selected tile roofing system.

3 EXECUTION

Conditions

3.1 INSPECTION

Inspect the roof framing and supporting structure and do not start work until it is complete and fully braced ready for tiling, all to the requirements of NZS 3604 or specific design where required.

3.2 STORAGE

Stack tiles on a level, hard base, ventilated and protected from damage and weather.

3.3 HANDLING

Unload and handle tiles without soiling, scratching, crushing or other damage.

3.4 COMPLY

Comply with the preparation, laying and fixing requirements of NZS 4217, NZBC E2/AS1 8.0 **Roof claddings.**

Application

3.5 SET-OUT

Carefully set out the roof with a measuring rod to position the battens accurately taking account of rafter lengths, overhangs into gutters and spoutings and verge overhangs, all to minimise tile cutting.

3.6 LAY UNDERLAY

Lay roof underlay, drawn tight, over rafters from ridges and hips, over fascia into gutters and into valleys to NZS 4217 and NZBC E2/AS1: 8.1.5 **Underlays**. Fix to GERARD® Roof's requirements, without any damage. If damaged make good with full lap inserts as the work proceeds.

3.7 FIX BATTENS

To NZS 3604. Fix battens over the underlays in straight courses, spanning at least 3 rafters, between fascia and ridge and elsewhere to required details. Nail at every crossing to NZS 3604, table 10.12. Square cut ends to form butt joint over rafters with joints staggered.

3.8 LAYING

Do not take heavy equipment onto the roof. Plan work to minimise foot traffic. Work on the roof only using appropriate footwear. Interlock, lap and lay tiles to NZBC E2/AS1: 8.3 **Pressed metal tiles**, and requirements. Finish ridge, hip, valley, barge and eaves to required details if not detailed elsewhere.

3.9 NAILING TILES

Nail tiles to battens generally through the upstand and downturn of the tile lap as well as all elements to details and to NZBC E2/AS1. Fix bottom course of satin finish tiles with vertical nails with butyl/EPDM washers. Fix the bottom course of textured tiles with vertical nails and cover heads with touch up materials.

3.10 CUTTING AND BENDING

Cut, bend and straighten tiles neatly to finish true to line and plane when in place, using installation equipment maintained in the proper condition, all to NZS 4217.

3.11 FIT FLASHINGS, COVERS AND CAPPINGS

Cut, fit and fix all elements true to line and plane, to NZBC E2/AS1: 4.0 **Flashings**, NZBC E2/AS1: 5.0 **Roof/wall junctions**, to details and the NZMRM CoP NZ metal roof and wall cladding Code of Practice, section 10, if not detailed elsewhere.

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3.12 PENETRATIONS

Form to NZBC E2/AS1: 8.1.7 **Roof penetrations**, and to the NZMRM CoP NZ metal roof and wall cladding Code of Practice.

3.13 PENETRATIONS AND JUNCTIONS

Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof. Required work includes the following:

- underlay turned up at wall and parapet lines
- underlay finished and dressed off to all openings, ready for the installation of skylights and other penetrations
- roofing installation neatly finished to all sides of openings and to all wall and parapet junctions including proprietary PVC stop ends.
- installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings).

Completion

3.14 MAKE GOOD

Touch up all damaged coatings with finishing kit.

3.15 LEAVE

Leave this work complete with all necessary flashings, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

3.16 REMOVE

Remove trade rubbish and unused materials from the roof and surrounds regularly during the work. Sweep down the completed roof and clean out spoutings, gutters and rainwater pipes. Remove debris, unused materials and elements from the site.

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4610 GLAZING RESIDENTIAL

1 GENERAL

This section relates to the supply and fixing of glass products for external and internal joinery in residential type buildings and includes:

- windows and doors
- frameless shower and bath screens
- mirrors

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
CIP	Cast in place

Documents

1.2 DOCUMENTS

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

NZBC F4/AS1	Safety from falling
NZBC H1/AS1	Energy Efficiency
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4218	Thermal insulation - Housing and Small Buildings
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 337	Protecting window glass from damage

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

Performance

1.4 ENERGY EFFICIENCY

Provide glazing to meet the energy requirements of NZS 4218 and NZBC H1/AS1 for housing small buildings.
Refer to SELECTIONS and schedules for location and type of glazing.

2 PRODUCTS

Materials

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2.1 CLEAR FLOAT GLASS

Clear ordinary annealed transparent float glass for general window glazing. Thickness to NZS 4223.1 and NZS 4223. Supp 1.

2.2 LAMINATED GLASS

Grade A Safety Glass to AS/NZS 2208 with PVB or CIP resin interlayer.

2.3 TOUGHENED GLASS

Grade A Safety Glass to AS/NZS 2208.

2.4 INSULATING GLASS UNITS (IGU'S)

To AS/NZS 4666, NZS 4223.2 and the IGU Manufacturers Association (IGUMA) requirements. Marking to NZS 4223.2 as modified by NZBC B2/AS1, 3.5.

Materials, mirrors

2.5 SAFETY MIRROR GLASS

4mm, 5mm and 6mm annealed float glass mirror vinyl back safety glazing material to AS/NZS 2208.

Materials, screens

2.6 GLASS SCREENS SHOWER & BATH

Proprietary shower / bath screens, formed to shape before toughening, complete with matching hardware.

Components, aluminium and uPVC glazing

2.7 GLAZING TAPE AND GASKETS

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.

2.8 SETTING BLOCKS

Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes.

Components, wall mounted glass (mirrors and splashbacks)

2.9 GLASS ADHESIVE

Adhesive mirror-mastic and double-sided adhesive tape.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.3, NZS 4223.4. All external glazing to be wind and watertight on completion.

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 337.

3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces.

3.4 GLASS THICKNESS

If not specifically stated in the glazing schedule determine the minimum thickness of glass for each sheet as required by NZS 4223.1, NZS 4223.3, NZS 4223.4 and NZS 4223. Supp 1. For windows tested to NZS 4211, ensure glass meets the requirements of the window testing.
Determine the final glass thickness based on whether wind loading or human impact considerations govern.

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3.5 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to NZS 4223.1, Section 4 Glazing.

3.6 JOINTING, PUTTY AND SEALING MATERIAL COMPATIBILITY

Ensure jointing, putty and sealing materials are compatible with glass substrates. Confirm compatibility with laminated glass, IGUs and coatings.

Conditions - human impact safety requirements

3.7 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 for thickness and maximum areas of safety glass.

3.8 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in NZS 4223.3, that also comply with the relevant requirements of AS/NZS 2208. Ensure material is permanently marked and if cut by the distributor or installer mark each piece to NZS 4223.3, 2.8 Identification.

3.9 CONTAINMENT

Edge cover to comply with NZS 4223.1, Section 4 Glazing, table 5. Otherwise to NZS 4223.3, 2.3 Edge cover.

Assembly

3.10 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.11 EDGE WORK AND BEVELLING

Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.

3.12 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.13 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

3.14 INSTALL SAFETY GLASS

To NZS 4223.3.

Application aluminium

3.15 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS4223.1.

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

Application - wall mounted glass (mirrors and splashbacks)

3.16 WALL MOUNTED GLASS, ADHESIVE FIXED

For mirrors and splashbacks, fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive area 0.2 m2 per 1 m2 of glass to NZS 4223.3.

Application miscellaneous

3.17 INSTALL GLASS SHOWER & BATH SCREENS

Install shower and bath screens and doors to manufacturer's requirements.

Finishing

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3.18 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

Completion

3.19 TRADE CLEAN

Clean off or remove safety indicators at completion of the building.

3.20 REPLACE

Replace damaged, cracked or marked glass.

3.21 LEAVE

Leave work to the standard required by following procedures.

3.22 REMOVE

Remove debris, unused materials and elements from the site.

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7420 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3500.2:2003	Plumbing and drainage - Sanitary plumbing and drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.
White polybutylene or PVC, including all associated fittings.

3 EXECUTION

3.1 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work and complete all tests to NZBC G1/AS1: 2.0, 3.0 and AS/NZS 3500.2:2003, as modified by NZBC G13/AS3.

3.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

3.3 INSTALL TRAPS, WASTE AND VENT PIPES - AS/NZS 3500.2

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to AS/NZS 3500.2:2003, as modified by NZBC G13/AS3, and AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.4 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.5 TEST

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

3.6 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

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7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC B1/AS1	Structure
NZBC E1/AS1	Surface water
NZBC G13/AS2	Foul Water
NZBC G13/AS3	Plumbing and Drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
NZS 3104	Specification for concrete production
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 CONCRETE

17.5 MPa prescribed mix to NZS 3104.

2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260. Underground PVC-U pipe to be Classified as follows:

Classification	Use
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.4 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to AS/NZS 3500.2, 4.6 Gullies, as modified by NZBC G13/AS3.

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2.5 TRENCH BACKFILLING MATERIAL - AS/NZS 3500.2

Bedding & surround:	Crushed rock or gravel screenings of nominal size of 7 - 10 mm.
Backfill material:	Excavated material from the trench (free from rock, hard matter and organic material) containing no soil lumps larger than 75 mm.

3 EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.
Trenches running parallel, below and close to foundations of buildings to NZS 3604 or NZS 4229 to be separated to:

- NZBC E1/AS1, 3.9.7, **Proximity of Trench to Building**, for stormwater and subsoil drains.
- NZBC G13/AS2, 5.6, **Proximity of Trench to Building**, for foul water drains.

3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

3.3 DRAINAGE GENERALLY - AS/NZS 3500.2 & NZBC E1/AS1

Carry out drainage work and tests to AS/NZS 3500.2, as modified by NZBC G13/AS3 (foul water), NZBC E1/AS1 (stormwater). Lay uPVC pipe systems to relevant sections of AS/NZS 2032, NZS 2566.1 and AS/NZS 2566.2. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033 and NZS 2566.1.

3.4 LAY FOUL WATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.

3.5 INSTALL GULLY TRAPS

Set on concrete 50mm above the surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.

3.6 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into Soak pit on site.

3.7 CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

3.8 FIELD TEST

Field test drains for watertightness (PVC-U to AS/NZS 2032 or AS/NZS 2566. 2 Appendix N) to the satisfaction of the territorial authority inspector.

3.9 PLACING & COMPACTING TRENCH BACKFILLING MATERIAL FOR PVC-U PIPE

Place and rake in bedding material so as to support the pipe once laid.
Embedment material shall be placed uniformly along and around the pipe to ensure uniform density of side support and overlay with no distortion, dislodgment or damage to the pipeline. Following placement, the embedment material shall be compacted in layers to uniformly support the pipe. Trench fill material shall be placed on the pipe embedment and compacted to fill the trench, with care taken to avoid impact loading of the pipe.

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7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrically-powered fittings

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.
The following abbreviations apply specifically to this section:

CFL	compact fluorescent lamp
ELV	extra low voltage
GLS	general lighting service
IP	international (ingress) protection classification
LCD	liquid crystal display
LED	light emitting diode
MCB	miniature circuit breaker
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
RCBO	residual current-operated circuit breaker with over current protection
RCCB	residual current-operated circuit breakers
RCD	residual current device
SIA	security integration architecture
TPS	tough plastic sheathed
TCF	Telecommunications Carriers' Forum

Documents

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1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC F6/AS1	Visibility in escape routes
NZBC F7/AS1	Warning systems
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3100:2009	Approval and test specification-general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
AS/NZS 3190	Approval and test specification - Residual current devices (current-operated earth-leakage devices)
AS/NZS 3350.1	Safety of household and similar electrical appliances - General requirements
AS/NZS 3439.3	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
AS 3786	Smoke alarms
NZS 4514	Interconnected smoke alarms for houses
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60598.2.2:2001	Luminaires - Particular requirements - Recessed luminaires
IEC 61643	Components for low voltage surge protection devices

Electricity (Safety) Regulations 2010 (Reprint as at 4 April 2016)
TCF Premises Wiring Code of Practice 2011

Warranties

1.3 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:	Warranty period

Requirements

1.4 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2 and TCF Premises Wiring Code of Practice for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.5 QUALIFICATIONS

Carry out work under the supervision of an electrical licensed supervisor.

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1.6 ELECTRICAL CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations (2010), prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect as required by regulation 70.

1.7 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electrical (Safety) Regulations 2010, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

2 PRODUCTS

2.1 MAINS SUPPLY, SINGLE PHASE

Tough plastic sheathed neutral screened cable to AS/NZS 4961 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0mm², and to AS/NZS 3008.1.2. Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm² on 16 amp MCBs
Power circuits:	2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm² on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm² on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C.

2.3 METER BOX

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

2.4 DISTRIBUTION BOARD

Flush surface mount boards manufactured to AS/NZS 3439.3 and installed in accordance with AS/NZS 3000. Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

2.5 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with AS/NZS 3190. MCBs to 4.5kA or 6kA rated.

2.6 BATTEN HOLDERS

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

2.7 DOOR BELL SYSTEM

Complete with transformer for mounting on distribution board.

2.8 RESIDENTIAL RECESSED LIGHT FITTINGS

Residential recessed luminaires to AS/NZS 60598.2.2, types IC-F, IC only.

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2.9 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to NZBC G4/AS1, and compliant with AS/NZS 3350.1.

2.10 HEATED TOWEL RAILS

Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with AS/NZS 3350.1, scratch resistant powdercoated or chrome finish.

3 EXECUTION

3.1 MAIN SUPPLY

Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.

3.2 METER BOX

Fit to meter box manufacturer's and Electricity Retailer's requirements. Recess into external wall in sheltered area and flash to weatherproof to NZBC E2/AS1 fig 69. Arrange for meter installation and connection.

3.3 DISTRIBUTION BOARD

Fit to AS/NZS 3000 and board manufacturer's requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

3.4 CIRCUIT PROTECTION

Install MCBs at distribution board to AS/NZS3000 to protect each final sub circuit.

3.5 EARTH BONDS

Bond together and to earth all plumbing fittings not adequately isolated, to AS/NZS 3000, the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.

3.6 MAIN EARTH

Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.7 EARTH LEAKAGE PROTECTION

Install RCD protection to AS/NZS 3000.

3.8 RCD - DOMESTIC INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to AS/NZS 3000.

3.9 RCD - SPECIFIC INSTALLATIONS

Install 30mA RCDs at the distribution board.
Install fixed wired RCD protected outlets (SRCD) in the following areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

3.10 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.11 CABLING

Install wiring systems to AS/NZS 3000. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.

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3.12 CABLING CIRCUITS

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of 8 light switch units or 4 double or single switched socket units on any circuit. Minimum 2 lighting circuits per floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits.

3.13 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.

3.14 EXTRA LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer's requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

3.15 RECESSED LIGHT FITTINGS - CLEARANCE TO INSULATION

Non-residential applications;
The clearance between insulation and recessed downlights;

- Leave 100mm gap to AS/NZS 3000, figure 4.9
- Provide larger gaps where required by the downlight manufacturer

Residential applications;

- Classification type IC and IC - F, to AS/NZS 60598.2.2;
- Provide larger gaps where required by the light manufacturer
- In a retrofit situation where the insulation is non-approved or unknown, ensure 100mm clearance from the insulation to AS/NZS 3000, figure 4.9.

3.16 SURGE PROTECTION

Install surge protection devices to manufacturer's requirements and in accordance with AS/NZS 3000 and AS/NZS 1768. When fitting IEC 61643 Class ll protection at the switchboard, protect the device by a dedicated MCB.

3.17 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

3.18 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturers requirements and installed in accordance with AS/NZS 3000 and the NZBC G9/AS1
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.

3.19 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer's recommendations:
Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.
Use the appropriate rated fittings for power control and power supply. Weather protected switches to IP56, and sockets to IP53 as a minimum. Install to manufacturer's specifications using recommended fittings and sealants to maintain the products integrity.
Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

3.20 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

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Completion

3.21 COMPLETION

Leave installation operating correctly, with equipment clean and operational.

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8990 SELECTIONS

1 GENERAL

1.1 GENERAL

The following selections are to be read in conjunction with the related work sections, where they are available.

2 PRIMARY STRUCTURE

2.1 CONCRETE

DAMP-PROOF MEMBRANE

Brand/type:	250 Micron

REINFORCEMENT LAPS

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

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

CONCRETE

Normal concrete:	SED MPa

2.2 EXTERIOR WALL

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

CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Non Structural:	Radiata pine	Merchantable	H3.1

2.3 ROOF FRAMING

Member	Species	Grade	Treatment
Rafters:	Radiata pine	SG8	H1.2
Trusses:	Radiata pine	SG8	H1.2
Purlins:	Radiata pine	SG6	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merchantable	H1.2
Sarking:	Radiata pine	Merchantable	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

ROOF TRUSSES

Type/treatment:	Radiata pine, Grade SG8, Treated H1.2
Truss supplier:	Prenail Systems

2.4 EXTERIOR TIMBER

Member	Species	Grade	Treatment
Ground contact members	Radiata pine	SG8	H5 CCA

Note all CCA to be preservative code 01 or 02

EXTERIOR FINISHING TIMBERS

Member	Species	Grade	Treatment
Exterior trim:	Radiata pine	Dressing	H3.1

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2.5 INTERIOR TIMBERS

INTERIOR FRAMING

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

INTERIOR FINISHING TIMBERS

Member	Species	Grade
Architraves:	Radiata pine	Dressing
Skirtings:	Radiata pine	Dressing
Cornices:	Radiata pine	Dressing

3 ENCLOSURE

3.1 DPC & UNDERLAYS

DPC
Location: Refer details
Brand / type: Thermakraft Polyethylene - Supercourse 500

DPM
Location: Under slab
Brand / type: 250 Micron polyethylene DPM
Jointing tape: PVC

WALL UNDERLAY
Location: Exterior walls
Brand / type: Marshall Tekton

ROOFING UNDERLAYS
Location: Roof
Brand / type: Thermakraft 215

Accessories Choose proprietary self adhering window and door flashing tape.

AIR SEAL BACKING ROD
Location: Refer details
Brand / type: Thermakraft window worm or equivalent
Size: 8mm

WINDOW FLASHING TAPE
Brand/Type: Thermakraft Aluband

3.2 JAMES HARDIE WEATHERBOARD - LINEA

CAVITY BATTENS
Timber species: Radiata pine
Treatment: H3.1

JAMES HARDIE LINEA WEATHERBOARDS
Location: Refer elevations
Brand/type: James Hardie Linea Weatherboard
Thickness: 16mm
Width: 180mm
Nails: Galv Jolt head

JAMES HARDIE LINEA WEATHERBOARD CORNERS
Type: Soaker

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3.3 ROCKCOTE EIFS PLASTER SYSTEM

POLYSTYRENE CAVITY BATTENS
Type: 40mm x 20mm Polystyrene

UPVC ROCKCOTE CAVITY BASE VENTED STARTER STRIP
Type: uPVC **Rockcote** starter strip

ROCKCOTE EPS40 CAVITY PLUS RENDER SYSTEM - ACRYLIC FINISH
Location: Ref elevations
Substrate: EPS 40mm FR H Grade polystyrene
Basecoat 1st layer: **Rockcote** PM100 Quick Render; plus Fibreglass mesh
Second coat: **Rockcote** PM100 Quick Render
Sealer coat: **Rockcote** Render Prime or **Resene** Limelock
Texture coat: **Rockcote** Acrylic Texture
Texture finish: TBA
Texture colour: TBA
Paint coat: **Resene** X-200 or **Rockcote** Armour
Paint colour: TBA

3.4 STEEL TILE ROOFING

Substitutions are not permitted to the following, unless stated otherwise.
SHAKE STEEL TILES
Finish: Satin
Colour: TBC

4 OPENINGS AND THERMAL

4.1 ALUMINIUM WINDOWS AND DOORS

THERMAL PERFORMANCE
R-value: 0.26 (as determined from NZBC H1/VM1 or H1/AS1)

WIND - NON SPECIFIC DESIGN
Building wind zone: High

Window and door system
WINDOWS AND DOORS TYPE
Manufacturer: TBC
Type/location: Double Glazed within thermal envelope

WINDOW AND DOOR REVEALS - TIMBER
Timber species: Rad
Grade/treatment: H1.2
Thickness: 19mm
Finish: Paint Quality

Finishes
ORGANIC POWDER COATING FINISH
Thickness: Average of 80 microns with a minimum of 50 microns
Colour: TBC

4.2 GARAGE DOORS

Brand/Type: Sectional, on Auto opener, provide 2 remotes.

4.3 THERMAL INSULATION

WALL INSULATION
Brand/Type: Pink Batts or Equivalent
R value/Thickness: R 2.4

CEILING/ROOF INSULATION
Brand/Type: Pink Batts or Equivalent
R value/Thickness: R 3.2

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4.4 GLAZING

WIND ZONE - NON-SPECIFIC DESIGN
Building wind zone: High

Glass by type

CLEAR FLOAT GLASS
Location: Refer elevations
Thickness: To comply with NZS 4223

PVB LAMINATED GLASS
Location: Refer elevations
Thickness: To comply with NZS 4223

TOUGHENED GLASS
Location: Refer elevations
Thickness: To comply with NZS 4223

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Demand Calculation Sheet

Job Details

Name:	Main & Hyde
Street and Number:	283a Kimberley Road
Lot and DP Number:	Lot: 03 DP: 351707
City/Town/District:	Levin
Designer:	Jonathan Barlow
Company:	Plans.co.nz
Date:	Friday, 11 September 2020

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Light
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	1.5
Building Height to Apex (m)	4.5
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	20.50
Building Width (m)	15.7
Building Plan Area (m²)	203

Building Location

Wind Zone = High

Earthquake Zone 3

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	**753**	**846**

Bracing Units required for Earthquake

	Along & Across
Single Level	**1101**

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Single Level Along Resistance Sheet

Job Name: Main & Hyde

									Wind	EQ
									Demand	
									753	1101
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1488 198%	1468 133%
a	1	1.20		2.4	TR10	JNL	126	150		
	2	1.20		2.4	TR10	JNL	126	150		
	3	0.59		2.4	GS1-N	GIB®	34	35		
	4	1.50		2.4	GS1-N	GIB®	104	90		
									389 OK	425 OK
b	1	1.96		2.4	GS1-N	GIB®	135	118		
	2	2.05		2.4	GS2-NOM	GIB®	103	103		
									238 OK	220 OK
c	1	1.20		2.4	TR10	JNL	126	150		
	2	1.20		2.4	TR10	JNL	126	150		
	3	1.40		2.4	GS1-N	GIB®	97	84		
	4	0.69		2.4	GS1-N	GIB®	41	41		
									389 OK	425 OK
d	1	2.42		2.4	GS1-N	GIB®	167	145		
	2	1.31		2.4	GS1-N	GIB®	90	79		
									257 OK	224 OK
e	1	1.68		2.4	BL1-H	GIB®	215	175		
									215 OK	175 OK

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Single Level Across Resistance Sheet

Job Name: Main & Hyde

									Wind	EQ
									Demand	
									846	1101
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1347 159%	1364 124%
m	1	0.99		2.4	TR10	JNL	104	124		
	2	0.99		2.4	TR10	JNL	104	124		
									208 OK	248 OK
n	1	0.51		2.4	GS1-N	GIB®	28	30		
	2	1.20		2.4	TR10	JNL	126	150		
	3	1.20		2.4	TR10	JNL	126	150		
									280 OK	330 OK
o	1	0.91		2.4	GS1-N	GIB®	58	54		
	2	0.91		2.4	GS1-N	GIB®	58	54		
	3	3.20		2.4	GS2-NOM	GIB®	160	160		
									275 OK	268 OK
p	1	1.88		2.4	GS1-N	GIB®	130	113		
	2	1.88		2.4	GS1-N	GIB®	130	113		
	3	2.71		2.4	GS1-N	GIB®	187	163		
									446 OK	388 OK
q	1	0.81		2.4	GS1-N	GIB®	50	48		
	2	0.81		2.4	BL1-H	GIB®	88	83		
									138 OK	130 OK

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Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
JNL	STR9	0.6	100	115
JNL	TR10	0.6	105	125
Ecoply	EP1 0.4	0.4	80	95
Ecoply	EPI 0.6	0.6	95	105
Ecoply	EPI 1.2	1.2	120	135
Ecoply	EPBS 0.4	0.4	60	60
Ecoply	EPBS 1.2	1.2	65	70
Ecoply	EPBS 0.6	0.6	60	65
JHDn	JHDn 1.2	1.2	118	102
JHD	JHD 0.4	0.4	83	107
JHD	JHD 0.6	.6	99	107
JHD	JHD 1.2	1.2	154	140
HPg	HPg	0.4	90	98
Nelson Pine	NP2	1.2	150	140
Engineer	Portal	1	1	1

GIB EzyBrace® Systems specification GS1-N

Specification code	Minimum length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

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

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

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

External Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for external wall bottom plate fixing.

WALL LINING

- Any 10mm or 13mm GIB® plasterboard lining.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

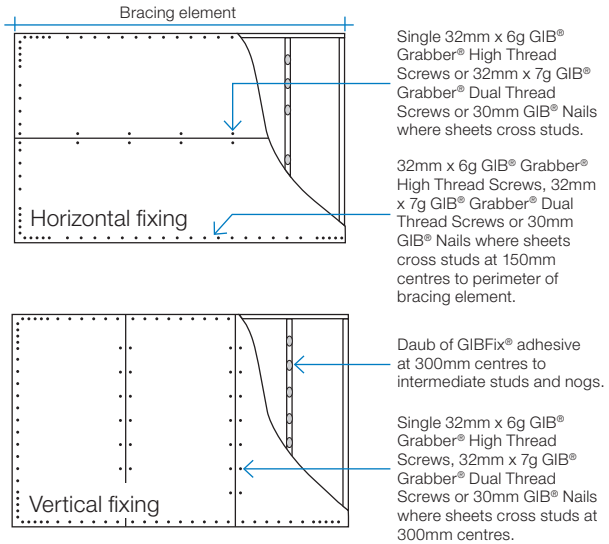
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

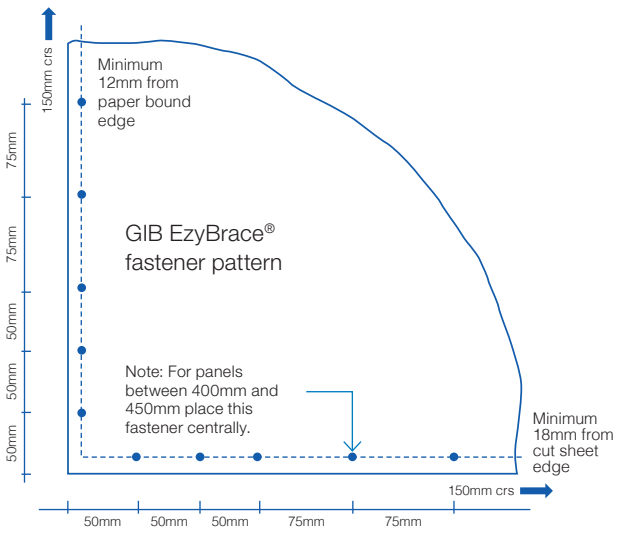
Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

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GIB® plasterboard linings

When fixing part sheets of GIB® plasterboard, a minimum sheet width of 300mm applies for bracing elements. Horizontal fixing is recommended. If fixing vertically, full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs or over the studs and fastened at 200mm centres. Alternatively, and preferably, sheet end butt joints may be back-blocked.

When a GIB® Bracing element has been designated for a section of wall, BU ratings cannot be increased by incorporating additional proprietary bracing elements within that same section of wall.

LIMITATIONS

- GIB® plasterboard must be stacked flat and protected from the weather.
- GIB® plasterboard must be handled as a finishing material.
- GIB® plasterboard in use must not be exposed to liquid water or be installed in situations where extended exposure to humidities above 90% RH can reasonably be expected.
- GIB EzyBrace® Systems must not be used in showers or behind baths.
- It is highly recommended not to install GIB® plasterboard in any situation where external claddings are not in place or the property is not adequately protected from the elements.
- If GIB® plasterboard is installed under these conditions, the risk of surface defects such as joint peaking or cracking is greatly increased.

GIB EzyBrace® Systems in water-splash areas

When GIB® plasterboard is installed in locations likely to be frequently exposed to liquid water it must have an impervious finish. Examples are adhesive fixed acrylic shower linings or ceramic tiles over an approved waterproof membrane over GIB Aqualine®. The NZBC requires 15 years durability in these situations. Bracing elements are required to have a durability of 50 years. Bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members. Otherwise GIB EzyBrace® Systems can be used in water-splash areas as defined by NZBC Clause E3, provided these are maintained impervious for the life of the building.

For futher design details refer to the current GIB Aqualine® Wet Area Systems literature.

Renovation

When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in bracing elements

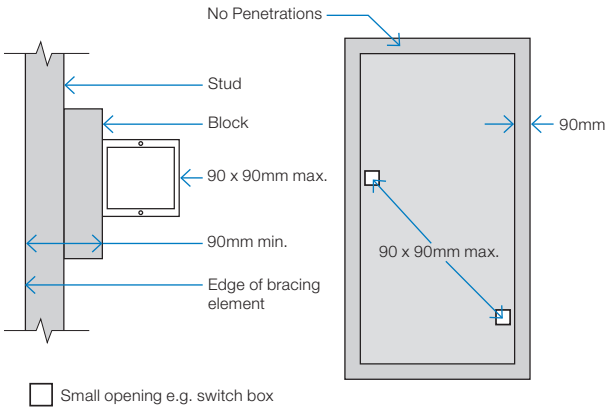
SMALL OPENINGS

Small openings (e.g. power outlets) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element. A block may need to be provided alongside the perimeter stud as shown below.

LARGE OPENINGS

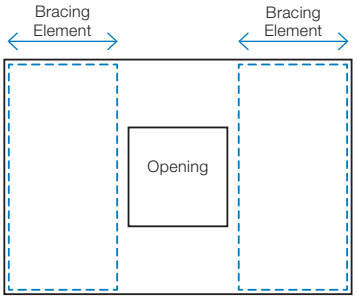
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



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Timber framing

General framing requirements such as grade, spacings and installation shall comply with the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 45mm for external walls and 70 x 45mm for internal walls.

As a minimum the use of Kiln Dried Stress Graded timber for all wall, roof and mid-floor framing members is recommended.

GIBFix® Framing System (alternative layout)

Practices recommended as part of the GIBFix® Framing System aim to increase timber framing efficiencies, reduce reliance on unnecessary framing at wall junctions and minimise surface imperfections that commonly arise from constructing plasterboard junctions over multiple timber members. GIBFix® Angles fixed to a single timber framing member are introduced to tie together plasterboard junctions, improving seismic resilience and decrease the risk of future defects due to timber movement. The GIBFix® Framing System can be used in conjunction with the GIB EzyBrace® System.

Note: GIBFix® Angles and 32mm x 7g GIB® Grabber® Dual Thread Screws may also be used in traditional wall framing layouts and in GIB EzyBrace® Systems.

When the GIBFix® Framing System is used a minimum of 2 equally spaced nogs for walls between 2.4m and 3m in height are required at corners and wall junctions.

When used in GIB EzyBrace® systems GIBFix® Angles must run from top to bottom on all applicable studs. If 2 GIBFix® Angles are required on a stud they must be overlapped by a minimum of 300mm with 2/32mm 7g GIB® Grabber® Dual Thread Screws penetrating through both GIBFix® Angles.

For full specification details refer to GIBFix® Framing System literature available at gib.co.nz/gibfix.

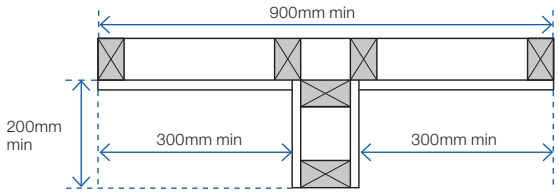
Guidelines for intersection walls

GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions shall be fixed and jointed as specified for intermediate sheet joints. The bracing element length must be no less than 900mm.

Where a Wall Bracing Element is interrupted by a T-junction the element is deemed to be continuous for the whole length (900mm minimum in the example illustrated).

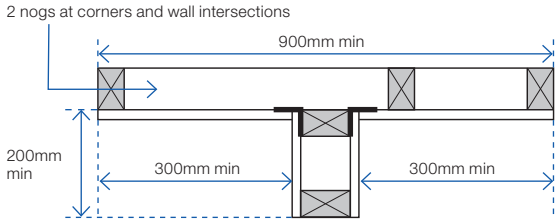
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



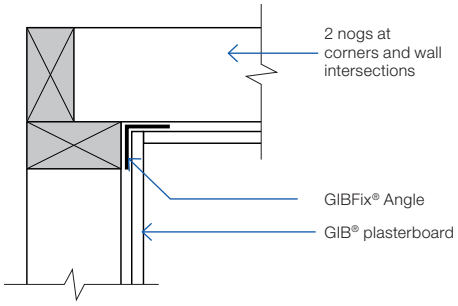
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



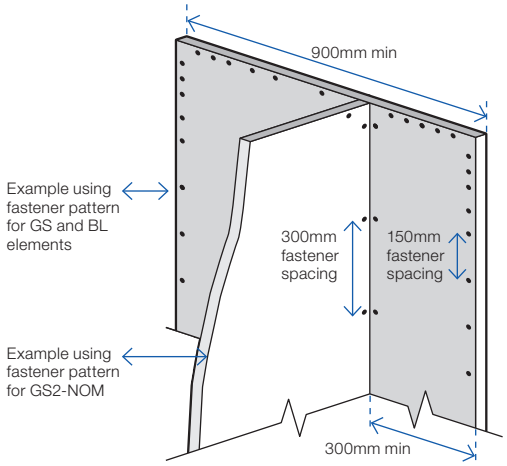
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

Min 32mm x 6g GIB® Grabber® High Thread or 32mm x 7g GIB® Grabber® Dual Thread Screws @ 300mm ctrs each side.

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Top plate connections

For top plate connections refer to NZS3604:2011 section 8.7.3.

Parapets and gable end walls

Bracing elements must be fixed from top plate to bottom plate. Fixing to a row of nogs is not acceptable unless either:

A continuous member such as an ex 90 x 45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line, as shown in figure 16.

or

GIBFix® Angle as shown in figure 17. The angle is fixed to a row of nogs with 30 x 2.5mm galv flat head nails or 32mm x 7g GIB® Grabber® Dual Thread Screws at 300mm centres.

Bottom plate fixing

TIMBER FLOOR

For elements with an 'N' specification use 2/100 x 3.75mm hand or 3/90 x 3.15mm power-driven nails at 600mm centres.

In addition, for elements with an 'H' specification, use GIB HandiBrac® panel hold-down fixings at each end of the bracing element, see p.16.

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix external wall plates in accordance with NZS 3604:2011.

Use GIB HandiBrac® panel hold-down fixings at each end of bracing elements with an 'H' specification and minimum intermediate fixings as required by NZS 3604:2011.

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix plates in accordance with NZS 3604:2011 or use 75 x 3.8mm shot-fired fasteners with 16mm discs spaced at 150 and 300mm from end-studs and 600mm centres thereafter.

For bracing elements with an 'H' specification use GIB HandiBrac® panel hold-down fixings at each end of the element and minimum intermediate fixings as required by NZS 3604:2011.

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

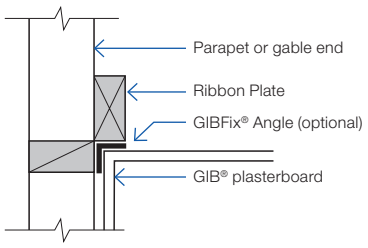
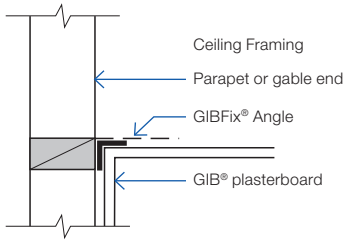


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required.	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011.
GS2-N	Not applicable.		
GS2-NOM			
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011 In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.		Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011. In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.
BLG-H	Not applicable	As for GSP-H, BL1-H, BLP-H on concrete slab as illustrated on p.15 and 16.	

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CBI 5113

July 2015

GIB HandiBrac®

Panel Hold-Down Bracket

NEW GIB HANDIBRAC® UPDATES INSIDE



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GIB HandiBrac®

Panel Hold-Down Bracket

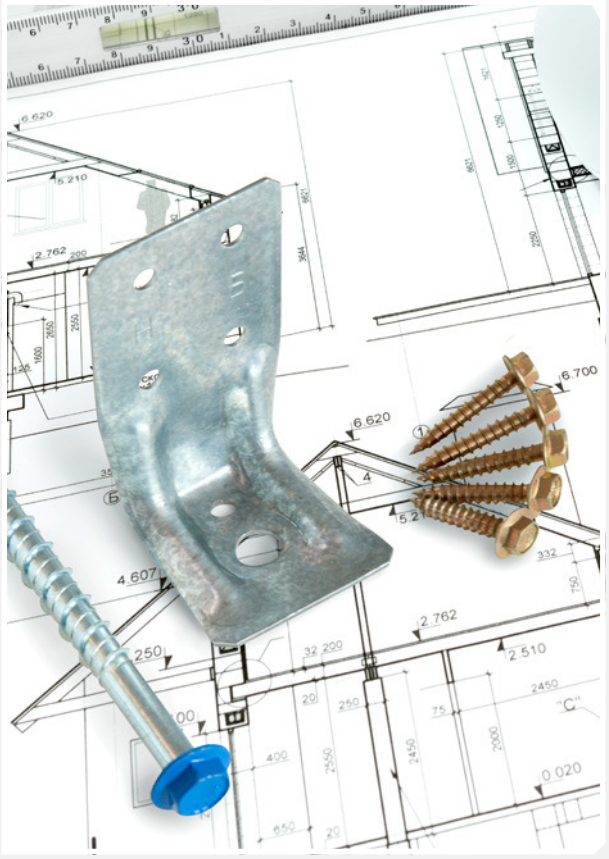
Developed in conjunction with MiTek™, the GIB HandiBrac® has been designed and tested by Winstone Wallboards for use in GIB EzyBrace® elements that require hold-downs. The GIB HandiBrac® is a substitute for bottom plate hold-down straps.

- Quick and easy to fit
- May be fitted at any stage before lining
- Framing face is clear to allow flush lining
- Easily inspected

The GIB HandiBrac® with BOWMAC® blue head screw bolt is suitable for timber and concrete floors constructed in accordance with NZS 3604:2011

The GIB HandiBrac® provides quick and easy installation. The registered design provides a flush surface for the wall linings because it is fitted inside the framing.

There is therefore no need to check in the framing as is recommended with conventional straps. Because the GIB HandiBrac® conveniently allows for installation and inspection at any stage prior to fitting internal linings, it is suitable for both new and retrofit construction.



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GIB HANDIBRAC® OVERVIEW

COMPONENTS

GIB HandiBrac® is available in boxes of 10, each containing 5 pairs.

Components per paired pack include:

- 2 x GIB HandiBrac® Brackets
- 10 x Tek Screws
- 2 x BOWMAC® screw bolts included within specific GIB HandiBrac® pack

GIB® BRACING ELEMENTS

The GIB HandiBrac® is a proprietary product that has been tested and is suitable for use with specified GIB EzyBrace® Systems.

FIXING TO TIMBER FRAMED FLOORS

BOWMAC® screw bolt to achieve a characteristic uplift strength of 12kN.

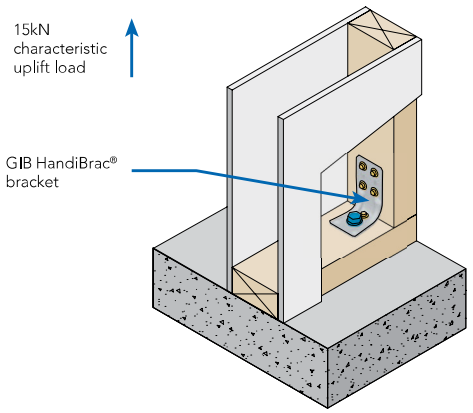
FIXING TO CONCRETE SLABS

BOWMAC® screw bolt to achieve a characteristic uplift strength of 15kN

PANEL HOLD-DOWN DETAILS

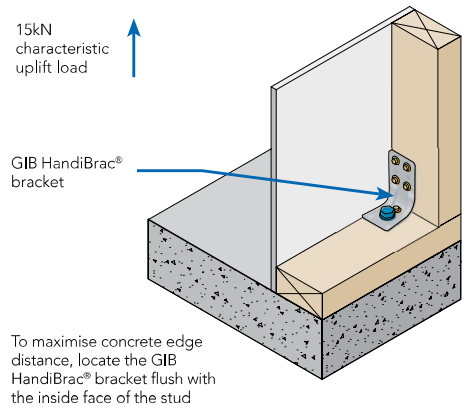
CONCRETE FLOOR – INTERNAL WALL

The bottom plate at both ends of the bracing element is fixed using a BOWMAC® screw bolt. For BOWMAC® screw bolt installation see instructions on next page



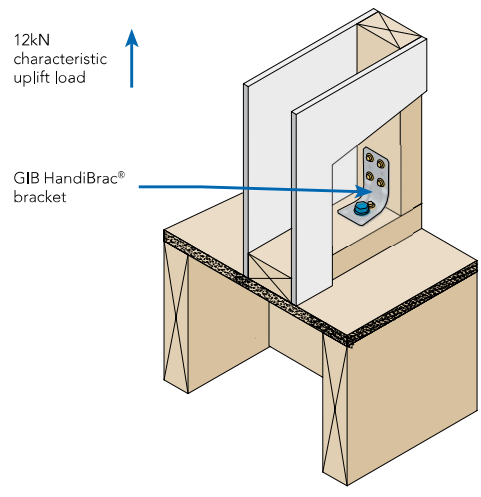
CONCRETE FLOOR – EXTERNAL WALL

The bottom plate at both ends of the bracing element is fixed using a BOWMAC® screw bolt. For BOWMAC® screw bolt installation see instructions on next page.



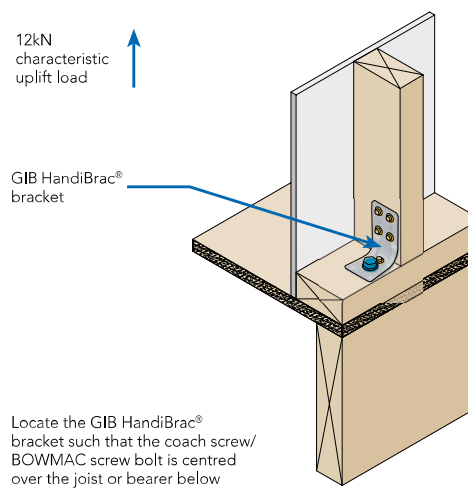
TIMBER FLOOR – INTERNAL WALL

Bottom Plate is fixed using a BOWMAC® screw bolt. For BOWMAC® screw bolt installation see instructions on next page.



TIMBER FLOOR – EXTERNAL WALL

Bottom Plate is fixed using a BOWMAC® screw bolt. For BOWMAC® screw bolt installation see instructions on next page.



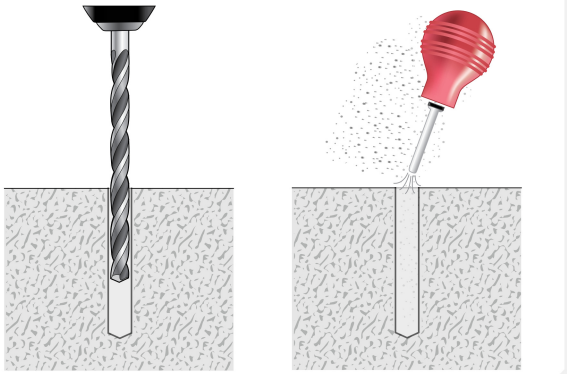
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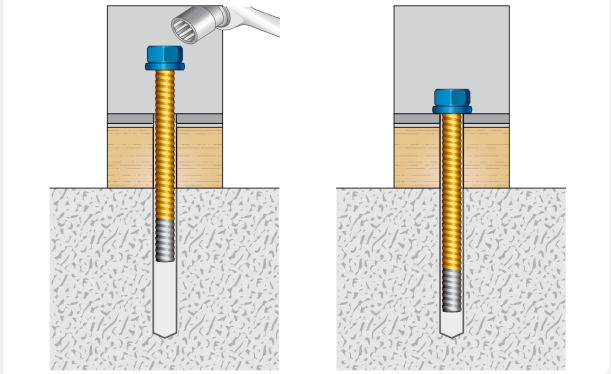
INSTALLATION OF GIB HANDIBRAC® BRACKET

1. Install the screw located in the bracket base
2. Install the BOWMAC® screw bolt as per instructions below
3. Install remaining four screws into the face of the timber stud

Installation Tips

- Use quality hexagonal socket with a ratchet spanner
- During installation debris or dust created by the thread cutting action may cause some resistance to be experienced. This is easily overcome by unscrewing the BOWMAC® screw bolt for one turn or more and then continuing to fix to the full embedment.





PREPARATION

- Use a 10mm diameter masonry bit for a solid concrete substrate and an 8mm diameter bit for fixing to a timber sub-floor.
- Drill a hole into the base material to depth 8 mm deeper than the required embedment and clean out the hole of dust and debris prior to installation of BOWMAC® screw bolt.

FIXING THE BRACKET

- Insert the bolt through the GIB HandiBrac® plate and bracket and into the hole.
- Begin tightening the bolt by applying forward pressure when engaging the first thread.
- Additional forward pressure may be required for installation in high strength, dense base materials.
- Continue tightening the anchor until the head is firmly seated against the GIB HandiBrac® base.
- In extremely dense material, use of an impact wrench is recommended.
- Be sure the bolt is at the required embedment depth.
- The installation is now complete.

GIB HANDIBRAC®

TRADEMARKS

The name GIB®, GIB HandiBrac® and the shield device are registered trademarks of Fletcher Building Holdings Limited.

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NZ Registered Design Application #420161

MANUFACTURER

GIB HandiBrac® is manufactured and distributed by MiTek New Zealand Ltd.

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P O Box 8387, Riccarton, New Zealand
Ph: 64-3-348 8691, Fax: 64-3-348 0314

www.miteknz.co.nz

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Length of GIB EzyBrace® elements ('N' Type)

The length of GIB EzyBrace® elements with an 'N' extension (requiring standard NZS3604:2011 plate connections) can be taken as the full frame length measured from the outside of the end-stud to the opening face as illustrated in figures 29-32.

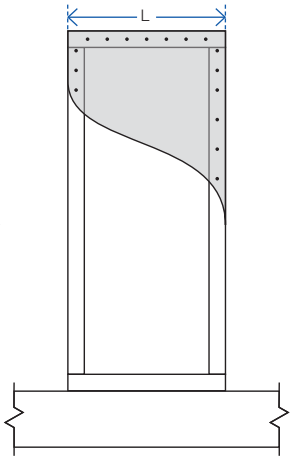
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

The dimension 'L' shall not be less than 400mm.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening.

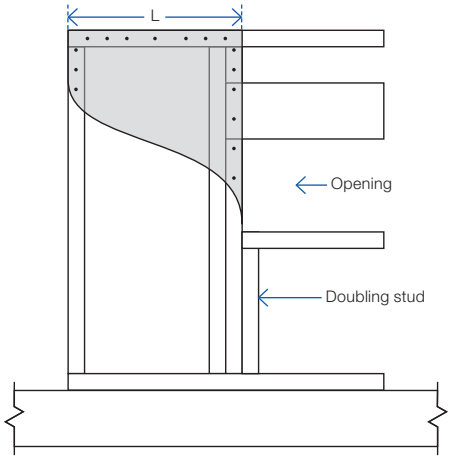
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



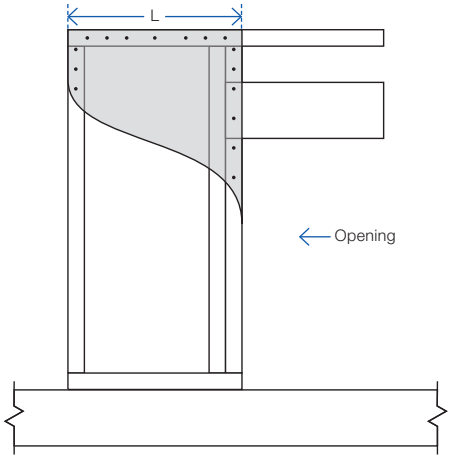
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



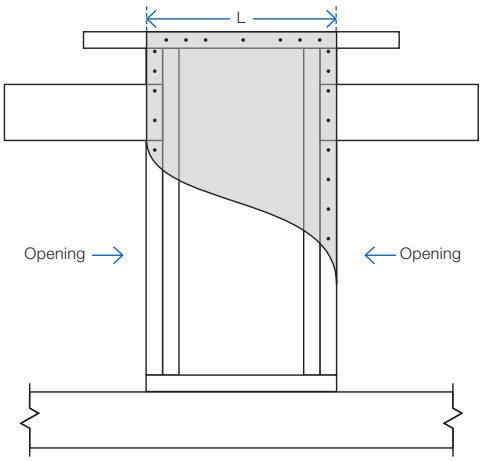
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

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Length of GIB EzyBrace® elements ('H' Type)

GIB EzyBrace® elements with an 'H' extension (requiring special panel hold-down fixings) can be used when the dimension 'L' as illustrated in figures 33–36 is 400mm or more.

'H' type GIB EzyBrace® elements are identified by GIB® specification numbers GSP-H, BL1-H, BLG-H and BLP-H.

The length of an 'H' type element is not only determined by the sheet material, but also by the placement of the hold-down fixings.

Hold-down fixings cannot be placed closer together than what is shown for the standard panel in figure 33.

Hold-down fixings can be placed under windows provided sill trimming studs beneath the opening are connected to the bracing element using 8/90mm gun nails, as illustrated in figure 34.

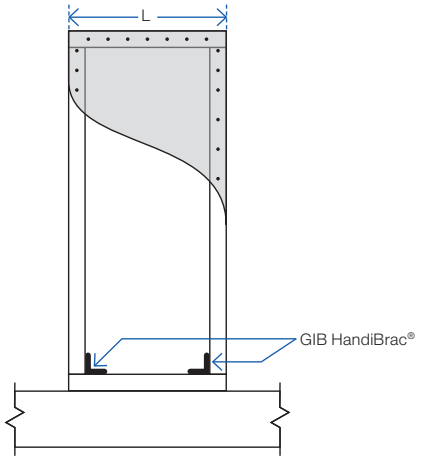
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening as indicated in figures 34-36.

When using bracing straps, installed in accordance with p.17, fix the strap to the same framing member as shown for the GIB Handibrac® below, and install the adjacent anchor bolt in the same position as the GIB HandiBrac® bolt.

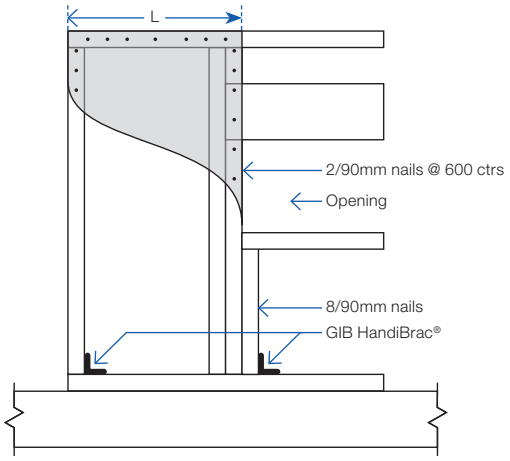
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



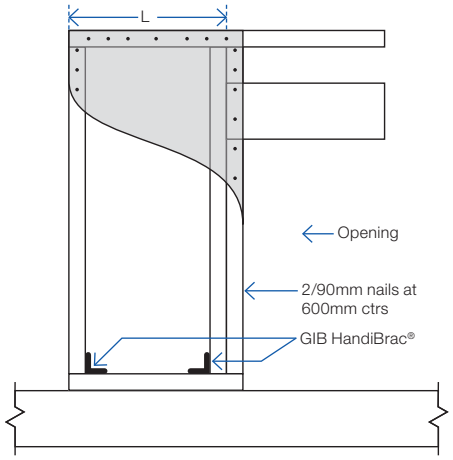
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



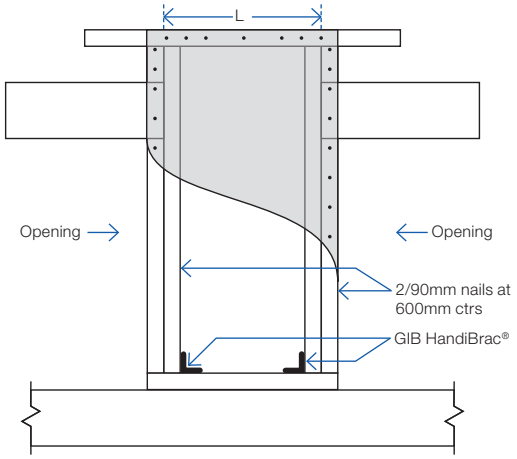
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

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GIB EzyBrace® System Specification – BL1-H

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

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

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide.
Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or
Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604.

WALL LINING

One layer 10mm or 13mm GIB® Braceline.
Sheets can be fixed vertically or horizontally.
Sheet joints shall be touch fitted.
Use full length sheets where possible.

PERMITTED SUBSTITUTION

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

FASTENING THE LINING

Fasteners

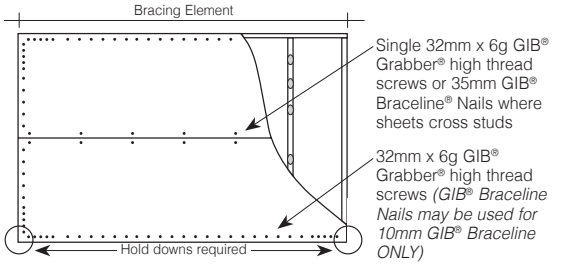
32mm x 6g GIB® Grabber® high thread screws.
(GIB Braceline® Nails may be used with 10mm GIB Braceline® only.)

Fastener centres

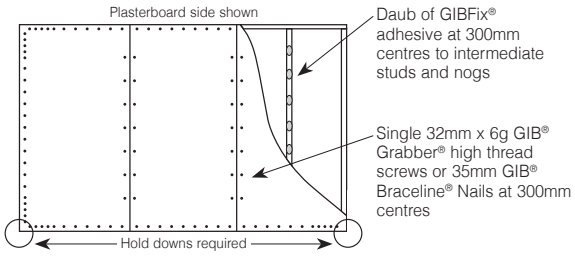
50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.
For vertically fixed sheets place fasteners at 300mm centres to the sheet joint.
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.
Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

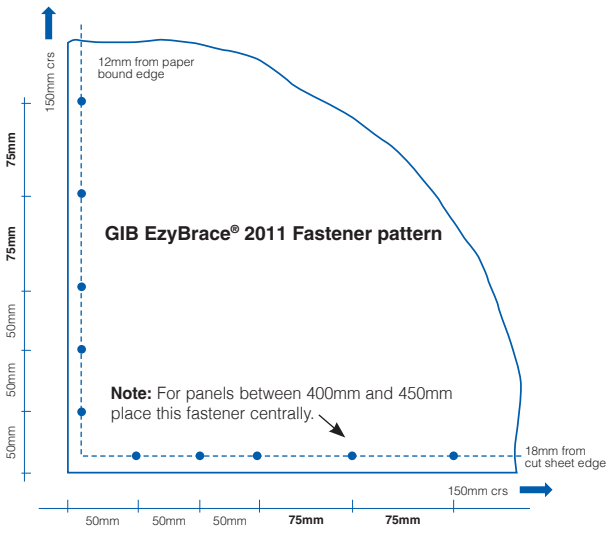
All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



Horizontal Fixing



Vertical Fixing



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

BRANZ Appraised
Appraisal No.294 [2011]

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GIB EzyBrace® System Specification – BLP-H

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm Ecoply to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Use panel hold downs at each end of the bracing element. The GIB® HandiBrac is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide.
Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or
Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604.

WALL LINING

One layer 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm Ecoply construction plywood manufactured to AS/NZS 2269:2004 to the other side. Plasterboard sheets can be fixed vertically or horizontally. Plywood is to be fixed vertically with edges supported. Sheet joints shall be touch fitted. Use full length sheets where possible.

PERMITTED SUBSTITUTION

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

FASTENING THE LINING

Fasteners

GIB Braceline® side
32mm x 6g GIB® Grabber® high thread screws.
(GIB Braceline® Nails may be used with 10mm GIB Braceline® only)

Plywood
50 x 2.8mm Galv or Stainless steel FH nails.

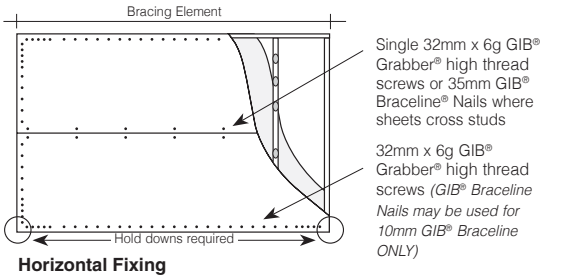
Fastener centres

GIB® Plasterboard side
50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element.
For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints.
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.
Use daubs of GIB®Fix adhesive at 300mm centres to intermediate studs.
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

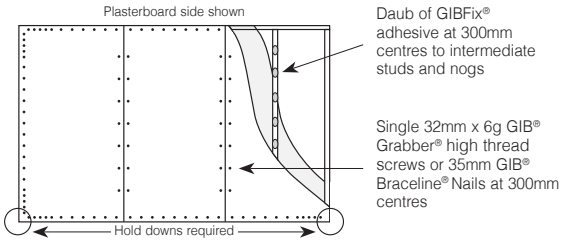
Plywood side
150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

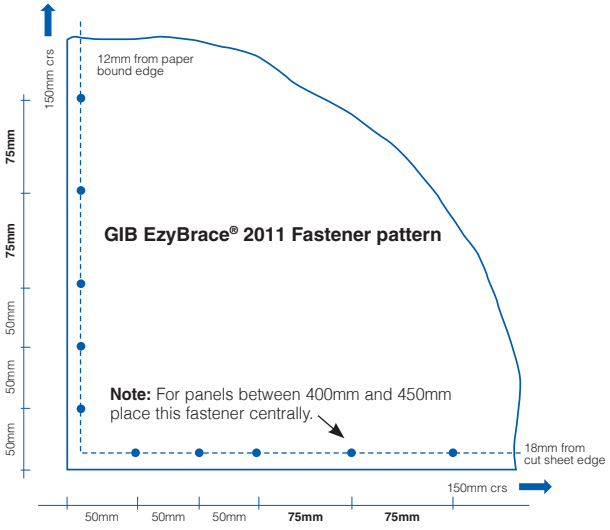
All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



Horizontal Fixing



Vertical Fixing



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

BRANZ Appraised
Appraisal No.294 [2011]

GIB EzyBrace® Systems specification GS2-NOM

Specification code	Minimum length (m)	Lining requirement
GS2-NOM	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

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

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100mm x 3.75mm nails at 600mm centres; or three power driven 90mm x 3.15mm nails at 600mm centres.

Concrete floor

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

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

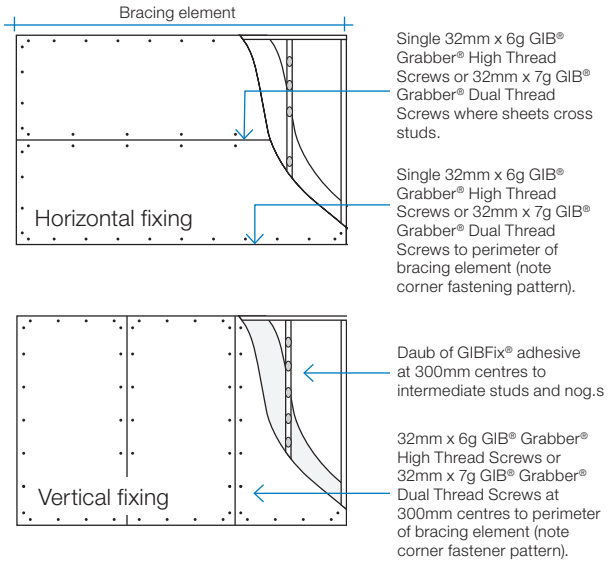
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

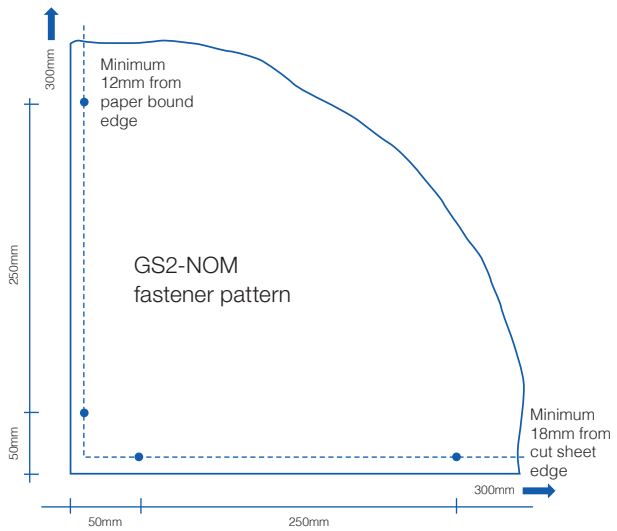
Fastener centres

50, 300mm from each corner and 300mm maximum thereafter around the perimeter of the bracing element. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

As an alternative to using screw fixings, a continuous 6-10mm bead of solvent based GIBFix® All-Bond can be applied along the full height studs immediately adjacent to an internal door opening and at the door lintel or head trimmer. The lining is then bedded into the adhesive and installed into the rebated jamb, as shown in figure 38.

This solvent based adhesive option may only be used with GS2-NOM specification and is designed to reduce popping of fasteners around door openings on internal walls.

FIGURE 37: SCREW FIX FOR OPENINGS

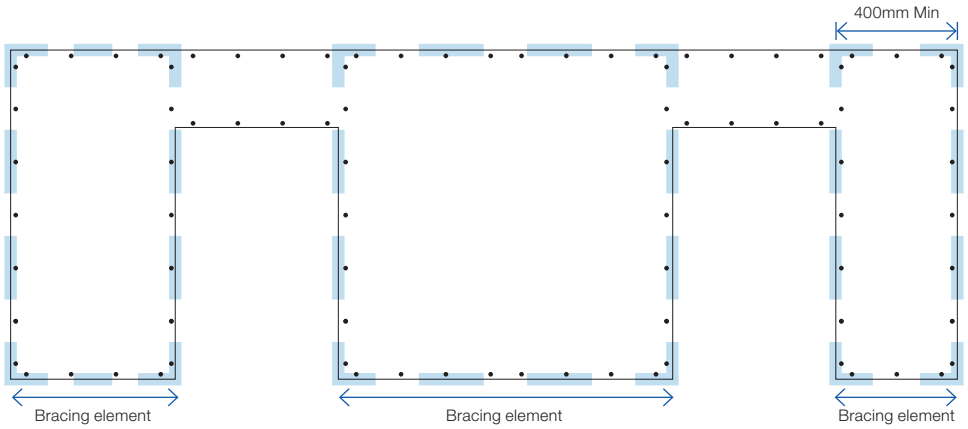
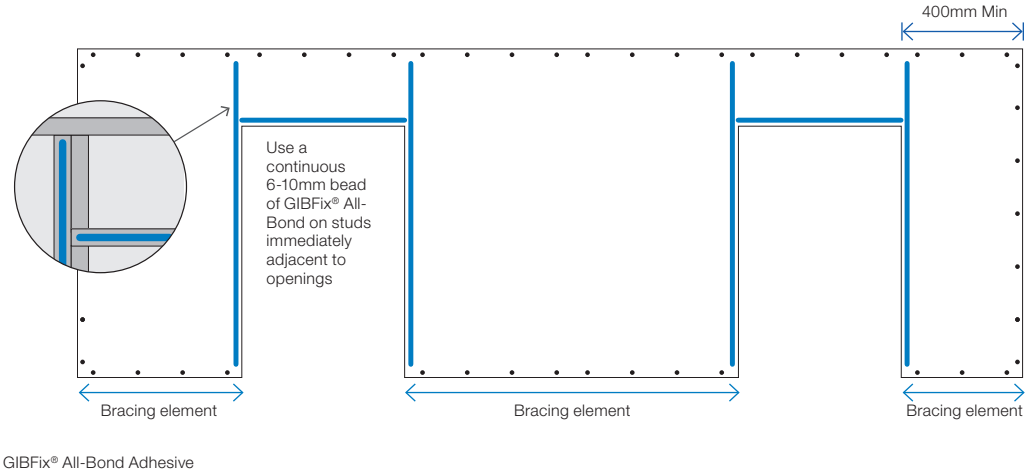
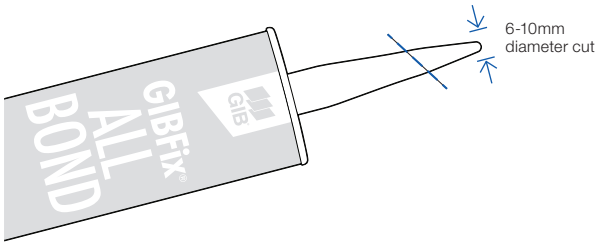


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



ADHESIVE NOZZLE APERTURE



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1.0 ECOPLY® PRODUCT RANGE

Manufactured in New Zealand by Carter Holt Harvey Woodproducts, the Ecoply® portfolio represents a range of structurally rated plywood products.

Ecoply is manufactured under a third party audited quality control programme to monitor compliance with AS/NZS 2269 Plywood Structural. All Ecoply products carry Engineered Wood Products Association of Australasia (EWPAA) Joint Accreditation System - Australia and New Zealand (JAS-ANZ) certification.

For information relating to Shadowclad® panels and plywood used as an exterior cladding, refer to the current Shadowclad Specification & Installation Guide for Cavity Construction. For information relating to Ecoply Barrier used as a rigid air barrier refer to the current Ecoply Barrier Specification & Installation Guide. Both of these documents can be downloaded from www.chhwoodproducts.co.nz.

Ecoply products must be competently installed in accordance with good building practices and sound design principles to satisfy the requirements of the Building Act 2004, the New Zealand Building Code (NZBC), and applicable New Zealand Standards. This is the responsibility of building owners and the design professionals and builders that they engage. This document contains information, limitations, and cautions regarding the properties, handling, installation, usage, and the maintenance of Ecoply products. However, to the maximum extent permitted by law, Carter Holt Harvey Woodproducts assumes no legal liability to you in relation to this information.

1.1 TECHNICAL INFORMATION AND CAD DETAILS

When specifying or installing any Ecoply® plywood products visit www.chhwoodproducts.co.nz or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

The information contained in this document is current as at September 2015. It is your responsibility to ensure you have the most up to date information available.

The information contained in this publication relates specifically to Ecoply structural plywood products manufactured by Carter Holt Harvey Woodproducts and must not be used with any other plywood manufacturer's product no matter how similar they may appear.

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

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1.2 PRODUCT DESCRIPTION AND RANGE

Ecoply structural plywood panels are manufactured from radiata pine wood veneers. The veneers are placed at right angles to each other for maximum strength and stability then bonded together with synthetic phenolic (PF) resin to form a strong and permanent Type A bond.

The strength of Ecoply plywood is optimised for maximum performance parallel to the face grain with cross plies providing enhanced stability across the grain.

The Ecoply plywood range can be specified for:

- Surface grade (e.g. CD) - where the first letter describes the face veneer appearance and the second letter describes the back veneer of the Ecoply sheet. Surface grades are defined in AS/NZS 2269 and summarised in Tables 2A & 2B
- Stress grade - utilises the symbol F and a suffix, for example;
  - F8 as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade. F8 is the standard stress grade for Ecoply products
  - Ecoply 19 mm Longspan Flooring and 15 mm Ecoply Roofing are F11[1] stress grade (See Tables 1, 4 and 5). Other Ecoply products are also available in F11[1] upon request
- Thickness - ranging from 7 mm to 25 mm. (Thicknesses above 25 mm subject to availability)
- Length - being 2400 mm and 2700 mm with a standard nominal width of 1200 mm
- Preservative treatment - being untreated, H3.2 CCA or H3.1 LOSP Azole treated
- Edge finish - being square edge or for Ecoply Flooring and Roofing, routed on the long edges of the sheet with a polypropylene plastic tongue inserted into one side for a tongue-in-groove joint

For general installation advice refer to section 2.0: General Installation Guide.

For specification and installation advice for Ecoply used in typical applications refer to the following sections.

Typical Application	Section
Structural bracing and ceiling diaphragms	3.0
Roofs and decks	4.0
Flooring	5.0

Note: Technical notes referenced in this guide can be downloaded from www.chhwoodproducts.co.nz or contact Carter Holt Harvey Woodproducts on 0800 326 759.

Table 1: Ecoply® Product Range

Nominal Thickness (mm)		7		9		12		15		17		19		21		25	
Sheet length (x 1200 mm width)		2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700
Ecoply Structural Square Edge	BD			●		●	●	●		●							
	CD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	DD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ecoply Flooring (pt)	CD							●	●	●	●	● LS	● LS	●	●		●
Ecoply Roofing (pt)	DD							●	●	●	●						

- ● Available untreated only
- ● Available either untreated or H3.2 CCA
- ● Available either untreated or H3.1 LOSP

pt Machine grooves on both long edges with a plastic polypropylene tongue in one groove, 1200 mm cover

LS Ecoply 19 mm F11/F8 Longspan Flooring

- Full range may not always be available ex stock, check with your Ecoply supplier to ensure availability
- Non standard specifications, including thicker sheets may be available to special order in significant quantities
- All products are F8 stress grades
- Ecoply 15 mm/17 mm Roofing and Ecoply 19 mm Longspan Flooring are supplied as standard in F11 stress grade[1]
- Other Ecoply products are also available in F11[1] upon request

[1] Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain

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1.3 SURFACE GRADES

Table 2A summarises the surface appearance grades in which Ecoply structural plywood is available with some typical applications for each surface grade.

The surface grade specifications are defined in AS/NZS 2269. Table 2B details surface appearance grades for specialty Ecoply plywood and typical applications.

Table 2A: Ecoply® Structural Square Edge Products

Face Grade B	Face Grade C	Face Grade D
		
Appearance grade with a solid sanded surface. Suitable for a higher quality finish.	Solid sanded surface with filled holes and splits, with intergrown knots. Suitable for a basic paint finish.	Non appearance grade allowing open imperfections up to 75 mm across the face veneer. Splits and knots allowable
Possible Uses:	**Possible Uses:**	**Possible Uses:**
• Furniture/Joinery/Signs • Interior Linings • Sheathing • Engineering components where a superior visual finish is required	• Structural gussets • Stressed skin panels • Bins, boxes, crates • Hoardings • Membrane substrate	• Non visual bracing • Strength critical pallets • Structural components • Portal frame gussets

Table 2B: Speciality Ecoply® Products

Flooring CD	Roofing DD
	
Solid sanded C grade surface with tongue and groove profile on long edges. Features void free second layer under the face veneer for increased protection against high point loads	Unfilled D grade surface with tongue and groove profile on long edges
Possible Uses:	**Possible Uses:**
• Substrate for flooring overlays such as linoleum, tiles and rigid coverings • Substrate for membrane roofing and decking where visible appearance is critical	• Substrate for asphalt shingles • Substrate for roof systems where a smooth substrate is not required

Notes: A higher visual grade may be substituted if required. e.g. Ecoply CD can be used anywhere DD is used. Pictures shown above are scaled down versions of typical Ecoply sheets. Grain pattern and colour may vary. If sheet appearance is critical select panels individually.

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1.4 PRESERVATIVE TREATMENT

Ecoply structural plywood is available untreated or treated in accordance with AS/NZS 1604.3. If treated, Ecoply structural plywood is treated with either H3.2 CCA (Copper Chrome Arsenate) or H3.1 LOSP (Azole) clear treatment. H3.1 LOSP is the standard preservative treatment for BD Structural Square Edge products and by special request for other Ecoply plywood products.

H3.2 CCA and H3.1 LOSP treated plywood in accordance with AS/NZS 1604.3 is described as suitable for: "outside, above ground, subject to periodic moderate wetting and leaching."

Ecoply plywood is envelope preservative treated. Where sheets are cut, cuts must be coated with a brush on timber preservative. Holdfast® Metalex® Concentrated Timber Preservative Clear (Holdfast® Metalex® Clear) is recommended. Failure to do so will affect the long term durability of the panel.

The characteristics of the treatments are shown in Table 3.

Table 3: Preservative Treatment

	Untreated	H3.2 CCA	H3.1 LOSP (Azole)
Preservative carrier	N/A	Water	Light organic oil (white spirits)
Colour	Natural	Green	Clear (i.e. natural)
Fungicide	Heat treated dry wood	Copper	Propiconazole and Tebuconazole
Insecticide	Heat treated dry wood	Arsenate	Permethrin
Other chemicals	N/A	Chrome (to fix preservative in wood)	Butyl Oxitol (co-solvent to assist active stability)
Mouldicide	N/A	Copper (limited efficacy)	IPBC
Notes	Plywood for dry interior use, supplied ex mill at <15% moisture content	Dried after treatment to average 18% moisture content for use in service at higher moisture contents	Solvent does not affect dimensions. Solvent smell disappears over time
Availability	Readily available	Standard treatment except for Ecoply BD	Treated to order for CD, DD, flooring and roofing products. Standard treatment for Ecoply BD
Applications (Refer NZ3602)	Interior dry protected	Exterior/Interior damp (service performance subject to detailing & coatings)	

H3.2 CCA

Ecoply structural plywood, which is H3.2 CCA treated (waterborne preservative with a green colour), is dried following treatment so that sheets may return to the correct dimensions. The moisture content after treatment with CCA and drying will be higher than the limits placed in AS/NZS 2269 on untreated product. The target is for an average moisture content of approximately 18% to provide a panel closer to the expected equilibrium moisture content for most H3.2 CCA applications.

The fillets used to separate sheets in drying may leave marks on the sheet surface. These will fade over time as the plywood weathers, and can be disguised with paint but may be visible under stain. The process of treating with H3.2 CCA and subsequent drying is likely to increase the face checking of the panel.

For more information on face checking refer to section 1.8 General Design Considerations - Aesthetics.

H3.1 LOSP

H3.1 LOSP treated Ecoply retains the wood colour and does not contain moisture so the plywood remains at the same dimensions and moisture content during treatment. However, the plywood when freshly treated may contain more than 60 litres of organic fluid per cubic metre. When coating H3.1 LOSP treated plywood, traces of residual solvent may be present on the sheet surface from the treatment process. Sheets feeling greasy to touch should be placed in a well ventilated area and allowed to flash off to ensure proper adhesion of paints and stains to the sheet surface.

The H3.1 LOSP solvent smell can be quite strong and venting is recommended until most of the solvent has evaporated. Untreated plywood is recommended for internal applications where NZS 3602 allows the use of untreated plywood

Mechanical fasteners are recommended to fix H3.1 LOSP treated Ecoply to framing. If adhesives are required, thorough venting is recommended and H3.1 LOSP tolerant adhesives should be applied according to the adhesive manufacturer's instructions. See section 2.3 Adhesives.

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1.5 SECTION PROPERTIES

Table 4A: Section Properties of Ecoply® Structural Plywood

		Section properties per mm width						
		Parallel to the face grain			Perpendicular to the face grain			
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Mass** (kg/m³)	**Parallel Moment of Inertia** (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant** I/Q (mm²)	**Perpendicular Moment of Inertia** I (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant** I/Q (mm²)
7	7-24-3	4.0	30.0	8.3	5.2	2.0	1.7	2.3
9	9-30-3	5.0	58.6	13.0	6.4	4.0	2.7	2.9
12	12-24-5	6.6	115.0	19.2	9.3	33.4	9.3	5.4
15	15-30-5	8.3	225.0	29.9	11.6	65.2	14.5	6.8
17	17-24-7	9.2	285.0	33.9	12.2	122.0	20.4	9.4
17	17-24-6	9.2	273.0	32.5	12.3	134.0	22.3	9.5
19	19-30-7	10.6	451.0	46.9	13.7	157.0	23.8	10.7
21	21-30-7	11.6	556.0	52.9	15.2	239.0	31.9	11.8
25	25-30-9	13.5	897.0	72.9	17.8	381.0	41.0	13.9

Table 4B: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design: F8 Grade

		Nominal strengths (Limit States) per mm width					
		Parallel to the face grain (F8)			Perpendicular to the face grain (F8)		
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)
12	12-24-5	1046.5	480.0	15.6	303.9	231.7	9.2
15	15-30-5	2047.5	747.5	19.5	593.3	362.5	11.4
17	17-24-7	2593.5	847.5	20.5	1110.2	510.0	15.9
17	17-24-6	2484.3	812.5	20.7	1219.4	557.5	16.0
19	19-30-7	4104.1	1172.5	23.0	1428.7	595.0	18.0
21	21-30-7	5059.6	1322.5	25.5	2174.9	797.5	19.8
25	25-30-9	8162.7	1822.5	29.9	3467.1	1025.0	23.4

Table 4C: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design: F11[1] Grade (Including Longspan Flooring)

		Nominal strengths (Limit States) per mm width					
		Parallel to the face grain (F11)			Perpendicular to the face grain (F8)		
Nominal plywood thickness[2] (mm)	**ID code**[3]	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)
12	12-24-5	1207.5	595.2	16.7	303.9	231.7	9.2
15	15-30-5	2362.5	926.9	20.9	593.3	362.5	11.4
17	17-24-7	2992.5	1050.9	22.0	1110.2	510.0	15.9
17	17-24-6	2866.5	1007.5	22.1	1219.4	557.5	16.0
19	19-30-7	4735.5	1453.9	24.7	1428.7	595.0	18.0
21	21-30-7	5838.0	1639.9	27.4	2174.9	797.5	19.8
25	25-30-9	9418.5	2259.9	32.0	3467.1	1025.0	23.4

1 Where the stress grade F11 is referred to in all CHH Woodproducts plywood literature actual stress grade properties of panels are F11 parallel to the face grain and F8 perpendicular to the face grain

2 Actual thickness of Ecoply sheets manufactured to thickness tolerances stated in AS/NZS 2269

3 Identification code: panel thickness – outermost veneer thickness x 10 – number of plies

4 I/Q values for rolling shear are for stress at the neutral axis calculated as in NZS 3603

Notes:

- Use Tables 4A & B values for all F8 stress grade Ecoply products
- Use Tables 4A & C values for all F11 stress grade Ecoply (including 19 mm Ecoply Longspan Flooring)
- The section properties in Tables 4A, B & C have been calculated in accordance with AS/NZS 2269
- For section properties for other thicknesses and Shadowclad® products contact CHH Woodproducts on 0800 326 759

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Structural properties of Ecoply® plywood

The majority of Ecoply plywood is F8 grade (exceptions are identified in section 1.2: Product Description & Range) and the characteristic values may be used in conjunction with both NZS 3603 and AS 1720 for the design of timber components. The characteristic strengths in Table 5 have been used to provide the nominal strengths in Tables 4B and 4C.

Table 5: Structural Properties of Ecoply® Plywood

	Characteristic Strength MPa	
Stress Grade	**F8**	**F11**
Bending (f_{pb})	25.0	31.0
Tension (f_{pt})	15.0	18.0
Panel shear (f_{ps})	4.2	4.5
Rolling shear (f_{pr})	1.7	1.8
Compression in plane of sheet (f_{pc})	20.0	22.0
Compression normal to the plane of the sheet (f_{pp})	9.7	12.0
Modulus of elasticity (E)	9100	10500
Modulus of rigidity (G)	455	525

Source: AS/NZS 2269

Wood is strongest when stressed parallel to the grain and weakest across the grain, so the lay up or arrangement of veneers in the panel determines the properties. Because of its cross banded construction, plywood possesses significant strength and stiffness both parallel and perpendicular to the direction of the face grain, but is generally strongest and stiffest along the direction of the face grain.

The section properties of structural plywood in Table 4A are calculated in accordance with AS/NZS 2269 to allow for the reduced contribution of veneers perpendicular to the direction of stress. For engineering design to NZS 3603, the section properties are multiplied by stresses and 'k' and ø factors to determine resistances for limit states design.

Resistances and nominal strengths in Tables 4B and 4C assume all 'k' factors are equal to 1.0. Multiply tabled values by the strength reduction factor ø and 'k' factors for specific in-service conditions for design to a structural code such as NZS 3603.

Table 5A: Strength Reduction Factors

Structural Timber Material	**Application of Structural Member**		
	Category 1	**Category 2**	**Category 3**
	Structural members for houses for which failure would be unlikely to affect an area[1] greater than 25 m²; OR secondary members in structures other than houses	Primary structural members in structures other than houses; OR elements in houses for which failure would be likely to affect an area[1] greater than 25 m²	Primary structural members in structures intended to fulfil essential services or post disaster function
	Value of Strength Reduction Factor Ø		
Structural Plywood – AS/NZS 2269.0	0.95	0.85	0.75

[1] In this context area should be taken as plan area.

1.6 PRODUCT IDENTIFICATION

In accordance with AS/NZS 2269, Ecoply structural plywood sheets have the following information marked on the back:

- Brand name: e.g. ECOPLY
- Face grade, back grade: e.g. CD
- Intended application: e.g. STRUCTURAL
- Panel construction code: e.g. 19-30-7 (Thickness (mm)-Face veneer thickness (mm x 10)-Number of veneers)
- Glue bond: eg. A BOND
- Formaldehyde emission class: E0 for A Bond Ecoply
- Australasian Standard: e.g. AS/NZS 2269
- Treatment Standard (if applicable): eg. AS/NZS 1604.3:2012
- Date and time of manufacture: e.g. 01/12/15 12:23:45
- Stress grade: e.g. F8 (exceptions include Shadowclad® and Grooved Lining which are performance rated)
- The Engineered Wood Products Association of Australasia (EWPAA) brand and mill number: e.g. 911 (Tokoroa mill)

Untreated example:

ECOPLY CD FLOORING STRUCTURAL
19-30-7 A BOND E0 AS/NZS 2269.0:2012
PAT 01/12/15 12:23:45 F11/F8
911

Treated example:

ECOPLY CD STRUCTURAL
25-30-9 A BOND E0 AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 046 01 H3 E CCA
RETREAT CUTS PAT 01/12/15 12:23:45 F8/F8
911

Note: Performance based products like Grooved Lining and Shadowclad may include brand identification instead of visual quality, stress grade, and panel code. These panels, when accompanied with specification literature, are still deemed to comply with AS/NZS 2269

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1.7 CODE COMPLIANCE

Ecoply plywood manufacture is third-party audited through the product quality control programme of the Engineered Wood Products Association of Australasia (EWPAA) which is itself audited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

CHH Woodproducts is licensed by the EWPAA to stamp plywood with the EWPAA/JAS-ANZ Product Certification Mark. This certifies it has been manufactured under the third party audited Joint Product Certification programme to monitor compliance with joint Australian/New Zealand Standard AS/NZS 2269 Plywood – Structural. Plywood to this standard is referenced in the NZBC Acceptable Solutions and Verification Methods through:

- NZS 3602 The Use of Timber and Wood-based products for Use in Building
- NZS 3603 Timber Structures
- NZS 3604 Timber Framed Buildings
- AS/NZS 1604.3 Specification for Preservative Treatment, Part 3:Plywood
- E2/AS1 External Moisture

WARNING: Plywood which is non-certified or is manufactured to standards other than AS/NZS 2269, such as US voluntary standard PS1-95, is not referenced in the NZBC. There can be significant differences between AS/NZS 2269 certified and non certified plywood around bond durability, structural ratings and veneer quality.

Structure B1

Design to NZS 3603 Timber Structures complies with the NZBC in Verification Method B1/VM1 Clause 6.0 Timber. Plywood is the only sheet material with properties listed in NZS 3603. Ecoply structural plywood is available in F8 stress grade. Some specialty products are available F11 or with specifically designed properties for specialised applications.

1.8 GENERAL DESIGN CONSIDERATIONS

Durability (Clause B2) and exterior moisture (Clause E2)

Ecoply plywood is made from softwood solid radiata pine veneer. Designers should assess the level of exposure to biological, moisture, and other hazards and apply appropriate preservative treatment and detailing to minimise exposure to these hazards.

Information in this manual outlines suggested practices for detailing building components to exclude moisture to comply with the durability requirements of the NZBC.

Formaldehyde

Ecoply plywood is manufactured using phenol formaldehyde resins which are fully cured in the hot press. Cured resin is thermally and moisture stable and formaldehyde emissions for the glued plywood are similar to background levels for the wood by itself when tested to AS/NZS 2098.11 Determination of formaldehyde emissions for plywood. Accordingly every panel is branded with the lowest emission class (less than 0.5 mg/litre for E_0).

Actual formaldehyde emissions for Ecoply plywood have been tested and approved as having an actual formaldehyde emission level of less than 0.3 mg/ litre (equivalent to a Super E_0 emission level).

Moisture content and dimensional change

At the time of leaving the factory, the moisture content of untreated Ecoply plywood should generally be in the range of 8% to 15% as required by AS/NZS 2269. All wood products including plywood respond to changes in ambient humidity so the eventual moisture content of plywood varies according to how dry or how wet the environment is. After manufacture, the moisture content will move to equilibrium with the environment, and the veneers swell or shrink across the grain in response. The total expansion both along and across a 2400 x 1200 mm panel can be in the order of 1.5 mm to 3 mm as the plywood changes from a dry to a saturated state.

Ecoply that is treated with waterborne preservatives (e.g. H3.2 CCA) is expected to be used in applications that have higher humidity than interior dry use, so following treatment it is dried to a higher average moisture content of approximately 18%. This provides for a more stable panel in service than placing a dry (less than 15%) sheet in a higher moisture environment.

Detailing and construction must allow for movement if the plywood will be subject to cycles of moisture change. Seasonal and daily cycles can be significant depending on the end use.

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Temperature

Wood will expand upon heating as do practically all solids. The thermal expansion of plywood is quite small and there is little effect on the structural performance or durability of plywood when used in temperatures below 54°C. The average co-efficient of thermal expansion of plywood is 4.5 x 10-6 mm/mm/°C. At temperatures above 55°C wood begins to deteriorate. Colours of coatings and finishes should be selected to reduce heat gain. For extreme conditions, further technical information is available by calling CHH Woodproducts on 0800 326 759.

The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214 Methods of determining the total thermal resistance of parts of buildings. e.g. Plywood has a Conductivity (k) of 0.13 W/mK so a 12 mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Aesthetics

Ecoply plywood products can be selected for decorative or weather protection functions as well as structural performance. Acceptable Solution E2/AS1- External Moisture allows plywood manufactured to AS/NZS 2269, (minimum CD appearance grade, minimum 12 mm thickness and treated as required by NZS 3602) to be used for exterior cladding. For exterior cladding applications CHH Woodproducts strongly recommends Shadowclad® exterior cladding rather than smooth faced plywood such as Ecoply.

Shadowclad® features a textured (bandsawn) face which reduces the visibility of face checking and other appearance related issues which can occur on smooth faced plywood if not regularly maintained by the homeowner. For more information on plywood used as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction.

Face checks on plywood exposed to weather

Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture. It is important to realise that these checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way. If you are the specifier, it is important to discuss these issues with your client and consider the length of exterior exposure, climate conditions and protection offered by the surface coating before finalising product choice.

Durability

The durability of Ecoply structural plywood will depend on the application. Detailing, treatment and installation details need careful consideration to satisfy the requirements of the NZBC.

Normally, 50 year durability can be achieved with untreated Ecoply in dry, interior exposure. For internal environments subject to high humidity or condensation H3.2 CCA treated Ecoply should be used.

For plywood as a rigid air barrier (including rigid air barrier acting as bracing) refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhwoodproducts.co.nz.

Fire, spread of flame and smoke development

The following data on early fire hazard properties of uncoated Ecoply plywood are the result of tests carried out by Australian Wool Testing Authority AWTA to test structural plywood manufactured to AS/NZS 2269 in accordance with ISO 5660, reaction to fire tests (heat release, smoke production and mass loss rate). Part 1: Heat Release rate (cone calorimeter method).

Table 6 summarises the test configurations and associated material groups.

For plywood with decorative finish coatings or intumescent coating, performances depend on spread rates of the coating. For advice on specific coating systems and their suitability for use with Ecoply products, always refer to the coating manufacturer.

Table 6: Early Fire Hazard Properties of Ecoply® Plywood

Material	Species	Origin	Thickness	Treatment	Material groups
Plywood	Radiata Pine	New Zealand	7mm	CCA Treated	Group 3
Plywood	Radiata Pine	New Zealand	12mm	Untreated	Group 3
Plywood	Radiata Pine	New Zealand	12mm	LOSP Treated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	Untreated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	LOSP Treated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	CCA Treated	Group 3

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1.9 SUSTAINABILITY

Ecoply is manufactured from radiata pine. It is grown on tree farms which are tended and harvested to provide wood for plywood manufacture. The crop is managed on a sustainable basis to yield millable trees.

New Zealand plantations are managed in compliance with the New Zealand Forest Accord.

Ecoply is manufactured in New Zealand at CHH Woodproducts Tokoroa plywood mill.

Ecoply is available Forestry Stewardship Council (FSC) (SCS-COC-001316) certified upon request.

1.10 HEALTH & SAFETY

Ecoply should be handled in accordance with the Material Safety Data Sheets (MSDS) for untreated, H3.2 CCA and H3.1 LOSP treated Ecoply, which can be downloaded from www.chhwoodproducts.co.nz.

Always wear safety glasses or non-fogging goggles when machining Ecoply panels.

If wood dust exposures are not controlled when machining (sawing, routing, planing, drilling etc) a class P1 or P2 replaceable filter or disposable face piece respirator should be worn.

Wear comfortable work gloves to avoid skin irritation and the risk of splinters. Wash hands with mild soap and water after handling panels.

1.11 STORAGE & HANDLING

Ecoply panels must be stored and handled with care to maintain good condition before use and after installation:

- The storage area must be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity
- Support for the sheets must be provided at both ends and middle to avoid distortion. Ensure bearers in packs above are aligned over bearers below (to avoid inducing curves in sheets)
- The stack must be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage
- The sheets must be stacked flat, NOT on edge
- Store in well-ventilated areas away from sources of heat, flame or spark
- To avoid staining, fading and surface checking, the sheets must not be exposed to the weather while awaiting installation
- Store in well-ventilated areas away from sources of heat, flames or sparks

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2.0 GENERAL INSTALLATION GUIDE

The following is a general guide to be followed unless otherwise specified. For additional installation instructions for typical applications refer to sections 3, 4 and 5.

2.1 FRAMING

Use kiln dried framing e.g. Laserframe® in accordance with timber framing manufacturer's specifications and treated in accordance with NZS 3602. All timber frame sizes and set out must comply with NZS 3604 (or be specifically designed to NZS 3603). The current Laserframe Product Guide can be downloaded from www.chhwoodproducts.co.nz. Ecoply may be specified for frame spacing determined by design, or using tables in section 3 for specific product applications such as bracing, flooring and as a substrate for shingle roofs or membrane roofs and decks.

H3.1 LOSP treated framing should be vented before fixing and if construction adhesives are required (for example to screw and glue floor panels) the adhesive must be compatible with H3.1 LOSP. See section 1.4: Preservative Treatment.

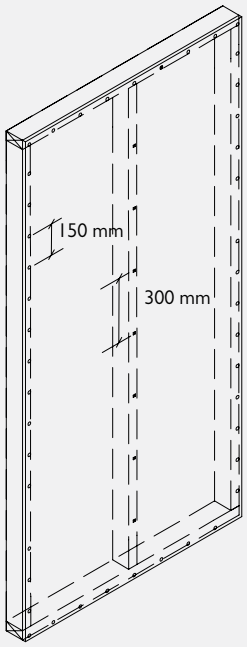
For plywood used as exterior cladding refer to the current Shadowclad® Specification & Installation Guide for Cavity Construction which can be downloaded from www.chhwoodproducts.co.nz

For plywood used as a rigid air barrier refer to the current Ecoply Barrier Specification & Installation Guide which can be downloaded from www.chhwoodproducts.co.nz

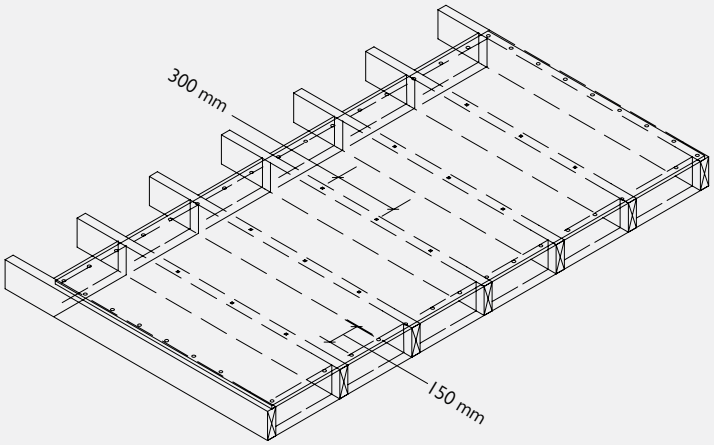
2.2 SHEET FASTENERS AND FIXING

- Where there is risk of panel size change due to changes in moisture levels, allow a 2 to 3 mm expansion gap between sheets
- Use only flathead nails or screws, with or without construction adhesives
- Fastener length should penetrate at least 10 nail diameters into the framing or be three times the sheet thickness, whichever is the greater. Longer or ring shank nails may be specified
- Fasteners must be at least 3 fastener diameters or 7 mm from the edge of the sheet
- For tongue and groove products such as flooring and roofing fasten 15 mm from tongue and groove edges
- Standard fixing pattern: unless otherwise specified fasten edges and ends of sheets at 150 mm centres, and within the panel at no more than 300 mm centres (see diagram below)
- Use hot dipped galvanised fasteners or corrosion resistant fasteners (i.e. stainless steel) determined by design for specific hazards
- Where using stainless steel nails, nails must be annular grooved
- Refer to Table 7 for minimum fastener sizes
- Do not overdrive power driven nails

EC001: Fastener spacings for Ecoply®



Ecoply® fastened in vertical plane



Ecoply® fastened in horizontal plane

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Table 7: Fasteners and Characteristic Shear Loads for Ecoply®

Nominal Thickness (mm)	7mm / 9mm	Load[1]	12mm / 15 mm	Load[1]	17 mm	Load[1]	19mm / 21mm	Load[1]	25 mm	Load[1]
Minimum nail size in timber framing[2]	40 x 2.5 mm	570	60 x 2.8 mm	736	60 x 2.8 mm	736	60 x 2.8 mm	736	75 x 3.15 mm	883
Screw size in timber framing[2]	8g x 30 mm	1230	8g x 40 mm	1230	10g x 40 mm	1650	10g x 45 mm	1650	10g x 50 mm	1650
1.15 mm steel framing[3]	10-24-35[4]	1300	10-24-40[4]	2000	10-16-45[4]	2100	10-16-45[4]	2100	10-16-45[4]	2100
Screw size in 2.80 mm steel framing[3]	10-24-35[4]	1200	10-16-404	1200	14-20-45[4]	3000	14-20-45[4]	4000	14-20-45[4]	5000

1 The load is the characteristic load (N) for one fastener in single shear
2 Characteristic load based on fixing into a timber of J5 joint group or better
3 Self tapping, self countersinking screw
4 Screw Numbers indicate: Gauge – Threads per inch – Length (mm)

Notes

- Steel thickness, screw sizes, characteristic loads, refer to assemblies actually tested
- Other screw sizes may be used. Screw properties vary between screw suppliers and the suitability of a particular size should be verified by the designer for performance under changing physical conditions and cyclic loading
- Non-standard nailing may be specifically designed with NZS 3603 or similar

Fasteners for H3.2 CCA treated Ecoply®

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Notes

H3.2 CCA treated timber should not be fixed in direct contact with light gauge steel products. Refer to the framing manufacturer for advise on fixing and treatments.

2.3 ADHESIVES

Tube applied construction adhesives

Site applied construction adhesives may be used together with nails and screws for non permanent loads, reduced fastener popping, and to lower the risk of squeaking in floors. Available types include polyurethane (e.g. Holdfast® Gorilla Nailpower®) and elastomeric (e.g. Bostik® Wallboard Gold) based adhesives.

Elastomeric adhesives should meet the requirements of APA Performance specification AFG 01 Adhesives for field gluing plywood to wood framing. Other types should have appraisal from an independent authorising body such as BRANZ or equivalent authorities for the specific applications proposed. Follow manufacturer's recommendations. In addition:

- Use a bead or daubs of adhesive as per manufacturer's recommendations
- Apply pressure using fastener patterns outlined in section 2.2: Sheet Fasteners and Fixing
- Work from the middle of the sheet outwards to develop glueline pressure
- Ensure adhesives are compatible with treatment in the framing timber, see section 1.4: Preservative Treatment

Structural adhesive joints

Structural bonds are generally only achievable in factory controlled conditions using approved structural adhesives in accordance with approved standards for glue lamination, e.g. Resorcinol formaldehyde joints made to AS/NZS 1328 Glued laminated structural timber. Site gluing is not recommended for structural plywood components. Contact CHH Woodproducts on 0800 326 759 for further information.

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3.0 STRUCTURAL BRACING & CEILING DIAPHRAGMS

The Ecoply bracing system provides bracing resistance for walls and subfloor foundations for light timber framed buildings under wind and earthquake loading, to meet the requirements of the NZBC - B1 Structure, and NZS 3604 *Timber Framed Buildings* or specifically designed to NZS 3603 *Timber Structures Standard.*

Any Ecoply structural panel may be used for bracing as long as it is 7 mm, 9 mm or 12 mm thick, has a minimum wall length as described in Table 9, treated for the specific application in accordance with NZS 3602 (summarised in Table 8) and fixed in accordance with Ecoply bracing specifications outlined in this guide.

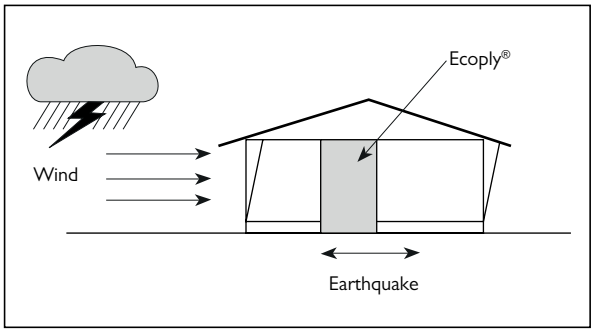
3.1 DESIGN TO COMPLY WITH THE NEW ZEALAND BUILDING CODE

Structure

Timber framed buildings to NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution B1/AS1 Structure.

CHH Woodproducts have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604.

Specific design



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

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

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

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

Timber Floors

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

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

Durability

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

Table 8 summarises the applications in which Ecoply can be used as structural bracing together with the required preservative treatment and fastener material.

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Table 8: Ecoply® Suitability for Bracing Applicatons Including Treatment Type & Fastener Material

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray): E.g. Interior linings	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B & C, as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/ without building paper/ wrap over, with/ without cavity battens behind cladding	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/without building paper/wrap over, with/ without cavity battens behind cladding	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply® Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones' D	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones, as per section 4 of NZS 3604 (including sea spray)	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

Note: Power driven nails are suitable for use. Do not overdrive, nails must be full round head

Rain wetting and construction bracing

Untreated Ecoply will withstand normal exposure conditions during construction for up to 3 months however aesthetically the sheet appearance will deteriorate as the level of exposure increases. Rain and exposure can cause thinner plywood panels to buckle. Plywood stability is related to the number of veneers and thickness of the panel. Where panel stability is critical, consider using thicker panels.

Humidity and condensation

In conditions where the moisture content may exceed 18% for prolonged periods, Ecoply must be H3.1 LOSP or H3.2 CCA treated to resist decay or insect hazard.

Subfloor sheet bracing

H3.2 CCA treated Ecoply can be used as sheet bracing where dampness does not allow the use of untreated plywood or other sheet materials (section 5 of NZS 3604). Where Ecoply subfloor sheet bracing is exposed to both rain and sun, it must be coated with a three coat, 100% acrylic exterior coating system with a light reflectance value of 50% or greater.

Adjustments for wall height

Use section 5 of NZS 3604 to calculate bracing values: "Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4 m, the bracing rating determined by test or from Table 9 should be multiplied by 2.4 ÷ element height in metres, except that elements less than 2.4 m high shall be rated as if they are 2.4 m high.
(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height."
(c) Walls with heights < 1.5m, Specific Engineering Design is required.

Joining panels for walls higher than maximum sheet length

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

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Cladding as bracing

12 mm Ecoply (CD face grade or better) can be H3 treated to meet the requirements of Acceptable Solution E2/AS1 and will perform as a structural, durable and weathertight cladding and bracing element when installed in accordance with E2/AS1.

It should be noted smooth faced plywood such as Ecoply may be prone to appearance related issues such as face checking which occurs naturally and is not considered by CHH Woodproducts to be a manufacturing or product fault. For more information refer to section 1.8: General Design Considerations - Face Checks on Plywood Exposed to Weather. H3.2 CCA treated Ecoply may also have a green tinge to the wood surface and may have fillet marks on the face of the sheet.

Plywood for exterior cladding applications where a high visual appearance is desired, CHH Woodproducts recommends the use of Shadowclad as an exterior cladding. Shadowclad has a textured (bandsawn) face which reduces the visibility of face checking and is most commonly H3.1 LOSP treated (clear preservative treatment) which does not leave fillet marks on the panel face.

For further information on Shadowclad as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction which can be downloaded from www.chhwoodproducts.co.nz.

Soil

Ecoply must not be allowed to come in contact with soil. The bottom edge of the plywood sheet must be a minimum of 100 mm above decks or paved ground and a minimum of 175 mm above unprotected ground.

Service penetrations in bracing elements

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

3.2 ECOPLY® BRACING SPECIFICATIONS SUMMARY

CHH Woodproducts has a range of bracing specifications called the EP bracing series. The EP bracing series simplifies the design and construction of bracing elements using plywood, by itself or in conjunction with GIB® Plasterboard and features:

- Single sided and double sided bracing elements High performance bracing element utilising GIB® Standard plasterboard
- A single type, GIB Handibrac®, hold-down for all bracing elements
- Specifications for each bracing element type

Table 9: Summary P21 Ratings for 2.4m High Ecoply® Wall Elements

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1	0.4 m	Ecoply one side	80	95
	0.6 m		95	105
	1.2 m		120	135
EPG	0.4 m	Ecoply one side and 10 mm GIB® Standard plasterboard other side	100	115
	1.2 m		150	150

Note: Bracing and other technical information has been specifically tested using Ecoply branded structural plywood. This information cannot be used with any other plywood brand and bracing data must be sought directly from the specific plywood manufacturer.

More information

The following pages provide a full specification of EP bracing elements. Copies of specifications can be downloaded from www.chhwoodproducts.co.nz

NZS 3604 provides the method of calculating demand on a building. Calculation sheets are available from BRANZ or GIB EzyBrace® software is available as a free download from www.gib.co.nz. Information is available at www.chhwoodproducts.co.nz which can be placed in the custom elements of GIB EzyBrace® for ease of calculation

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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3.3 ECOPLY® BRACING SPECIFICATION - EPI

Table 10: Singled Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1_0.4	0.4 m	Ecoply one side	80	95
EP1_0.6	0.6 m	Ecoply one side	95	105
EP1_1.2	1.2 m	Ecoply one side	120	135

Framing

Wall framing must comply with:

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

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

Bottom plate fixing

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

Lining

One layer of 7 mm, 9 mm or 12 mm Ecoply plywood fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Fastening the Ecoply® panels

Fasten with 50 x 2.8 mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7 mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

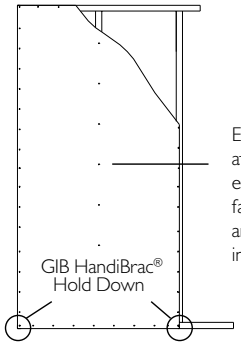
Fasteners for H3.2 CCA treated Ecoply® panels

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised.

In certain circumstances stainless steel fasteners may be required. Refer to Table 8 of the Ecoply Specification and Installation Guide for these circumstances and further fastener selection advice. Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

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



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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Table 11: Ecoply® Suitability For Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray):	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B & C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification & Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones D, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

* Refer to Table 8, page 16 of Ecoply Specification & Installation Guide.

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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3.4 ECOPLY® BRACING SPECIFICATION – EPG

Table 12: Structural Plywood Brace with Plasterboard Other Side

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EPG_0.4	0.4 m	Ecoply one side and 10 mm GIB® Standard plasterboard other side	100	115
EPG_1.2	1.2 m		150	150

Framing

Wall framing must comply with:

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

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

Bottom plate fixing

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

Lining

Side 1: One layer of 7 mm, 9 mm or 12 mm Ecoply plywood exterior wall cladding fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

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

Fastening the Ecoply® panels

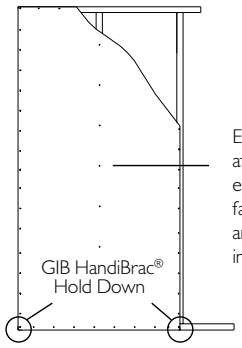
Fasten with 50 x 2.8 mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7 mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

Fasteners for H3.2 CCA treated Ecoply®

Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to Table 8 of the Ecoply Specification and Installation Guide for these circumstances and further fastener selection advice. Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

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



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply manufactured by Carter Holt Harvey and SG8 timber framing, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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Fastening the GIB® Plasterboard

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

Fastening centres

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

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

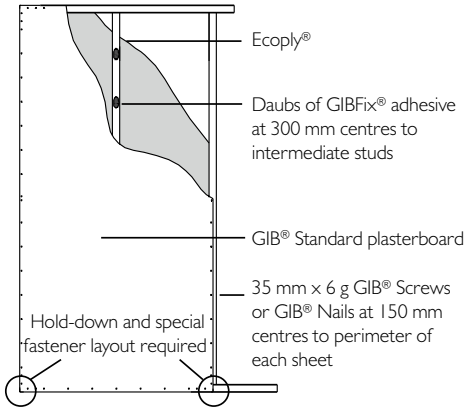


Table 13: Ecoply® Suitability For Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones including sea spray, as per section 4 of NZS3604):	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones1 B & C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone1 D (sea spray), as per section 4 of NZS3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification & Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B & C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in eexposure zone D, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

* Refer to Table 8, page 16 of Ecoply Specification & Installation Guide.

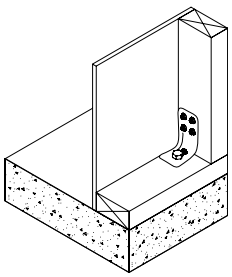
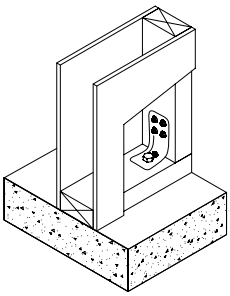
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3.5 GIB HANDIBRAC® – RECOMMENDED INSTALLATION METHOD

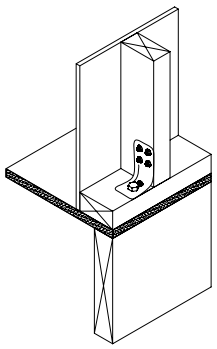
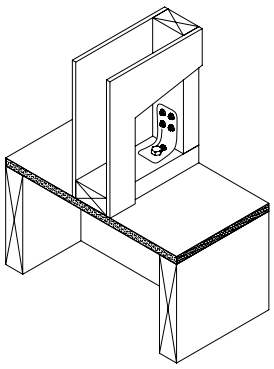
Developed in conjunction with MiTek®, the GIB HandiBrac® has been tested for use as the hold-down in all EP bracing elements.

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

Concrete Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate	Position GIB HandiBrac® at the stud/plate junction
Hold-down fastener requirements	
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or screw bolt supplied with the bracket	

Timber Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® in the centre of the perimeter joist or bearer	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block
Hold-down fastener requirements	
M12 x 150 mm galvanised coach screw	

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3.6 STRUCTURAL CEILING DIAPHRAGMS

Diaphragms are used to transfer lateral loads to braced walls and allow for greater spacing between bracing lines. Diaphragms do not have a BU rating themselves.

Plywood diaphragms are an acceptable solution as described in section 13 of NZS 3604 13.5.2 which allows for plywood not less than 6 mm thick and a minimum of three ply for:

(a) Diaphragms not steeper than 25 degrees to the horizontal and not exceeding 12 metres long under light or heavy roofs and;
(b) Diaphragms not steeper than 45 degrees to the horizontal and not exceeding 7.5 metres long under light or heavy roofs

Plywood ceiling diaphragms required to comply with NZS 3604 must be constructed as follows:

(a) The length of diaphragm shall not exceed twice its width measured between supporting walls
(b) The ceiling lining must consist of plywood over the entire area of the diaphragm
(c) Complete sheets with a minimum size of 1800 x 900 must be used
(d) Framing size and spacing must comply with NZS 3604
(e) Fastener size should comply with Table 7 of this guide. E.g. 40 mm x 2.5 mm flat head nails for 7 mm and 9 mm Ecoply
(f) Fastening is at 150 mm centres around the perimeter of each sheet and at 300 mm centres to intermediate framing
(g) Fixings are no closer than 10 mm from sheet edges
(h) Perimeter ceiling framing must be connected to wall framing by a perimeter 140 mm x 35 mm ribbon plate nailed to the top of the top plate or alternative such as a 0.55 mm thick steel angle or proprietary steel channel
(i) Sheets must be layed in a staggered pattern
(j) The basic shape of a ceiling diaphragm should be rectangular. Protrusions are permitted but cut-outs are not (see Figure 13.4 NZS 3604)

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7.0 REFERENCES AND SOURCES OF INFORMATION

- New Zealand Building Code (NZBC)
- CHH Woodproducts technical notes - downloadable from www.chhwoodproducts.co.nz/document-library
- NZS 3640:2003 "Chemical Preservation of Round and Sawn Timber"
- NZS 3602:2003 "Timber and Wood-based products for use in Buildings"
- NZS 3603:1993 "Timber Structures Standard"
- NZS 3604:2011 "Timber Framed Buildings"
- AS/NZS 1170:2011 "Structural design actions"
- AS/NZS 2269:2012 "Plywood Structural"
- AS/NZS 1604.3:2010 "Specification for Preservative Treatment, Part 3: Plywood"
- AS 1684:2010 "Residential Timber Framed Construction"
- US Product Standard PS1-95
- Acceptable Solution 'E2/AS1 – External Moisture'
- Acceptable Solution 'B2/AS1 – Durability'
- BRANZ Bulletin 345: Flat membrane roofs – design and installation
- BRANZ Bulletin 346: Flat membrane roofs – materials
- BRANZ Bulletin 289: Asphalt shingle roofing
- BRANZ Appraisals 307, 404, 411
- Shadowclad® Specification & Installation Guide for Cavity Construction
- Ecoply® Barrier Specification & Installation Guide
- Material Safety Data Sheets
  - MSDS Azole Treated Plywood, LVL & I-Joists
  - MSDS H3 CCA Treated Plywood & I-Joist
  - MSDS Untreated Plywood
- APA (www.buildabetterhome.org)
- EWPAA (www.ewp.asn.au)
- Product Technical Statement for Ecoply available online (www.chhwoodproducts.co.nz/product-technical-statements)
- EWPAA Technical Note - Plywood Roofing and Flooring: Installation and detail factors

Standards can be purchased online at www.standards.co.nz
Building Code Compliance Documents can be downloaded free of charge at www.dbh.govt.nz

8.0 LIMITATIONS

The information contained in this document is current as at September 2015 and is based on data available to CHH Woodproducts at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Ecoply products installed in accordance with this document or NZBC compliance documents.

This publication replaces all previous CHH Woodproducts design information and literature relating to Ecoply structural plywood products. CHH Woodproducts reserves the right to change the information contained in this document without prior notice.

It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit www.chhwoodproducts.co.nz to obtain current information.

CHH Woodproducts has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, to the maximum extent permitted by law, CHH Woodproducts assumes no responsibility or liability for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

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09/2011

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STUD TO TOP PLATE FIXING SCHEDULE
ALTERNATIVE TO TABLE 8.18 NZS 3604:2011

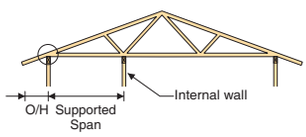
NOTE:

- ★ All fixings are designed to resist vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ Gable end wall top plate/stud connections where the adjacent rafter/truss is located within 1200mm of gable end wall with a maximum verge overhang of 750mm, requires fixing type A as shown below.
- ★ All fixings assume top plate thickness of 45mm maximum.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011.

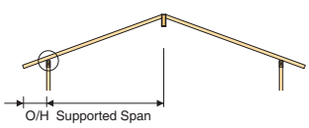
LOADED DIMENSION DEFINITION



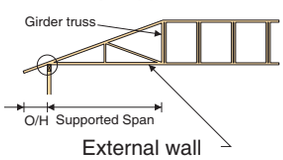
External wall
Standard truss



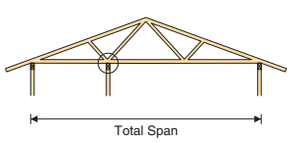
External wall
Internally supported truss



External wall
Rafter roof



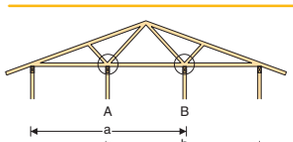
External wall
Jack truss



Internal wall
Internally supported truss
(overhang dimension does not apply)

EXTERNAL WALL
LOADED DIMENSION =
$\frac{\text{SUPPORTED SPAN}}{2}$ + O/H

INTERNAL WALL
LOADED DIMENSION =
$\frac{\text{TOTAL SPAN}}{2}$



Multiple internal walls
(overhang dimension does not apply)

MULTIPLE INTERNAL WALL
LOADED DIMENSION FOR
WALL A = $\frac{a}{2}$
WALL B = $\frac{b}{2}$

FIXING SELECTION CHART

(Suitable for walls supporting roof members at 600, 900 or 1200mm crs.)

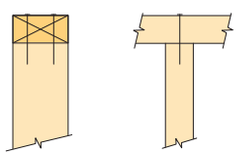
Wind Zones L, M, H, VH, EH, as per NZS 3604:2011

Loaded Dimension (m) Stud Centres			Light Roof Wind Zone					Heavy Roof Wind Zone				
300mm	400mm	600mm	L	M	H	VH	EH	L	M	H	VH	EH
3.0	2.3	1.5	A	A	B	B	B	A	A	B	B	B
4.0	3.0	2.0	A	A	B	B	B	A	A	B	B	B
5.0	3.8	2.5	A	B	B	B	B	A	A	B	B	B
6.0	4.5	3.0	A	B	B	B	B	A	A	B	B	B
7.0	5.3	3.5	A	B	B	B	B	A	A	B	B	B
8.0	6.0	4.0	A	B	B	B	B	A	A	B	B	B
9.0	6.8	4.5	B	B	B	B	B	A	A	B	B	B
10.0	7.5	5.0	B	B	B	B	B	A	A	B	B	B
11.0	8.3	5.5	B	B	B	B	B	A	A	B	B	B
12.0	9.0	6.0	B	B	B	B	B	A	A	B	B	B

FIXING OPTIONS

FIXING TYPE A
0.7 kN

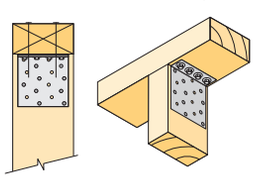
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



FIXING TYPE B
4.7 kN

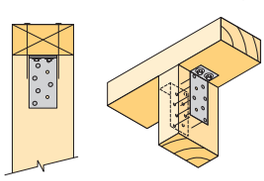
CHOOSE ANY OF THE 3 OPTIONS BELOW

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
LUMBERLOK
6kN Stud Anchor
(CPC80)

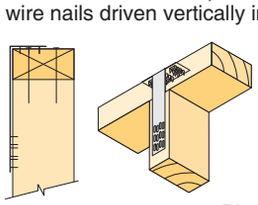
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
2 x LUMBERLOK
CPC40

Recommended for internal wall options to avoid lining issues

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
LUMBERLOK
Stud Strap
(one face only)

Note:
To calculate the number of B type fixings required, divide the wall length by the stud centres, add 1 to this figure and locate this number of fixings as evenly as possible along the wall length. This figure includes the start and end studs in each wall length.

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GANG-NAIL® LUMBERLOK® BOWMAC®

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TOP PLATE JOINTING

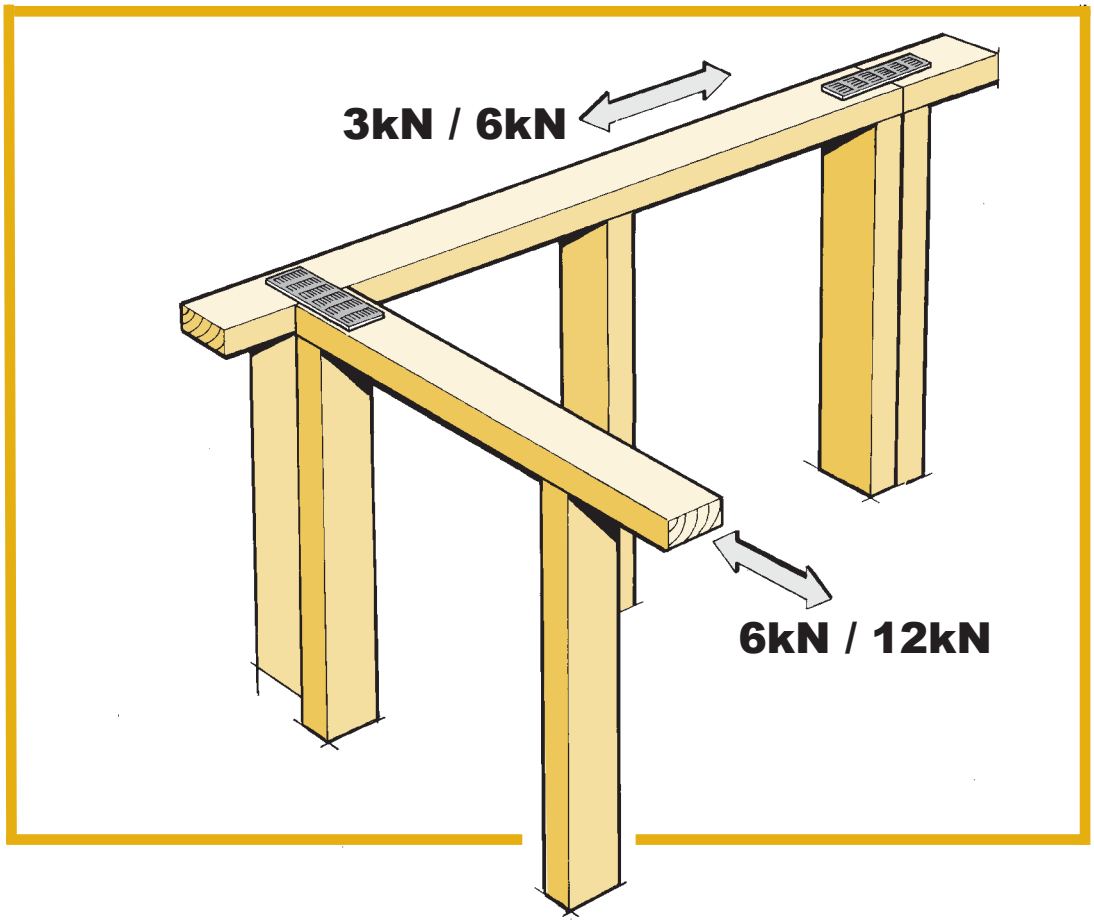
AS PER CLAUSE 8.7.3 NZS 3604:2011

Top Plates at Right Angles

Connection capacity	LUMBERLOK Connector
6 kN	Tylok 6T10 **OR** 2 x Strap Nails
12 kN	2 x Sheet Brace Straps fixed with 6 x LUMBERLOK Product Nails 30mm x 3.15 dia. per end per strap (24 nails total)

Top Plates in Line

Connection capacity	LUMBERLOK Connector
3 kN	Tylok 6T5 **OR** Strap Nail
6 kN	Tylok 6T10 **OR** 2 x Strap Nails



Available from leading Builders Supply Merchants throughout New Zealand

MiTek New Zealand Limited

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Fax: 09-274 7100

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GANG-NAIL® LUMBERLOK® BOWMAC®

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24 Nov 2020

BRANZ Appraised
Appraisal No.427 [2007]

BRANZ Appraisals

Technical Assessments of products for building and construction

BRANZ APPRAISAL No. 427 (2007)

Amended 31 January 2012

GIB AQUALINE® WET AREA SYSTEMS

Winstone Wallboards Limited
P O Box 12 256
Penrose
Auckland 1642

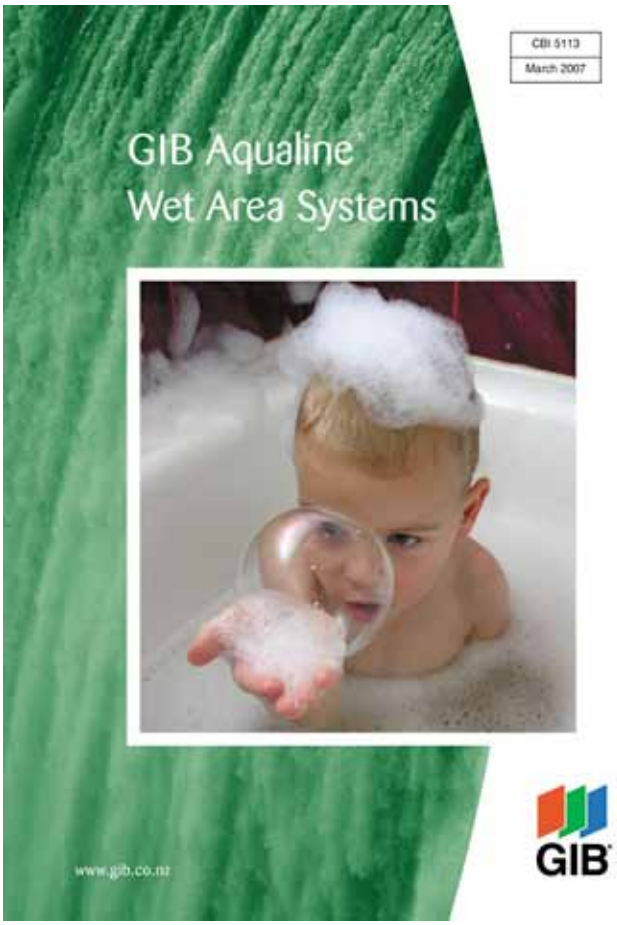
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Web: www.gib.co.nz
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BRANZ

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Product

1.1 GIB Aqualine® Wet Area Systems are for the interior lining of timber and steel frame walls and ceilings in wet areas such as bathrooms, laundries, kitchens and toilets where a water resistant lining material is desirable.
1.2 GIB Aqualine® Wet Area Systems are based on 10 mm and 13 mm thick GIB Aqualine® water resistant plasterboard.



Scope

2.1 GIB Aqualine® Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:
- on framed walls and ceilings within the scope limitations on NZS 3604; and,
- on timber and light gauge steel framed walls and ceiling subject to specific design; and,

2.2 GIB Aqualine® may also be used to substitute for some other GIB® Plasterboards in fire-rated, sound-rated and bracing-rated wall and floor/ceiling constructions.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the GIB Aqualine® Wet Area Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:
Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GIB Aqualine® Wet Area Systems meet the requirements for loads arising from self-weight, earthquake, wind and impact [i.e. B1.3.3 (a), (f), (h) and (j)]. See Paragraphs 8.1 - 8.3.
Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 9.1 - 9.5.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Clause C3 SPREAD OF FIRE: Performance C3.3.1, C3.3.2, and C3.3.5. GIB Aqualine® Wet Area Systems meet these requirements by providing passive fire and smoke protection.
Clause E3 INTERNAL MOISTURE: Performance E3.3.4, E3.3.5 and E3.3.6. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 13.1 - 13.3.
Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB Aqualine® Wet Area Systems meet this requirement and will not present a health hazard to people.
Clause G6 AIRBORNE AND IMPACT SOUND: Performance G6.3.1 and G6.3.2. GIB Aqualine® Wet Area Systems meet the requirements. See Paragraph 14.1.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 The GIB® plasterboards and accessories used in the GIB Aqualine® Wet Area System and supplied or specified by Winstone Wallboards Limited are as follows:

GIB Aqualine®

4.2 GIB Aqualine® is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. The sheets have a taper on the two long sheet edges. GIB Aqualine® is available in 10 mm and 13 mm sheet thicknesses, a sheet width of 1200 mm and in lengths of 2400 mm, 2700 mm, 3000 mm and 3600 mm. The maximum weights are 7.8 kg/m^2 and 10.2 kg/m^2 for 10 mm and 13 mm thick sheets respectively. GIB Aqualine® face paper is green in colour.

Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber:
  6g x 25 mm and 32 mm.
- GIB® Grabber® Self Tapping Drywall screws for fixing to light gauge steel:
  6g x 25 mm and 32 mm.
- GIB® Nails
  30 mm and 40 mm x 2.8 mm

Adhesive and Sealants

- GIBFix® One (Acrylic)
- GIBFix® All-Bond (Solvent)

GIB® Accessories and GIB® Jointing Compounds

- As specified in the GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature.

Finishes

4.3 Finishes such as tiling, flexible sheet vinyl, paints and wallpapers have not been assessed and are outside the scope of this Appraisal.

Handling and Storage

5.1 The best results are achieved when GIB Aqualine® is treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.
5.2 All accessories must be kept dry.

Technical Literature

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

Design Information

General

7.1 GIB Aqualine® provides a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, toilets, laundries and kitchens. The typical finishes are ceramic tiles and flexible sheet vinyl to walls and paint, and wallpaper to walls and ceilings.
7.2 GIB Aqualine® must not be used in the following situations:

- For bracing applications in shower areas or adjacent baths (See Paragraphs 7.4 and 8.2).
- In areas of high humidity (above 90% RH) or continually wet such as group showers, steam rooms, or swimming pools.
- Installed over a vapour barrier.
- Applied directly to masonry, concrete or solid plaster.
- Applied over other sheet lining materials.
- Used externally of the building envelope.
- Exposed to temperatures of 52ºC or greater for prolonged periods. (Refer to appliance and fitting manufacturer's for installation details.)

7.3 GIB Aqualine® may be substituted for some other GIB® Plasterboard products in specific GIB® Bracing Systems, GIB® Fire Rated Systems, GIB® Noise Control Systems and GIB Ultraline® PLUS Lining System.

Wet Areas

7.4 Wet areas are spaces where sanitary fixture and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:

1. Water Splash – These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
2. Shower Areas – These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.

7.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. Shower areas must additionally be waterproof. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finish, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

Intertenancy Walls – Wet Areas

7.6 Intertenancy drywall constructions that incorporate fire resistance and noise control must be protected from water splash. In shower areas GIB Aqualine® must not be substituted for other GIB® Plasterboards but must be an extra lining layer. Refer to the GIB Aqualine® Wet Area Systems Technical Literature.

Tiling

7.7 GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10 mm GIB Aqualine® up to 20kg/m^2
- 13 mm GIB Aqualine® up to 32kg/m^2.

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Note: Most ceramic and porcelain wall tiles weigh less than 20kg/m². For further information on tiling consult the BRANZ Good Practice Guide – Tiling.

Framing

7.8 Supporting framing must comprise one of the following subject to the minimum sizes, dwang centres and all other frame requirements of GIB Aqualine® Wet Area Systems Technical Literature:

- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170.
- Steel framing must be designed to withstand loads in accordance with AS/NZS 1170.

Structure

Bracing

8.1 GIB Aqualine® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. GIB Aqualine® can be used in place of GIB Braceline® in GIB® bracing elements 900 mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100 mm centres, using the GIB Braceline® corner fixing pattern.

8.2 GIB Aqualine® must not be used for bracing in shower areas or behind baths.

Impact Resistance

8.3 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications.

Durability

Serviceable Life

9.1 GIB Aqualine® has a serviceable life of at least 15 years as a fully protected shower or water splash lining. As a general wall and ceiling lining GIB Aqualine® will have a serviceable life in excess of 50 years. The ability of GIB Aqualine® to remain durable is dependent on being protected and remaining dry in service, and being maintained in accordance with this Appraisal.

Maintenance

9.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.

9.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the GIB Aqualine® substrate must be checked for defects and repaired or replaced, as required.

9.4 For flexible sheet vinyl, particular attention must be paid to joints especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.

9.5 Impact damage to GIB Aqualine® plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from Winstone Wallboards Ltd.

Outbreak of Fire

10.1 Separation or protection must be provided to GIB Aqualine® Wet Area Systems from heat sources such as stoves, heaters, flues and chimneys.

10.2 NZBC Acceptable Solution C/AS1, Part 9 and Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Spread of Fire

11.1 When 10 mm GIB Aqualine® is substituted into fire rated systems in place of 10 mm GIB Fyreline®, the FRR of that system will be maintained. Similarly, the FRR is maintained when 13 mm GIB Aqualine® is substituted for 13 mm GIB Fyreline®.

Flame Barrier

12.1 Where flame barriers are required by Acceptable Solution C/AS1 Table 6.3, GIB Aqualine® is a suitable material to provide a 10 minute flame barrier, provided all sheet joints are formed over framing, or backblocked with GIB® plasterboard.

Internal Moisture

13.1 When installed in accordance with this Appraisal, GIB Aqualine® Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.

13.2 The construction methods meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.

13.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.

Airborne and Impact Sound

14.1 When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur.

Installation Information

Installation Skill Level Requirement

15.1 Installation of GIB Aqualine® Wet Area Systems can be carried out by any competent building contractor.

General

16.1 GIB Aqualine® Wet Area Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Cutting

16.2 GIB Aqualine® is easily cut by scoring the face paper with a sharp short-bladed trimming knife, and then snapping the plasterboard away from the cut face and cutting the back paper or by sawing. Use of a metal straightedge facilitates clean straight cuts. Cut edges can be tidied up by using a knife. Paper dags should be removed.

Health and Safety

16.3 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.

Framing

16.4 To achieve an acceptable decorative finish, GIB Aqualine® Wet Area Systems and the GIB® Site Guide specifies that walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallbaords Limited recommend a moisture content of 8–12% where buildings are to be air conditioned or centrally heated.

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Fixing Sheets

Non-Tiled Areas

17.1 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws or GIB® Nails at 300 mm centres around the perimeter of the sheet, and with GIBFix® adhesive on all intermediate studs and dwangs. Adhesive must not be used under fasteners. A 5-10 mm gap must be left between the floor and the bottom of the sheet.

Tiled Areas

17.2 Control joints must be provided at maximum 4 m centres.
Internal corners in shower areas must be reinforced with a minimum 32 x 32 x 0.55 mm galvanised metal angle prior to lining the walls.
17.3 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 100 mm centres to perimeter of wall and to all intermediate studs. Adhesive must not be used in place of screws.

Ceilings

17.4 Supports of timber or steel battens or ceiling joists must be 450 centres for 10 mm GIB Aqualine®, or 600 mm centres for 13 mm GIB Aqualine®.
17.5 GIB Aqualine® sheets must be fixed with GIB® Grabber® screws at 600 mm centres around perimeter and at 200 mm centre along supports. Alternatively, sheets are screw fixed at 600 mm centres along the supports and GIBFix® adhesive fixed at 200 mm centre between.

Penetrations and Sealants

18.1 All cut-outs for pipe penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the pipe.
18.2 A bead of silicone sealant must be placed to the full thickness of the GIB Aqualine® sheet around all pipe penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.
18.3 In tiled areas, a bead of silicone sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

Jointing and Finishing

19.1 Jointing must be carried out in accordance with GIB® Site Guide Technical Literature.
19.2 Tiled shower areas must incorporate a waterproofing membrane over GIB Aqualine®. Waterproofing membranes are outside the scope of this Appraisal and must otherwise be specified and approved.

Investigations

20.1 The GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.
20.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.
20.3 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.
20.4 Winstone Wallboards Limited GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, hard and soft body impact tests.

Quality

21.1 Winstone Wallboards Limited's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.
The quality management systems of Winstone Wallboards Limited have been assessed and registered by TELARC as meeting the requirements of ISO 9001, Registration No. 581.
Winstone Wallboards Limited is responsible for the quality of the product supplied.
21.2 The quality of the application and finish on site is the responsibility of the installation, stopping and finishing contractors.
21.3 Designers are responsible for the design of buildings.
21.4 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Limited.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2588: 1998 Gypsum Plasterboard.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- BRANZ Good Practice Guide - Tiling, March 2004.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.

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BRANZ

In the opinion of BRANZ, GIB Aqualine® Wet Area Systems are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to the Client, Winstone Wallboards Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

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

For BRANZ

P Robertson
Chief Executive

Date of issue: 4 April 2007

Amendment No. 1, dated 29 April 2010.
This Appraisal has been amended to include a new adhesive, GIBFix® One, and to update reference to AS/NZS 1170.
Amendment No. 2, dated 31 January 2012.
This Appraisal has been amended to update reference to NZS 3604: 2011.

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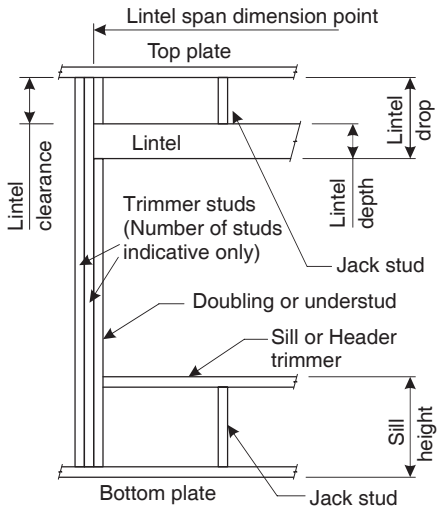
LINTEL FIXING SCHEDULE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12
NZS 3604:2011

NOTE:

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

DEFINITIONS



Lintel Supporting Girder Trusses						
Roof Tributary Area	Light Roof			Heavy Roof		
	Wind Zone			Wind Zone		
	L, M, H	VH	EH	L, M, H	VH	EH
8.6m²	G	G	H	G	G	H
11.6m²	G	H	H	G	G	H
12.1m²	G	H	H	G	H	H
15.3m²	H	H	-	G	H	H
19.1m²	H	-	-	G	H	-
20.9m²	H	-	-	H	H	-
21.8m²	H	-	-	H	-	-
34.3m²	-	-	-	H	-	-

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

Lintel Span (m)	Loaded Dimension (m) (See Fig. 1.3 NZS 3604:2011)	Light Roof Wind Zone					Heavy Roof Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	G	G	E	E	F	F	G
1.2	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	E	F	F	F	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	F	F	G	G	H	E	E	F	G	G
1.5	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	F	F	F	G	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	F	F	G	G	H	E	E	F	G	G
	6.0	F	F	G	H	H	E	E	F	G	H
2.0	2.0	E	F	F	F	G	E	E	F	F	F
	3.0	E	F	F	G	G	E	E	F	F	G
	4.0	F	F	G	G	H	E	E	F	G	G
	5.0	F	F	G	H	H	E	E	F	G	H
	6.0	F	G	G	H	H	E	F	G	H	H
2.4	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	G	H	E	E	F	G	G
	4.0	F	F	G	H	H	E	E	F	G	H
	5.0	F	G	G	H	H	E	F	G	H	H
	6.0	F	G	H	H	-	E	F	G	H	H
3.0	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	H	H	E	E	F	G	H
	4.0	F	G	G	H	H	E	F	G	H	H
	5.0	F	G	H	H	-	E	F	G	H	H
	6.0	F	G	H	-	-	E	F	G	H	-
3.6	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	F	G	H	H	E	F	G	G	H
	4.0	F	G	H	H	-	E	F	G	H	H
	5.0	F	G	H	-	-	E	F	G	H	-
	6.0	G	H	H	-	-	E	F	H	-	-
4.2	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	G	H	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	H	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
4.5	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.4	F	G	H	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
4.8	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.2	F	G	H	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	H	H	E	F	G	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.5	F	G	H	-	-	E	F	G	H	-
	4.0	G	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-
5.4	2.0	F	F	G	H	H	E	F	G	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-

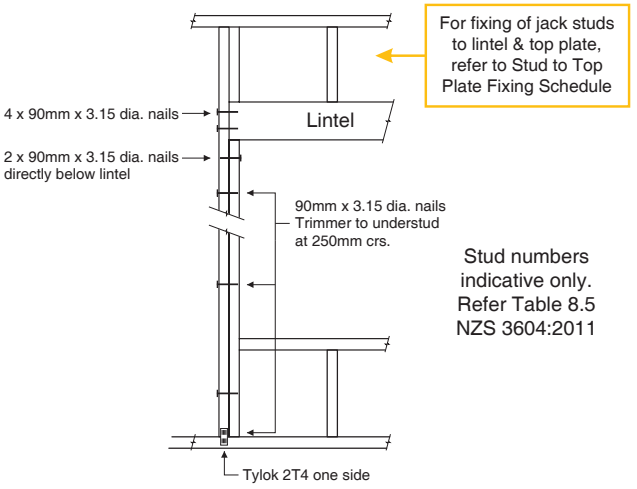
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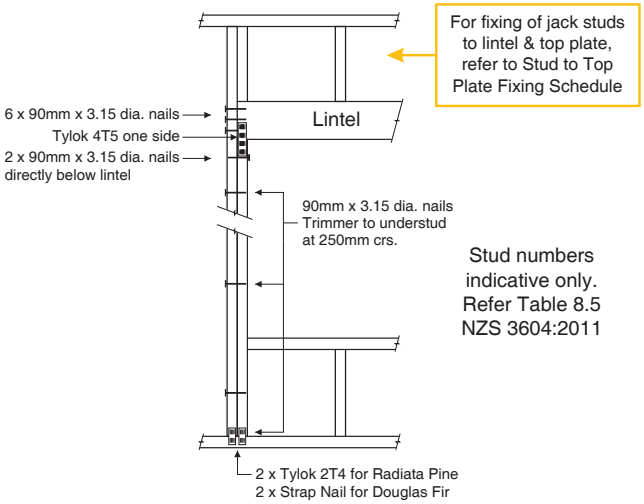
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LINTEL FIXING OPTIONS

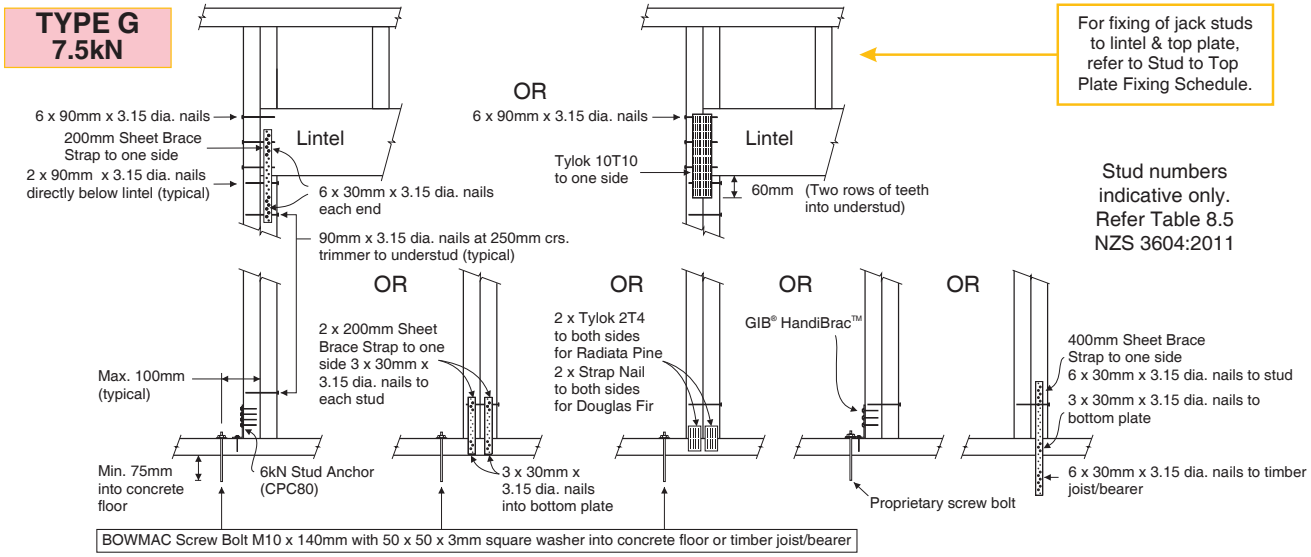
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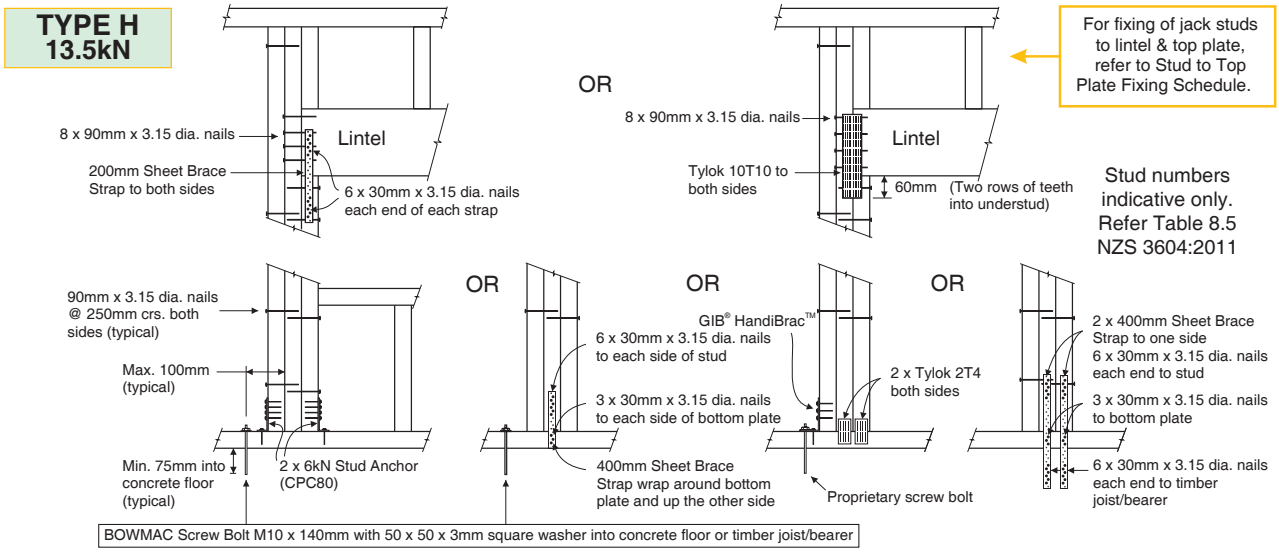
TYPE F 4.0kN



TYPE G 7.5kN



TYPE H 13.5kN



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GABLE END RAKING VERGE

OVERHANG OPTIONS



★ Covers raking verge using standard purlin overhang options.
★ Covers up to 750mm overhang using standard verge outriggers.
★ Covers up to 1200mm overhang using verge outrigger/purlin combination.

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OVERHANG OPTIONS

- **All gable end loading parameters are based on the design considerations used in NZS 3604:2011 and cover heavy roof weight, extra high wind load and snow load Sg of up to 1.0kPa.**
- **All live load considerations as per AS/NZS 1170.**
- **All timber to be minimum grade SG8 as defined in NZS 3604:2011.**

CANTILEVER PURLIN OPTION

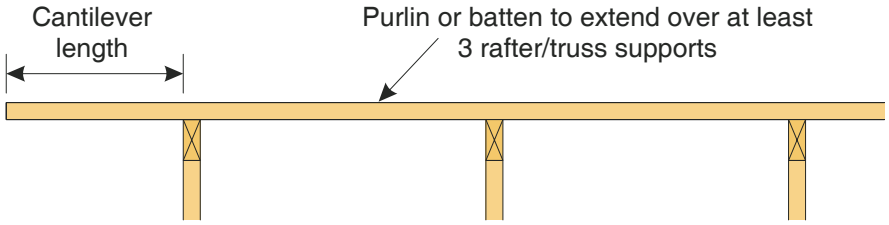


TABLE 1

PURLIN SIZE & ORIENTATION	MAX. CANTILEVER LENGTH (mm)	PURLIN CENTRES (mm)
45x45	200	400
70x45	300	900
90x45	450	900

CANTILEVER OUTRIGGER OPTION

(Note: Maximum sidewall overhang of 750mm)
(See details on next pages)

TABLE 2

MAX. CANTILEVER LENGTH 750mm	OUTRIGGER SIZE & ORIENTATION	MAX. CANTILEVER LENGTH (mm)	OUTRIGGER CENTRES (mm)
	70x45	750	600
		600	900
	90x45	750	900
		600	1200
	90x45	750	400
		600	600

CANTILEVER OUTRIGGER/PURLIN COMBINATION OPTION

(Note: Maximum sidewall overhang of 1200mm)
(See details on next pages)

TABLE 3

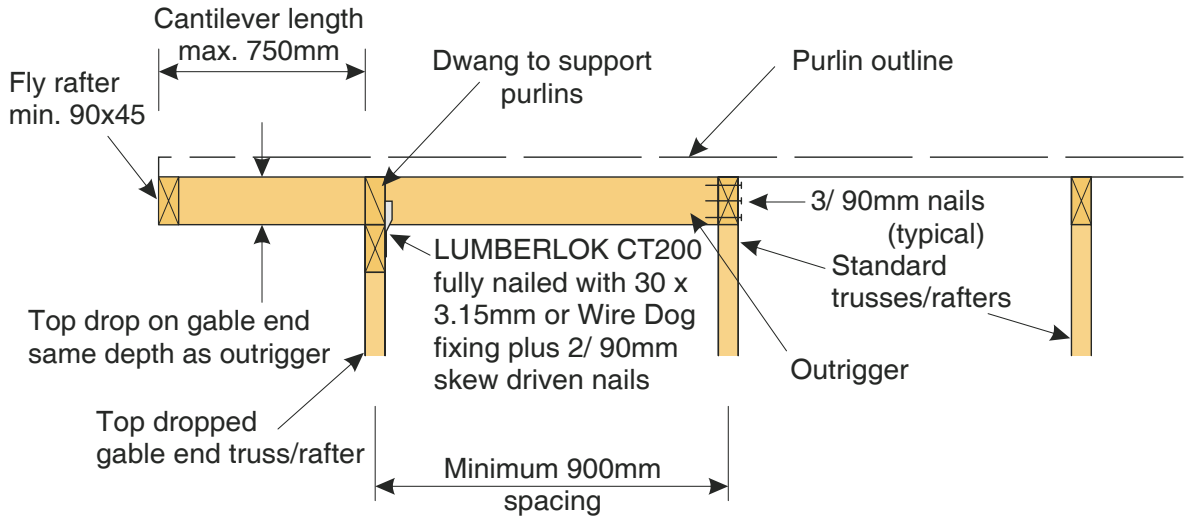
MAX. CANTILEVER LENGTH 1200mm	OUTRIGGER SIZE & ORIENTATION	MAX. CANTILEVER LENGTH (mm)	OUTRIGGER CENTRES (mm)
	45x45 Purlin 90x45 Outrigger	1200	450
	70x45 Purlin 90x45 Outrigger	1200	700
	90x45 Purlin 90x45 Outrigger	1200	900

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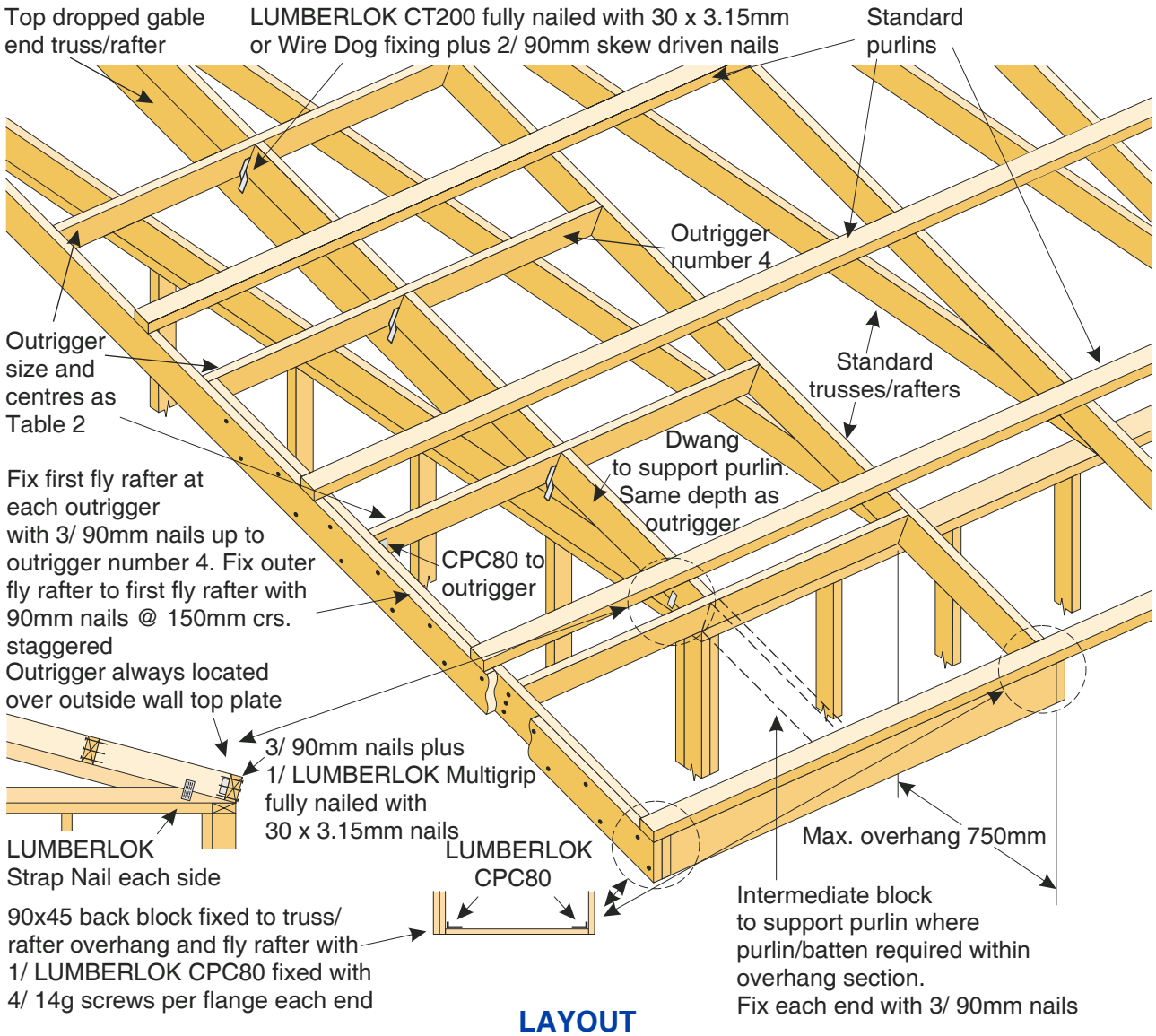
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CONSTRUCTION DETAILS FOR CANTILEVER OUTRIGGER OPTION

(SPANS & CENTRES AS PER TABLE 2)



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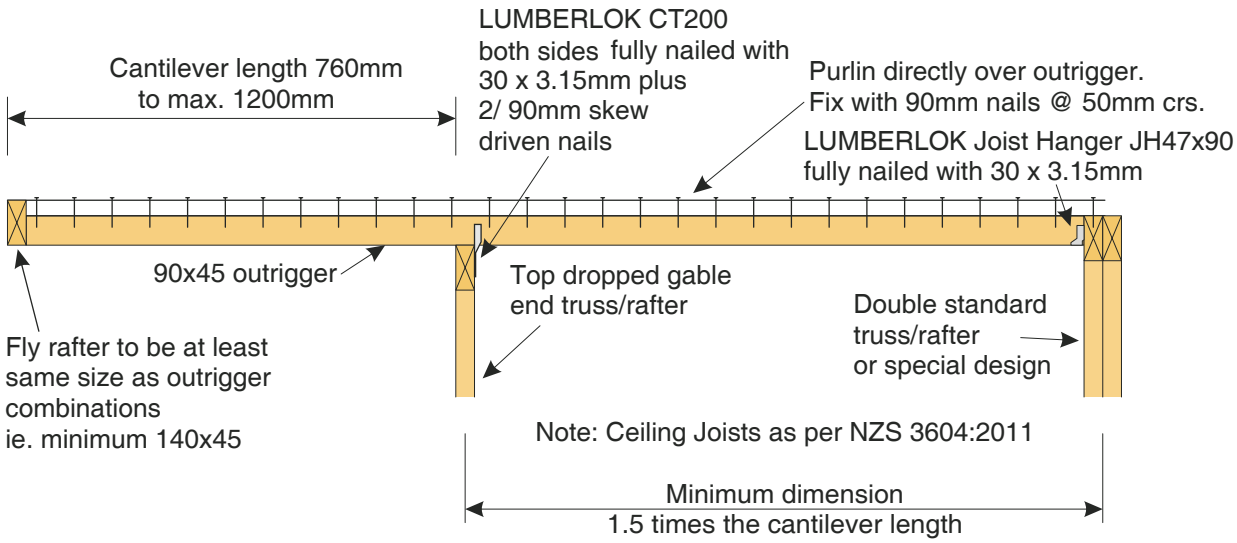
LAYOUT

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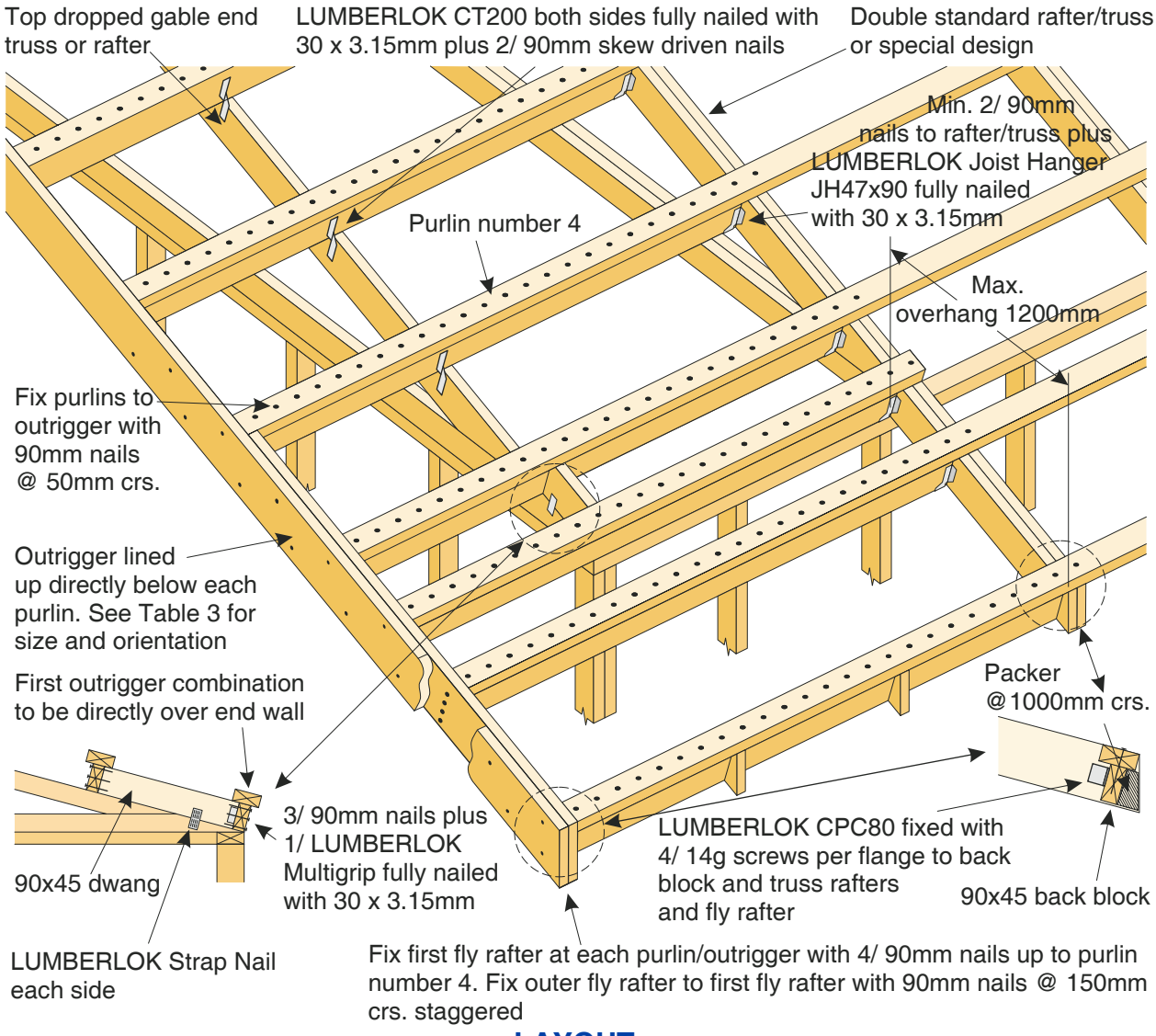
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CONSTRUCTION DETAILS FOR OUTRIGGER/PURLIN COMBINATION

(SPANS & CENTRES AS PER TABLE 3)



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GABLE END BRACING

OVER ROOF SECTION OF END WALLS



- ★ Covers bracing of the roof section on gable end construction.
- ★ Includes bracing on extra high gables.
- ★ All timber to be minimum grade SG8 as defined in NZS 3604:2011 apart from gable end webs which are either SG6 or SG8 (see Tables 1A & 1B).
- ★ Tables cover gable end truss installed as single component 45mm thick, double component 90mm thick, 45x70mm or 45x90mm webs on flat.
- ★ Design assumes restraints are provided at the ceiling and roof lines.
- ★ Bracing covers loading conditions as per NZS 3604:2011 up to Extra High wind and includes full height brick veneer gables.

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TABLE 1A - STRONGBACK LOCATION FOR WEBS @ 600MM CRS.

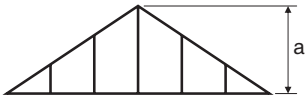
WIND ZONE	MAXIMUM STRONGBACK HEIGHT (h)											
	70x45 Web		90x45 Web		Double Component Gable End Webs 2/ 70x45		Double Component Gable End Webs 2/ 90x45		45x70 on flat		45x90 on flat	
	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8
LOW	1800	2000	2000	2200	2300	2550	2500	2750	2450	2700	3150	3450
MEDIUM	1650	1800	1800	2000	2100	2300	2250	2500	2150	2450	2800	3150
HIGH	1450	1600	1600	1750	1850	2050	2000	2200	1800	2150	2350	2800
VERY HIGH	1300	1500	1450	1600	1700	1850	1850	2050	1600	1900	2050	2450
EXTRA HIGH	1150	1350	1300	1500	1600*	1750*	1750*	1900*	1450	1700	1850*	2200*

TABLE 1B - STRONGBACK LOCATION FOR WEBS @ 400MM CRS.

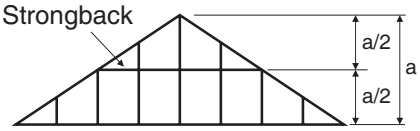
WIND ZONE	MAXIMUM STRONGBACK HEIGHT (h)											
	70x45 Web		90x45 Web		Double Component Gable End Webs 2/ 70x45		Double Component Gable End Webs 2/ 90x45		45x70 on flat		45x90 on flat	
	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8	SG6	SG8
LOW	2100	2300	2250	2500	2650	2900	2850	3150	2800	3100	3600	3900
MEDIUM	1900	2100	2050	2250	2400	2650	2600	2850	2550	2800	3300	3600
HIGH	1700	1850	1850	2000	2100	2350	2300	2550	2250	2500	2850	3200
VERY HIGH	1550	1700	1700	1850	1950	2150	2100	2350	1950	2300	2550	2950
EXTRA HIGH	1400	1600	1550	1750	1850*	2000*	2000*	2200*	1800	2100	2300*	2700*

*Use these values for full height brick veneer attached to gable end.
Please note that the maximum height of brick veneer on a gable end wall is 5.5m.

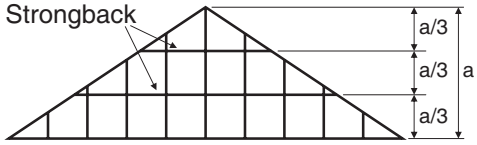
SELECTION PROCESS



- Where (a) is less than or equal to (h) - no strongback required.

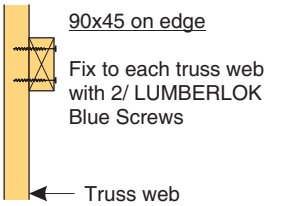


- Where (a) is greater than (h) but less than 2(h) - lower strongback is required.
- Locate the strongback at height of (a/2).

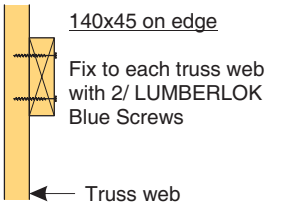


- Where (a) is greater than 2(h) but less than 3(h) - lower and upper strongbacks are required.
- Locate strongbacks at height increments of (a/3).

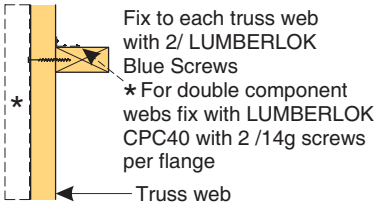
STRONGBACK OPTIONS



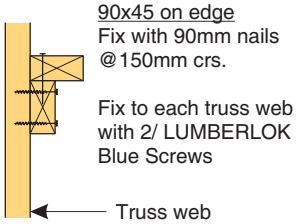
OPTION 1



OPTION 2



OPTION 3



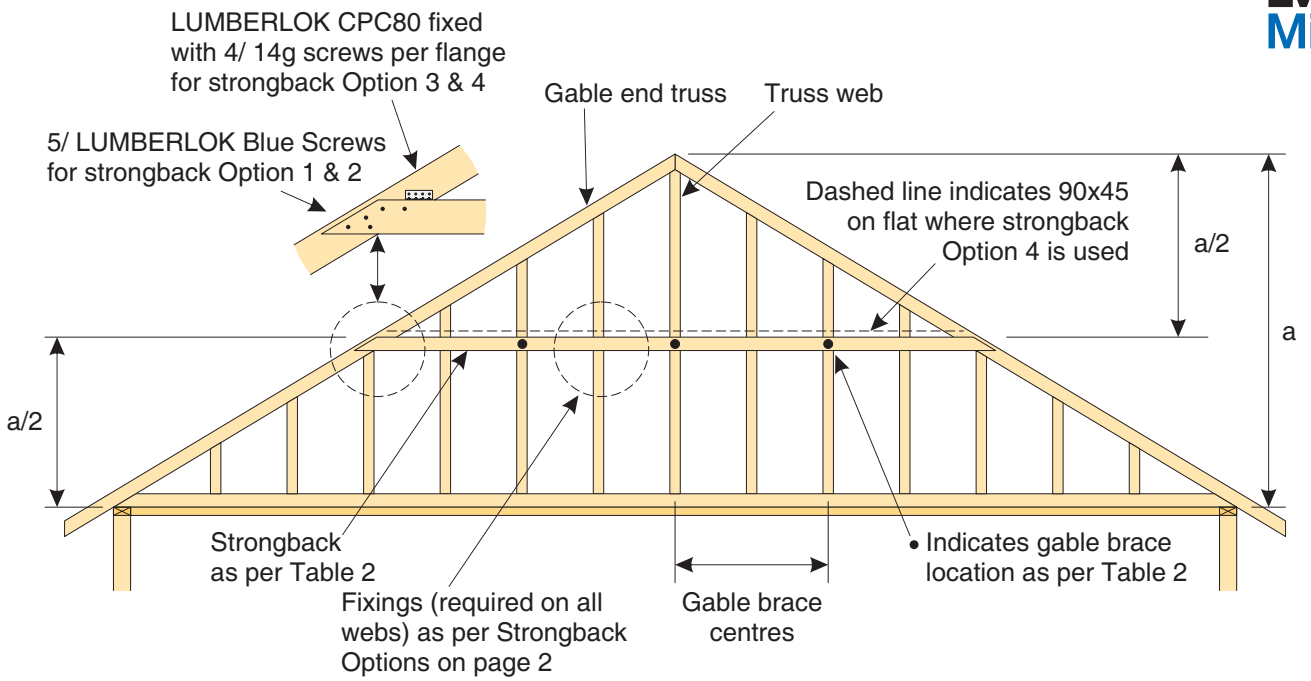
OPTION 4

TABLE 2 - STRONGBACK SPAN AND GABLE BRACE LOCATION

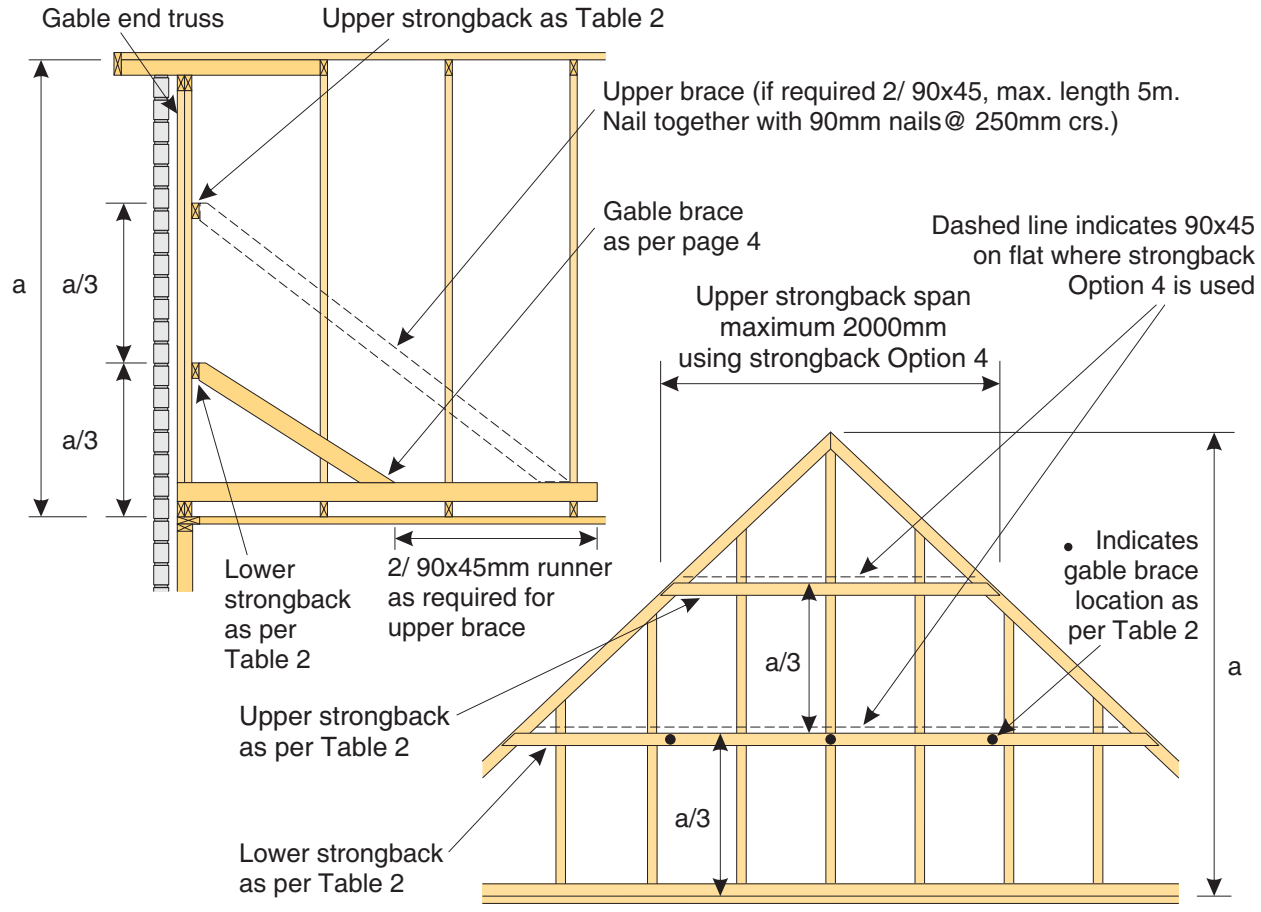
OPTION 1	OPTION 2	OPTION 3	OPTION 4
90x45 on edge	140x45 on edge	90x45 on flat	90x45 on flat plus 90x45 on edge
Max. span and/or gable brace location 1200mm	Max. span and/or gable brace location 1400mm	Max. span and/or gable brace location 1600mm	Max. span and/or gable brace location 2000mm

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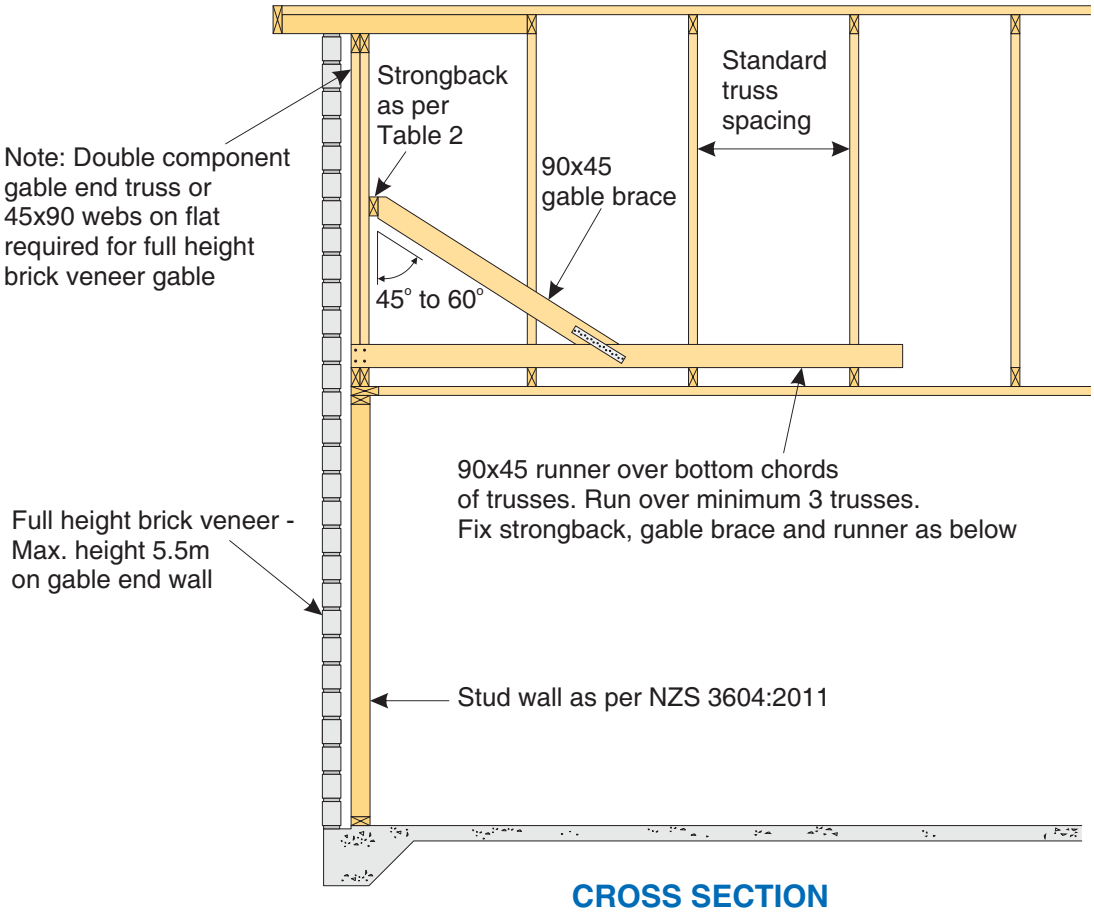
SINGLE STRONGBACK DETAILS



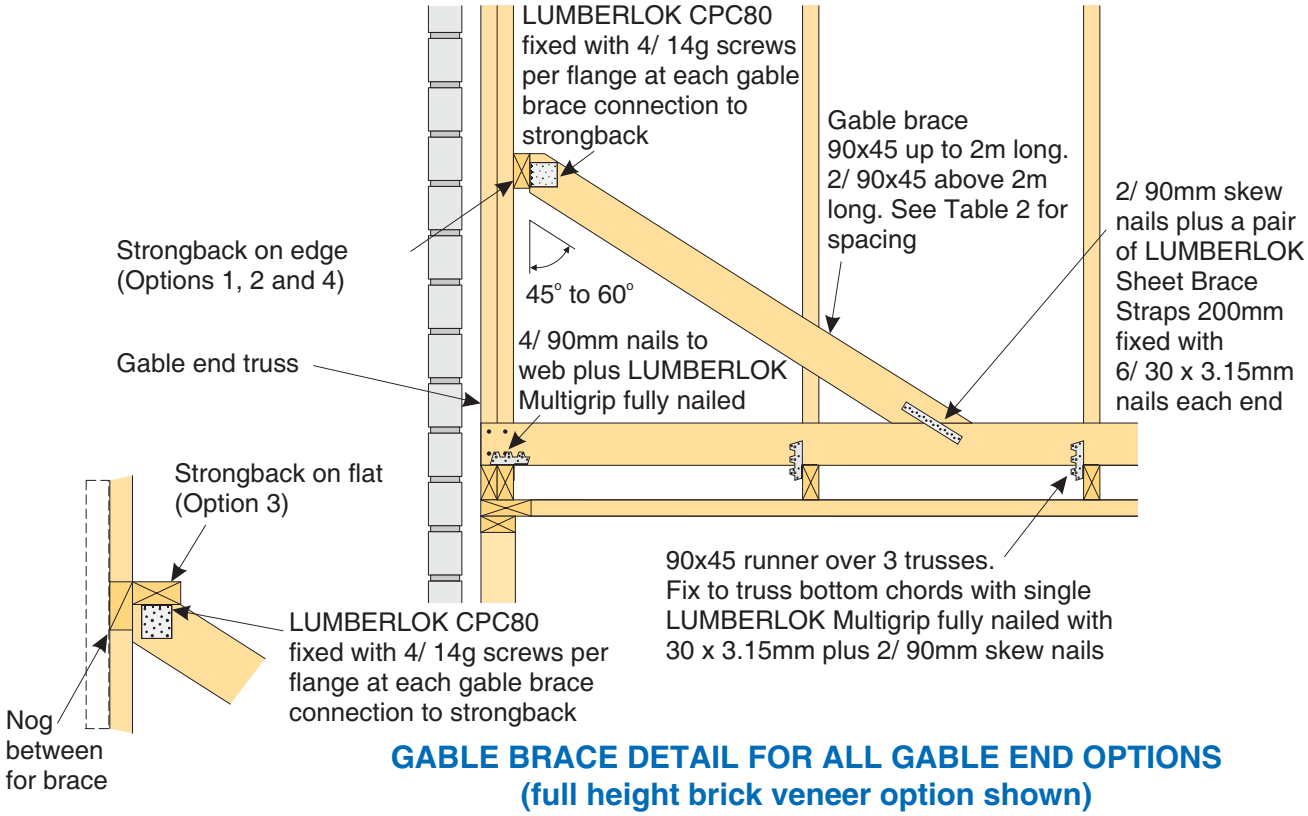
DOUBLE STRONGBACK DETAILS FOR ALL GABLE END OPTIONS (full height brick veneer option shown)

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CROSS SECTION
(full height brick veneer option shown)



GABLE BRACE DETAIL FOR ALL GABLE END OPTIONS
(full height brick veneer option shown)

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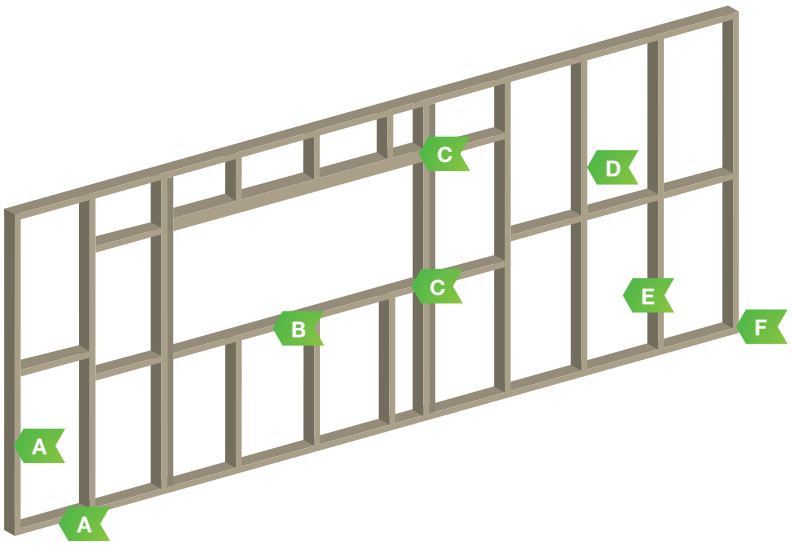
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triboard engineered panel

strand board engineered panel

BRACING DETAILS

Framing as per NZS 3604



- **A** Edge and end nail spacing as per table below
- **B** Edge nail spacing around opening and along adjacent nogs
- **C** 6kN strap
- **D** Stud spacing at maximum 600mm centres
- **E** Board on one face (not fully shown for clarity)
- **F** 6 kN tiedown to floor at ends of wall

type of board	minimum wall length (mm)	nail* spacing (mm)	tiedowns (kN)	BU/m wind	BU/m e'quake
9mm Strandboard	600	150	6	100	115
10mm Triboard	600	150	6	105	125
12mm Strandboard	600	150	6	105	125
15mm Triboard	600	150	6	115	130
15mm Triboard	1200	75	12[2]	150	165

Notes

1. Fixing using gun fired brads is approved. Wind bracing rating is 55 BU/m.
2. 12kN tie down only to be used into concrete floor.
3. Nails* for fixing board to wall framing to be 40 x 2.8mm diameter galvanised flat head nails.
   *Gun fired nails (FRH) or screws (8ga) of equal or longer lengths are acceptable as an alternative.
4. Intermediate nogs are not necessary for 15mm Triboard.
5. The bracing units shown are for board fixed to only one side of the framing.
6. The bracing units shown are for a 2.4m high wall. For walls more than 2.4m high, the bracing units need to be reduced on a pro rata basis as per NZS 3604, e.g. for a 3m high wall, the bracing units (wind) for 9mm strandboard are $^{2.4}/_{3}$ x 100 = 80.
7. Fixing to intermediate framing is at 300mm centres.
8. Elastomeric wood panel adhesive in dabs at 300mm centres required. (Avoid glue and fixing in same location).

The above information has been developed from tests carried out in the Timber Laboratory of SCION, Rotorua over the period 31 October to 26 November 2008 and 20 May 2014. The testing was carried out in accordance with the P21 test method and the results were evaluated on 23 February 2012 and 20 May 2014 as per the P21 2010 test method.

JNL
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Date of issue 22 July 2019

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JUKEN NEW ZEALAND LTD

Triboard and Strandboard Building and Construction Product Information

APPLICATIONS

- **Wall and Ceiling Linings**
- **Partitions**
- **Flooring Overlays**

LIMITATIONS

Triboard and Strandboard:

- Are intended for dry interior use only.
- Care should be taken when using a flush plaster stopped jointing system that is subsequently wallpapered or painted. Fixing and Stopping should not occur until the board has conditioned to the local environment – see Design Considerations below (exceptions to this apply to proprietary glued drywall partition systems).
- Ceiling lining installations, exposed on the upper face to elevated temperatures and humid conditions in roof spaces, must have insulation placed directly on the upper surface and have adequate provision for air changes within the roof space.
- Panels laid over exposed rafters/purlins, must be sealed on all edges and both faces with a protective coating after conditioning and prior to installation, in order to reduce moisture and humidity uptake during construction and building occupation.
- Must be paint or clear polyurethane finished, or overlaid with vinyl or similar, prior to building occupancy.
- The application of water based spray-on textured coatings must not be used.

Triboard and Strandboard **must not** be used for:

- Exterior use (exposed to the weather)
- Areas subjected to repeated water spillage or constant dampness (unless protected by a suitable impervious coating system)
- Marine use.
- Shower linings.
- Saunas.
- Window reveals.
- Exterior door panels.

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Product Care and Handling

- Due to the uptake of airborne moisture, permanent panel distortion may occur if Triboard or Strandboard is placed in close proximity to timber framework with a moisture content exceeding 18%.

- Adequate pre-conditioning prior to installation (ideally 48 hours) and precise following of installation instructions is essential for satisfactory results, especially during wet seasons and high humidity.

- Attention to site storage, pre-conditioning at the point of installation and provision of specified joint clearances will reduce the effects of moisture up-take after installation and help to accommodate any panel movement.

Storage

- Correct storage procedures will eliminate sagging and permanent distortion of panels.

- Panels must be stored away from heat and direct sunlight.

- Panels must be flat stacked on at least 3 evenly spaced level bearers clear of dry ground, or a dry concrete floor.

- Bearers must be of uniform thickness and must extend across the full width of the pack.

- If panels must be stored outside, they should be protected from the weather. A breather type cover must be supported clear of the top and sides of the panels using battens to allow air to circulate freely.

- Plastic strapping should be cut from packs as soon as practicable to avoid edge indentations.

Stock Rotation

- The uptake of atmospheric moisture into board edges, which can cause edge peaking, can be minimised by regular stock rotation.

COMPOSITION

- Strandboard and Triboard are composed of engineered strands orientated in such a way as to maximise strength and durability. Triboard has an additional MDF fibre surface.

Identification

- Board size, classification and production batch number are denoted on the label on the side of the pack.

Formaldehyde

- Triboard and Strandboard are manufactured to meet or exceed the E zero formaldehyde potential requirement in accordance with AS/NZS 1859.1:2004 and AS/NZS 1859.2:2004

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- During construction, and after close-in, emission levels can be further controlled by room ventilation and surface sealing.

- See the Triboard and Strandboard Material Safety Data Sheet (MSDS) for more detailed information.

DESIGN CONSIDERATIONS

Moisture

- Uncoated Triboard or Strandboard must not be exposed to water or high humidity situations such as shower enclosures, steam rooms and saunas (See Limitations). As with most wood based products, Triboard and Strandboard are subject to minor dimensional variations due to changes in relative humidity, resulting in expansion and shrinkage.

- Both Triboard and Strandboard are manufactured with adhesives which give improved durability and stability in areas of high surface humidity, but they are **not water proof** and **must not** be allowed to come into direct or prolonged contact with water. The panels must be finished with a protective coating system to prevent moisture penetration.

- If the moisture content of the Triboard or Strandboard panel is above 18% it is considered to be wet and the long-term durability of the panel cannot be guaranteed. Most coating systems such as polyurethane require the panel moisture content to be below 15% at time of coating for best results.

Heat

- Precautions must be taken to ensure that Triboard and Strandboard are kept well clear of nearby heat sources, such as free standing fireplaces, space heaters, ovens, cooking elements, etc. The structural life of Triboard and Strandboard may be impaired if the surface temperature exceeds 50ºC. Manufacturers of heat appliances must be consulted to ascertain the clearances or protection required to ensure 50ºC is not exceeded.

Fire Properties

- Triboard and Strandboard have a Group Number Classification of 3, as determined in accordance with the New Zealand Building Code Verification Method C/VM2, Appendix A.

  Note: This classification applies to uncoated Triboard and Strandboard and may alter with the application of any finish applied to the surface.

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INSTALLATION

Framework Setout

- Allow for studs, purlins, rafters, beams, etc. to accommodate a 2 to 3 mm expansion gap per 1.2m sheet at panel joints especially where large areas or long walls are to be covered. For negative detailing, allow an 8mm gap on a pre-painted stud.

- Alternatively, provide an 8 to 10mm clearance between sheet edges and fixed members such as beams and columns etc.

Exposed Beam Ceilings

- Pre-condition all panels, and then prime all surfaces and edges prior to fixing ceiling sheets.

- Weather protection is essential to avoid exposure to inclement conditions during the construction period.

- Where practicable, install exposed interior ceiling linings progressively with the exterior roof covering (the preferred method of installation is to fix after the roof is in place).

- Skillion roofs require special care. Maintain an air gap between the top of the insulation and underside of the roofing underlay, from the soffit to the ridge. The gap allows air circulation, to regulate humidity and temperature.

Flooring Overlays

- When up-grading existing wooden or concrete floors, Strandboard may be used as an overlay and clear finished, or used under carpet or vinyl.

Direct Overlay - Preparation

- The existing floor should be sanded level.

- Using a staggered sheet layout pattern, pre-conditioned panels must be fixed combining nails or screws plus a full spread adhesive application. Full details can be obtained by contacting Juken New Zealand Ltd.

- Refer also to the JNL Strandboard brochure for additional information.

Fixing

- Installation must not begin until the building is closed in and weatherproof.

- When using 3600mm x 1200mm or 2400mm x 1200mm panels, allow a 3mm edge clearance.

- A minimum 3mm panel edge clearance is recommended for **all** sheet sizes during wet winter months or in extremely humid conditions.

- Board surfaces should be primed or clear sealed as soon as practical after fixing.

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- Panels can be fixed to timber or steel framing. When fixing to steel framing, 12 gauge, self-tapping screws can be used.

- The moisture content of any timber framing must not exceed 18% at the time of installing the panels. Excess moisture content will result in timber shrinkage and may lead to possible "popping" of nail or screw heads.

Suggested Fixing Schedule

Panel Thickness (mm)	Nail Size (mm)	Screw length (mm)	Fixing Centres Edges (mm)	Fixing Centres Intermediate (mm)	From Panel Edge (mm)
9/10	40 x 2.5	30	150	200	10
12	45 x 2.5	30	150	200	10
15	45 x 2.5	40	150	200	10

Note: screws are 8 gauge for Timber framing.

The use of Power Driven brads and elastomeric adhesive is an alternative fixing method.

- For fixing of panels that are to be used as bracing panels, refer to separate Bracing Details sheet available from Juken New Zealand Ltd website www.jnl.co.nz/product/triboard
- For Information on Triboard TGV Panels, see separate "Triboard TGV Lining Panel FAQs" available from Juken New Zealand Ltd website www.jnl.co.nz/product/triboard-tgv

FINISHING

Stopping

- Fill fastening holes with non-shrinking plaster based stopping systems, or a solvent-based wood dough with tinting as required for clear-coated applications.

Clear Finishing

- For flooring overlays, polyurethane coatings should provide protection in normal residential applications for up to five years if properly applied and maintained. This does not apply to areas such as laundries, bathrooms, shower, changing rooms and toilets. The defined wet areas must be covered by an impervious surface finish system.

Paint Finishing

- Triboard and Strandboard can be finished using either solvent based or water based paints. In all instances, the paint manufacturer's recommendations should be followed.

- Acrylic primer coatings will provide a more textured surface than solvent based paint systems.

Flame Retardant Paint Coatings

- Proprietary flame retardant coating systems (intumescent coatings) are available. Some of these are as follows:

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Resene	Fireguard
Firepro	Firepro C646, Flamecoat Interior Acrylic Paint.
Benjamin Moore	Flame Control

HEALTH AND SAFETY

- Material Safety Data Sheets for all Juken New Zealand Ltd Triboard and Strandboard products are available and should be consulted before using these products. Please contact Juken New Zealand Ltd or www.jnl.co.nz.

WORKING CHARACTERISTICS

Machining

- Triboard and Strandboard can be easily machined, grooved and routed in any direction. Triboard and Strandboard are easily cut with a fine toothed hand saw or circular saw adjusted to protrude just through the board surface. Tungsten tipped machine tools are recommended for volume production. To avoid breakouts apply only nominal pressure when using power tools.

  Note: For best results always ensure that hand and machine tools are sharp, and always use approved eye protection when machining these products.

TECHNICAL SUPPORT

For advice on all technical matters please contact Juken New Zealand Ltd.

Juken New Zealand Ltd reserves the right to revise any information contained in this document without notice.

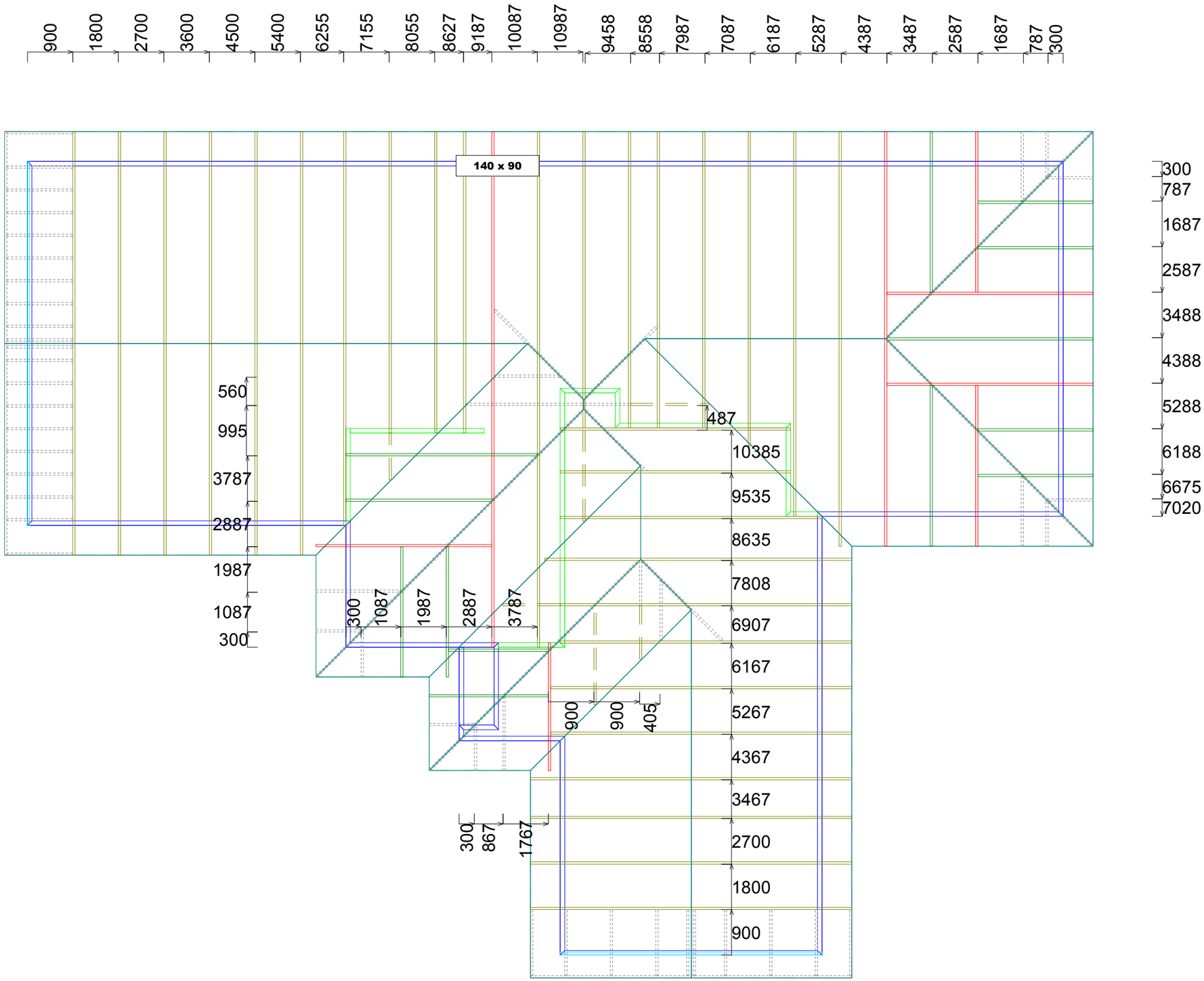
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Soak Pit Calculations	Main & Hyde							
Job Number	20-37							
Variables:							date	1/10/2020
ASP								
	length (m)	width (m)	depth (m)	Pit volume (M^3)	Rock fill adjustment	ASP volume (m^3)		
Proposed soak pit size	15	1.5	1.5	33.75	0.38	12.825		
SR								
	mm/hour							
Soak Rate	300							
C								
	Sourced NZBC E1 A/S1							
Run off Coefficient	0.9	metal roof						
I								
	Sourced NZBC E1 A/S1							
Rainfall intensity	70	mm / hour						
A								
	Area (m^2)	Area (ha)						
Catchment area	249	0.0249						
Calculations:								
Vsoak								
ASP x SR / 1000								
12.825	x	300	/	1000	=	3.8475		
RC								
10 x C x I x A								
10	x	0.9	x	70	x	0.0249	=	15.687
Soak pit volume required:								
Vstor								
RC-Vsoak				(m^2)				
15.687	-	3.8475	=	11.8395				
Volume required	/	Volume achieved		(ratio)				
11.8395	/	12.825	=	0.923157895				
Summary:								
Soak pit size acceptable								

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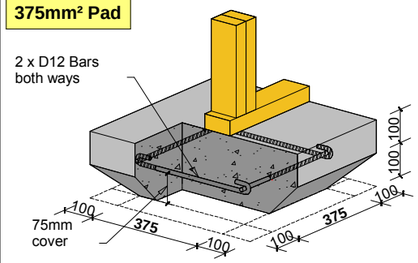
	Site Address : Hyde & Main 283a Kimberly Rd Levin	Sheet Title : For Consent Buildable Truss Layout Date : 26 Aug,2020 Drawn : Austin Scale : 1: 100 System : MiTek 20/20	Job Details: Roof Pitch : 25.00deg Roof Material : Metal Tiles Ceiling Material : Rondo screwed to BC Wind Zone : High Roof Snow Load : 0.000kPa	Truss Centres : 900mm Roof Live Load : 0.250kPa Floor Live Load : Wind Speed : 44m/s Overhang : 590mm	MiTek™	Job Title : Q95149 Sheet : 1 Revision Number :

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SLAB THICKENING & STUD REQUIREMENTS

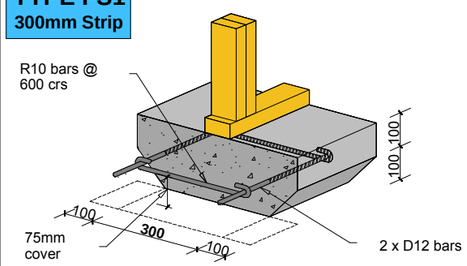
TYPE FP1
375mm² Pad

2	3



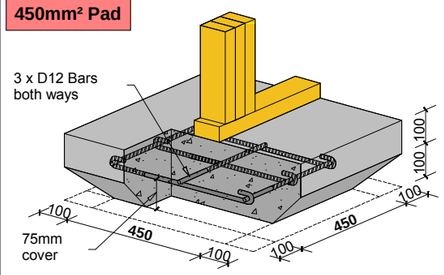
TYPE FS1
300mm Strip

2	3



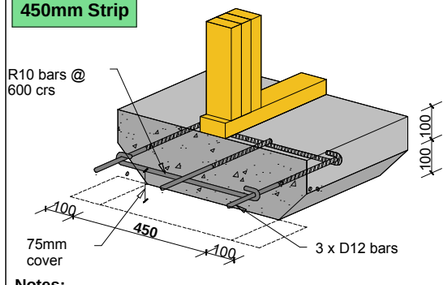
TYPE FP2
450mm² Pad

3	4



TYPE FS2
450mm Strip

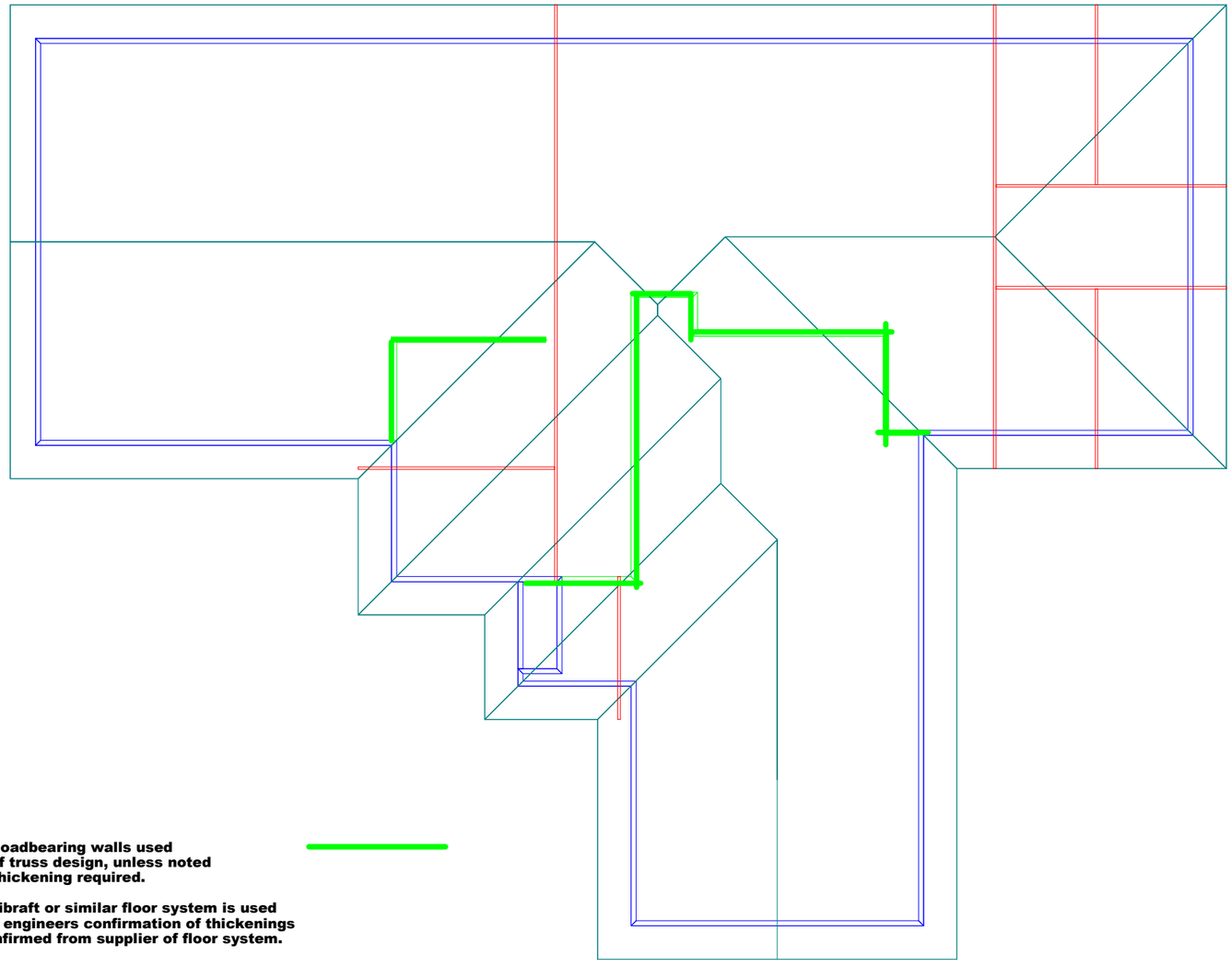
3	4



Notes:
- The numbers found in the hatched areas are the numbers of studs required below each truss
- Standard 100mm reinforcing concrete slab, as per NZS3604:2011

Refer to:
MiTek Internal Load Bearing on Concrete Floor Slabs 10/2011
MiTek Structural Fixings **On-Site Guide** for Building Code Compliance

Concrete Slab Thickening Guide



Internal loadbearing walls used as part of truss design, unless noted no slab thickening required.

Note if Ribraft or similar floor system is used separate engineers confirmation of thickenings to be confirmed from supplier of floor system.

NO SLAB THICKENING REQUIRED

PrimeCad v4.7.301

Site Address :
Hyde & Main
283a Kimberly Rd
Levin

Sheet Title :
For Consent
Slab Thickening

Date : 26 Aug,2020 | Drawn : Ausitn
Scale : 1: 100 | System : MiTek 20/20

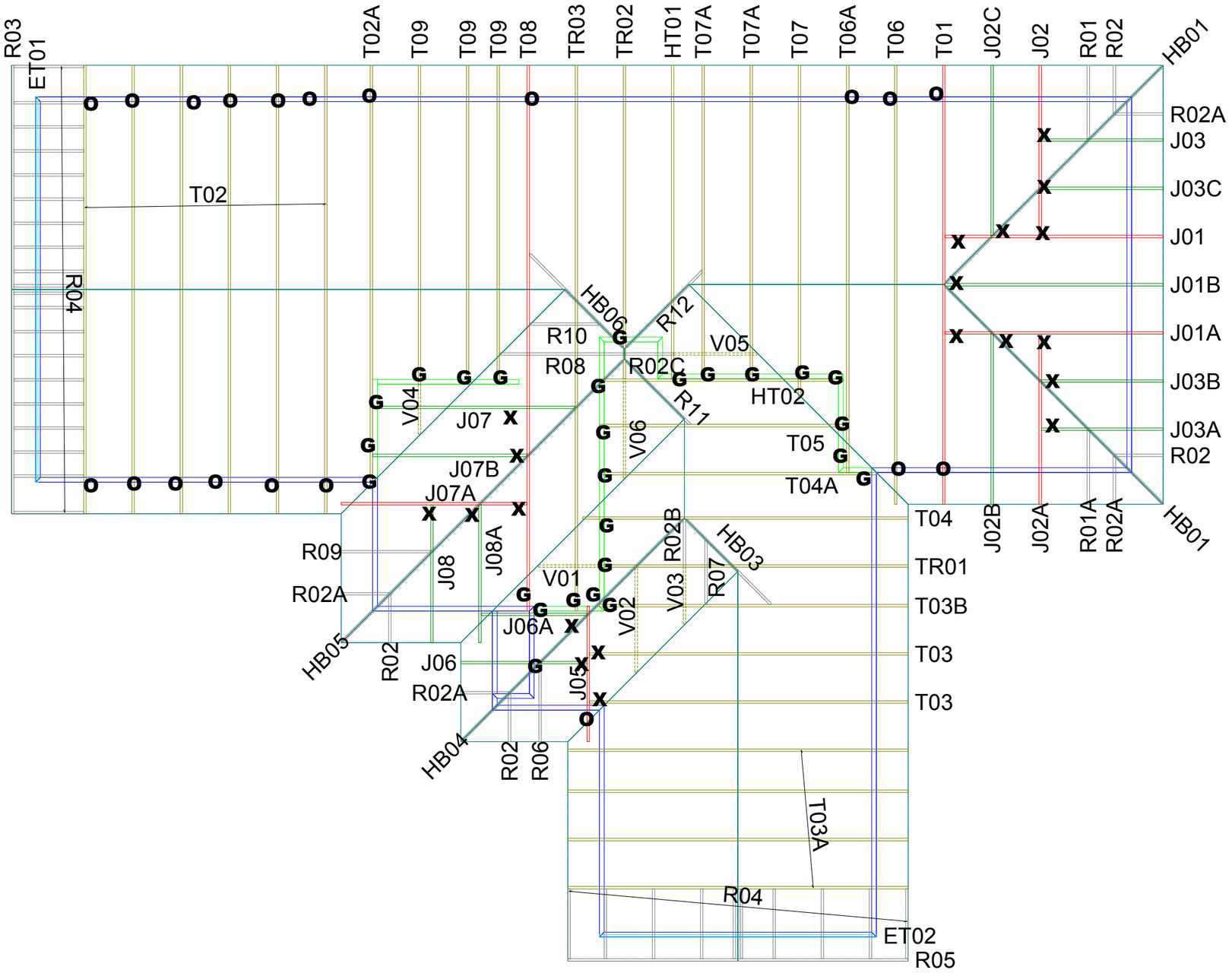
Job Details:

Roof Pitch	: 25.00deg	Truss Centres	: 900mm
Roof Material	: Metal Tiles	Roof Live Load	: 0.250kPa
Ceiling Material	: Rondo screwed to BC	Floor Live Load	:
Wind Zone	: High	Wind Speed	: 44m/s
Roof Snow Load	: 0.000kPa	Overhang	: 590mm

MiTek™

Job Title : Q95149
Sheet : 2
Revision Number :

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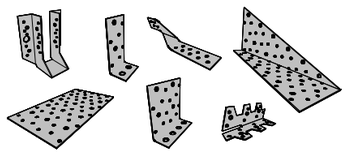
LUMBERLOK® TRUSS FIXINGS

D - Pair of Wire Dogs and 2 x 90mm 3.15mm skew nails
X - LUMBERLOK JH47x90 Joist Hanger
Z - LUMBERLOK JH47x120 Joist Hanger
P - LUMBERLOK JH47x190 Joist Hanger
E - LUMBERLOK JH95x165 Joist Hanger
T - LUMBERLOK CT200 Ceiling Tie
O - Pair of LUMBERLOK CT200 Ceiling Ties
H - LUMBERLOK CT400 Cyclone Tie
B - LUMBERLOK CT600 Cyclone Tie
4 - LUMBERLOK Multi Grip
M - Pair of LUMBERLOK Multi Grips
NP - LUMBERLOK Nailon Plate
N - LUMBERLOK N21 Diagonal Cleat
V - LUMBERLOK CPC40 Cleat
W - Pair of LUMBERLOK CPC40 Cleats
K - LUMBERLOK TTP 16kN Truss to Top Plate set
G - LUMBERLOK TTP 9kN Truss to Top Plate set

Joist Hanger Installation

CT200 Truss to Top Plate Fixing Installation

16kN & 9kN Truss to Top Plate Fixing Installation



Notes:
All other areas must have the minimum 2 x 90mm 3.15mm skew nails and 2 x wire dogs for truss to top plate connections
Refer to:
LUMBERLOK Timber Connectors Characteristic Loadings Data Brochure 08/2014

PrimeCad v4.7.301

Site Address :
Hyde & Main
283a Kimberly Rd
Levin

Sheet Title :
For Consent
Truss Fixings

Date : 26 Aug,2020 | Drawn : Austin
Scale : 1: 100 | System : MiTek 20/20

Job Details:

Roof Pitch	: 25.00deg	Truss Centres	: 900mm
Roof Material	: Metal Tiles	Roof Live Load	: 0.250kPa
Ceiling Material	: Rondo screwed to BC	Floor Live Load	:
Wind Zone	: High	Wind Speed	: 44m/s
Roof Snow Load	: 0.000kPa	Overhang	: 590mm

MiTek™

Job Title : Q95149
Sheet : 3
Revision Number :

MiTek New Zealand Limited

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www.miteknz.co.nz

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

ISSUED BY: **MiTek New Zealand Limited**

TO: **Pre-Nail Systems LTD**

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 **Q95149** 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: Monday, September 28, 2020**



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

Job: Q95149
Client: GJ Gardner Homes
Phone:
Site: Hyde & Main
283a Kimberly Rd
Levin
Description:
Building Consent No.:

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24 Nov 2020

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **Pre-Nail Systems LTD**, 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:	PNS MSG H1.2	Pitch:	25.000 deg	Nominal Overhang:	590 mm
Roof		**Ceiling**		**Wind**	
Material:	Metal Tiles	Material:	Rondo screwed to BC	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		
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN		

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

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
ET01	1	7200	25.000	900 GB	J06	1	1767	25.000	900	V06	1	1803	25.000	900
J05	1	1940	25.000	900	J06A	1	1767	25.000	900	*HB01	2	5767	18.249	900
T01	1	7020	25.000	900	J07	1	2887	25.000	900	*HB03	1	2256	18.249	900
T02	6	7200	25.000	900	J07A	1	2887	25.000	900	*HB04	1	5880	18.249	900
T02A	1	7200	25.000	900	J07B	1	2887	25.000	900	*HB05	1	7464	18.249	900
T06	1	7020	25.000	900	J08	1	1987	25.000	900	*HB06	1	2483	18.249	900
T06A	1	7020	25.000	900	J08A	1	1987	25.000	900	*R01	1	1390	25.000	900
T08	1	9610	25.000	900	T03	2	5180	25.000	900	*R01A	1	1390	25.000	900
TR03	1	9610	25.000	900	T03A	4	5180	25.000	900	*R02	4	903	25.000	900
ET02	1	5180	25.000	900	T03B	1	5180	25.000	900	*R02A	4	903	25.000	900
HT01	1	5270	25.000	900	T04	1	5180	25.000	900	*R02B	1	901	25.000	900
HT02	1	4560	25.000	900	T04A	1	5180	25.000	900	*R02C	1	900	25.000	900
J01	1	3487	25.000	900	T05	1	4560	25.000	900	*R03	1	8380	25.000	900
J01A	1	3487	25.000	900	T07	1	5270	25.000	900	*R04	30	1305	0.000	900
J01B	1	3487	25.000	900	T07A	2	5270	25.000	900	*R05	1	6360	25.000	900
J02	1	2587	25.000	900	T09	3	5370	25.000	900	*R06	1	1470	25.000	900
J02A	1	2587	25.000	900	TR01	1	5180	25.000	900	*R07	1	1203	25.000	900
J02B	1	2587	25.000	900	TR02	1	5270	25.000	900	*R08	1	2315	25.000	900
J02C	1	2587	25.000	900	V01	1	1138	25.000	900	*R09	1	1690	25.000	900
J03	1	1687	25.000	900	V02	1	1955	25.000	900	*R10	1	1304	25.000	900
J03A	1	1687	25.000	900	V03	1	1055	25.000	900	*R11	1	1716	18.249	900
J03B	1	1687	25.000	900	V04	1	930	25.000	900	*R12	1	2039	18.249	900
J03C	1	1687	25.000	900	V05	1	1550	25.000	900					

Total quantity : 116

The computer design input has been carried out by:

Signed: .....

Date: ...Monday, September 28, 2020....

Name of Detailer: .....Austin Brown.....

Qualifications and Title:

On behalf of:

Pre-Nail Systems LTD
21 Coventry Street, LEVIN 5510, ,
Phone: 06 368 9470

APPROVED
Q95149
24 Nov 2020
26 August 2020

SN-R10153064

PROLAM SUMMARY

Customer/Project: Q95149
Physical Address: Hyde and Main, 283a Kimberly Rd, Levin

Designer: Austin Brown, Detail Direct LTD
PO BOx 10, Southland 9641
E: ddlaustin@xtra.co.nz P: 027 241 8777

Living

Prolam Lintels Supporting Girder/Setback Trusses

Building Type	House	Roof Weight	Light with Ceiling
Timber	Pine, Machined	Roof Load	0.40 kPa
Treatment	H1.2	Live Load	0.25 kPa uniform
Visual	No		1.10 kN concentrated
Exposed	No	Wind Zone	High (44.0 m/s)
Roof Pitch	25 °	Snow Region	Region N1
Eaves	600 mm	Altitude	200 m
Position of Girder Truss on Lintel	0.56 m	Ground Snow Load	0.00 kPa
Setback	1.67 m	Roof Snow Load	0.00 kPa
Supported Truss Span	5.18 m		
Lintel Span	2.40 m		

Use Prolam PL8H1-200100 190 x 90mm PL8

Capacity Ratio	2.1
Long Term Deflection	< 1.0 mm
Max. Bearing Reaction	5.8 kN
Load Combination	1.2G + 1.5Q
Minimum Bearing Length	35 mm
Uplift Fixing Requirements	4.5 kN Characteristic Load

PRODUCER STATEMENT

TASMAN CONSULTING ENGINEERS CIVIL & STRUCTURAL

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

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

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

David King

David King
ME (civil, MIPENZ CPEng (no 145511) IntPE
For Tasman Consulting Engineers, PO Box 3631, Richmond, NELSON 7050
26 August 2020

APPROVED
Q95149
24 Nov 2020
26 August 2020

SN-R10153065

PROLAM SUMMARY

Customer/Project: Q95149
Physical Address: Hyde and Main, 283a Kimberly Rd, Levin

Designer: Austin Brown, Detail Direct LTD
PO BOx 10, Southland 9641
E: ddlaustin@xtra.co.nz P: 027 241 8777

Toilet

Prolam Lintels Supporting Girder/Setback Trusses

Building Type	House	Roof Weight	Light with Ceiling
Timber	Pine, Machined	Roof Load	0.40 kPa
Treatment	H1.2	Live Load	0.25 kPa uniform
Visual	No		1.10 kN concentrated
Exposed	No	Wind Zone	High (44.0 m/s)
Roof Pitch	25 °	Snow Region	Region N1
Eaves	600 mm	Altitude	200 m
Position of Girder Truss on Lintel	0.30 m	Ground Snow Load	0.00 kPa
Setback	2.89 m	Roof Snow Load	0.00 kPa
Supported Truss Span	9.61 m		
Lintel Span	0.60 m		

Use Prolam PL8H1-150100 140 x 90mm PL8

Capacity Ratio	3.0
Long Term Deflection	< 1.0 mm
Max. Bearing Reaction	5.1 kN
Load Combination	1.2G + W_down
Minimum Bearing Length	35 mm
Uplift Fixing Requirements	4.5 kN Characteristic Load

PRODUCER STATEMENT

TASMAN CONSULTING ENGINEERS CIVIL & STRUCTURAL

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

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

David King

David King
ME (civil, MIPENZ CPEng (no 145511) IntPE
For Tasman Consulting Engineers, PO Box 3631, Richmond, NELSON 7050
26 August 2020

LUMBERLOK®

APPROVED
24 Nov 2020

10/2011

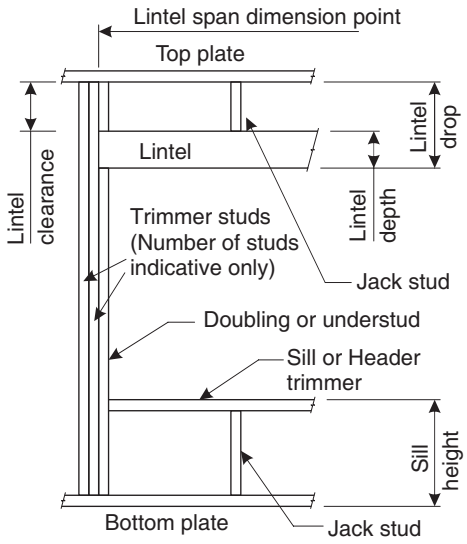
LINTEL FIXING SCHEDULE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

NOTE:

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

DEFINITIONS



Lintel Supporting Girder Trusses:

Roof Tributary Area	Light Roof			Heavy Roof		
	Wind Zone			Wind Zone		
	L, M, H	VH	EH	L, M, H	VH	EH
8.6 m²	G	G	H	G	G	H
11.6 m²	G	H	H	G	G	H
12.1 m²	G	H	H	G	H	H
15.3 m²	H	H	-	G	H	H
19.1 m²	H	-	-	G	H	-
20.9 m²	H	-	-	H	H	-
21.8 m²	H	-	-	H	-	-
34.3 m²	-	-	-	H	-	-

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

SELECTION CHART FOR LINTEL FIXING

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

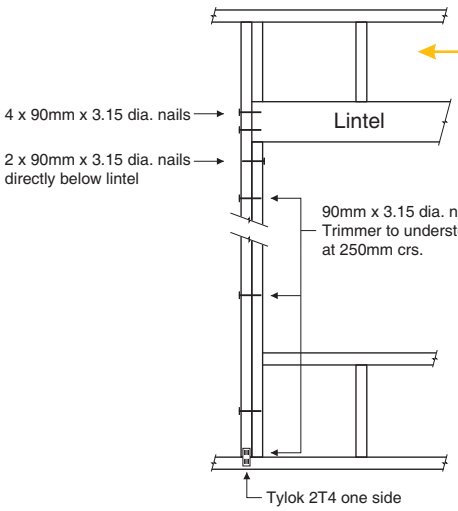
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24 Nov 2020
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LINTEL FIXING OPTIONS

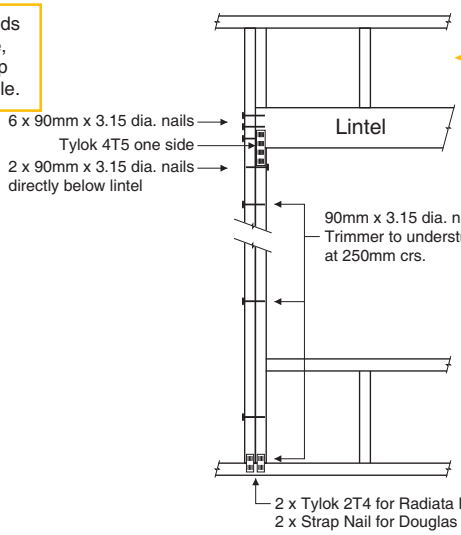
TYPE E
1.4 kN



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

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

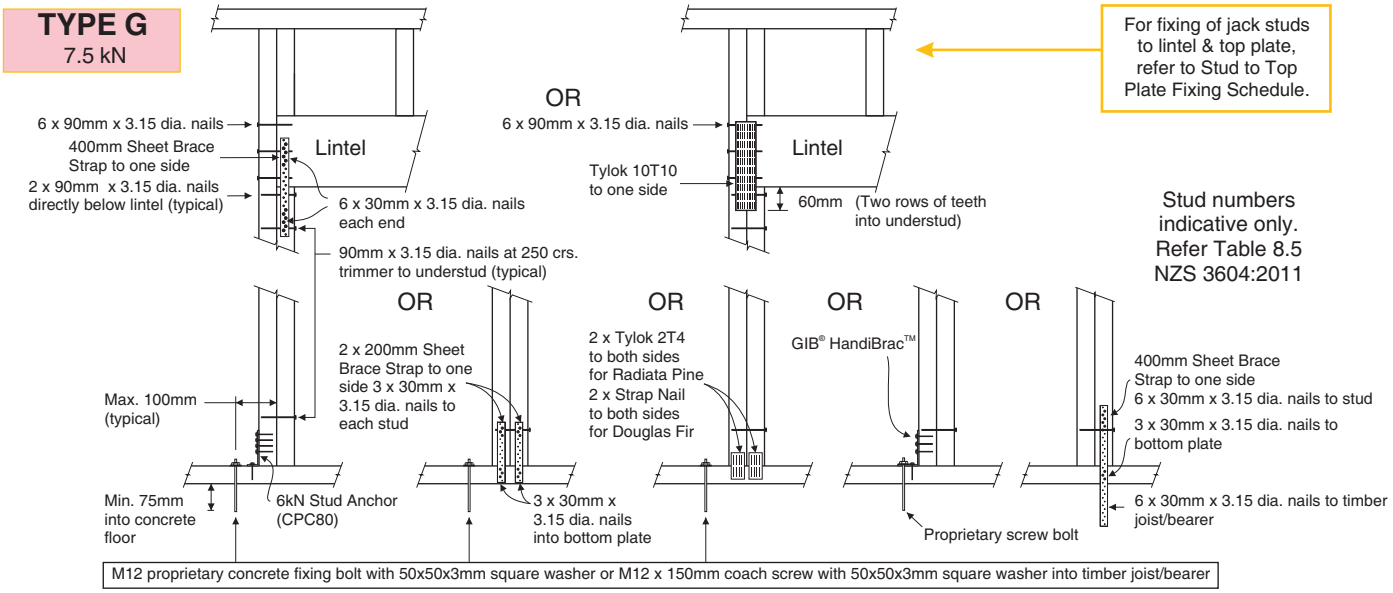
TYPE F
4.0 kN



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

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

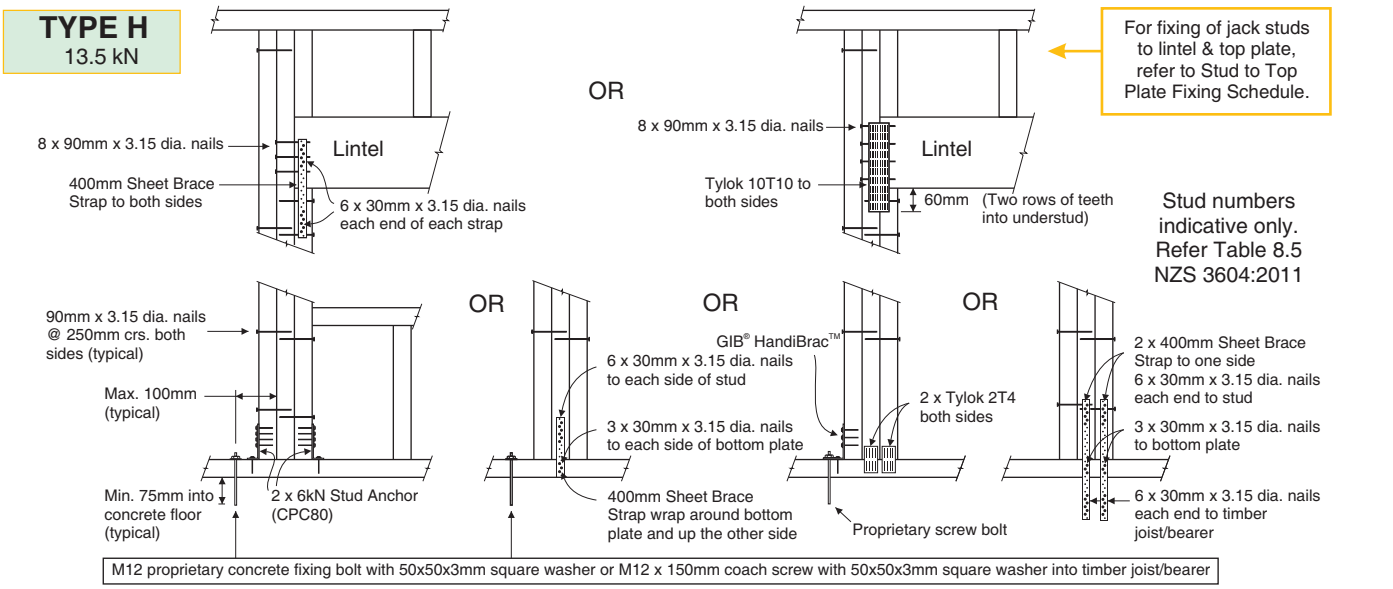
TYPE G
7.5 kN



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

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

TYPE H
13.5 kN



MiTek New Zealand Limited

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

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

www.miteknz.co.nz

MiTek®
GANG-NAIL® LUMBERLOK® BOWMAC®

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PROLAM® products are manufactured to the requirements of AS/NZS 1328.1:1998 Glue Laminated Structural Timber, and AS/NZS 1491:1996 Finger Jointed Structural Timber under an approved quality system based on the 1S0 9000 series of standards. As such if the product is used in accordance with **PROLAM®** product literature, it will meet the durability clauses of the New Zealand Building Code B2.

Subfloor Applications:

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

External Use:

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

Preservative Treatment:

- **PROLAM®** Beams are CCA H3.2 treated as defined by NZS 3640:2003, for weather exposed applications, such as verandah beams, deck bearers, and subfloor applications.

- **PROLAM®** Posts are CCA H5 treated as defined by NZS 3640:2003 for in-ground and weather exposed applications, such as deck piles, verandah posts and similar applications.

Storage of **PROLAM®:**

- To ensure **PROLAM®** remains straight and true at the time of installation, follow the below recommendations:

1. Store under cover so that it remains dry until installation.
2. Stack clear of the ground for good ventilation.
3. Stack on bearers to keep flat and straight.

Branded **PROLAM®:**

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

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24 Nov 2020

Hamish Wells
Engineer Ltd
Civil Engineer
CMEngNZ #186323

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202 Otaki Gorge Rd, Otaki
PO Box 188, Otaki 5512
Hamish Wells
M: 0274 459 757
E: hamish@engenr.co.nz

3/07/2020

SITE SOIL REPORT

Address : 283a Kimberly Road
Levin

Prepared for: R.F.L.

APPROVED
24 Nov 2020

Hamish Wells
Engineer Ltd

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Civil Engineer
CMEngNZ #186323

Site suitability test report

in terms of NZS 3604:2011 Timber framed buildings - Section 3 "Site requirements"

Date: 3/07/2020

Site Data

Address: 283a Kimberly Road
Town: Levin
Post code 5510

Client Data

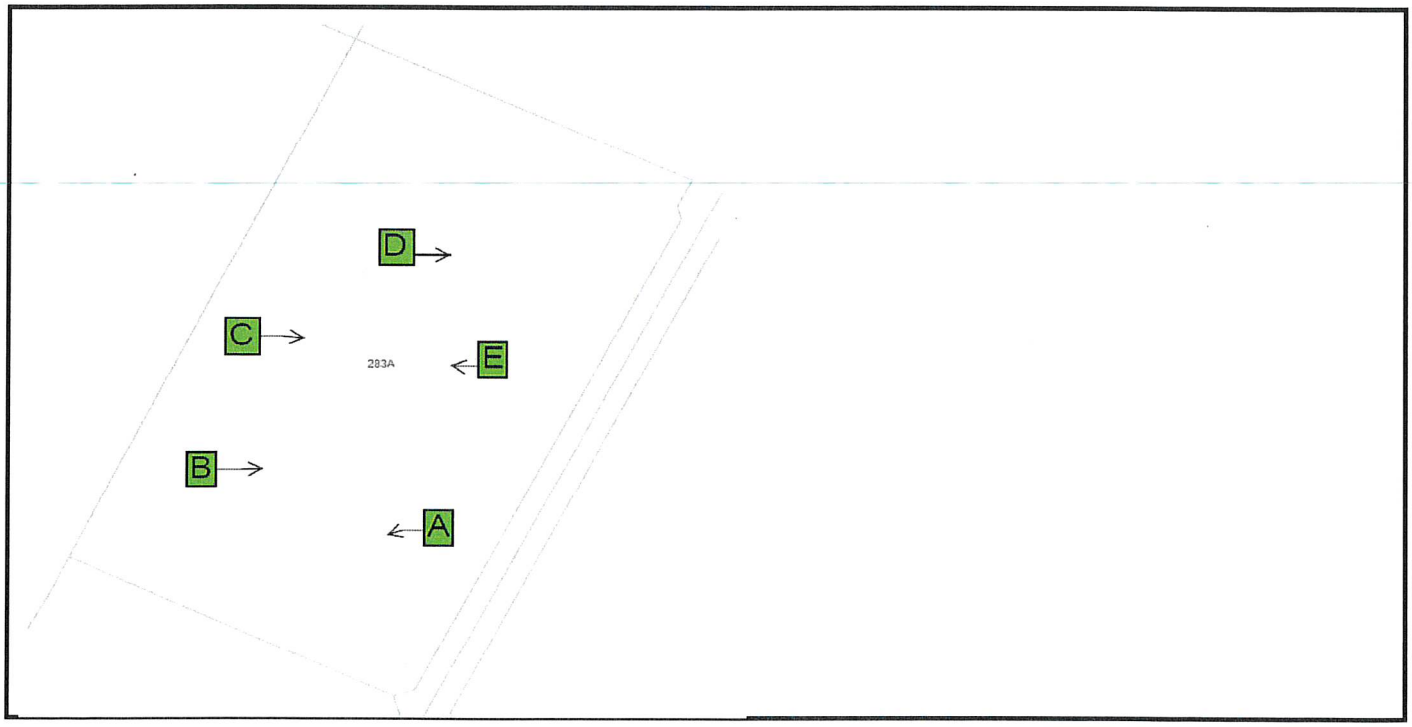
Client: R.F.L.
Email: Northisland@rfl.co.nz
Address:
Mobile:
Landline: 0800 ribraft

Legal

Lot: 3 **DP:** TBC
TA: HDC
RA: Horizons

Wind Zone	H	**Topography**	Flat Rural Section
Corrosion zone	C		
Earthquake zone	3	**Basic soil type**	loess clay to depth
Site subsoil class	D & E		
		NZGS data	Q3a on the map mQa on site
		Tested by	J

Site Plan showing test locations



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Civil Engineer
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CMEngNZ #186323

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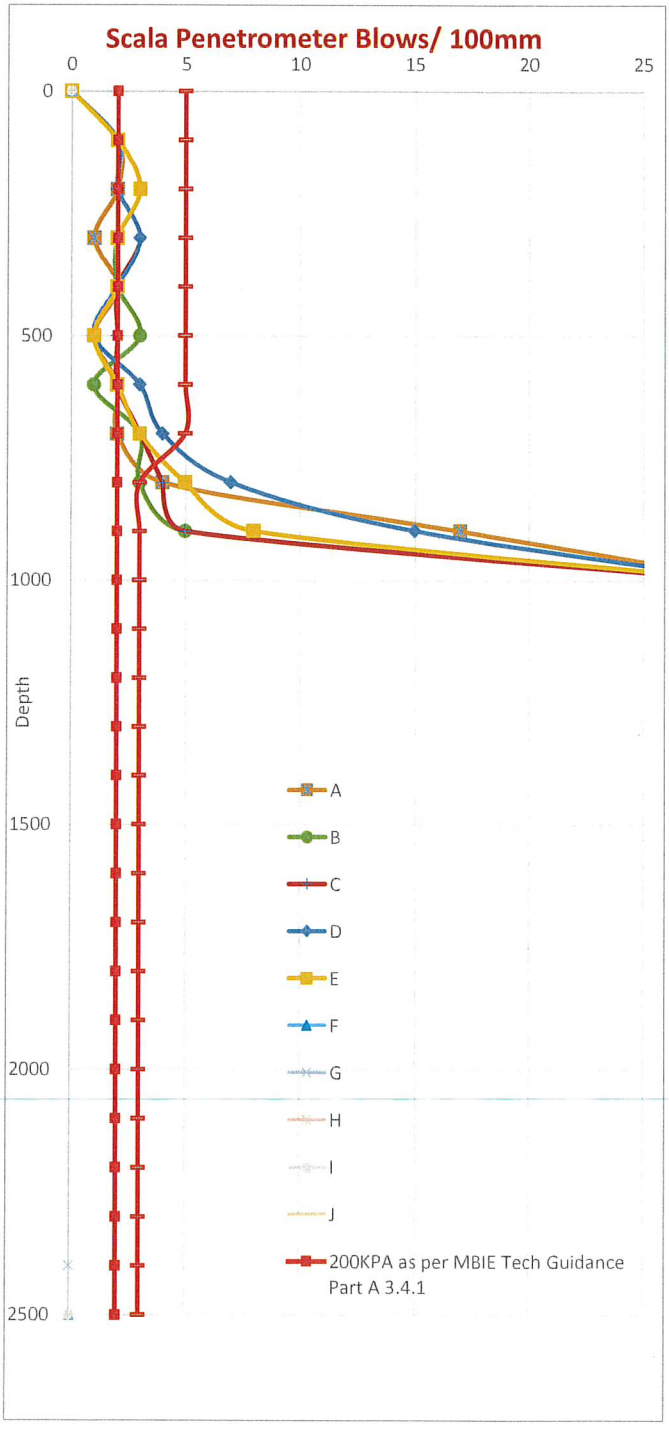
202 Otaki Gorge Rd, Otaki
PO Box 188, Otaki 5512
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M: 0274 459 757
E: hamish@engenr.co.nz

SCALA PENETROMETER FIELD SHEET - SUMMARY

Property: 283a Kimberly Road **BY** J
Client: R.F.L.

Depth (m)	A	B	C	D	E	F	G	H	I	J	G.G.
0	0	0	0	0	0	0	0	0	0	0	5
100	2	2	2	2	2						5
200	2	3	2	2	3						5
300	1	2	3	3	2						5
400	2	2	2	2	2						5
500	1	3	2	1	1						5
600	2	1	2	3	2						5
700	2	3	3	4	3						5
800	4	3	4	7	5						3
900	17	5	5	15	8						3
1000	30	30	30	30	30						3
1100											3
1200											3
1300											3
1400											3
1500											3
1600											3
1700											3
1800											3
1900											3
2000											3
2100											3
2200											3
2300											3
2400											3
2500											3

Additional Notes:
G.G. = Good Ground as per NZS3604:2011



APPROVED
24 Nov 2020

Hamish Wells Engineer Ltd

Civil Engineer
CMEngNZ #186323

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202 Otaki Gorge Rd, Otaki
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Test data analysis and comments for 3604:2011 type foundations systems

Symbol	Meaning
Y	Yes
N	No
Blank	Not applicable
P	Part
A	All
SED	Specific Engineering Design

Typical 3604:2011 compliant foundation systems

		Timber subfloor			Slab on ground	
		Standard piles	Driven timber piles	Ring Foundation	3604 Type	Non SED RibRaft
1	**Do the test results comply with NZS 3604:2011 Section 3 Site requirements?**	N	N	N	N	N
2	**Reasons / causes of non compliance?**					
a)	Peat or other organic materials					
b)	Clays or/and soft silts	✔	✔	✔	✔	✔
c)	Shallow poorly consolidated sands					
d)	Deep poorly consolidated sands					
e)	Uncertified fills					
f)	Unstable ground, adjacent slips, erosion					
g)	Proximity to banks					
h)	Ground water issues					
i)	Other issues see summation para 7					
3	**Is specific foundation design required ?**					
a)	Part of the site					
b)	All of the site	Y	Y	Y	Y	Y
4	**Can the site soils be mechanically stabilised to provide a complying site?**					
a)	Required digout depth mm	N/A	N/A	N/A	N/A	N/A
b)	Required digout area - footprint +					
c)	Can the work be carried out with the soil still in situ (roll / compact with suitable heavy machinery)					

Notes:

Good ground to 3604 is at 800mm below EGL where tested

			Timber subfloor			Slab on ground	
			Standard piles	Driven timber piles	Ring Foundation	3604 Type	Non SED RibRaft
5	**Piling options**						
a)	Driven timber piles		YES	YES	YES	YES	YES
b)	Cast in situ concrete piles for a concrete slab		YES	YES	YES	YES	YES
c)	Extended depth standard piles		YES	YES	YES	YES	YES
6	**Slab options - is specific design required**						
a)	3604:2011 slab/s		YES	YES	YES	YES	YES
b)	3604:2011 timber subfloors		YES	YES	YES	YES	YES
c)	RibRaft or waffle slab	Type A house	YES	YES	YES	YES	YES
	Maxraft or similar	Type B	YES	YES	YES	YES	YES
		Type C	YES	YES	YES	YES	YES
		Type D	YES	YES	YES	YES	YES

7 Summation

Site tests do not comply with NZS 3604:2011 Sec 3 Good ground requirements, q allowable = 50kpa or 150kpa. Due to soft, moisture sensitive silts this site requires a specific engineer designed foundation. Cast insitu concrete piles are recommended.

APPROVED
24 Nov 2020

Hamish Wells

Civil Engineer
CMEngNZ #186323

Engineer Ltd

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SCALA A PENETROMETER FIELD SHEET - SUMMARY

Property: 283a Kimberly Road

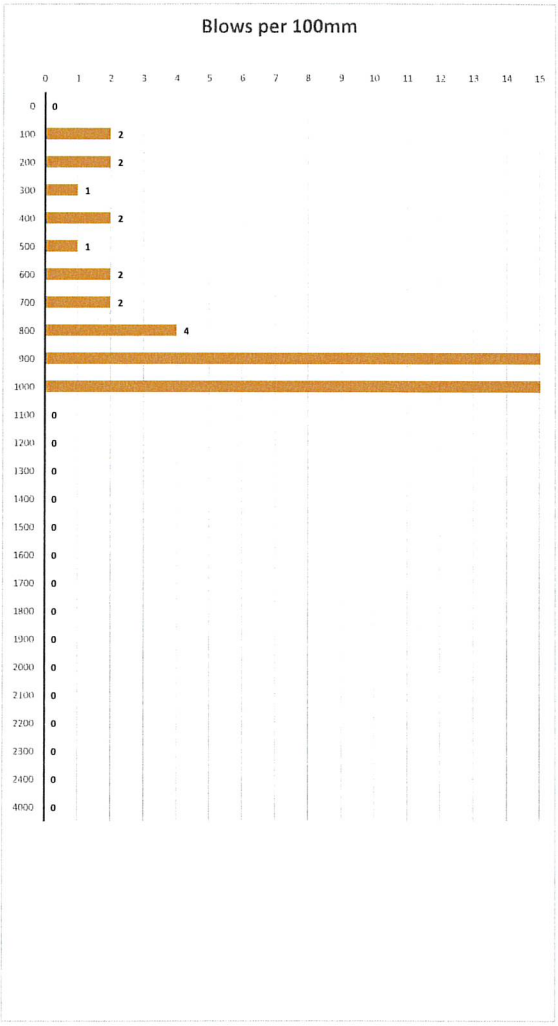
Logged by:	J
Date Tested:	3/07/2020

Client: R.F.L.

Water Table not encountered

Soil Description	Depth (m)	Blows
	0	0
	100	2
	200	2
	300	1
	400	2
	500	1
	600	2
	700	2
	800	4
	900	17
	1000	30
	1100	0
	1200	0
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	2100	0
	2200	0
	2300	0
	2400	0
	4000	0

Additional Notes:



Notes & References

Field Descriptions of Soils and Rocks by NZ Geotechnical Society Dec 2005
NZS 4402 Test 6.5.2:1988 Determination of the Penetration Resistance of a Soil
Indicative Bearing Capacity is based on MJ Stockwell's "Determination of Allowable Bearing Capacity Under Small Structures" and converting to Ultimate Bearing Capacity

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24 Nov 2020

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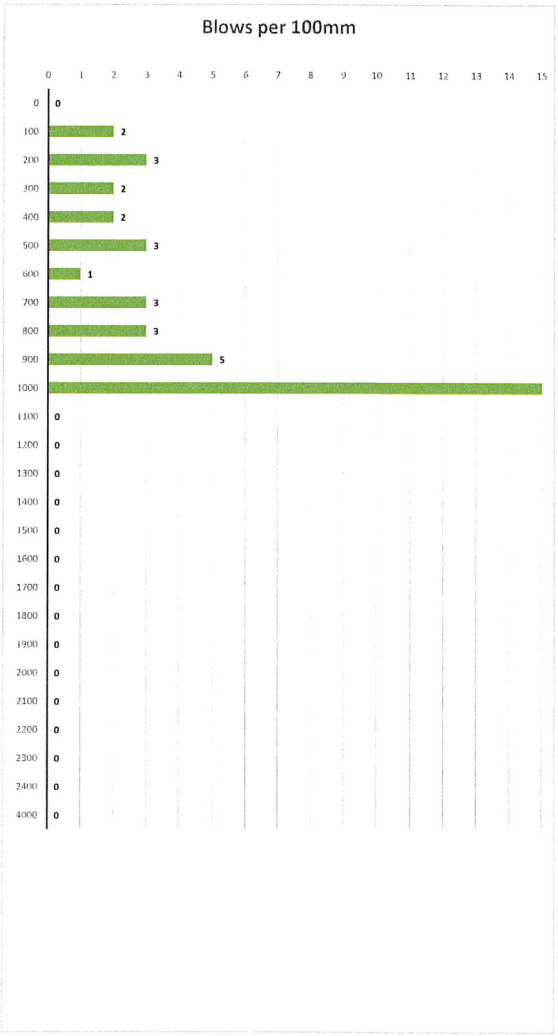
SCALA B PENETROMETER FIELD SHEET - SUMMARY

Property: 283a Kimberly Road
Client: R.F.L.

Logged by:	J

Water Table not encountered		
Soil Description	**Depth (m)**	**Blows**
	0	0
	100	2
	200	3
	300	2
	400	2
	500	3
	600	1
	700	3
	800	3
	900	5
	1000	30
	1100	0
	1200	0
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	3600	0
	3700	0
	3800	0
	3900	0
	4000	0

Additional Notes:



Notes & References

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Property: 283a Kimberly Road

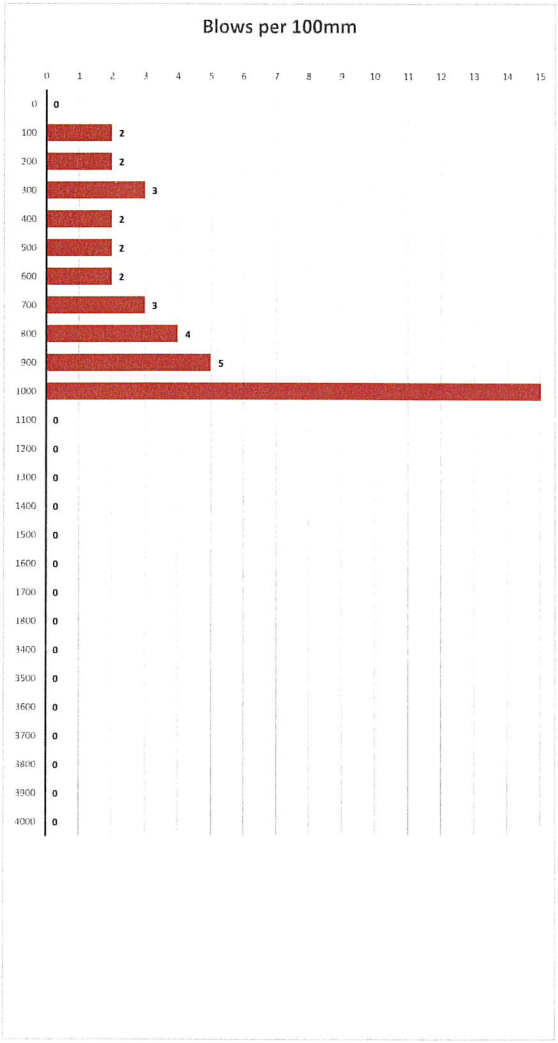
Logged by: J

Date Tested: 3/07/2020

Client: R.F.L.

Water Table not encountered		
Soil Description	**Depth (m)**	**Blows**
	0	0
	100	2
	200	2
	300	3
	400	2
	500	2
	600	2
	700	3
	800	4
	900	5
	1000	30
	1100	0
	1200	0
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	3400	0
	3500	0
	3600	0
	3700	0
	3800	0
	3900	0
	4000	0

Additional Notes:



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SCALA D PENETROMETER FIELD SHEET - SUMMARY

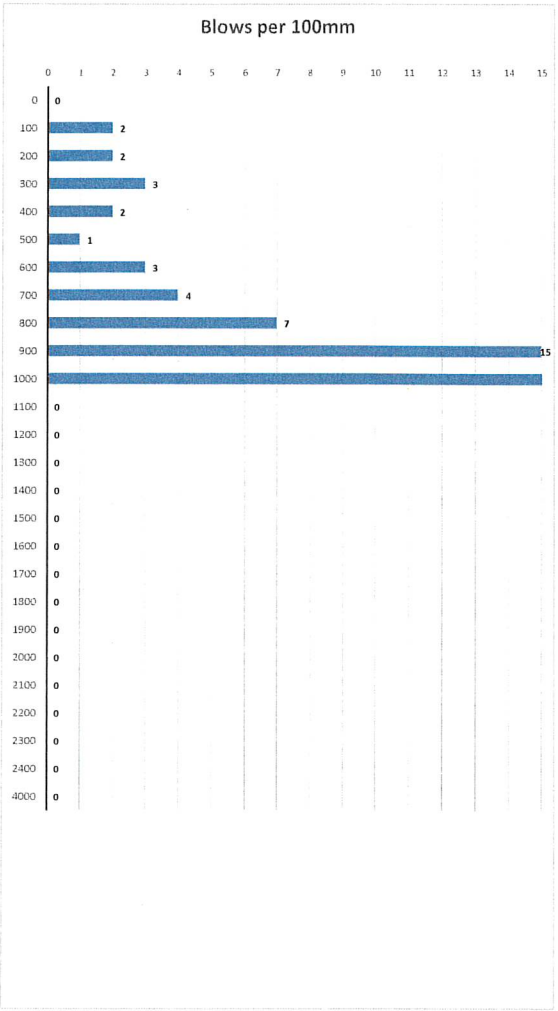
Property: 283a Kimberly Road

Logged by: J

Date Tested: 3/07/2020

Water Table not encountered

Soil Description	Depth (m)	Blows
	0	0
	100	2
	200	2
	300	3
	400	2
	500	1
	600	3
	700	4
	800	7
	900	15
	1000	30
	1100	0
	1200	0
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	2100	0
	3700	0
	3800	0
	3900	0
	4000	0



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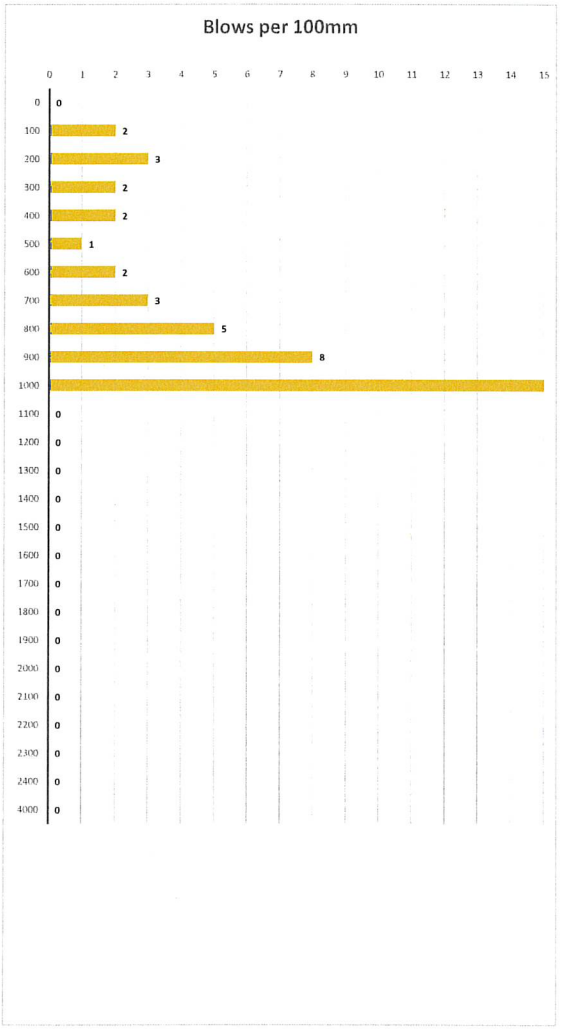
Property: 283a Kimberly Road

Logged by: J

Date Tested: 3/07/2020

Water Table not encountered

Soil Description	Depth (m)	Blows
	0	0
	100	2
	200	3
	300	2
	400	2
	500	1
	600	2
	700	3
	800	5
	900	8
	1000	30
	1100	0
	1200	0
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	2100	0
	3700	0
	3800	0
	3900	0
	4000	0



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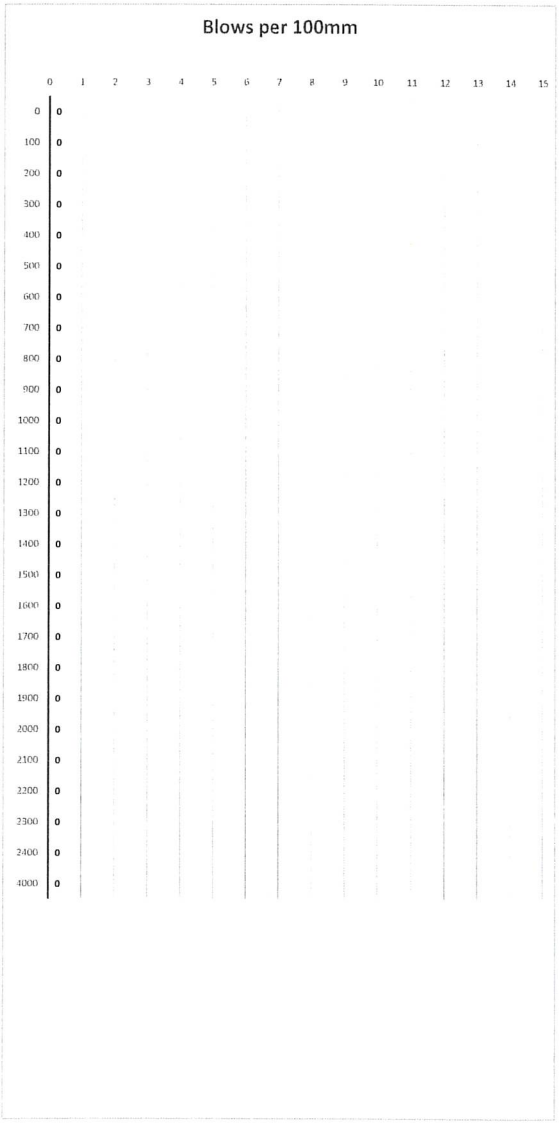
Property: 283a Kimberly Road

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Date Tested: 3/07/2020

Water Table not encountered

Soil Description	Depth (m)	Blows
	0	0
	100	0
	200	0
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	400	0
	500	0
	600	0
	700	0
	800	0
	900	0
	1000	0
	1100	0
	1200	0
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	2100	0
	3700	0
	3800	0
	3900	0
	4000	0



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Site Report Explantion Notes

Soils/Foundation Site Requirements

This testing was carried out in general accordance with the requirements of NZS 306:2011 Section 3 "Site Requirements". This general procedure was used as the end use of the site is residential housing and the method is the most appropriate for that use.

1) **NZS 3604:2011 Section 3 Site Requirements** part 3.3 Test Method for soil bearing capacity, part 3.3.7 Ultimate Bearing Capacity defined ground as having 300kpa Ultimate bearing capacity (UBC) of not less than 300kpa as below.

3.3.7.1
The soil below the underside of the foundations shall be assumed to have an ultimate bearing capacity of not less than 300 kpa when:

a) none of the following is encountered below the depth of the footing at any test site:
- (i) Organic topsoil
- (ii) soft or very soft peat
- (iii) soft or very soft clay
- (iv) fill material,except where a certifcate of suitability has been issued under NZS 4431

b) Scala penetrometer tests conducted in accordance with 3.3.2(a), where the number of blows per 100mm depth of penetrometer below the underside of the proposed footingat each test site exceed.
- (i) Five down to a depth equal twice the width of the widest footing
- (ii) Three at greater depths; and
- (iii) Providing the set blow is relatively uniform, the number of blow per 100mm may be obtained by averageing the number of blow for depths not exceeding 300mm and

c) Comparisons of the results at all test sites show thst conditions are closely similar at each test site.

Based on a standard slab on ground foundation width of 240mm for a masonary veneer clad dwelling (either 1 or 2 story) from figure 7.15 NZS 3604:2011 section 7 floors - Masonry veneer foundation edge detail - in situ concrete and a minimum in ground embedment of 300mm for the concrete foundation, the minimum requirements in terms of Scala blows/100mm penetration are:

Existing ground level to - 300mm	not applicable to the foundation but relevant to the slab see section 7.5 re granular base for slab, minimum 5 blows/100mm penetration in the in granular fill recommend
-300mm to 800mm below existing ground level	5 blows/100mm
-800mm + depth	3 blows/100mm

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2) **Analysis of the scala for each lot in term of paragraph 4 above (NZS 3604:2011 compliance):**

a) If site test comply with the requirements of NZS 3604:2011 section 3 "site requirements" and it is reasonable to assume,Not gauranteed, that based on the test carried out, are suitable for standard foundation designs in accordance with NZS 3604 or non specific Rib raft slab on ground foundation systems.

b) If tests do not comply with NZS 3604:2011 section 3 "site requirements" and specifically designed foundations (typically driven timber piles) or ground improvement of the existing site soils (which are readily compacted) to provide a complying building platfform will be required.

3) **Ribraft foundation system: Ribraft** Ribraft systems are being increasingly specified for domenstic construction and nonspecific design Ribraft foundations (ie in compliance with firth Ribraft manual 2012) have a **lower soil soil bearing requirement** than standard slab on ground system in compliance with NZS 3604:2011 (note: all other aspects of the requirements. Section 3 must be complyed with). This lower soil bearing strength requirements is based on building type and the Ribraft ability to better distribute load to the ground than conventional 3604 foundation solutions. There are four building types identified in the Ribraft design manual and their relative minimum foundation soil requirements are as below:

Building identifier

Building Type	Description	Ground Floor External walls	Second Story External walls
A	Single Story	Light	
B	Single Story	Heavy	
C	Two Story	Light	Light
D	Two Story	Heavy	Light

Scala Penetrometer Blows Required For Determining Ultimate Bearing Capacity

Building type	Min. blows per 300mm depth
A	6
B	7
C	8
D	9

In blows/100mm consistent with the appended Scala tests

a) For type A 2 blows/100mm minimum
b) For type B 2.33 blows/100mm minimum
c) For type C 2.67 blows/100mm minimum
D) For type D 3 blows/100mm minimum

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Should you require any further information please contact us directly.

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BRANZ Appraised
Appraisal No. 447 [2010]

LINEA® WEATHERBOARD CAVITY CLADDING



Appraisal No. 447 (2010)

Amended 01 March 2016

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Linea® Weatherboard Cavity Cladding is a cavity-based bevelbacked fibre cement weatherboard wall cladding. It is designed to be used as part of an external cladding system for residential and light commercial type buildings where domestic construction techniques are used.

1.2 Linea® Weatherboard Cavity Cladding consists of Linea® Weatherboard, which is a bevelbacked fibre cement weatherboard, fixed over timber battens to form the cavity. The cladding is finished with a latex paint system.

1.3 The cladding incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall framing with a nominal 20 mm cavity. The cavity allows for any occasional ingress of water that may get past the external skin to drain to the exterior of the building, and any remaining moisture to dry by evaporation.

Scope

2.1 Linea® Weatherboard Cavity Cladding has been appraised as an external wall cladding for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including Extra High.

2.2 Linea Weatherboard Cavity Cladding has also been appraised for weathertightness and structural wind loading when used as an external horizontally fixed wall cladding solution for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- constructed with timber framing complying with the NZBC; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

2.3 Linea® Weatherboard must only be installed horizontally on vertical surfaces.

2.4 Linea® Weatherboard Cavity Cladding is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *(The Appraisal of Linea® Weatherboard Cavity Cladding relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone.)*

(Note: Linea® Weatherboard Cavity Cladding can be used to provide fire resistance rated construction, but these aspects have not been assessed by this Appraisal and are outside its scope.)

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Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Linea® Weatherboard Cavity Cladding if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Linea® Weatherboard Cavity Cladding meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraphs 9.1 - 9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Linea® Weatherboard Cavity Cladding meets these requirements. See Paragraphs 10.1 and 10.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.7. Linea® Weatherboard Cavity Cladding meets this requirement. See Paragraph 12.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Linea® Weatherboard Cavity Cladding meets this requirement. See Paragraphs 14.1 - 14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Linea® Weatherboard Cavity Cladding meets this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 Linea® Weatherboards are bevelback weatherboards with a tongue and groove at each end for jointing. The weatherboards are pre-primed with an acrylic primer on the front face and both edges. Linea® Weatherboards are 16 mm thick and are available 135 mm, 150 mm and 180 mm wide. All boards are supplied 4200 mm long.

4.2 Linea® Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a bevel is cut on the back face of the weatherboards, the front edge at the bottom of the board is chamfered and the ends are tongue and grooved for jointing. Linea® Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

Accessories

4.3 Accessories used with Linea® Weatherboard Cavity Cladding which are supplied by James Hardie New Zealand are:

- **Axent™ Trim** - a 16 mm thick fibre cement trim manufactured from a reduced density cellulose fibre cement formulation. Axent™ Trim is pre-primed with an acrylic primer on the front face and both edges, and is available in sizes of 84 mm and 100 mm wide by 2600 mm long.
- **External and internal corner mouldings** - chromate treated aluminium external box corner, 90° internal corner 'W' mould and 135° internal corner 'W' mould. The mouldings are available in 2700 mm and 4000 mm lengths.
- **Corner soakers** - 90° soakers are available for 135 mm, 150 mm and 180 mm Linea® Weatherboards. The soakers are available in chromate treated aluminium, copper and stainless steel.
- **Cavity vent strip** - uPVC, available in 3000 mm lengths.

4.4 Accessories used with Linea® Weatherboard Cavity Cladding which are supplied by the building contractor are:

- **Flexible wall underlay** – building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
- **Flexible building underlay support** – polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *(Note: mesh and wire galvanising must comply with AS/NZS 4534.)*

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- **Rigid wall underlay** – Plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
- **Flexible sill, head and jamb flashing tape** - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **Cavity battens** - nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) timber treated to Hazard Class H3.1.
- **Joinery head flashings** - folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Planted sill and scribers** - timber treated to Hazard Class H3.1, pre-primed before installation.
- **Window and door trim cavity air seal** - air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Flexible sealant** - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- **Cavity batten fixings** - 40 x 2.8 mm flat head hot-dip galvanised nails.
- **Linea® Weatherboard fixings** - 60 x 3.15 mm flat head hot-dip galvanised HardieFlex nails or stainless steel ring shank HardieFlex nails (for concealed nailing in NZS 3604 wind zones up to and including Very High), 75 x 3.15 mm jolt head hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in NZS 3604 wind zones up to and including Very High), and 90 x 4.0 mm jolt head hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa).
- **Axent™ Trim fixings** - 60 x 3.15 mm or 75 x 3.15 mm hot-dip galvanised jolt head nails and stainless steel ring shank jolt head nails.

(Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680).

Paint System Specification

4.5 Paint systems are not supplied by James Hardie New Zealand and have not been assessed, therefore they are outside the scope of this Appraisal.

4.6 All exposed faces, including top edges at sills and all bottom edges of Linea® Weatherboard, Axent™ Trim and accessories must be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730.

Handling and Storage

5.1 Handling and storage of all materials supplied by James Hardie New Zealand or the building contractor, whether on site or off site, is under the control of the building contractor. Linea® Weatherboards must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. Weatherboards must always be carried on edge.

5.2 Accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer.

Technical Literature

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

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Design Information

Framing

Timber Treatment

7.1 Timber wall framing behind Linea® Weatherboard Cavity Cladding must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

7.2 Timber framing must comply with NZS 3604 for buildings or parts of a building within the scope limitations of NZS 3604. Buildings or parts of a building outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Studs must be at maximum 600 mm centres in Low, Medium, High and Very High Wind Zones and maximum 400 mm centres for the NZS 3604 Extra High Wind Zone and specifically designed buildings. Nogs must be fitted flush between the studs at maximum 800 mm centres (for studs at 600 mm centres) or maximum 1200 mm centres (for studs at 400 mm centres).

7.3 Timber framing must have a maximum moisture content of 24% at the time of the cladding application. *(If weatherboards are fixed to framing with a moisture content of greater than 24% problems may occur at a later date due to excessive timber shrinkage.)*

7.4 Timber wall framing must have a maximum moisture content of 18% before the weatherboards are painted.

General

8.1 When the Linea™ Weatherboard Cavity Cladding is used for specifically designed buildings up to 2.5 kPa ULS wind pressure, only the weathertightness and structural aspects of the cladding are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.

8.2 Punchings in the cavity vent strip provide a minimum ventilation opening area of 1000 mm^2 per lineal metre of wall.

8.3 At ground level the bottom edge of Linea® Weatherboards must be kept clear of paved surfaces, such as footpaths, by a minimum of 100 mm and unpaved surfaces by 175 mm in accordance with NZBC Acceptable Solution E2/AS1, Table 18. The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to.

8.4 At balcony, deck or low pitch roof/wall junctions, the bottom edge of Linea® Weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 50 mm.

8.5 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High, and rigid underlays for buildings in the Extra High wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.

8.6 Where cladding penetrations are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities by leaving a minimum gap of 10 mm between the bottom of the vertical cavity batten and the flashing to the opening.

8.7 Where Linea® Weatherboard Cavity Cladding abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

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Interstorey Junctions

8.8 Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 (b).

Structure

Mass

9.1 The mass of the 135 mm wide Linea® Weatherboard when installed on the wall is 25.7 kg/m^2 at equilibrium moisture content (EMC). The mass of the 150 mm wide board is 24.9 kg/m^2 at EMC and the mass of the 180 mm wide board is 23.9 kg/m^2 at EMC. Linea® Weatherboard Cavity Cladding is therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

9.2 Linea® Weatherboard Cavity Cladding will resist impacts likely to be encountered in normal residential use. The likelihood of impact damage to the cladding when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers provided for vulnerable areas.

Wind Zones

9.3 Linea® Weatherboard Cavity Cladding is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa ULS wind pressure where buildings are specifically designed.

Durability

Serviceable Life

10.1 Linea® Weatherboard Cavity Cladding installations are expected to have a serviceable life of at least 50 years provided the paint coating system is maintained in accordance with this Appraisal to ensure the Linea® Weatherboards and fixings remain dry in service. Linea® Weatherboards must be painted within 3 months of fixing.

10.2 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604, Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. To achieve a 50 year serviceable life in Zone D, Linea® Weatherboards must be fixed with stainless steel fasteners. Fasteners outside Zone D may be hot-dip galvanised steel.

10.2 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of Linea® Weatherboards in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

11.1 Regular maintenance is essential for Linea® Weatherboard Cavity Cladding installations to continue to meet the NZBC durability performance provision and to maximise their serviceable life.

11.2 Annual inspections must be made to ensure that all aspects of the cladding system, including the paint coating system, flashings and any sealed joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately. Sealant and paint coatings must be repaired in accordance with the sealant or paint coating manufacturer's instructions.

11.3 Regular cleaning (at least annually) of the paint coating surface is recommended to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Paint systems must be recoated at approximately 7-15 yearly intervals in accordance with the paint manufacturer's instructions.

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11.4 Minimum ground clearances as set out in this Appraisal must be maintained at all times during the life of the cladding. *[Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of Linea® Weatherboard Cavity Cladding.]*

Control of External Fire Spread

12.1 Linea® Weatherboard has a peak heat release rate of less than 100 kw/m^2 and a total heat released of less than 25 MJ/m^2 in accordance with NZBC Acceptable Solution C/AS1, Table 5.1. The system is suitable for use on buildings with a SH Risk Group classification, at any distance to the relevant boundary. Linea® Weatherboard is also suitable for use where a non combustible material is specified. When Linea® Weatherboard is finished with a paint coating of not more that 1.0 mm in thickness, the exterior surface finishes requirements of NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8.1 do not apply in accordance with NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8.2 a).

Prevention of Fire Occurring

13.1 When Linea® Weatherboard Cavity Cladding is finished with a paint coating of not more than 1.0 mm in thickness, clearance separations from chimneys and flues are not required. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solutions C/AS1 - C/AS6, Paragraph 7.5.9 for the protection of combustible materials.

External Moisture

14.1 Linea® Weatherboard Cavity Cladding, when installed in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

14.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with Clause E2.3.5.

14.3 Linea® Weatherboard Cavity Cladding allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with Clause E2.3.6.

14.4 The details given in the Technical Literature for weather sealing are based on the design principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

14.5 The use of Linea® Weatherboard Cavity Cladding where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

15.2 Linea® Weatherboard Cavity Cladding is not a barrier to the passage of water vapour, and when installed in accordance with the Technical Literature and this Appraisal will not create or increase the risk of moisture damage resulting from condensation.

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Installation Information

Installation Skill Level Requirements

16.1 Installation of Linea® Weatherboard and accessories supplied by James Hardie New Zealand and the building contractor must be completed by tradespersons with an understanding of cavity construction and bevelback weatherboard installation, in accordance with instructions given within the Linea® Weatherboard Cavity Cladding Technical Literature and this Appraisal.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

17.1 The selected building underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Linea® Weatherboard Cavity Cladding system. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints. Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

Cavity Battens

17.2 Cavity battens must be installed over the building underlay to the wall framing at maximum 600 mm centres where the studs are at 600 mm centres or at 400 mm centres when studs are at 400 mm centres. The battens must be fixed in place with 40 x 2.8 mm hot-dip galvanised flat-head nails at maximum 800 mm centres.

17.3 Where studs are at greater than 400 mm centres, a building underlay support must be installed over the building underlay between the cavity battens at maximum 300 mm centres.

Linea® Weatherboard Installation

17.4 Linea® Weatherboards may be cut on site by power saw. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.

17.5 Weatherboards must be dry prior to installation. Before the weatherboards are installed, cut ends exposed to the exterior such as at aluminium box corners or internal corners must be sealed with an acrylic sealer to reduce the absorbency of the fibre cement.

17.6 Linea® Weatherboards must be installed starting at the bottom of the wall. A cant strip (H3.1 treated timber or fibre cement) must be fixed behind the bottom course of weatherboards to ensure the weatherboards are set at the correct angle. The cant strip must be continuous around the perimeter of the building. The bottom course of weatherboards must overhang the bottom plate by a minimum of 50 mm.

17.7 Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner, corner soaker. The necessary flashings, including window flashings, must be installed before commencing weatherboard fixing.

17.8 The first course of weatherboards must be full length, i.e. 4200 mm and commence from an external corner. Jointing of Linea® Weatherboards is made off the stud using the pre-cut tongue and groove joint. Tongue and groove joints may be located centrally between the studs, but must be no closer than 100 mm to the edge of a stud. A bead of sealant must be applied to the front side of the tongue before the corresponding board is inserted. Subsequent courses of weatherboards must be installed so that the tongue and groove joints are staggered by 600 mm minimum from joints in the previous course.

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17.9 Linea® Weatherboards must have a minimum lap of 30 mm, and should be set out so as near to a full board as possible will finish under and over windows and doors and at the top of the wall. A storey rod can be used to accurately position weatherboard courses.

17.10 Linea® Weatherboards must be fixed to each stud using concealed fixings behind the lap of the boards or face nailing, except that face nailing must be provided at all corners and vertical edges of openings.

17.11 Concealed fixing must be carried out using 60 x 2.8 mm hot-dip galvanised or stainless steel Hardieflex nails depending on the location - see Paragraph 10.2. Nails must be fixed 25 mm from the top edge of the board and must be driven flush with the board surface.

17.12 Face nailing must be carried out using 75 x 3.15 mm hot-dip galvanised or stainless steel jolt-head nails in NZS 3604 wind zones up to and including Very High, or 90 x 4.0 mm hot-dip galvanised or stainless steel jolt-head nails in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa, depending on the location - see Paragraph 10.2. Nails must be fixed 15 mm up from the bottom of the board and punched a maximum of 2 mm below the surface of the board. When stainless steel nails are used, the top board at each lap must be pre-drilled.

17.13 Linea® Weatherboards can be hand or gun nailed. Nails must not be closer than 25 mm to the end of the board when hand nailing, or closer than 50 mm when gun nailing. *[Note: Gun nailing must only be used for concealed nailing.]*

Aluminium Joinery Installation

17.14 Aluminium joinery and associated head and sill flashings must be installed by the building contractor in accordance with the Technical Literature. A 7.5 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

17.15 After installing the window and door joinery, Axent™ Trim, planted sills and scribers may be installed in accordance with the Technical Literature to provide additional weatherproofing for the joinery/weatherboard junction.

Inspections

17.16 The Technical Literature must be referred to during the inspection of Linea® Weatherboard Cavity Cladding installations.

Finishing

17.17 The paint coating manufacturer's instructions must be followed at all times for application of the paint finish. Linea® Weatherboards and trim must be clean and dry before commencing painting.

Health and Safety

18.1 Cutting of Linea® Weatherboard must be carried out in well ventilated areas, and a dust mask and eye protection must be worn.

18.2 When power tools are used for cutting, grinding or forming holes, health and safety measures as set out in the Technical Literature must be observed because of the amount of dust generated.

18.3 Safe use and handling procedures for Linea® Weatherboard and the components that make up the cladding system are provided in the relevant manufacturer's Technical Literature.

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Basis of Appraisal

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

Tests

19.1 The following testing has been completed by BRANZ:

- BRANZ expert opinion on NZBC E2 code compliance for Linea® Weatherboard Cavity Cladding was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Linea® Weatherboard Cavity Cladding was tested to E2/VM1 (as contained within NZBC Clause E2, Third Edition, Amendment 5). The testing assessed the performance of the foundation detail, window head, jamb and sill details, meterbox head, jamb and sill details, balustrade to wall junction, parapet cap and internal and external corners. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of NZBC Acceptable Solution E2/AS1 for drained cavity claddings.
- Uniform wind face load tests to simulate wind pressures on 12 mm thick Linea® Weatherboards were carried out by BRANZ, and the results were used in assessing 16 mm thick Linea® Weatherboard used in Linea® Weatherboard Cavity Cladding.
- Cone Calorimeter testing to determine the peak rate of heat release and total heat release of Linea® Weatherboard was completed by BRANZ. The testing was carried out in accordance with AS/NZS 3837.

19.2 Linea® Weatherboards have been tested by a James Hardie NATA accredited laboratory in accordance with AS/NZS 2908.2. The testing covered: soak-dry, bending strength, warm water soaking, heat/rain, freeze/thaw and apparent density. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

19.3 Testing has been carried out by James Hardie New Zealand to determine the modulus of rupture and inter-laminar bond strength of carbonated and non-carbonated Linea® Weatherboard. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

20.1 Weathertightness, structural, fire and durability opinions have been provided by BRANZ technical experts.

20.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

20.3 The manufacturer's Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

21.1 The manufacture of Linea® Weatherboard has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

21.2 The quality of materials, components and accessories supplied by James Hardie New Zealand is the responsibility of James Hardie New Zealand. The quality control system of James Hardie New Zealand has been assessed and registered as meeting the requirements of ISO 9001: 2008.

21.3 Quality on site is the responsibility of the installer.

21.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the building underlay, cavity battens, Linea® Weatherboard and accessories in accordance with the instructions of James Hardie New Zealand.

21.5 Building owners are responsible for the maintenance of Linea® Weatherboard Cavity Cladding in accordance with the instructions of James Hardie New Zealand.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Sources of Information

- AS 3730 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4534: 1998 Zinc and zinc/aluminium-alloy coatings on steel wire.
- AS/NZS 4680: 2006 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011 and NZBC Acceptable Solution E2/AS1 Third Edition, Amendment 5.

Amendment No. 2, dated 30 October 2013.

This Appraisal has been amended to change the Appraisal Holder, change the Product Name and to update clause changes as required by the introduction of NZBC Fire Clauses C1 – C6 Protection from Fire and A3 Building Importance Levels.

Amendment No. 3, dated 5 March 2014.

This Appraisal has been amended to alter the scope to include NZS 3604 Wind Zone Extra High, and specific design wind pressures up to and including 2.5 kPa.

Amendment No. 4, dated 01 March 2016.

This Appraisal has been amended to remove the term Scyon®.

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BRANZ

In the opinion of BRANZ, Linea® Weatherboard Cavity Cladding is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to James Hardie New Zealand, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

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

For BRANZ



Pieter Burghout
Chief Executive

Date of Issue:
14 September 2010

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Linea™ WEATHERBOARD

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Cavity Fix

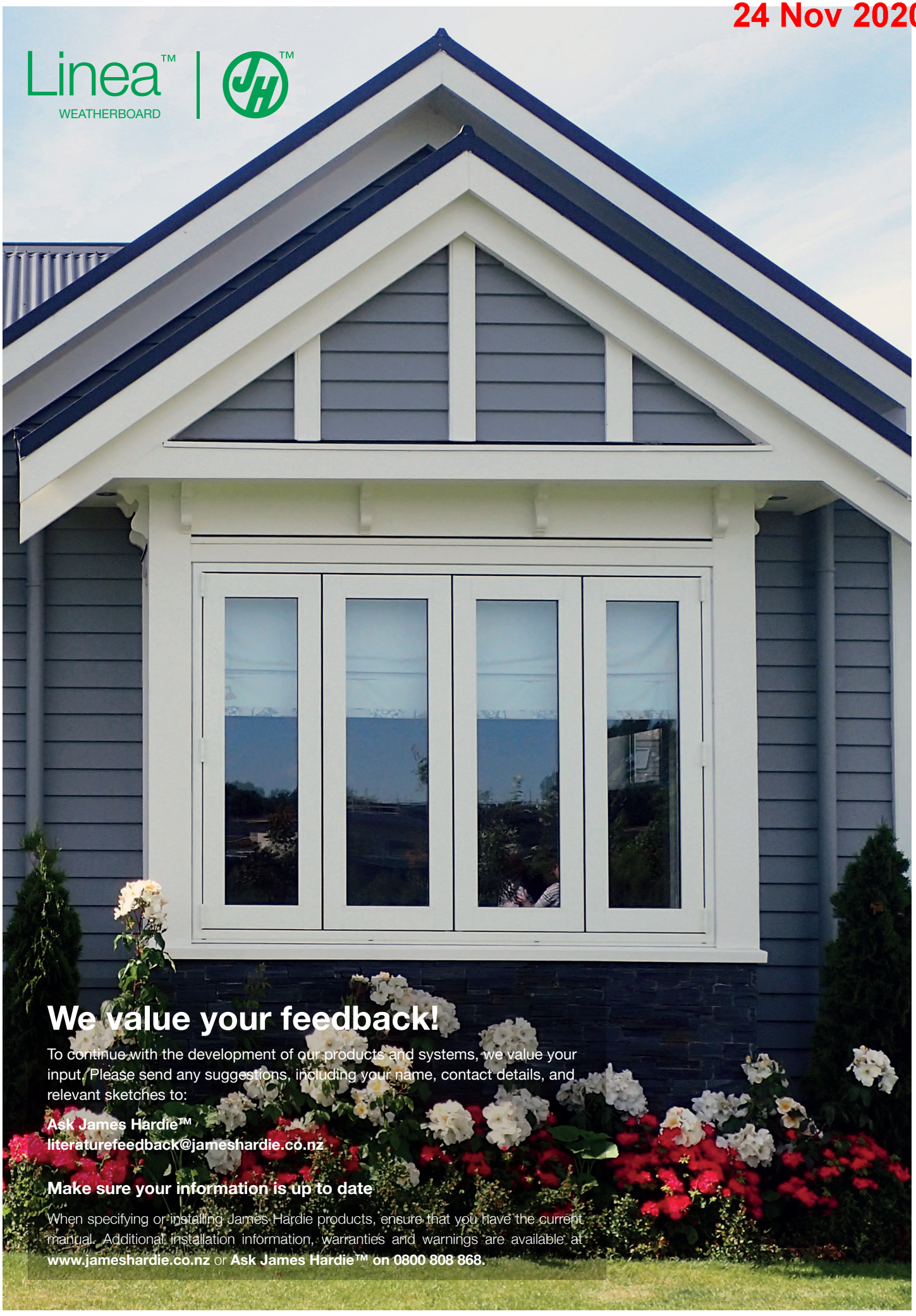
Technical Specification

May 2020 New Zealand



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Linea™ WEATHERBOARD | JH™



We value your feedback!

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

Ask James Hardie™
literaturefeedback@jameshardie.co.nz

Make sure your information is up to date

When specifying or installing James Hardie products, ensure that you have the current manual. Additional installation information, warranties and warnings are available at **www.jameshardie.co.nz** or **Ask James Hardie™ on 0800 808 868.**

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1 Product Overview

1.1 Product Information

Linea™ Weatherboard is an external cladding.

Linea Weatherboard is a 16mm thick, pre-primed bevel back fibre cement weatherboard. The bottom front edge of Linea Weatherboard is chamfered. It has tongue and groove ends for jointing and is classified as lightweight wall cladding for use in residential and light commercial buildings using timber or lightweight steel framed external walls. Linea Weatherboard is available in 135mm, 150mm and 180mm widths.

James Hardie also has available:

- Axent™ Fascia is a 16mm thick, pre-primed fibre cement product available in two widths. It's designed to accommodate James Hardie soffit linings.
- Axent™ Trim is a 16mm thick, pre-primed fibre cement product available in two widths. For use as decorative trims around openings and external corners.

For fixing to a steel frame. Ask James Hardie™ on 0800 808 868 for specific requirements. Or refer to the James Hardie cladding to steel framing technical supplement about the installation of Linea Weatherboard to steel frame.

Table 1

Linea Weatherboard and Axent Trim sizes									
							Coverage Information		
Product	Code	Length (mm)	Width (mm)	Thickness (mm)	End details	Effective cover (mm)	No. of planks/ metre height (approx.)	Mass kg/lineal m (approx. at EMC)	Mass kg/m2 (approx. at EMC)
Linea Weatherboard 135	401844	4200	135	16	T & G	105	9.5	2.62	25.70
Linea Weatherboard 150	402533	4200	150	16	T & G	120	8.3	3.1	24.93
Linea Weatherboard 180	401847	4200	180	16	T & G	150	6.7	3.57	23.92
Axent Trim 84mm	401943	2600	84	16	Square	N/A	N/A	1.6	N/A
Axent Trim 100mm	401930	2600	100	16	Square	N/A	N/A	1.9	N/A

The effective thickness of finished Linea Weatherboard on the wall at the lap is approximately 33 to 35mm

All dimensions and masses provided are approximate only and are subject to manufacturing tolerances.

Linea Weatherboard is categorised as a Light Weight Wall Cladding as described in the NZS 3604.

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1.2 Manufacturing and Classification

The manufacturing process of Linea Weatherboard by James Hardie is ISO 9001 Certified.

Linea Weatherboard is an advanced lightweight cement composite cladding manufactured using a basic composition of Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Linea' printed on the back.

Axent Trim is an advanced lightweight cement composite cladding manufactured using a basic composition of Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Axent' printed on the back. The trims are factory sealed and primed.

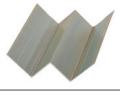
Linea Weatherboard and Axent Trim products are manufactured to Australian/New Zealand Standard AS/NZS 2908.2 'Cellulose-Cement Products' (ISO 8336 'Fibre-Cement Flat Sheet').

Linea Weatherboard is classified Type A, Category 2 in accordance with AS/NZS 2908.2 "Cellulose-Cement Products".

For Safety Data Sheets (SDS) visit **www.jameshardie.co.nz** and view them in the technical literature section or Ask James Hardie on **0800 808 868**.

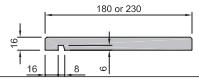
1.3 Components and Accessories

Table 2

Accessories/tools supplied by James Hardie			
Accessories	**Description**	**Size (mm)**	**Code**
	**External corner soaker 90º for Linea Weatherboards 180mm** • Aluminium • Copper • Stainless Steel	200 long	 **301186** **301188** **301197**
	**External corner soaker 135º for Linea Weatherboards 180mm** • Aluminium	200 long	 **301178**
	**External corner soaker 90º for Linea Weatherboards 150mm** • Aluminium • Stainless Steel	170 long	 **302820** **302821**
	**External corner soaker 90º for Linea Weatherboards 135mm** • Aluminium • Stainless Steel	155 long	 **301185** **301196**
	**External Slimline Box Corner Mould** Etched primed aluminium extrusion used to create external corner	2700 long 4000 long	**301195** **305809**
	**Linea 35mm Cavity Closer**	3000 long	**306035**
	**Internal 'W' Mould 90º** Etched primed aluminium extrustion used to create 900 internal corner	2700 long 4000 long	**301184** **305807**
	**Internal 'W' Mould 135º** Etched primed aluminium extrustion used to create 135º internal corner	2700 long	**301183**

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Table 2 contd.

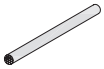
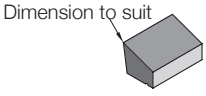
Accessories/tools supplied by James Hardie			
Accessories	**Description**	**Size (mm)**	**Code**
	**JH Corner Under Flashing 50 x 50mm** PVC moulding used as under fashing for internal and external corners	3000 long	**303745**
	**Axent Trim 84mm**	84 x 2600 long	**401943**
	**Axent Trim 100mm**	100 x 2600 long	**401930**
	**Axent Fascia** - 180mm - 230mm	4200 long	**401843** **402230**
	**HardieFlex™ Galvanised nail - 5kg**	60 x 3.15mm	**302782**
	**HardieFlex™ Stainless steel nail - 5kg**	60 x 3.15mm	**302784**
	**HardieBlade™ Saw Blade** Diamond tip fibre cement circular saw blade. Spacers not included	4 tooth - 184mm	**300660**
	**HardieBlade™ Saw Blade** Diamond tip fibre cement circular saw blade. Spacers not included	6 tooth - 254mm	**303375**
	**Gecko Gauge** This easy to use tool gauges and supports the weatherboard for a one person install.		**305941**

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Table 3

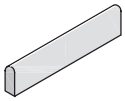
Accessories not supplied by James Hardie

James Hardie recommends the following products for use in conjunction with its Linea Weatherboard and Axent Trim. James Hardie does not supply these products. There may also be some other accessories required depending upon the application. Please contact component manufacturer for information on their warranties and further information on their products.

Accessories	Description	Size (mm)	Material/ appearance
	**Flexible Underlay** To comply with Table 23 of E2/AS1		
	D head or RounDrive Nail Gun nail for concealed fixing Linea Weatherboard.	60 x 2.87	Hot Dip Galvanised/ Stainless Steel
	**HardieFlex™ Hot Dip Galv. Nails** For concealed fixing by hand nail	60 x 3.15mm 75 x 3.15mm	Hot Dip Galvanised/ Stainless Steel
	Jolt Head Nail for face fixing Linea Weatherboard	75 x 3.15mm 90 x 3.55mm	Hot Dip Galvanised/ Stainless Steel
	Titanium Coated High Speed Drill Bit. For pre-drilling prior to face fixing with jolt head.	3.0mm 3.5mm	
	Brad Nail To tie boards together	32mm	
	**Joint sealant** Paintable flexible sealants are recommended for filling the joints. Refer to Section 7.2 for information.	Tube	Sika, Bostik or similar Holdfast
	**CRC ADOS Builders Fill** Two part exterior grade fill to finish over jolt head nails.		
	**PEF Rod**	Polyethylene foam	Sika or similar
	**Flexible tape** A flexible self-adhesive tape used in preparation of a window. Refer to the Window installation section in this manual for more information.	Proprietary tape to adhere to flexible underlay	Tyvek, Marshall Innovations or similar
	**Flashing Material** as per Table 20, 'E2/AS1'		Flashing Fabricator
	**Planted Sill**		H3.1 minimum Treated Timber Timber Merchant or cut on site

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Table 3 contd.

Accessories not supplied by James Hardie			
Accessories	**Description**	**Size (mm)**	**Material/ appearance**
	**Timber Scriber** To scribe beside window, site cut to suit.	As required	H3.1 minimum Treated Timber Timber Merchant or cut on site
	**Fibre Cement Cutting Blade** Diamond tip 305mm diameter circular saw blade to fit drop saw.	305mm	Diamond Tipped
	**Cavity Closer - aluminium** Used in walls taller than 10m for inter-tenancy fire separation.		
	Primers. Dulux 1-Step Prep, Resene Quick Dry etc.		

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2 Application and Scope

2.1 Application

This specification includes the installation of Linea Weatherboard cavity construction where risk matrix is 13 or more and must be read in conjunction with the current CodeMark Certificate and BRANZ Appraisal. This installation method can also be used for buildings where the risk matrix score is 0 - 12 if desired.

This document is intended for use by architects, designers, specifiers or builders who are involved in specifying Linea Weatherboard. The document also serves the purpose of an installation manual for this product.

For use of Linea Weatherboard outside this published scope, the architect, designer or engineer must undertake specific design. For advice on designs outside the scope of this specification, Ask James Hardie on 0800 808 868.

Refer to the Linea Weatherboard Direct Fixed Technical Specification when installing Linea Weatherboard without a cavity.

2.2 Scope

Linea Weatherboard cavity construction is suitable for use in timber framed buildings that fall within the scope limitations of the New Zealand Building Code (NZBC) Acceptable Solution E2/AS1, Paragraph 1.1.

Linea Weatherboard cavity construction is also suitable for use in specific engineering design projects (SED) subject to a wind pressure of 2.5kPa (ULS) maximum for building heights upto 25m.

2.3 Limitations

- Linea Weatherboard cladding must not be used on curved wall applications
- Linea Weatherboard cladding must not be installed vertically or angled
- The minimum ground clearances specified must be maintained
- Timber window joinery/recessed openings is subject to an alternative design by the designer
- Maximum SLS inter-story seismic deflections up to span/180 when used in specific design buildings (SED) buildings above 10m height. To accommodate higher inter-story drifts, a deflection should be used.

2.4 Details

Various typical Linea Weatherboard details are provided within this document. In addition to these, the construction details with HomeRAB™ Pre-Cladding/RAB™ Board have also been developed and are available on our website. These details are available in dwg, dxf, jpg and pdf file format and can be downloaded at **www.jameshardie.co.nz.**

All dimensions shown are in millimetres unless noted otherwise.

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3 Compliance

3.1 NZBC Compliance

When installed in accordance with the conditions of CodeMark number GM-CM30018 Linea Weatherboard complies with all relevant requirements of the NZBC.

CODEMARK™
30018

Please refer to www.building.govt.nz for a copy of the certificate.

Linea Weatherboard cavity fixed cladding also has a BRANZ Appraisal number 447 (2010) available at www.branz.co.nz or www.jameshardie.co.nz.

BRANZ Appraised
Appraisal No.447 [2010]

4 Design

4.1 Responsibility

The specifier or other party responsible for the project must ensure that the information and details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this technical specification.

All New Zealand Standards referenced in this manual are current edition and must be complied with.

Specifier

If you are a specifier or other responsible party for a project ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

Installer

If you are an installer ensure that you follow the design, moisture management principles, associated figures and material selection provided by the designer and this James Hardie Technical Specification. All the details provided in this document must be read in conjunction with the project specification.

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets their aesthetic expectations before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation. James Hardie will only offer a replacement product if Linea Weatherboard or Axent Trim supplied are found to be out of its manufacturing specification.

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4.2 Clearances

The clearance between the bottom edge of cladding and the paved/unpaved ground must comply with section 9.1.3 of E2/AS1. On the roofs and decks the minimum clearance must be 50mm. These clearances must be maintained throughout the life of the building.

Linea Weatherboard must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by the NZBC Acceptable Solution, E2/AS1 Table 18.

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 ‘Surface Water’.

Do not install cladding such that it may remain in contact with water or ground, refer to figures in section 9 of this manual.

4.3 Structure

4.3.1 Timber Framing

Timber framing must be in accordance with NZS 3604 (Timber-framed buildings) or designed as for specific engineering design (SED) in accordance with NZS 3603 and AS/NZS 1170 where specific engineering design is required, the framing stiffness must be equivalent to or more than the framing provisions of NZS 3604.

The stud spacing must not exceed 600mm centres maximum for buildings within the scope of NZS 3604 and 400mm centres maximum for wind pressures more than 1.5kPa (ULS).

For timber frame walls longer than 12m, it is best practice to allow for construction joints to accommodate movements generated due to timber shrinkage or deflections.

4.3.2 Durability

Timber framing must be treated to a minimum H1.2 treatment requirements and comply with Acceptable Solution B2/AS1 ‘Durability’ of the NZBC. For further timber treatment information refer to the NZS 3602 (Timber and Wood-Based Products for use in Buildings) for minimum timber treatment selection and treatment requirements. Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturers. Refer to the NZS 3602 for information about the allowable moisture content in timber framing.

4.4 Structural Bracing

Bracing can be achieved by using HomeRAB Pre-Cladding or RAB Board installed direct to framing instead of a flexible underlay or by using Villaboard™ Lining bracing system on the internal face.

4.5 Energy Efficiency

External walls constructed as per this technical specification, using Linea Weatherboard cladding must use suitable bulk insulation to meet the minimum thermal insulation requirements as per Clause H1/AS1 'Energy Efficiency' of the NZBC.

4.6 Fire Rated Walls

External walls with Linea Weatherboard cavity fix construction method can achieve fire ratings up to 60/60/60 when constructed in accordance with the James Hardie Fire and Acoustic Design Manual. Linea Weatherboard must be face fixed for fire rated applications.

Refer to the Fire and Acoustic Design Manual for further information about fire rated systems.

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4.7 Control of External Fire Spread

External spread of fire (clause C3.5 and C3.7) apply where:

- Building height is greater than 10m and upper floors have sleeping uses or are different property (C3.5), and
- Where the building is located within 1m of a relevant boundary (C3.7)

Refer to Table 5.1 of Section 5.4 of C/AS1 for group SH or table 5.5 of Section 5.8.1 of C/AS2 for the other risk groups to identify the external fire spread requirement applicable to the external cladding material and surface finish.

For the other situations where 'no requirement' is listed, Linea Weatherboard installed as per the details published in this specification complies.

For buildings that are >10m high and contain tenancies above as per Table 5.5. of C/AS2, Linea Weatherboard installed over timber cavity battens in conjunction with RAB Board with R2.2 fibreglass/James Hardie mineral insulation complies. Refer to Figure 38 and 39 for RAB Board and cavity batten layout. For the complete set of suitable Linea Weatherboard cavity construction details with RAB Board for this application, refer to www. jameshardie.co.nz.

4.8 Alpine regions

In regions subject to freeze/thaw conditions, Linea Weatherboard must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions subject to snow drifts over winter.

The Linea Weatherboard has been tested in accordance with AS/NZS 2908.2 Clause 8.2.3.

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5 Safe Working Practices

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

James Hardie products contain sand, a source of respirable crystalline silica may cause cancer if dust from product is inhaled. Causes damage to lungs and respiratory system through prolonged or repeated inhalation of dust from product.

Intact fibre cement products are not expected to result in any adverse toxic effects. The hazard associated with fibre cement arises from the respirable crystalline silica present in dust generated by activities such as cutting, rebating, drilling, routing, sawing, crushing, or otherwise abrading fibre cement, and when cleaning up, disposing of or moving dust.

When doing any of these activities in a manner that generates dust, follow James Hardie instructions and best practices to reduce or limit the release of dust.

If using a dust mask or respirator, use an AS/NZS1716 P1 filter and refer to Australian/New Zealand Standard 1715:2009 Selection, Use and Maintenance of Respiratory Protective Equipment for more extensive guidance and more options for selecting respirators for workplaces. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie.co.nz.

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

Crystalline Silica is

- Commonly known as sand or quartz
- Found in many building products e.g. concrete, bricks, grout, wallboard, ceramic tiles, and all fibre cement materials

Why is Crystalline Silica a health hazard?

- Silica can be breathed deep into the lungs when present in the air as a very fine (respirable) dust
- Exposure to silica dust without taking the appropriate safety measures to minimise the amount being breathed in, can lead to a potentially fatal lung disease – silicosis – and has also been linked with other diseases including cancer. Some studies suggest that smoking may increase these risks
- The most hazardous dust is the dust you cannot see!

When is Crystalline Silica a health hazard?

- It's dangerous to health if safety protocols to control dust are not followed when cutting, drilling or rebating a product containing crystalline silica and when cleaning up
- Products containing silica are harmless if intact (e.g. an un-cut sheet of wall board)

Avoid breathing in crystalline silica dust

Safe working practices

✕ NEVER use a power saw indoors or in a poorly ventilated area

✕ NEVER dry sweep

✓ ALWAYS use M Class or higher vacuum or damp down dust before sweeping up

✕ NEVER use grinders

✓ ALWAYS use a dust reducing circular saw equipped with a sawblade specifically designed to minimise dust creation when cutting fibre cement – preferably a sawblade that carries the HardieBlade™ logo or one with at least equivalent

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performance – connected to an M Class or higher vacuum

- ✓ Before cutting warn others in the area to avoid dust
- ✓ ALWAYS follow tool manufacturers' safety recommendations
- ✓ ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ✓ ALWAYS wear a properly-fitted, approved dust mask or respirator P1 or higher in accordance with applicable government regulations and manufacturer instructions
- ✓ Consider rotating personnel across cutting tasks to further limit respirable silica exposures.

When cutting

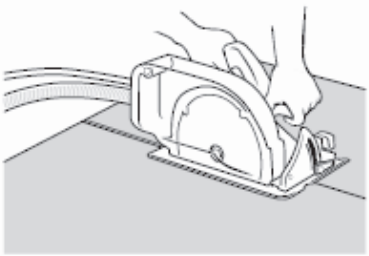
- ✓ Work outdoors only
- ✓ Make sure you work in a well ventilated area
- ✓ Position cutting station so wind will blow dust away from yourself and others in the working area
- ✓ Rotate employees across cutting task over duration of shift
- ✓ Cut products with a HardieBlade Saw Blade (or equivalent) and a dust reducing circular saw connected to a M Class or higher vacuum
- ✓ When sawing, sanding, rebating, drilling or machining fibre cement products, always:
  - Wear your P1 or higher (correctly fitted in accordance with manufacturers' instructions), ask others to do the same.
  - Keep persons on site at least 2 metres and as far as practicable away from the cutting station while the saw is in operation
  - If you are not clean shaven, then use a powered air respirator with a loose fitting head top
  - Wear safety glasses
  - Wear hearing protection
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

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Working Instructions

HardieBlade™ Saw Blade



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

Hole-Forming



For smooth clean cut circular holes:

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

For irregular holes:

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

5.1 Storage and delivery

Keeping products and people safe

Off loading

✓ James Hardie products should be off-loaded carefully by hand or by forklift

✓ James Hardie products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

James Hardie products should be stored:

✓ In their original packaging

✓ Under cover where possible or otherwise protected with a waterproof covering to keep products dry

✓ Off the ground – either on a pallet or adequately supported on timber or other spacers

✓ Flat so as to minimise bending

James Hardie products must not be stored:

✗ Directly on the ground

✗ In the open air exposed to the elements

James Hardie is not responsible for damage due to improper storage and handling.

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5.2 Tips for safe and easy handling of weatherboard products

Weatherboard products

- ✕ Do not lift planked products flat and in the middle
- ✓ Carry the products on the edge
- ✓ If only one person is carrying the product, hold it in the middle and spread arms apart to better support the product
- ✓ If two people are carrying the plank, hold it near each end and on edge
- ✓ Exercise care when handling weatherboard products to avoid damaging the edges/corners

6 Installation

The horizontal lap between the two Linea Weatherboard must be 30mm minimum. In certain scenarios you may require to creep up the lap, this must not exceed 33mm.

Linea Weatherboard must be kept dry whilst in storage prior to and during fixing. Site cut ends that are exposed such as slimline box corners, internal corners etc. and any sanded patches on the boards surface must be primed prior to installation. Dust and loose material must be removed before priming.

6.1 Fastener

6.1.1 Fastener – Size and Method

Linea Weatherboard and Axent Trim must be fixed to timber with the types of nails specified in Tables 4 and 5, in accordance with the following requirements:

- Linea Weatherboard can either be face/exposed fixed or concealed fixed
- Linea Weatherboard must be fixed into studs at maximum 600mm centres. Fixing centres to coincide with stud spacing, refer to figures in section 9 of this manual
- All concealed nails must be driven flush with the board surface
- When concealed fixing Linea Weatherboard, nails must be driven under the lap of boards, except at all corners and vertical edges of openings where Linea Weatherboard must be face fixed, refer to figures in section 9 of this manual
- Nails must be fixed 25mm from the end of the board when hand nailing. For gun nailing refer to Section 6.1.2
- When using concealed fixing method, any gaps that may appear under the lap due to site conditions can be minimised by fixing a jolt head nail through the lap as per the exposed nailing method. Refer to figures in section 9 of this manual
- When using concealed fixing method, Linea Weatherboard may be tied together by face fixing through the lap using a 32mm brad nail if desired.
- When face fixing Linea Weatherboard, the upper board must be pre-drilled before fixing with a jolt head nail

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Table 4

Wind pressure (kPa)	Underlay	Fixing method	Fixing type	Instructions
Up to 1.5 (up to and including VH Wind Zone)	Flexible underlay	Concealed nailing	60 x 3.15mm HardieFlex™ nail or a 60 x 2.87mm D/round head gun nail	Finish flush with the board surface.
		Face nailing	75 x 3.15mm jolt head nails	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3mm drill bit.
	Rigid air barrier	Concealed nailing	75 x 3.15mm HardieFlex™ nail or a 75 x 3.06mm D/round head gun nail	Finish flush with the board surface.
		Face nailing	90 x 3.55mm jolt head nails	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3.5mm drill bit.
1.5 to 2.5 (EH Wind Zone and SED projects)	RAB Board	Face nailing	90 x 3.55mm jolt head nail	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3.5mm drill bit.

Table 5

Nail requirements for Axent Trim	
Single thickness	60mm jolt head nails. If fixing over Linea Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled hole, using a 3mm drill bit.
Single thickness plus packer	If fixing over Linea Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled hole, using a 3mm drill bit. When fixing to timber support use 60mm jolt head nails.

For fire rated wall applications the Linea Weatherboards must be face fixed. For more information Ask James Hardie on 0800 808 868.

6.1.2 Gun Nailing

Linea Weatherboard can be gun nailed with a D-Head or RounDrive nail when concealed fixing method is used.

- Nails must be no closer than 50mm from the ends of boards when gun nailing is used, double studs will be required.
- Be minimum length and nearest gauge as per Table 4.
- Be finished flush with surface of board.

6.1.3 Fastener Durability

Fasteners must meet the minimum durability requirements of the NZBC. Refer to Table 6 for fixing materials requirements to be used in relation to the exposure conditions.

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Table 6

Exposure conditions and nail selection prescribed by NZS 3604		
Zone	**Application**	
D (sea spray) and geothermal hot spots	General	Stainless steel 304/316
	Fire	
*C and B	General	Hot dip galvanised**
	Fire	

* Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made Microclimatic conditions as detailed in NZS 3604, Paragraph 4.2.4 require SED.

**Hot dip galvanised must comply with AS/NZS 4680.

Also refer to the NZBC Acceptable Solution E2/AS1 Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

6.2 Framing

Framing to be in accordance with the NZS 3604. The following must be provided for fixing Linea Weatherboard:

- Studs at 600mm centres maximum for all wind speed zones up to and including very high (VH)
- Studs at 400mm centres maximum for wind pressures more than 1.5 kPa (ULS)
- Double studs are required at internal corners
- Extra packers may be required at external corners
- Extra studs are required for aluminium internal corner sections

6.2.1 Specific Engineering Design (SED)

For EH wind zone and specific engineering design projects the timber framing is required to be designed in accordance with NZS 3603 and AS/NZS 1170. The minimum framing sizes and layout must comply with this specification:

- Stud spacing 400mm centres maximum
- Nog spacing 1200mm centres maximum
- Double studs are required at internal corners
- Extra packers may be required at external corners
- Extra studs are required for aluminium internal corner sections

6.2.2 Gable Ends

In case of gable end trusses sitting on top plates of the external wall frame, the frame size must be in accordance with truss design and specification supplied by the frame and truss manufacturer/supplier supported by independent design producer statement.

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6.2.3 Tolerances

In order to achieve an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with the requirements of NZS 3604 and the manufacturer's specifications. All framing must be made flush. The visual aspects of the finished cladding can differ between two different sites or the builders installing the product. It is recommended that you also refer to a building guidance document published by MBIE to understand an acceptable level of tolerances allowed in building materials and workmanship. www.building.govt.nz Guide to tolerances, materials and workmanship in new residential construction 2015

6.3 Flexible Underlay or HomeRAB Pre-Cladding

Flexible underlay or HomeRAB Pre-Cladding must be provided to comply with the requirements of E2/AS1 up to and including very high wind zone.

Walls which are not lined on the inside face (e.g. garage walls or gable ends) must include a rigid sheathing or an air barrier behind the cladding. HomeRAB Pre-Cladding is suitable for use as an air barrier and must be installed in accordance with James Hardie Rigid Air Barriers Installation Manual.

6.4 Intermediate Support

Where studs are at 600mm centres an intermediate means of restraining the flexible underlay and insulation from bulging into the cavity must be installed. An acceptable method to achieve this is using one of the following:

- Intermediate cavity batten between the studs; or
- 75mm galvanised mesh; or
- Polypropylene tape at 300mm centres fixed horizontally and drawn taut.

No intermediate supports are required:

- Where studs are at maximum 400mm centres; or,
- When rigid sheathings instead of flexible underlays are used.

6.5 Rigid Air Barrier

In EH wind zone or for specific design wind zone, a rigid air barrier i.e. RAB Board, must be used instead of flexible underlay.

For buildings more than 10m, RAB Board must be used. To achieve the temporary weathertightness using James Hardie rigid air barriers, windows/doors need to be installed with required flashing tapes and seals etc. Refer to James Hardie Rigid Air Barriers Installation Manual for information regarding its installation and to achieve temporary weathertightness.

6.6 Vent Strip

Linea 35mm cavity closer vent strip (uPVC) must be installed at the bottom of all walls constructed using the drained and ventilated for cavity construction method. James Hardie Linea 35mm cavity closer vent strip has an opening area of 1000mm^2/m length. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. Alternate cavity closer can be used ensuring compliance of E2 and may need to be used with a cant strip.

6.7 Cavity Battens

The cavity battens provide airspace between the frame and cladding and are considered a "packer" only in this specification.

The timber battens must be minimum H3.1 treated to comply with the durability requirements of B2/AS1.

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Cavity battens must comply with E2/AS1 and:

- Be minimum 18mm thick
- Be minimum 45mm wide
- Until claddings are fixed the battens need only to be tacked to framing with 40 x 2.8mm nails at 800mm centres maximum (batten fixing is required temporarily to keep them straight on the wall during construction)

6.8 Joints

6.8.1 Jointing

The ends of Linea Weatherboard are jointed off-stud by means of a tongue and groove joint. Tongue and groove joints may be located centrally between studs but no closer than 100mm from the edge of a stud. The joints must be staggered by 600mm minimum. Flexible sealant must be applied to the front of tongue before pushing into the groove at the time of installation. From a visual perspective, the joint line will be visible and must not be hard filled.

6.8.2 Drainage Joint

After every two floors a horizontal drainage joint flashing is required, refer to figures Figure 29 in section 9 of this manual.

6.8.3 External Corner Joint

There are a number of options to select from when detailing external corners:

- 90º corner soaker in aluminium, copper or stainless steel
- 135º corner soaker 180mm aluminium
- Aluminium boxed corners
- Box corners using Axent Trim
- Mitred corners to weatherboards

Refer to figures in section 9 of this manual.

6.8.4 Internal Corner Joint

There are a number of options to select from when detailing internal corners:

- 90º or 135º Aluminium W-mould
- Scribed corner

Refer to figures in section 9 of this manual.

6.9 Junctions and Penetrations

All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for Linea Weatherboard which meet the performance requirements of E2 ‘External Moisture’, an approved document of the NZBC, refer to figures in section 9 of this manual.

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7 Finishes

Protective coating of Linea Weatherboard and Axent Trim is required in order to meet the durability requirements of the NZBC.

7.1 Preparation and Priming

The Linea Weatherboard and Axent Trim must be dry before painting. Punch and fill all exposed nails a maximum of 2mm below the surface. Fill the hole with an exterior grade 2 part builders fill, eg CRC ADOS Builders Fill, allow to cure and using 60 grit sand paper smooth ready for painting. Prime any sanded patch on board surface or the site cut edges that will be exposed.

It is not recommended to seal gap under the lap of weatherboards as it helps in circulation of air behind the weatherboard cladding. However if sealing of the gap is undertaken, the product warranty still applies.

7.2 Sealants

All sealants must demonstrate the ability to meet the relevant requirements of the NZBC. Application and use of sealants must comply with manufacturer's instructions. Sealants, if coated, must be compatible with the paint system.

7.3 Painting

All Linea Weatherboards are pre-primed on their face and bottom edge with a factory applied acrylic base coat.

Linea Weatherboard and Axent Trim must be painted within 90 days of installation. Dark coloured paints can be used, i.e. there is no restriction on the Light Reflectance Value (LRV) of paint to be applied. All exposed faces, including the top edges under the sills and bottom edges of Linea Weatherboard, Axent Trim and accessories must be finished with an exterior paint system.

For best aesthetic results a low sheen paint is recommended.

The dark colours in certain environments may fade over a period of time. Special paints/coatings are required in certain harsh environments.

Stainless steel soakers are generally left natural. For painting over stainless steel soakers, refer to paint manufacturer as special preparation and paints are required.

Paint selection and the preparation required is dependent on paint chosen. Refer to the paint manufacturer for information before starting painting.

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8 Care and Maintenance

The extent and nature of maintenance will depend on the geographical location and exposure of the building. It is the responsibility of the specifier to determine normal maintenance requirements to comply with the NZBC Acceptable Solution B2/AS1. As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6-12 months* using low pressure water and a brush, and every 3-4 months in extreme coastal conditions or sea spray zones
- Re-coating exterior protective finishes. Always refer to your paint manufacturer for re-coating requirements
- Maintaining the exterior envelope and connections including junctions, penetrations, flashings and sealants
- Cleaning out gutters, blocked pipes and overflow pipes as required
- Pruning back vegetation close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained especially where gardens are concerned
- The clearances between the bottom edge of Linea Weatherboard and the finished/unfinished ground must always be maintained
- Stainless steel soakers used in extreme coastal conditions or in sea spray zones may show some signs of 'tea staining'. It is an aesthetic issue and to minimise staining soaker must be washed/polished frequently

*Do not use a water blaster to wash down the cladding. Refer to your paint manufacturer for washing down requirements.

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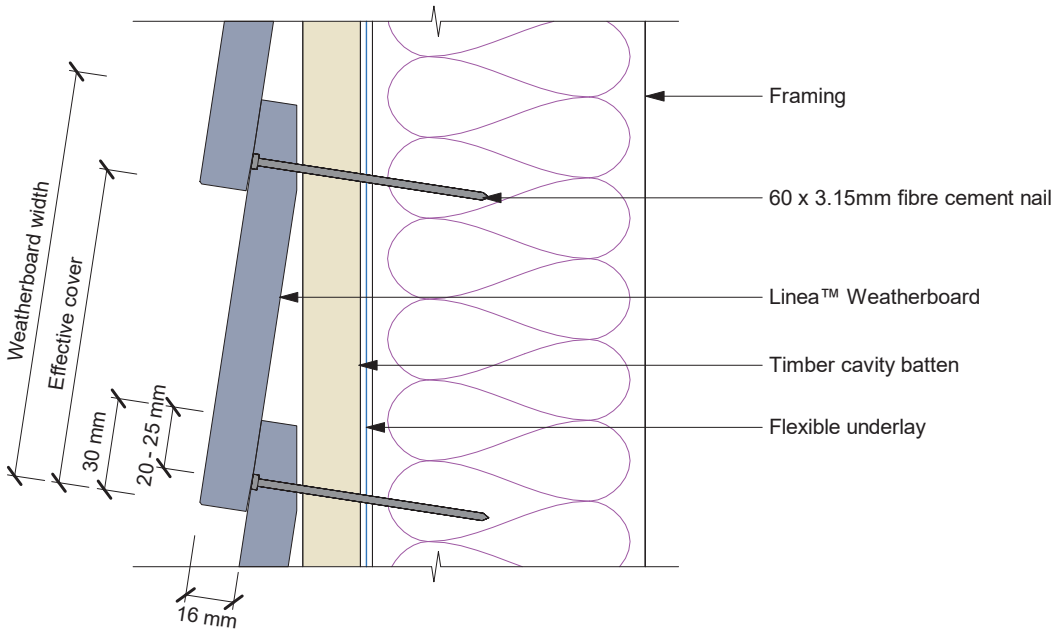
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Figure 39: Intertenancy vertical fire separation	47

For all meter box details please visit our website at **www.jameshardie.co.nz** or Ask James Hardie on **0800 808 868**.

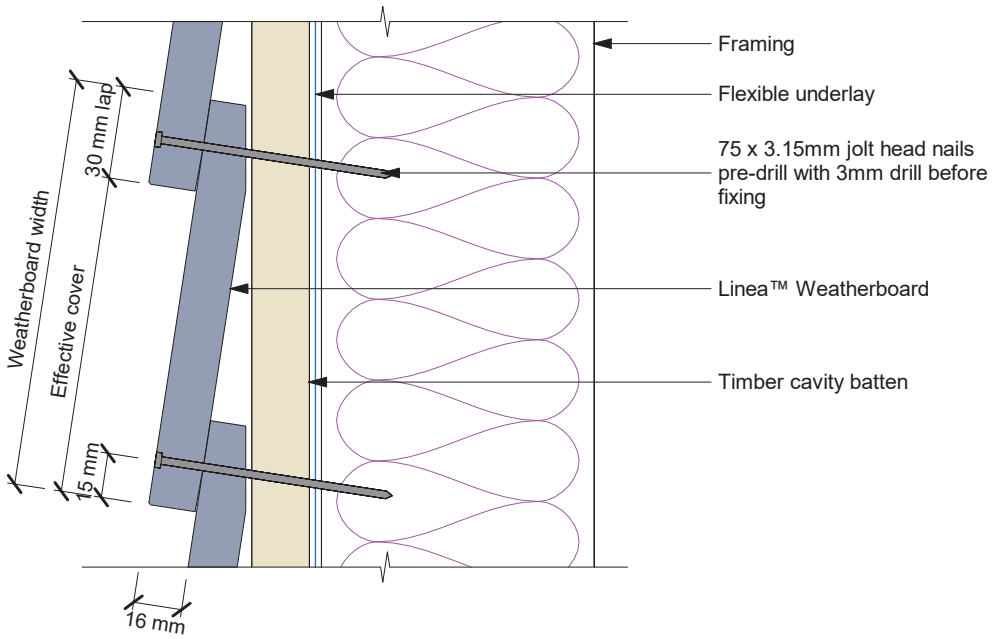
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Figure 1: Weatherboard fixing



Concealed Nailing

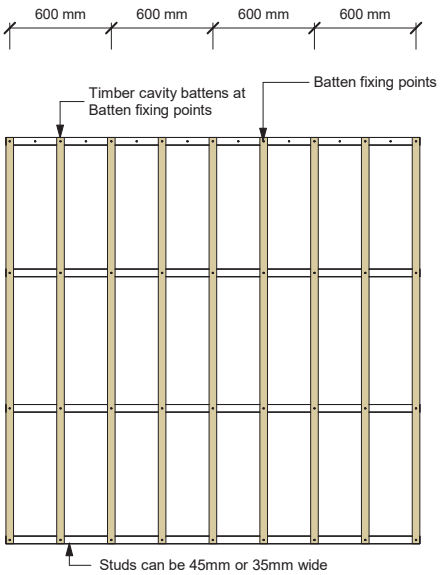
Linea™ Weatherboards to be face fixed at corners and down window and door openings using jolt head nails at 90° to face, punch 2mm below surface and fill. Refer to fixing table 4



Exposed Nailing

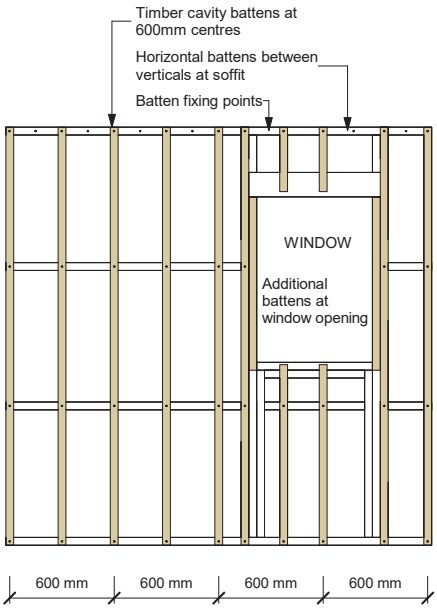
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Figure 2: Batten fixing



The intermediate support for insulation between the studs could be a timber cavity batten, polypropylene tape or 75 mm galvanised wire mesh. Refer to E2/AS1 Paragraph 9.1.8.5 Polypropylene tape must be fixed horizontally and drawn taut at 300 mm centres.

Figure 3: Batten layout at window opening

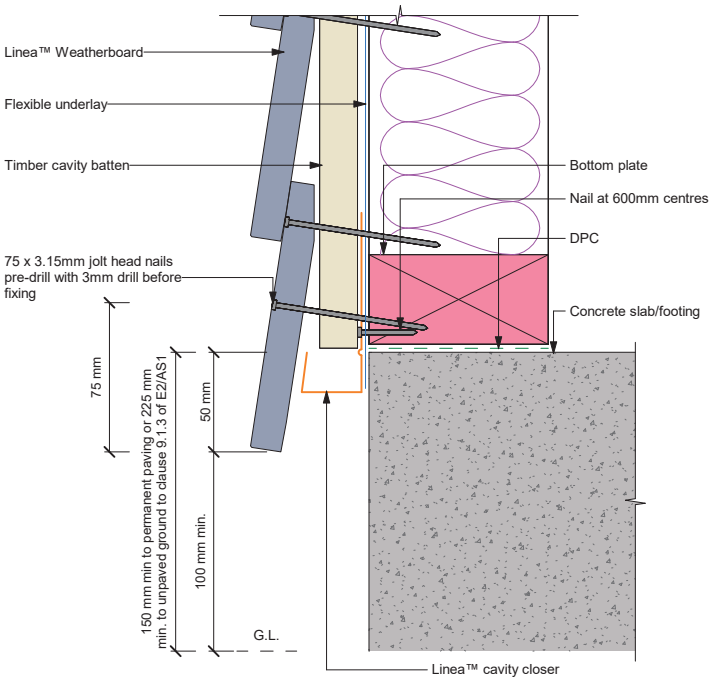


- Studs can be 45mm or 35mm wide

-The intermediate support for insulation between the studs could be a timber cavity batten, polypropylene tape or 75 mm galvanised wire mesh. Refer to E2/AS1 Paragraph 9.1.8.5 Polypropylene tape must be fixed horizontally and drawn taut at 300 mm centres.

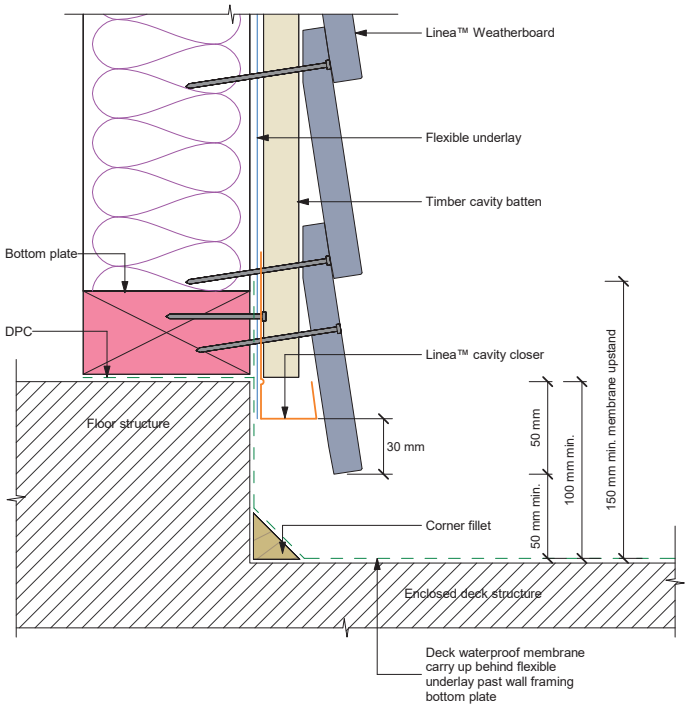
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Figure 4: Foundation detail



Note:
Drain holes in James Hardie uPVC vent strip are sufficient to achieve ventilation openings of 1000mm² per lineal metre

Figure 5: Enclosed Deck



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Figure 6: Jointing off stud

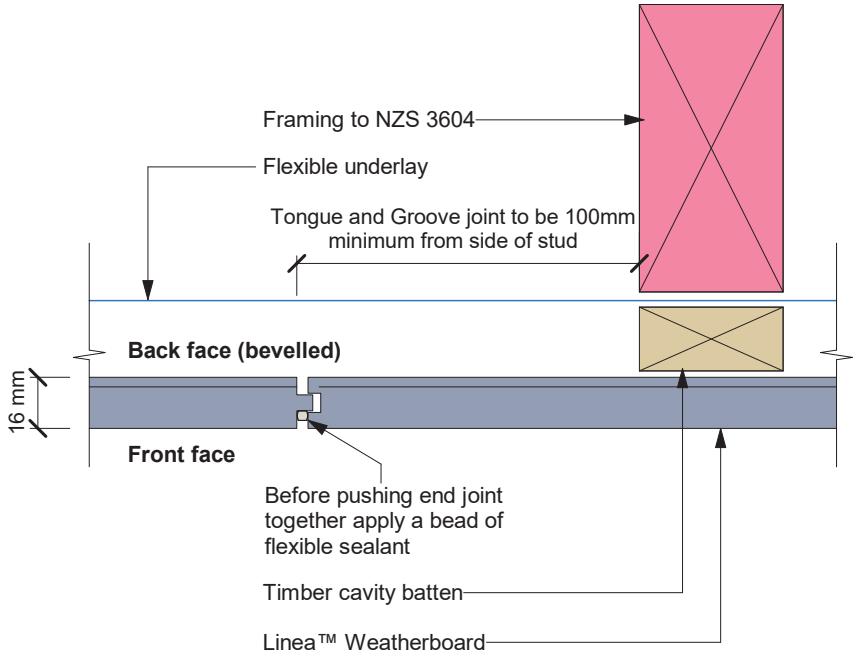
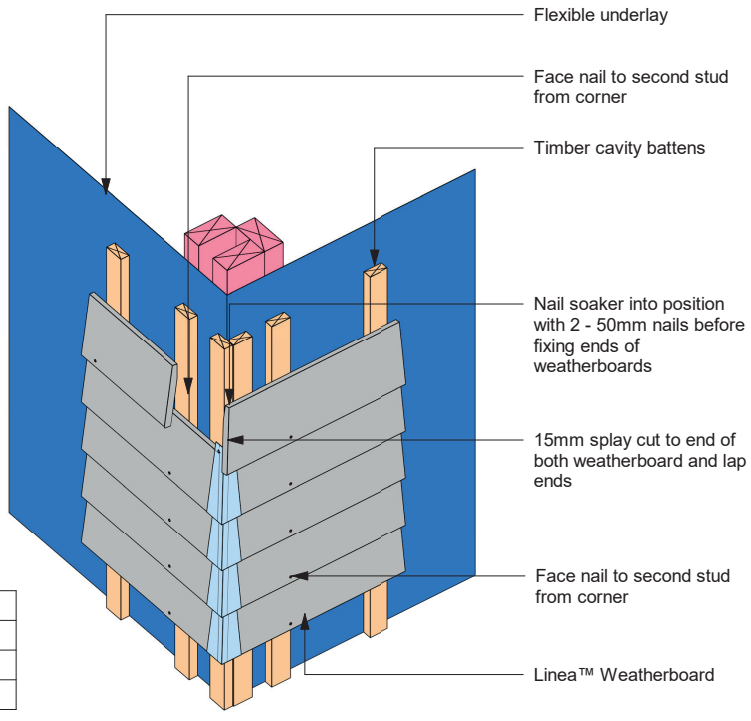


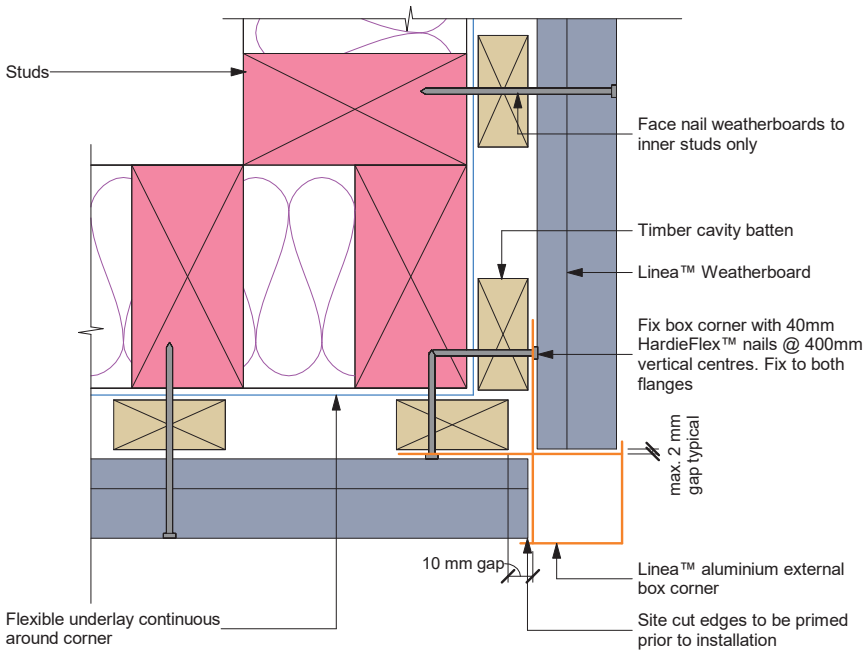
Figure 7: External corner soaker



Soaker material	Nail material
Copper	Copper or phosphor bronze
Aluminium	Hot dip galvanised
Stainless steel	Stainless steel

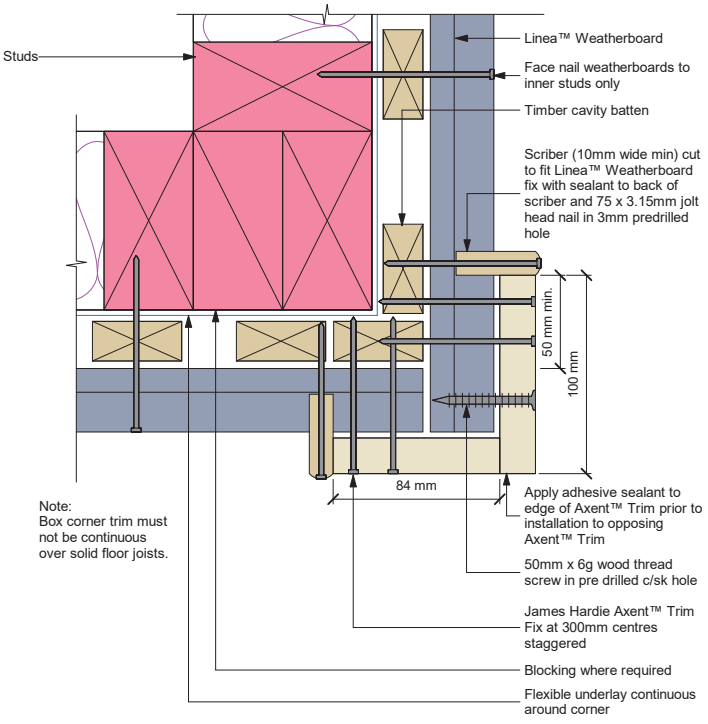
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Figure 8: Aluminium box corner



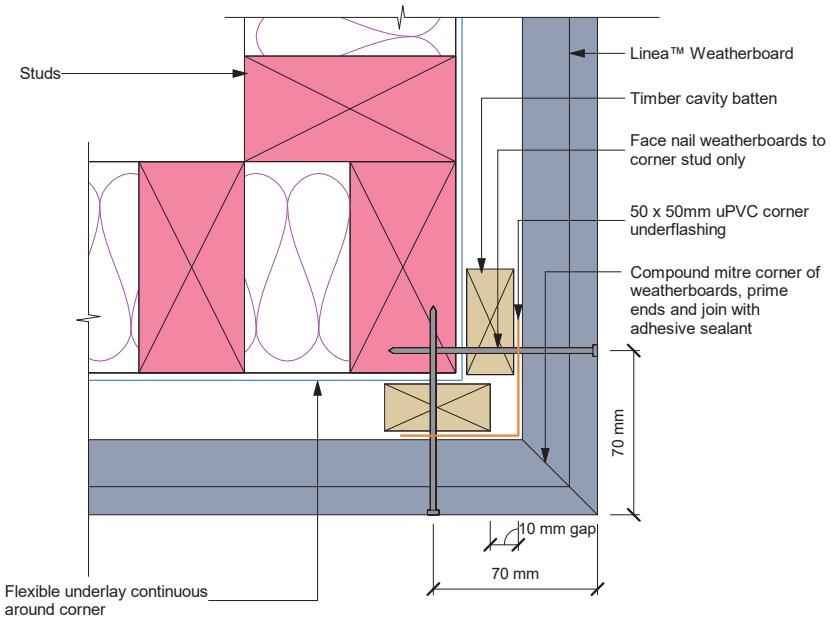
Note: Site cut edges to be primed

Figure 9: Boxed corner



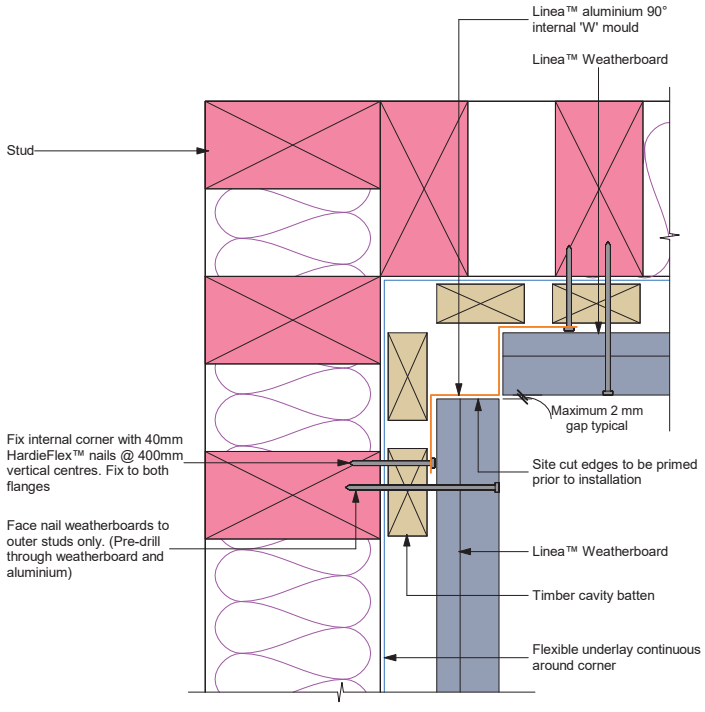
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Figure 10: Mitre corner



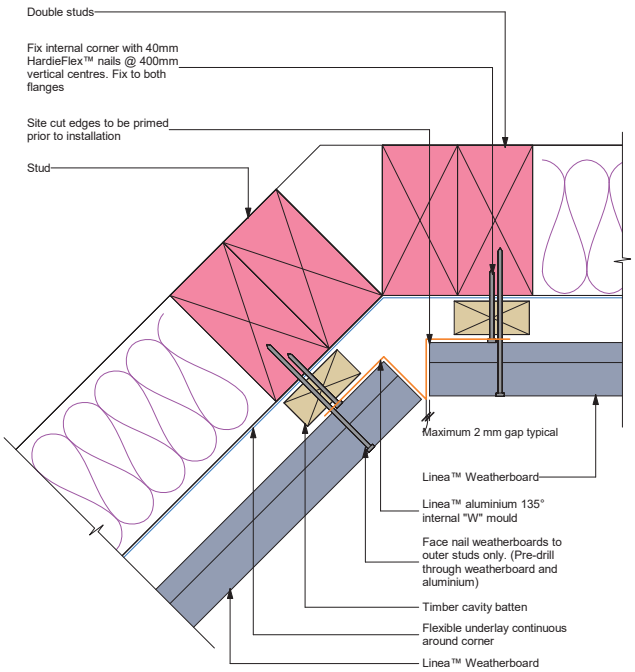
Note: Adhesive sealant must be used on the full end face of both weatherboards. Push lightly together

Figure 11: Internal 90 ° aluminium 'W' mould corner



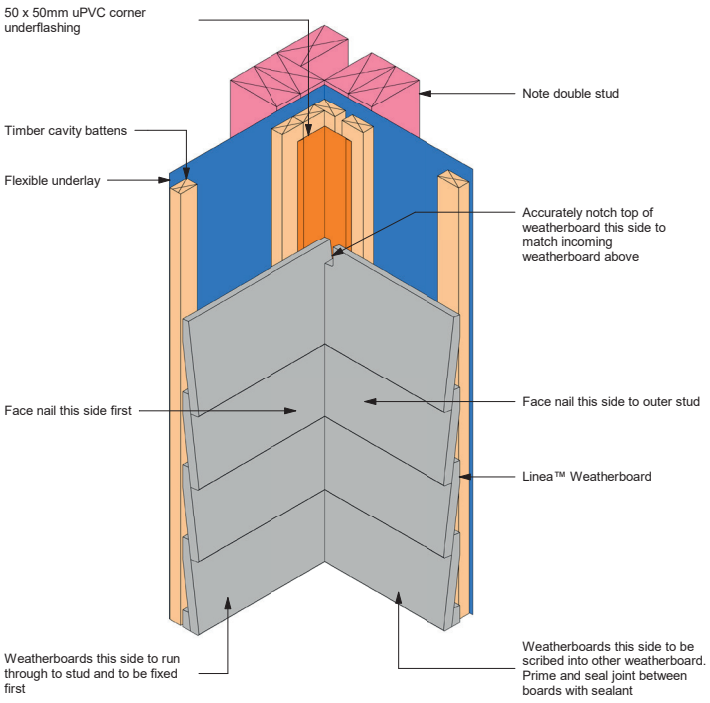
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Figure 12: Internal 135 º aluminium 'W' mould corner



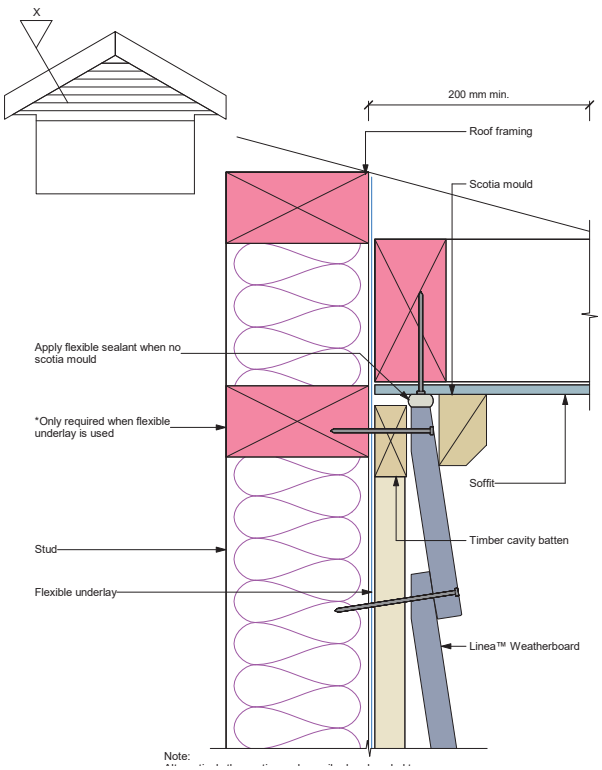
Note:
Aluminium extrusion must not be continuous over solid floor joists

Figure 13: Internal corner joint flashing



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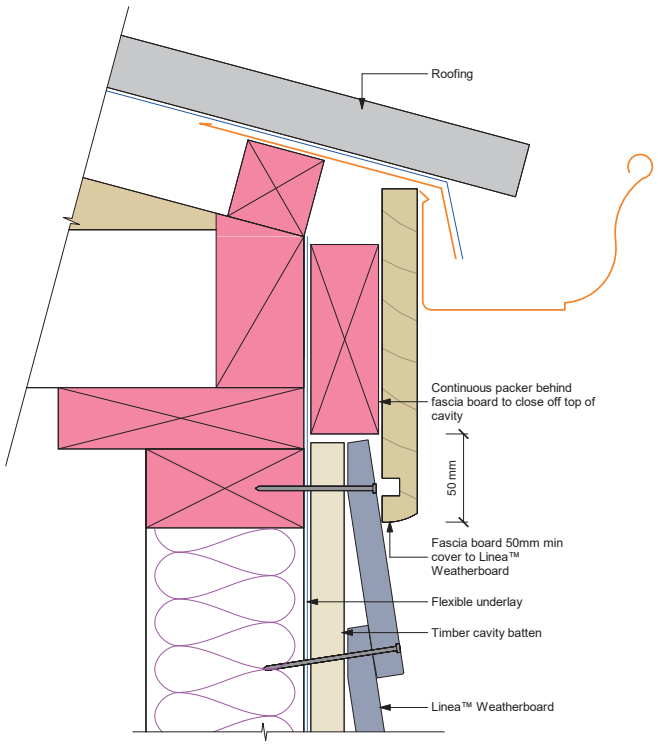
Figure 14: Wall to soffit junction 'X'



Note:
Alternatively the scotia can be scribed and sealed to Linea™ Weatherboard and the soffit lining

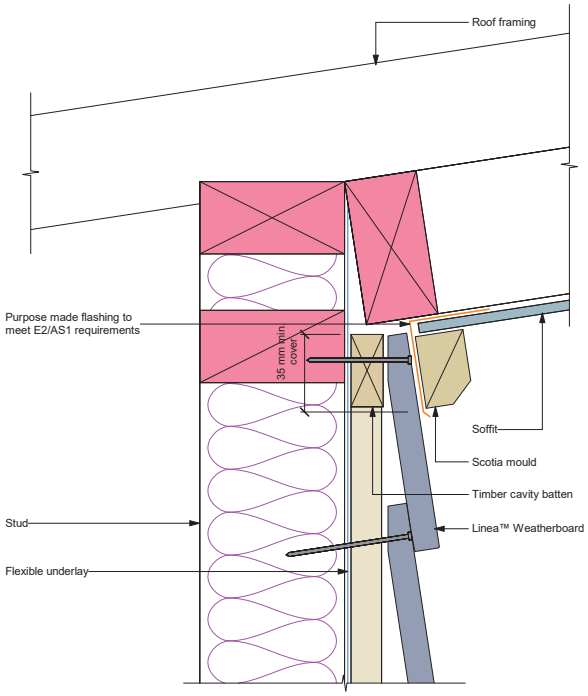
For soffits more than 200mm the Linea™ Weatherboard can be neat cut and silicone sealed to angle of soffit

Figure 15: Nil soffit detail



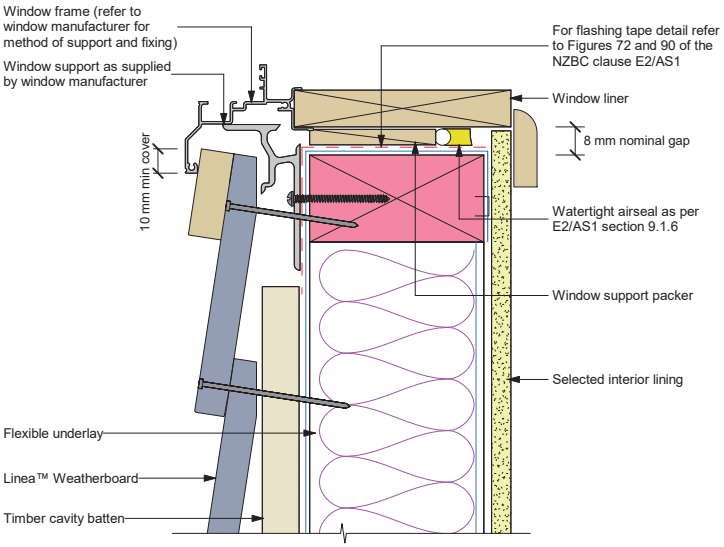
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Figure 16: Sloping soffit and wall junction



Note: Site cut edges to be primed

Figure 17: Window and door sill

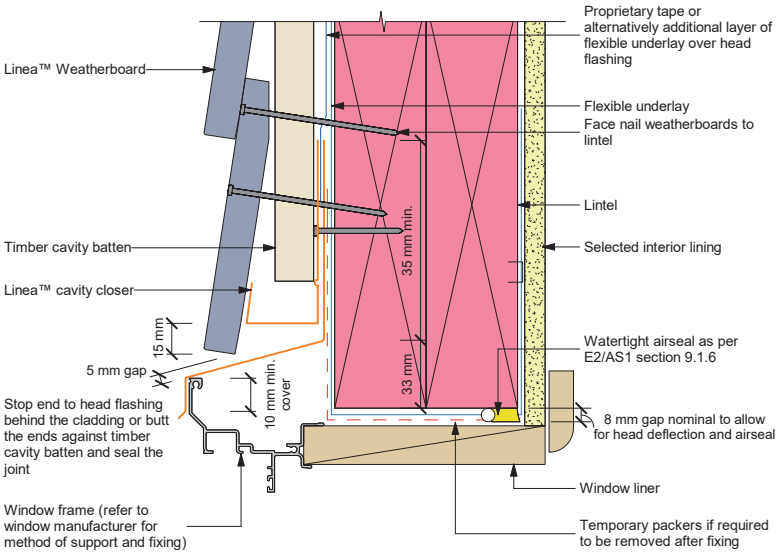


General notes for materials selection
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

Refer to the manufacturer or supplier for technical information for these materials

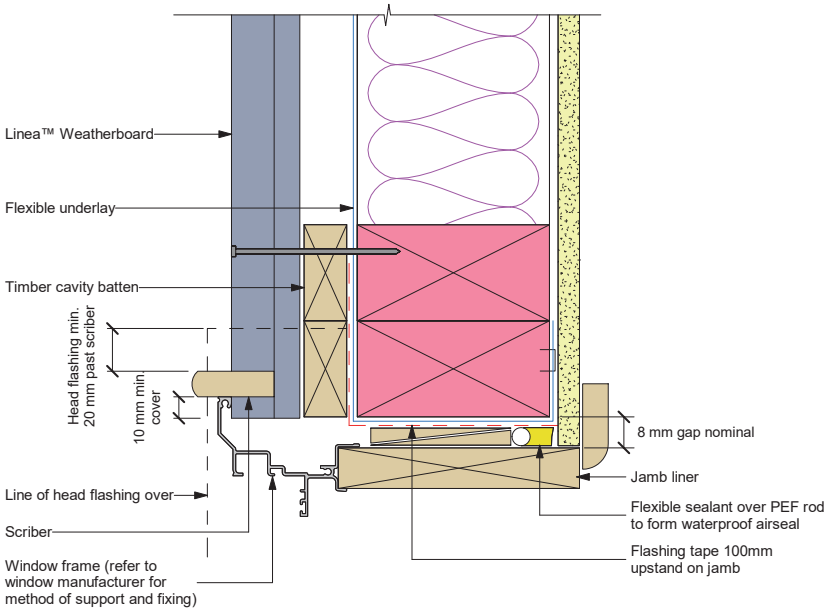
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Figure 18: Window head



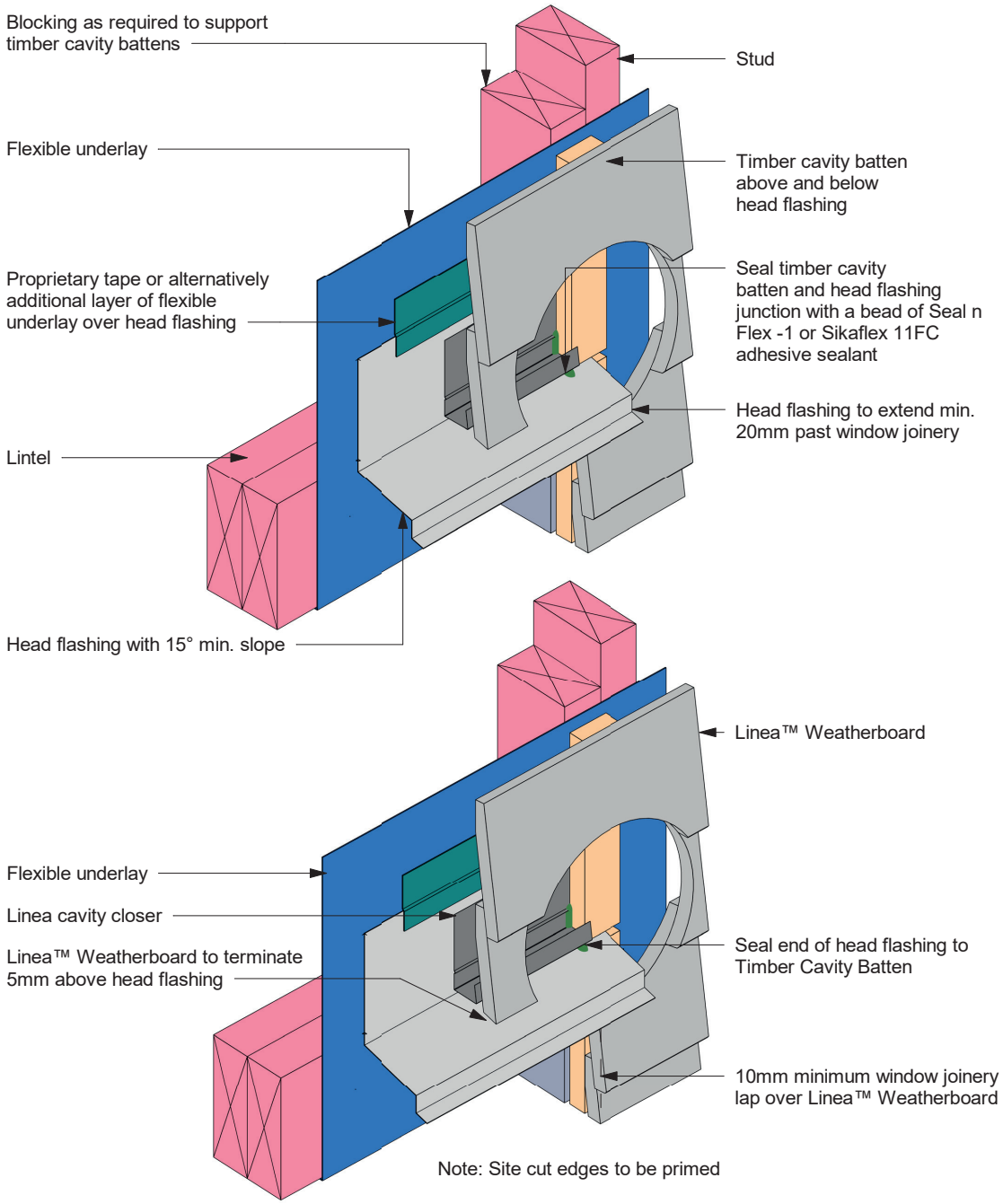
Note:
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED pressures
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1
- Refer to Figure 22 for sealing end battens to head flashing
- Site cut edges to be primed

Figure 19: Window jamb



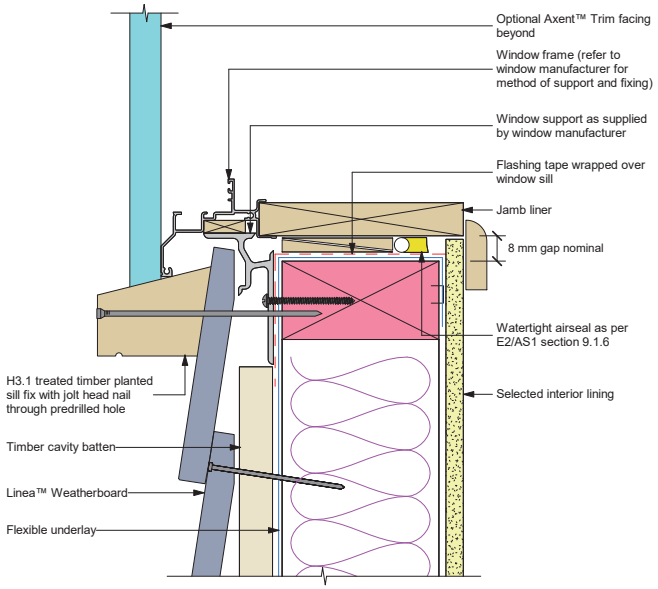
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Figure 20: Window head stop end



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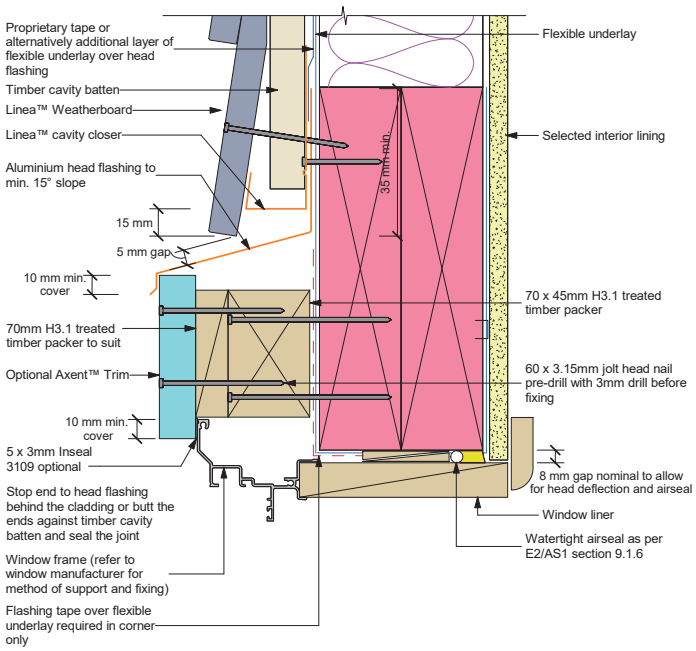
Figure 21: Window sill with facing



General notes for materials selection
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

Refer to the manufacturer or supplier for technical information for these materials

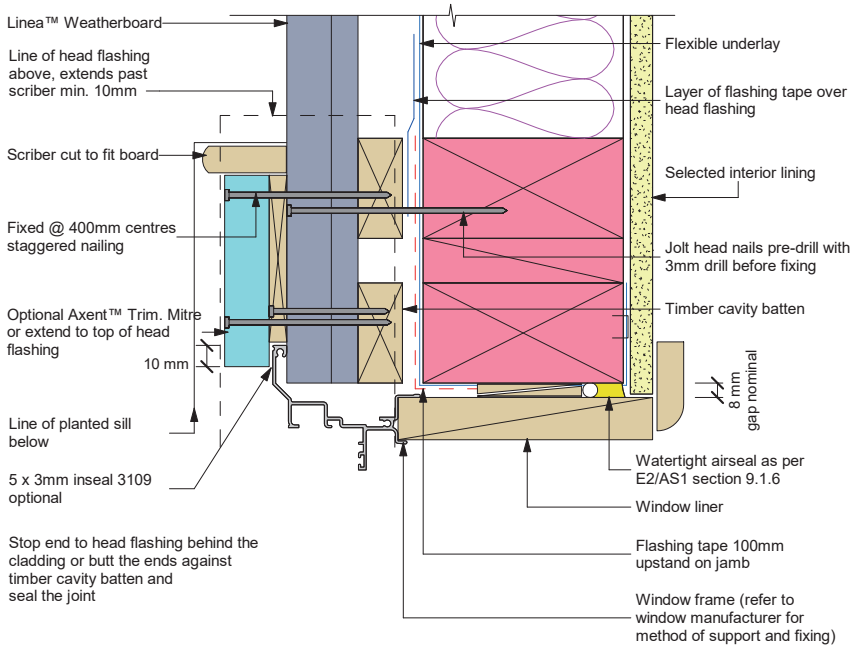
Figure 22: Window head with facings



Note:
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED pressures
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1
- Refer to Figure 22 for sealing end battens to head flashing

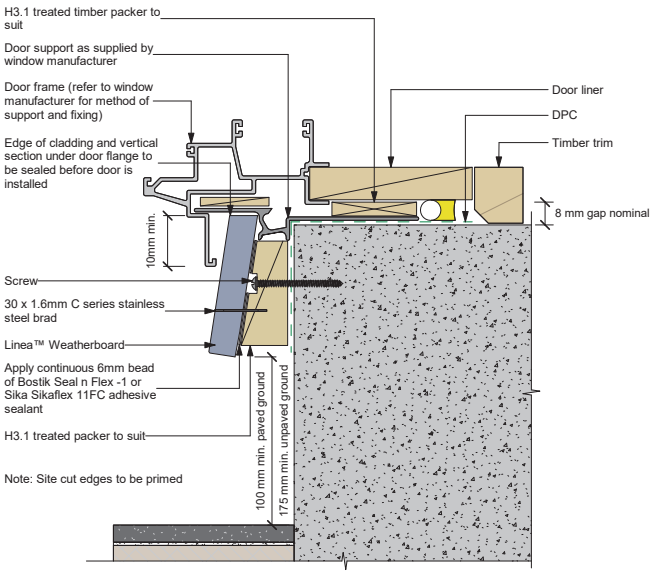
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Figure 23: Window jamb with facings



Note:
- Site cut edges to be primed

Figure 24: Door sill support detail

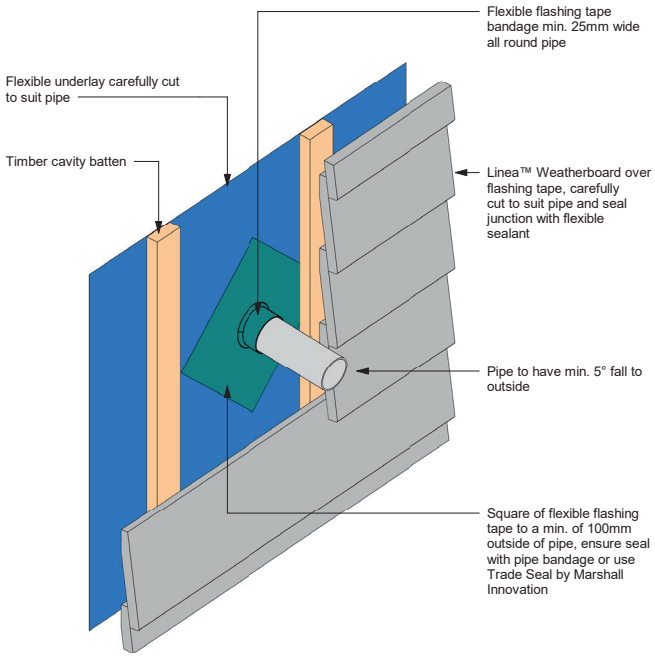


Refer to the manufacturer or supplier for technical information for these materials

General notes for materials selection
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of the NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact
4. Linea™ Weatherboard to have sealed butt joint over batten at each corner of opening

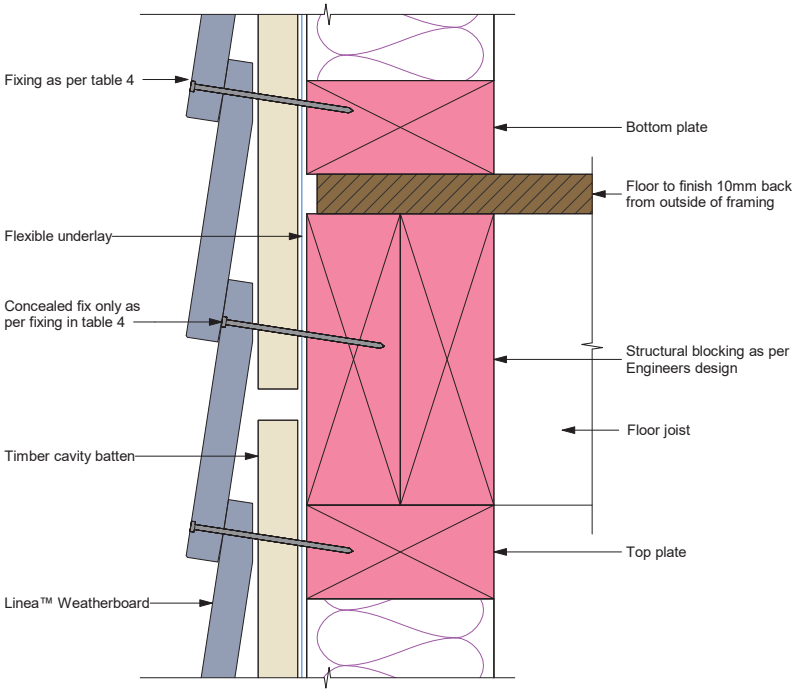
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Figure 25: Pipe penetration



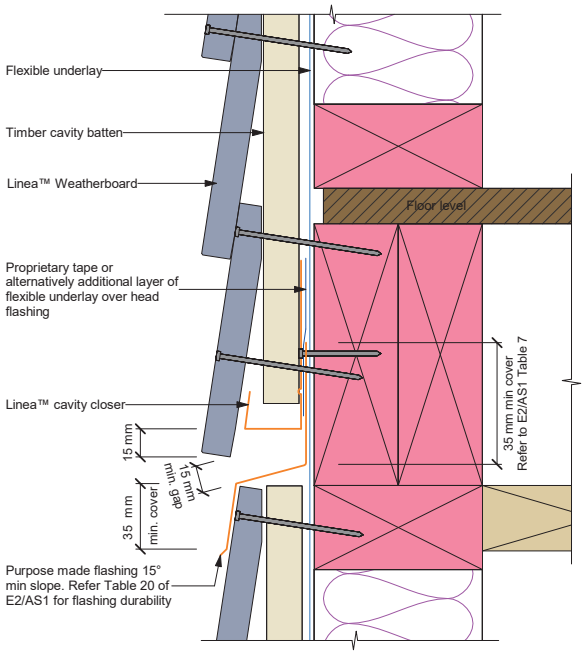
Note: Site cut edges to be primed

Figure 26: Continous cladding over joist



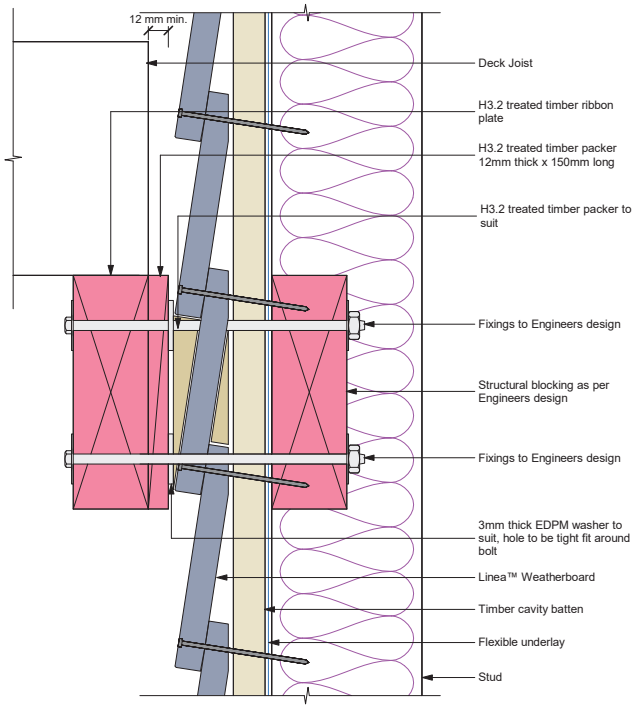
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Figure 27: Drained flashing joint at floor level



Note:
This detail is required to limit cavities to a maximum of 2 stories or 7 metres. Refer E2/AS1 clause 9.1.9.4.

Figure 28: Timber deck junction



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Figure 29: One piece apron flashing joint

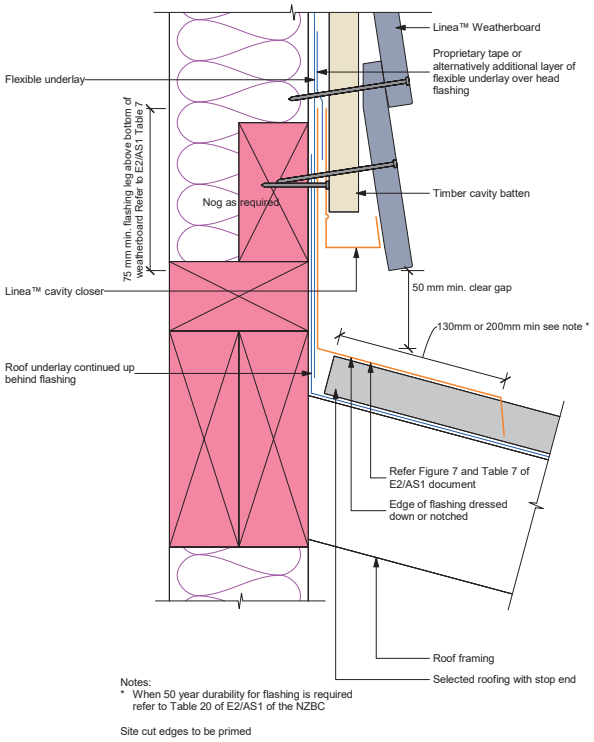
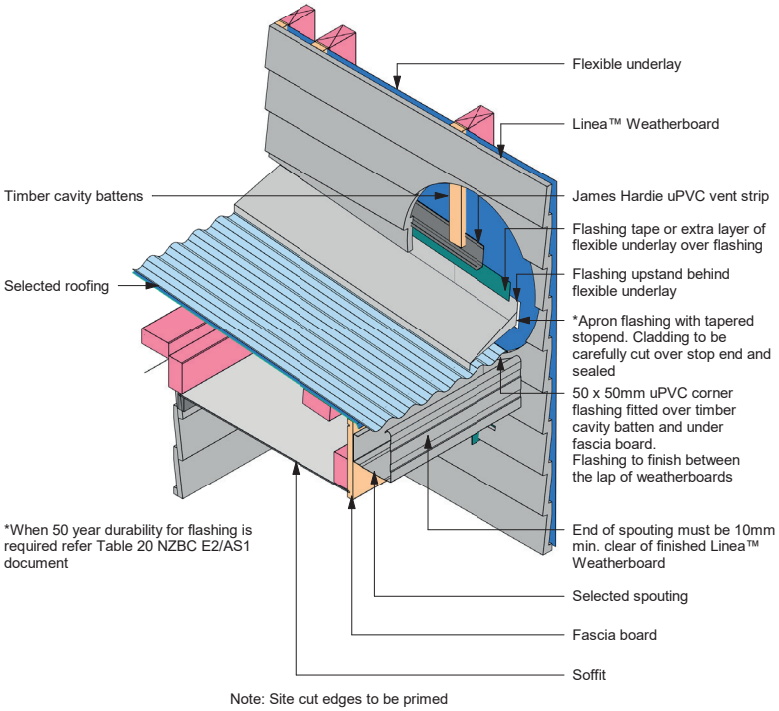


Figure 30: Roof to wall junction detail



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Figure 31: Parapet flashing

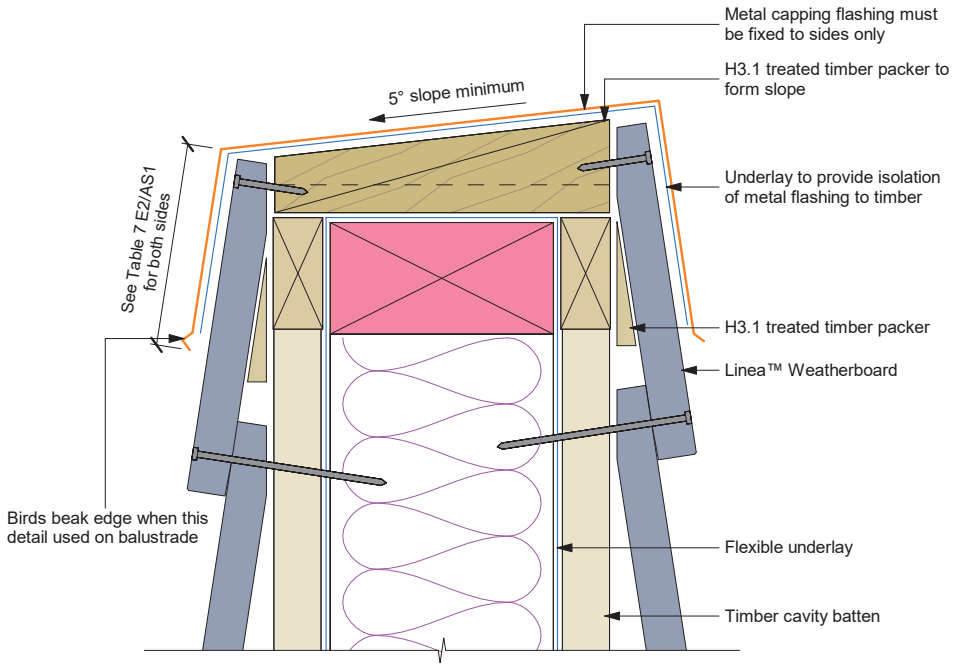
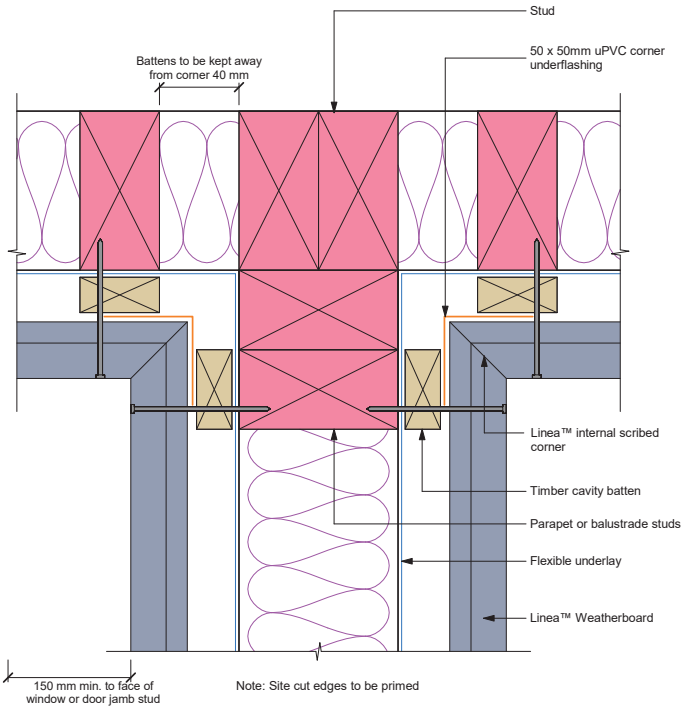
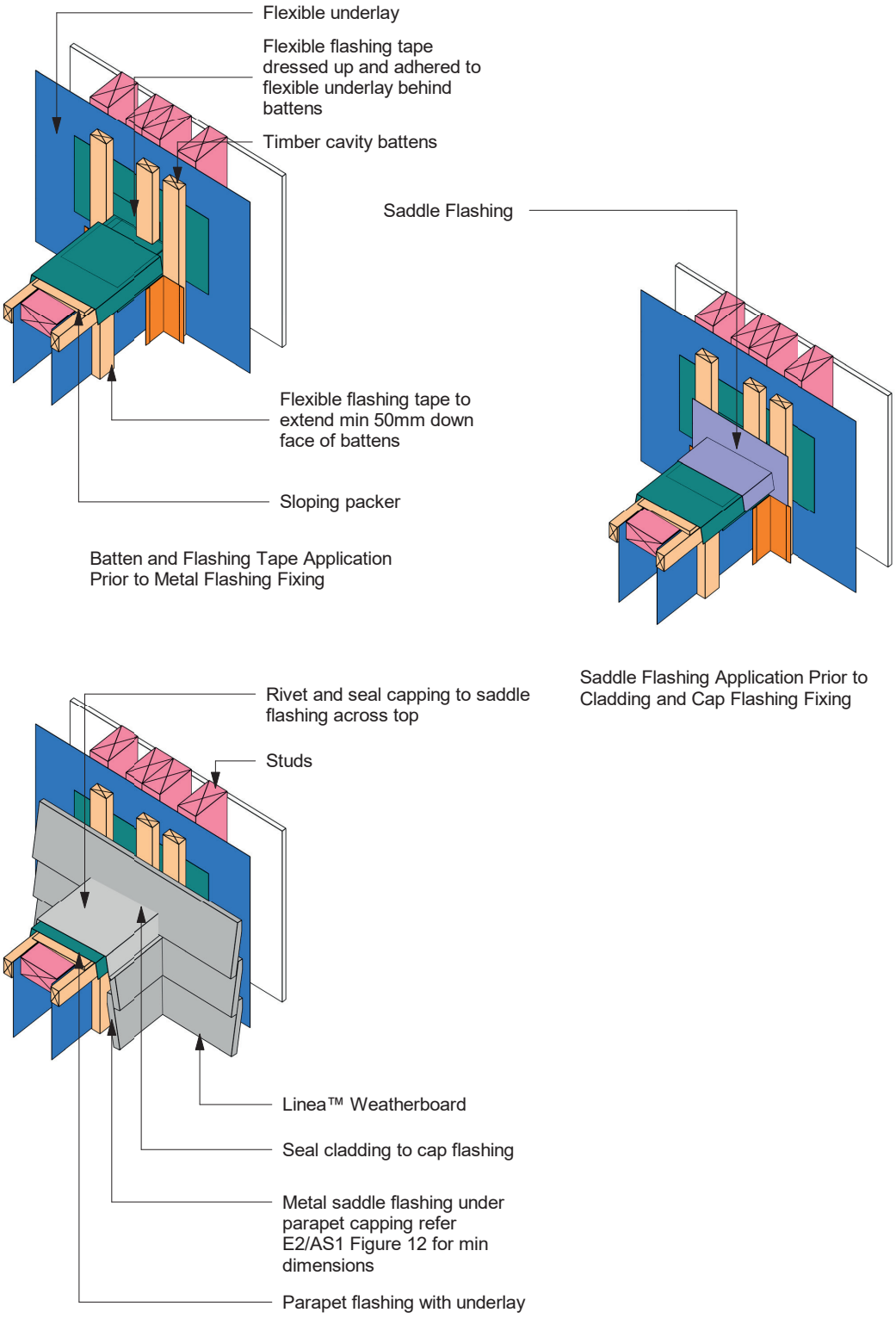


Figure 32: Enclosed deck balustrade to wall



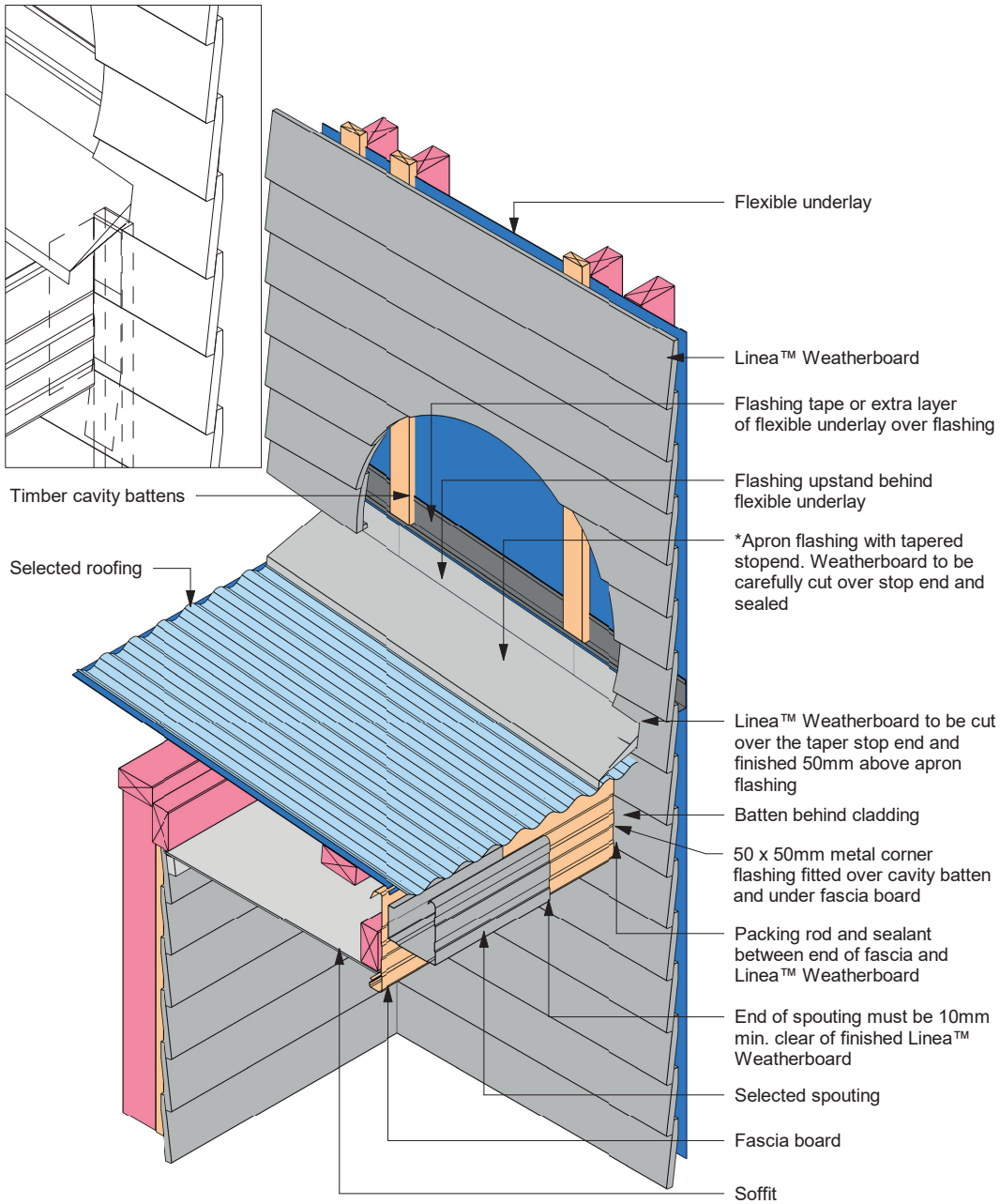
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Figure 33: Enclosed balustrade to wall



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Figure 34: Junction Linea™ Weatherboard and fascia board

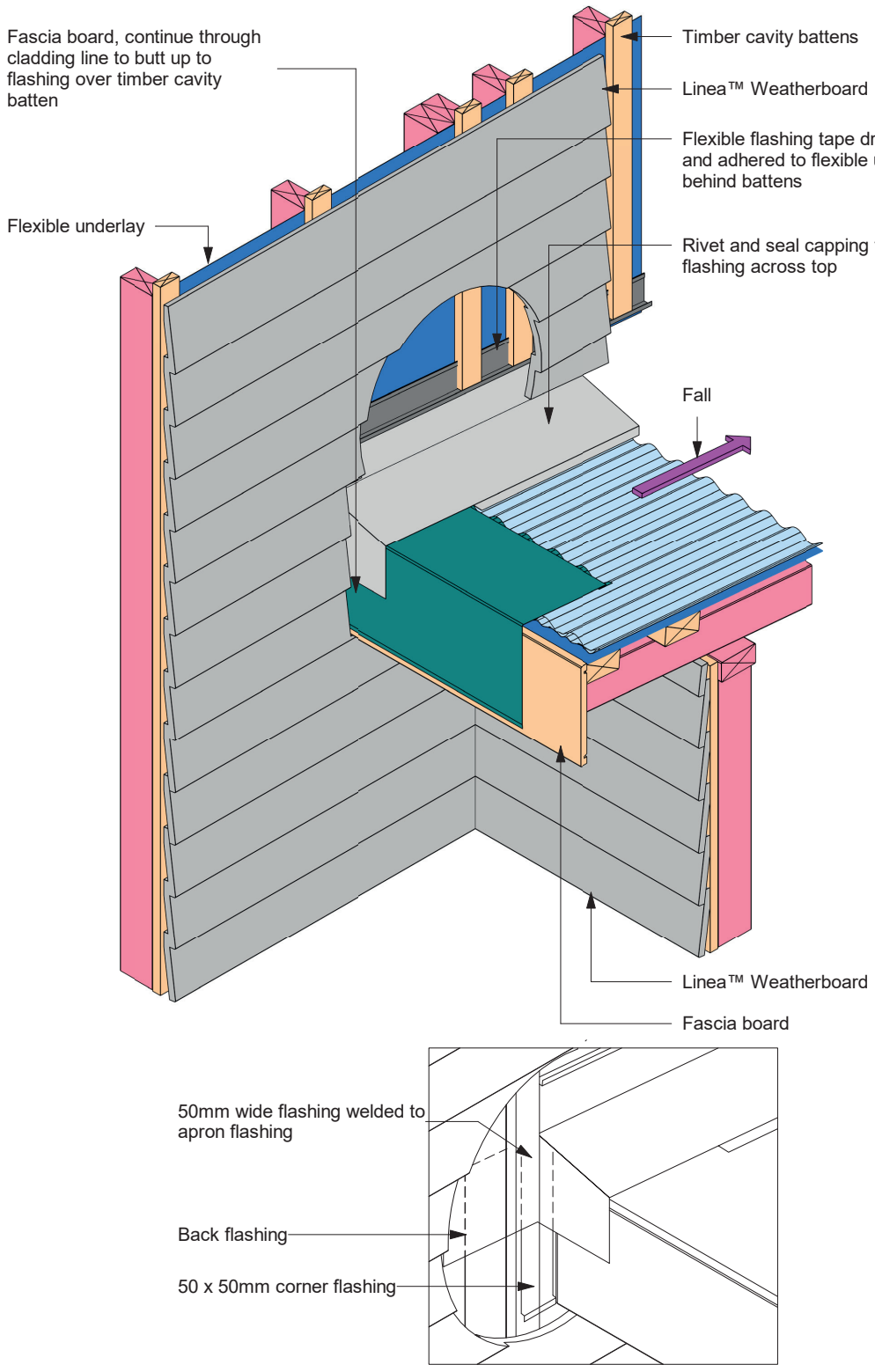


*When 50 year durability for flashing is required refer Table 20 NZBC E2/AS1 document

Note: Site cut edges to be primed

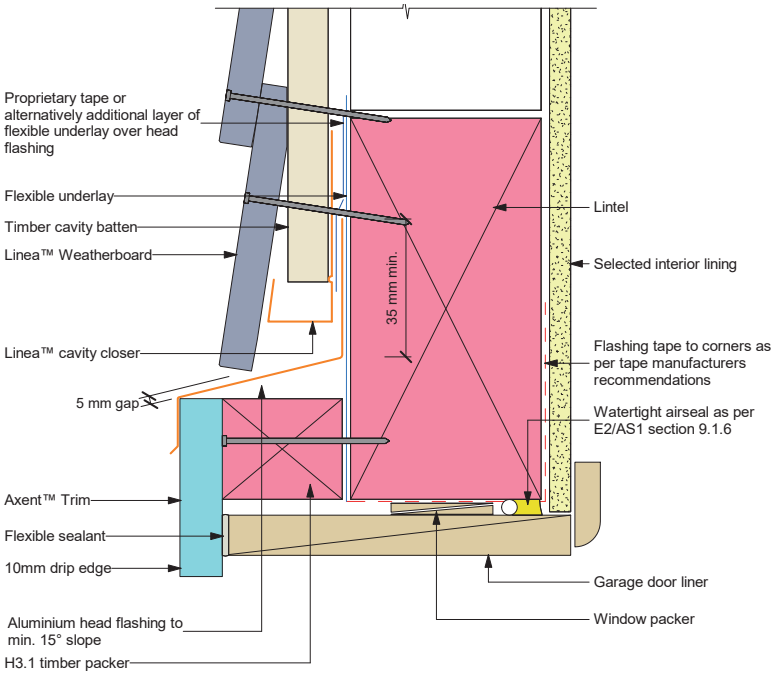
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Figure 35: Enclosed roof to wall intersection



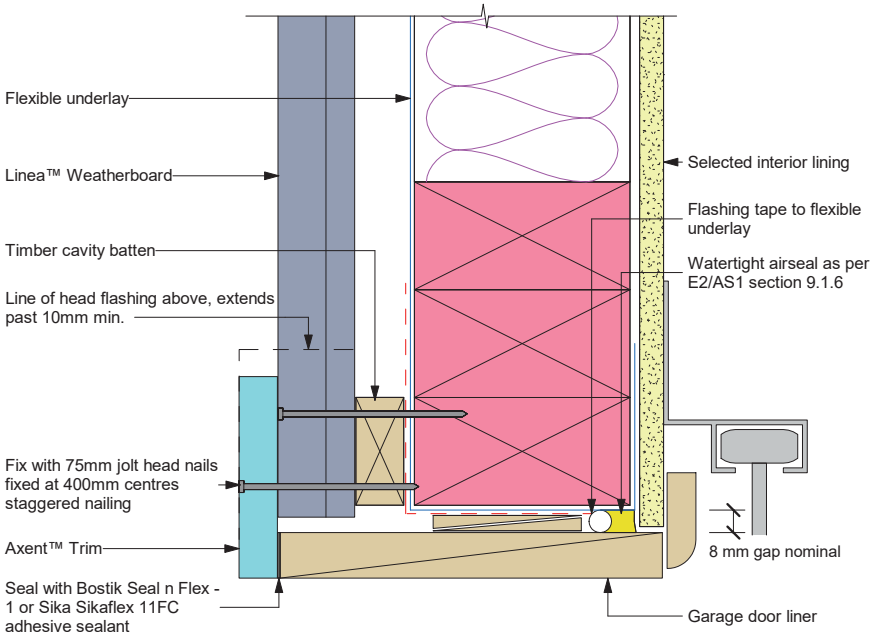
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Figure 36: Garage door head



Note:
- Sealant must be applied between head flashing and liner in VH and EH wind zones and SED wind pressures
- Site cut edges to be primed

Figure 37: Garage door jamb



Note: Site cut edges to be primed

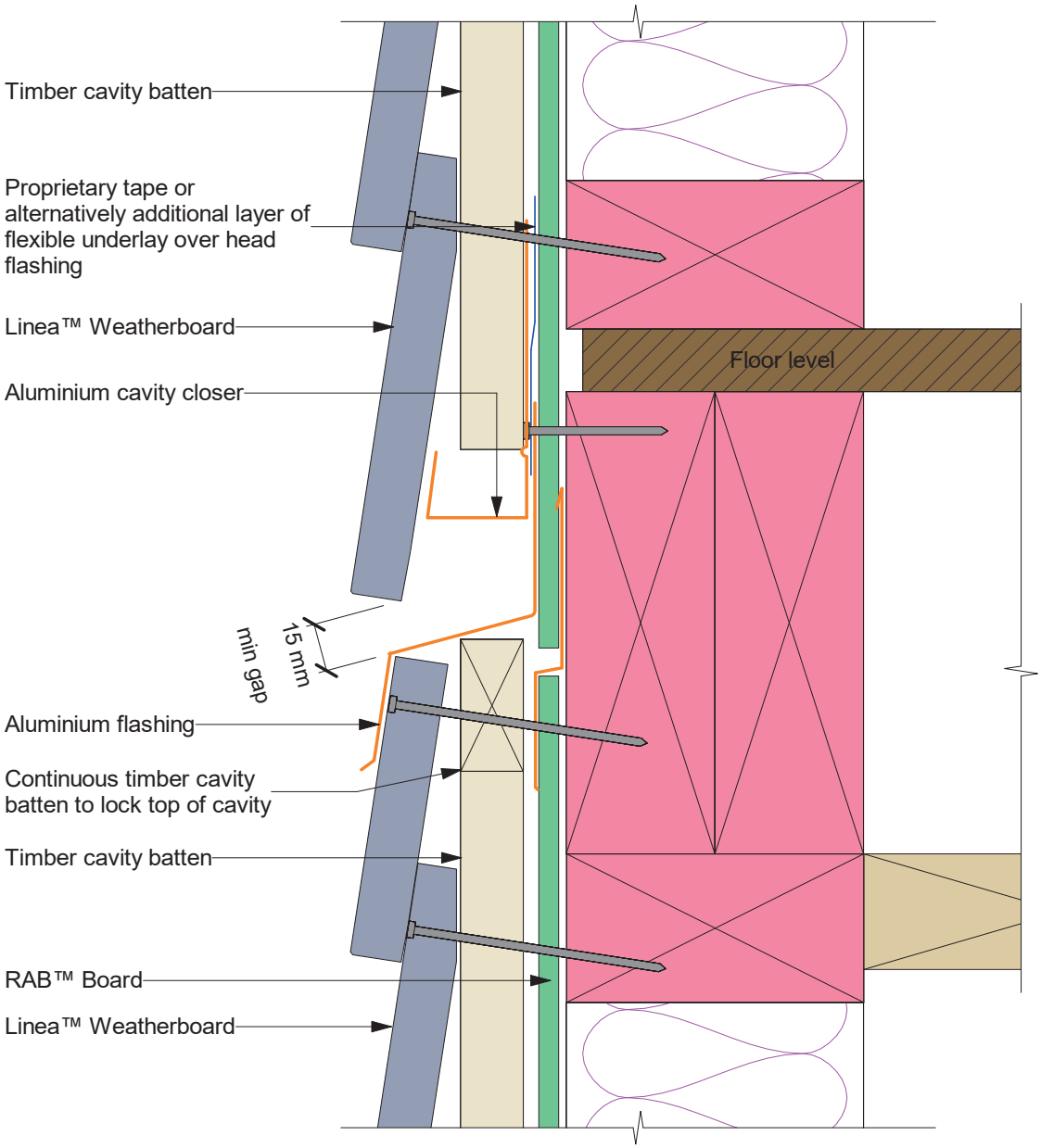
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Figure 38: Framing setout building height over 10m



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Figure 39: Intertenancy vertical fire separation



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Notes

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Notes

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Notes

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Linea™ WEATHERBOARD

Product Warranty

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 25 years from the date of purchase that the Linea™ Weatherboard (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the Axent™ Trim and accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.

b) This warranty is not transferable.

c) The Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice.

d) The project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("The NZBC"), regulations and standards.

e) The claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product.

f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces).

g) All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law.

h) If meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. James Hardie has tested the performance of Linea™ Weatherboard when installed in accordance with the appropriate Linea Weatherboard (cavity or direct fixed) technical specifications, in accordance with the standards and verification methods required by the NZBC and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

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Rinnai

Installation guide

Rinnai INFINITY A-Series continuous flow water heaters

REU-A2626WG-ZK



REU-A2426WG-ZK



REU-A2024WG-ZK



REU-A1620WG-ZK



The Rinnai INFINITY A-Series models are not suitable for commercial or solar applications

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Important

This appliance must be installed in accordance with:

- Manufacturer's installation instructions
- Current AS/NZS 3000, AS/NZS 3500, AS/NZS 5601.1 and G12/AS1

For use with Natural Gas or Universal LPG as indicated on the appliance.

Not suitable as a spa or swimming pool heater.
Not suitable for commercial or solar applications.

Appliance must be installed, commissioned and serviced by an authorised person, being in New Zealand a licensed gasfitter, in accordance with these instructions and all applicable local rules and regulations.

Warning

Improper installation, adjustment, alteration, service and maintenance can cause property damage, personal injury or loss of life.

For more information about buying, using, and servicing of Rinnai appliances call: 0800 RINNAI (0800 746 624).

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Before installation

- **Check for damage:** Unpack the appliance and check for damage. DO NOT install any damaged items.
- **Check components and gas type**: Check all components have been supplied and that you have the correct gas type.
- **Read these instructions**: Get an overview of the steps required before starting the installation. Failure to follow these instructions could cause a malfunction of the appliance. This could result in serious injury and property damage.
- **Applicable models:** These instructions apply only to the Rinnai A-Series continuous flow water heater models listed on the cover page of this guide.

Appliance location

This appliance is designed for outdoor installations only. It MUST BE located above ground in open air with natural ventilation, without stagnant areas, where gas leakage and products of combustion can be rapidly dispersed by wind and natural convection.

The appliance MUST BE mounted on a vertical structure with the water and gas connections on the underside pointing downwards.

Location of the flue terminal MUST BE in accordance with Section 6 and Figure 6.2 of the AS/NZS 5601.

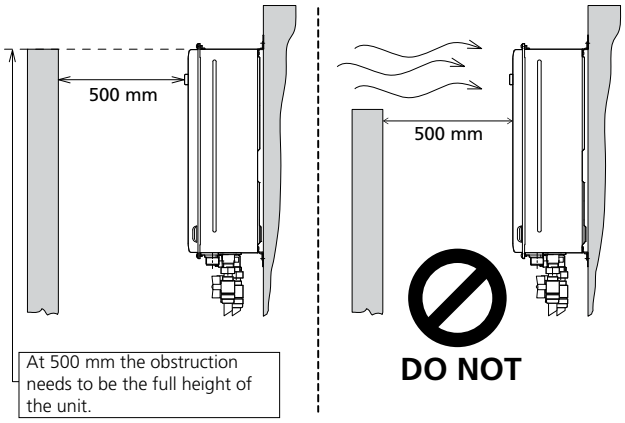
The appliance MUST BE placed **as close as practicable to the most frequently used hot water outlet** or outlets to reduce the delay time for hot water delivery[1]. For installations where the distance between the water heater and the outlets is considerable, a flow and return system can be used to minimise the waiting time for hot water delivery. Alternatively multiple appliances can be strategically placed to serve outlets with minimal delay time.

An AC 230 V, 10 A earthed power point must be provided adjacent[2] to the appliance. This power point must be weatherproof. It must be clear of the gas and water connections to the appliance and also the flue exhaust and water pressure relief valve. The power cord of the appliance is 1.5 m long.

All appliances MUST BE installed to ensure access can be gained without hazard or undue difficulty for maintenance and servicing. Sufficient clearances shall allow access and removal of all serviceable components. Appliances should not be mounted more than 2.5 m above the ground or floor level unless the customer can arrange permanent and safe access, or can provide another means of safe access.

Horizontal obstructions

AS/NZS 5601 states a minimum horizontal clearance of 500 mm between a building structure and obstruction facing the terminal. At 500 mm the obstruction needs to be the full height of the unit (as shown), and not a partial obstruction. A partial obstruction of less than 1 m could result in wind pushing the flue gases back into the flue terminal.



[1] Rinnai recommend a maximum pipe run of 10 m.
[2] Power point can be within the pipe cover if a pipe cover is installed—must comply with AS/NZS Wiring rules

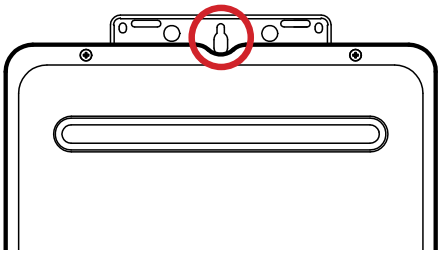
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General installation information

Securing the Rinnai INFINITY
The wall or structure on which the units are mounted MUST BE capable of supporting the weight of the appliance and associated pipe work. Refer p. 7 for the specific model weight.

Ensure that suitable fixing screws or bolts are used to secure the unit to the wall, in accordance with AS/NZS 5601 section 6. Wooden plugs shall not be used.

The top bracket has a keyhole slot so that the appliance can be positioned by hanging it on one screw, once in position the appliance can then be secured with appropriate fittings.



The appliance can be mounted directly against the wall or structure. There is no need to use non-combustible sheeting between the appliance back panel and the wall or structure for the purposes of meeting the temperature hazard requirements of AS/NZS 5601.

Pipe sizing
If the gas pipe sizing is insufficient the appliance won't perform properly. Gas pipe sizing must consider the gas input into this appliance as well as other gas appliances in the premises. The gas meter and regulator must be specified for this gas rate.

An approved sizing chart such as the one in AS/NZS 5601 should be used. Refer p. 7 for model specific gas consumption details.

Water pipe sizing and layout should be performed in accordance with AS/NZS 3500. All hot water pipe work should be insulated to optimise performance and energy efficiency.

Water supply
The appliance is intended to be permanently connected to the water mains.

Refer p. 7 for model specific operational water pressure limitations. Approved pressure limiting valves may be required if the maximum rated water supply pressures are exceeded. To achieve the rated flow, the minimum water supply pressures must be met.

The A-Series water heaters will operate at lower pressures than the specifications, but will not achieve the rated flow. Contact Rinnai for gravity fed or low pressure installations.

Water chemistry and impurity limits are detailed in the operation guide within the warranty section. Most metropolitan water supplies fall within the requirements.

If you are unsure about your local water quality, contact your water authority. If sludge or foreign matter is present in the water supply, a suitable filter or strainer should be incorporated in the water supply to the Rinnai INFINITY.

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Water delivery temperature

Requirements of AS/NZS 3500 MUST BE considered regarding the temperature limitations of hot water supplied to areas used primarily for personal hygiene. The temperature of these areas may be limited to 55 °C or less.

If the appliance is to deliver water primarily for the purposes of personal hygiene in an early childhood centre, school, nursing home or similar facility as defined in AS/NZS 3500.4, a Temperature Limiting Device (TLD), such as a tempering valve may be required, even if the appliance is set to 55 °C or less. For these types of applications contact Rinnai.

Requirements for Rinnai INFINITY units installed without controllers

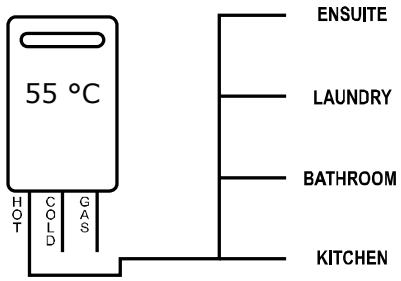


Diagram 1 - 55 °C Appliance

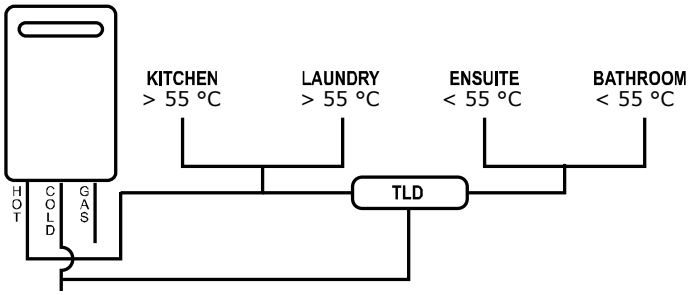
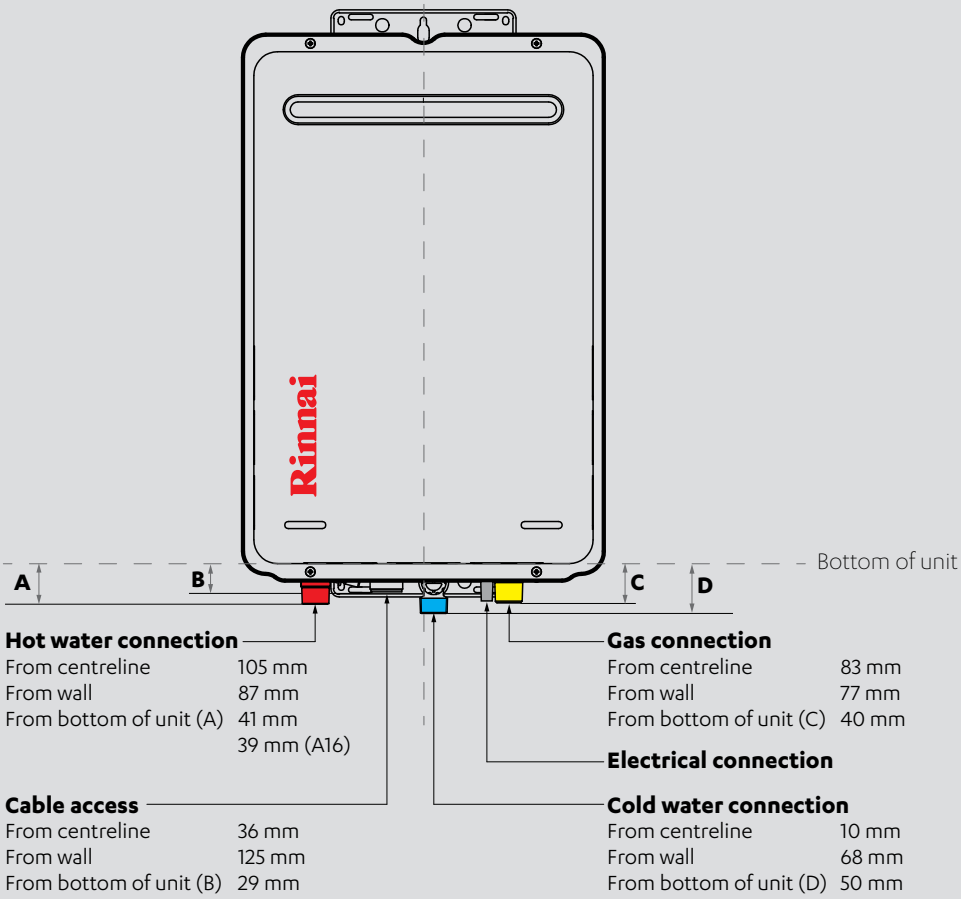


Diagram 2 - Not a 55 °C Appliance
(TLD = Temperature Limiting Device)

When the Rinnai INFINITY is set to deliver water at a temperature higher than 55 °C, it will be necessary to fit a Temperature Limiting Device for delivery to areas used for the purposes of personal hygiene.

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Connections and fittings



Model	Gas consumption MJ/h	Water Supply kPa Min.	Max.	Weight kg	Fittings Hot	Cold	Gas
A16 external REU-A1620WG-ZK	16.3-124	120	1000	13	R½ (15 mm)	R½ (15 mm)	R¾ (20 mm)
A20 external REU-A2024WG-ZK	19.9-156	160	1000	14	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)
A24 external REU-A2426WG-ZK	16.3-184	200	1000	15	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)
A26 external REU-A2626WG-ZK	16.3-199	200	1000	15	R¾ (20 mm)	R¾ (20 mm)	R¾ (20 mm)

Service connection points

An approved full flow isolation valve and disconnection union MUST BE fitted to the cold water inlet. A non-return valve is not required unless required by local regulations.

Isolation valves MUST NOT be fitted directly to the appliance.

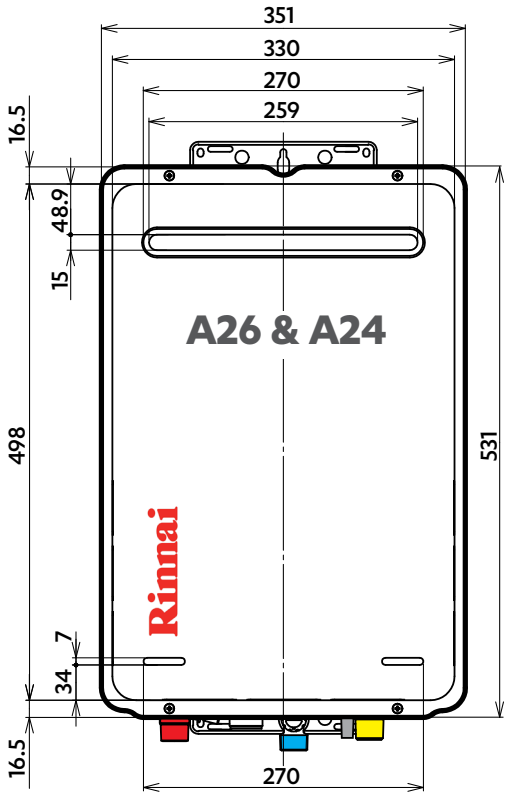
It may be necessary to fit a temperature limiting device for delivery to areas used primarily for the purposes of personal hygiene, refer previous page for 'Water delivery temperature' information.

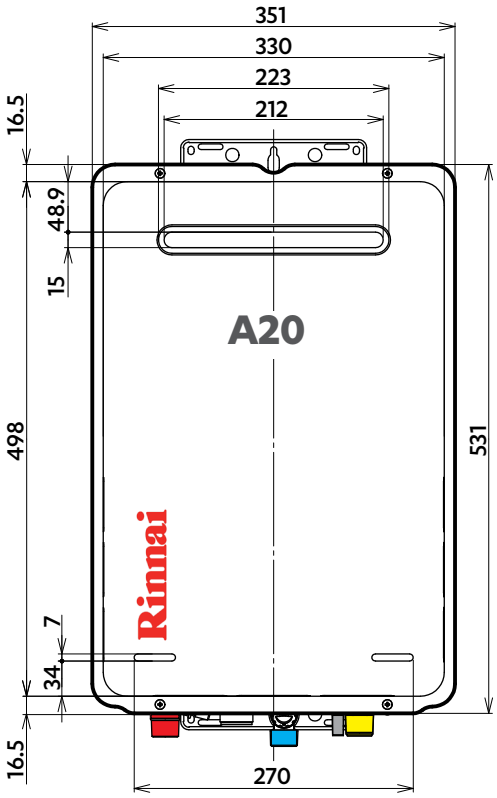
Purge gas and cold water supply lines to remove air and swarf before final connection. Swarf in the gas or water supplies may cause damage, a common problem, which is not covered by warranty.

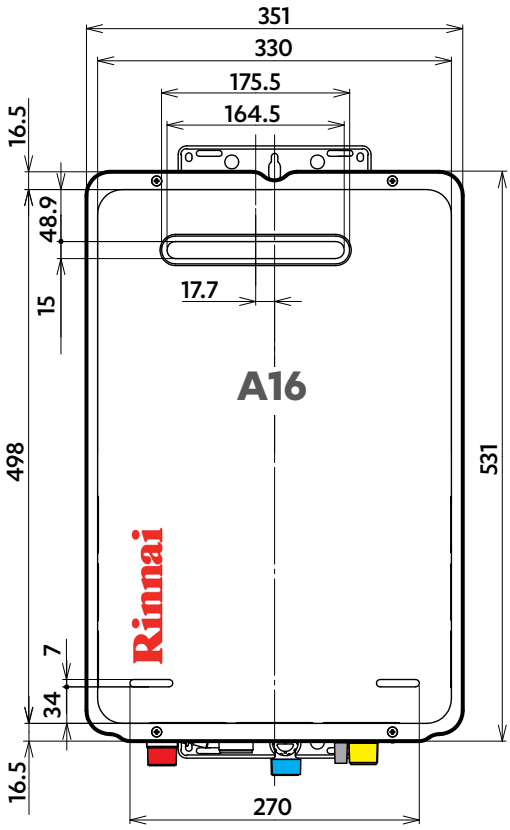
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Dimensions (mm)

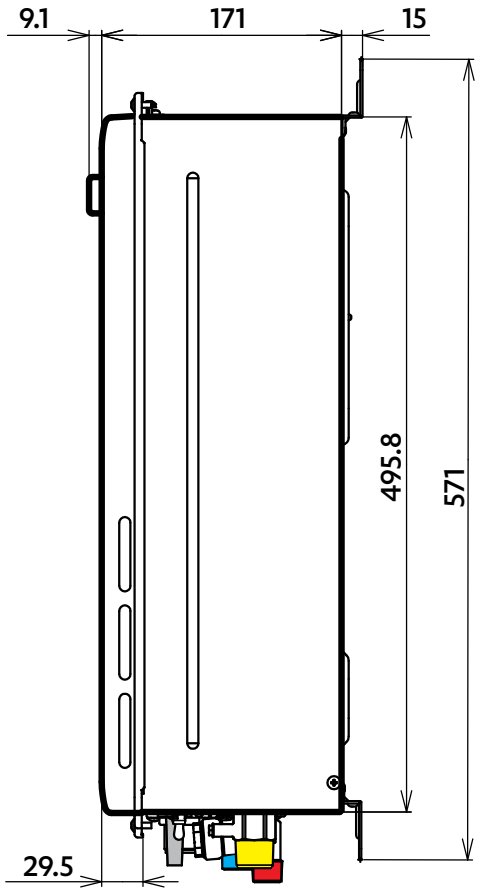
The basic dimensions, (height, width, and depth) are the same. The difference between the models are the dimensions and position of the flue outlet.

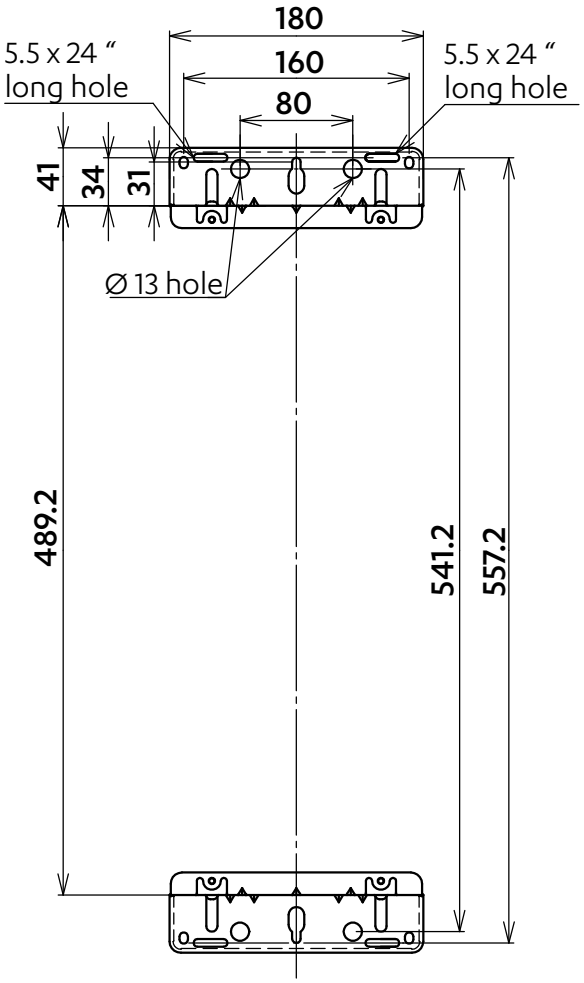






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Commissioning

AS/NZS 5601.1, clauses 2.6.8 and 6.11.2, states that every part of a gas installation shall be commissioned prior to initial use. It is the installer's responsibility to ensure all current AS/NZS 5601 requirements are met. The URL's provided are links to short videos on how key steps are performed.



The appliance operation must be tested after installation. Ensure the building occupants do not have access to the hot water outlets during this procedure.

Please note
The Rinnai INFINITY A-Series comes with a factory preset outlet temperature of 55 °C. The high and low gas operating pressures are also factory preset. Under normal circumstances the operating pressures do not require adjustment during installation. Make adjustments ONLY if the unit is not operating correctly and all other possible causes for incorrect operation have been eliminated.

Inlet supply pressure to the appliance MUST BE checked and set within the operating parameters of the appliance in all instances.

If the appliance can not be adjusted to perform correctly call 0800 RINNAI (0800 746 624) for assistance.

Steps to commissioning a Rinnai INFINITY A-Series model

1 **Flush water pipes, and gas line**
Before final connection of the water heater flush the gas, hot and cold water supply lines. Swarf in the gas or water supplies may cause damage, a common problem, which is not covered by warranty.

2 **Connect gas line**

3 **Purge the gas line of air**

4 **Final connection test**

5 **Check supply pressure**
Operate ALL other gas appliances at their maximum gas rate. With all gas appliances on maximum the supply pressure must read between 1.13-3.0 kPa on Natural Gas. On LPG the pressure must be 2.75-3.0 kPa.

If the pressure is lower, the gas supply is inadequate and the appliance will not operate to specification. It is the installer's responsibility to check the gas meter, service regulator and pipe work for correct operation and sizing, and rectify as required.

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6 PCB and/or dip switch settings checked.

Refer p.12-14.

PCB settings checked if the factory default temperature has been changed.

Dip switch settings checked if a flue diverter is fitted.

Short video: http://rinnai.co.nz/007

7 Operate and test for gas leaks

Replace the appliance front cover otherwise the unit won't operate correctly, and operate and test for gas leaks using an electronic leak detector.

8 Operational test—water flow and temperature at the hot water outlets

Confirm the hot water delivery temperatures using a thermometer.

If water controllers are fitted, it is necessary to test their operation through the complete range of functions, refer separate instructions provided with the water controllers.

9 Check cold water inlet filter

Inspect and clean the water inlet filter. This may need to be repeated to ensure the filter remains clear, especially on new installations.

Short video: http://rinnai.co.nz/006

If you feel the customer is capable of doing this check it would be beneficial to show them how to inspect and clean the filter as well.

10 Customer handover

After testing is completed, explain to the customer the functions and operation of the water heater and water controllers (if fitted).

Also talk to them about the gas, power, and water connections, how frost protection works, the procedure for draining the water heater, where to find the data plate, maintenance and servicing. If the customer is not there try and contact them by phone to relay the important points.

Ensure the installer details section is completed in the operation guide, the commissioning checklist has been completed and signed, and that guide and checklist are left with the customer.

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PCB interface and dip switch settings

The PCB interface and dip switch settings must only be changed by a licensed gasfitter. They have been provided as there may be a requirement to change the temperature of the water delivered from the water heater or change the dip switch settings if fitting a flue diverter.

WARNING Care must be taken when changing the temperature or dip switch settings as they can be easily switched or bumped into the wrong position. Fully check the operation of the water heater before leaving including the temperature of the water delivered.

The cover of the water heater will need to be removed to carry out this operation. As this will expose live mains voltage wiring **please disconnect the power supply before removing the front cover**.

We wish to draw your attention to the requirements of the New Zealand Building Code and compliance document G12. This requires that water delivered to sanitary fixtures be no more than 55 °C. Increasing the water heater set temperature will require that you protect all sanitary fixtures to which the appliance is plumbed with suitable tempering valves or something similar.

Rinnai will accept no liability for issues arising out of the use of this information.

If you have any doubts about the performance of the water heater, please contact Rinnai by phoning 0800 RINNAI (0800 746 624).

The following information details settings for the Rinnai INFINITY A-Series models only. They are not applicable for other models.

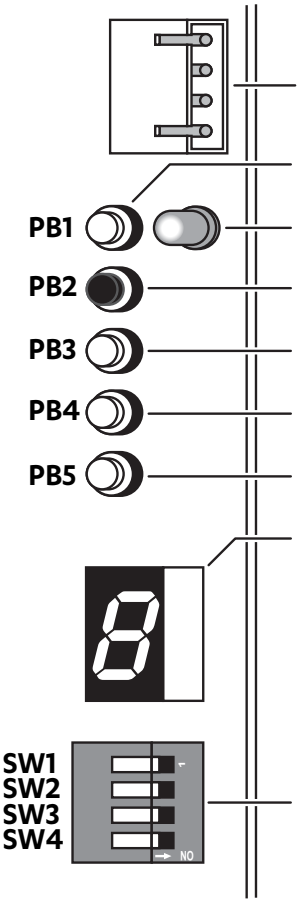
Basic operation of the PCB interface

- To place the PCB into programming mode press PB2 until the LED digital display shows *1*, noting that the current set value will be displayed shortly afterwards.
- To alter a value press PB4, each press of the button will select the next available value.
- To change to another menu, press PB3, each press of the button will select the next available menu.
- To exit the programming mode and save the selected settings press PB2 until the LED display goes blank.

Note:

- If no buttons are pressed the PCB will automatically exit programming mode after 10 mins.
- Exiting programming mode sets the value last viewed as the current value.

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Communication interface socket

Data transfer button for PCB replacement - push button 1 (PB1)

Data transfer LED, illuminates to show data transfer in progress

MODE button, places the PCB into programming mode (PB2)

MENU button, cycles through available modes (PB3)
Forced combustion rate setting mode, raises the gas pressure

VALUE button, cycles through available values (PB4)
Forced combustion rate setting mode, lowers the gas pressure

Forced high/low selection button, (PB5)

LED digital display, displays menu, value and forced high/low status

Dip switch (factory default all switches are in the off position)
SW1 and SW3 are only set to ON when a flue diverter is fitted, otherwise they MUST remain set in the OFF position.

SW2 and SW4 are not used and MUST remain set in the OFF position.

Menu	Menu description	Value							
		A	b	C	d	E	F	H	J
1	Gas type	ULPG	NG	N/A	N/A	N/A	N/A	N/A	N/A
2*	Model	2626	2426	2024	1620	N/A	N/A	N/A	N/A
3	Fixed / Max. temp	55 °C[1]	65 °C	60 °C	50 °C	42 °C	40 °C	N/A	N/A
4	OFF water flow rate	+ 3 °C[2]	+ 6 °C	N/A	N/A	N/A	N/A	N/A	N/A
5	50 °C delivery adjustment temp.	Min Step 0	Increase Step 1	Increase Step 2	Increase Step 3	Increase Step 4	Increase Step 5	Increase Step 6	Increase Max

The temperature of outgoing hot water is constantly monitored by a built-in sensor. If the temperature of the outgoing hot water rises to more than 3 °C (6 °C #) above the selected temperature shown on the digital monitor or the preset limit when water controllers are fitted, the burner will automatically go out.

* Values in menu 2 cannot be adjusted.

1 Factory default

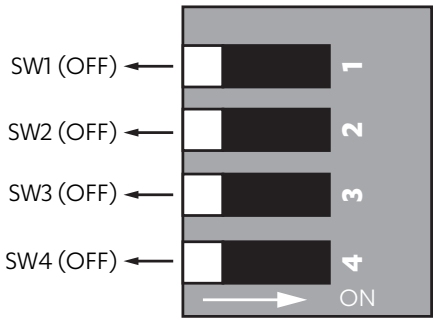
2 OFF water flow rate (+3 °C, factory default)

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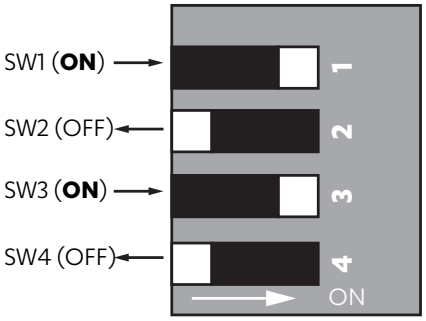
Flue diverter dip switch changes

When delivered ex-factory, by default SW1, SW2, SW3, and SW4 of the DipSW are set to the OFF position.

If a flue diverter is installed onto the water heater, SW1 and SW3 of the DipSW must be set to the ON position.



Default dip switch settings as they are ex-factory.



Dip switch settings required for flue diverter installation.

The dip switch change for flue diverters is required to increase the combustion fan speed, which helps overcome the friction losses from have a flue diverter installed on the water heater.

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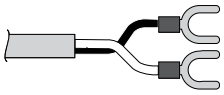
Appendix 1:
Water controller communication cables

Wired water controllers operate at an extra low voltage (12 V DC) which is supplied from the water heater, a 10 m long communication cable is supplied for connection to the water heater. Only Rinnai supplied communication cables may be used.

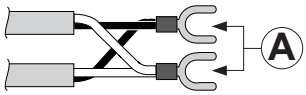
The water heater end of the cables is fitted with spade terminals. Only two pairs of cables (four spade connectors in total) may be terminated. When attaching three or four cables it is necessary to join the cable terminators as shown below.

For each pair cut off the existing spade connectors and re-terminate each pair into a new spade connector (A). Spade connectors are available from your local electrical component retailer

Single cables can be used when terminating up to two communication cables.



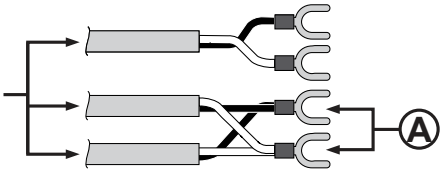
Paired cables are to be used when terminating three or four communication cables.



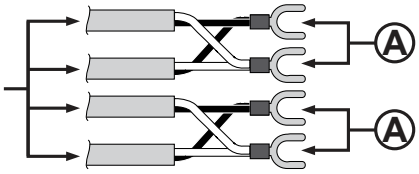
Connecting one or two communication cables
Follow steps one through five below to terminate the cables to the water heater.

Connecting three or four communication cables
To connect three or four cables, separate all the cables to be fitted into pairs.

When terminating three cables



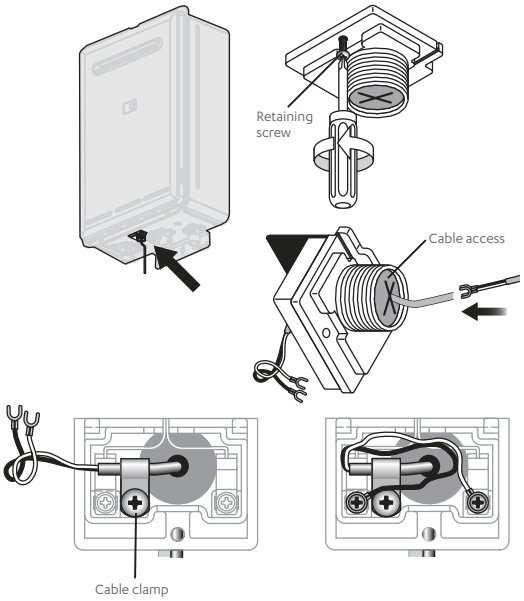
When terminating four cables



Follow steps one through five below to terminate the joined cable pairs to the water heater.

1. Isolate the power supply by switching the power point off and removing the power plug of the water heater from the electric power socket.
2. Removing the retaining screw of the cable connector at the base of the unit.
3. Swing the cable connector door open and thread the cable through the weather seal of the cable access hole, allowing sufficient cable length so that the sheath of the cable can be secured with the cable clamp supplied with the transceiver.
4. Loosen the screw terminals and connect the cable spade connectors to these terminals and re-tighten.

   Polarity is not important, either wire colour can be connected to either terminal.
5. Return the cable connector to the original position, taking care not to damage the cable wires in the process, and replace the retaining screw.



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a touch of magic



Experience our innovation

Rinnai.co.nz | **0800 746 624**

http://www.youtube.com/rinnainz

U340-1336(01)

BOTTOM PLATE FIXING SOLUTIONS 2013

| Meets NZS 3604:2011 Requirements| 90 x 45 Bottom Plate |

Bottom Plate Durability

Fixing Requirements				Installation		
Bottom Plate Location	Bottom Plate Fixing Requirement	Concrete Strength (min.)	Floor Edge Type	Max Spacing	Fastener	Min Edge Distance (FROM OUTERFACE)
External Wall	NZS3604:2011	17.5 MPa	Concrete	900 mm	12120BPAG*1 OR T12140GH*1	55 mm
			Masonry Block	600 mm		
	Proprietary Bracing Systems (15 kN)	17.5 MPa	Concrete	900 mm	AS12150GH + RPBA	
			Masonry Block	600 mm		
Internal Wall	NZS3604:2011	17.5 MPa	N/A	900 mm	12120BPAG*1 OR T12140GH*1	N/A
				600 mm	8x75 Drive Pin & Washer	N/A
	Proprietary Bracing Systems (15 kN)	17.5 MPa	N/A	900 mm	12120BPAG*1 + RPBA OR T12140GH*1 + RPBA	N/A



HD875 DRIVE PIN



AS12150GH ANCHOR



12120BPAG ANCHOR

Ramset Bracing Anchor (RPBA)

Advantages

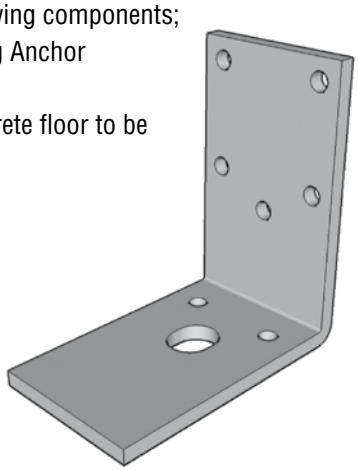
- Ease and speed of installation
- No checking of timber frame to ensure flush fitting of board
- The RPBA is a one piece anchor for either side of stud
- Slotted hole on bottom of bracket provides some flexibility in bolt & bracket position
- Installed prior to fixing of gypsum wallboard
- Easy inspection

The Ramset Bracing Anchor is sold as a set of 2.

Each set includes the following components;

- 2 Each Ramset Bracing Anchor
- 14 Each Tek screws

Fixings into timber or concrete floor to be purchased separately



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BIG BLUE® & BIG CLEAR FILTER HOUSINGS

- **Large capacity housing suitable for high flow applications**
- **10" and 20" lengths available in opaque and clear**
- **Pressure relief/bleed on inlet side of cap**
- **Accepts 4½" diameter cartridges**

Big Blue® Filter Housings offer the versatility to meet all of your large-capacity filtration needs, including high-flow and heavy-sediment applications. The extra large housing allows for greater cartridge capacity, reducing the number of vessels required for high flow-rate applications. Sumps are constructed of durable reinforced polypropylene and are available in both 10" and 20" lengths.

The high-flow polypropylene (HFPP) cap is available with 3/4", 1" or 1½" NPT inlet and outlet ports. The 1¼" internal port allows a greater volume of liquid to pass through the HFPP cap more rapidly.

Big Blue® housings are compatible with a broad range of chemicals and are available with or without a pressure relief button. They accept a wide variety of 4½" diameter cartridges.

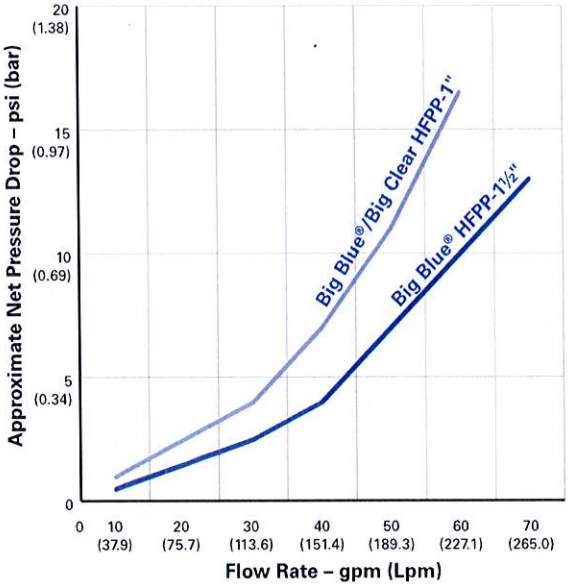
Big Clear Filter Housings offer on-site examination of flow, performance, and cartridge life and are ideal for a variety of applications. The blue polypropylene caps are available with an optional pressure-relief button on the inlet side to relieve pressure inside the housing when changing filter cartridges.

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BIG BLUE®/BIG CLEAR

Filter Housings





NSF COMPONENT

The 150233, 150234, 150235, 150236, 150237, 150238, 150239, 150240, 150467, 150468, 150469, and 150470 Tested and Certified by NSF International to NSF/ANSI Standard 42 for material and structural integrity requirements.

NOTE: The Big Clear Series of housings are not NSF component listed.

Housing Specifications and Performance Data

Model	Maximum Dimensions	Initial ΔP (psi) @ Flow Rate (gpm)
#10 Big Blue®–3/4"	13⅛" x 7¼" (333 mm x 184 mm)	2 psi @ 15 gpm (0.1 bar @ 57 Lpm)
#10 Big Blue®–1"	13⅛" x 7¼" (333 mm x 184 mm)	1 psi @ 15 gpm (0.1 bar @ 57 Lpm)
#10 Big Blue®–1½"	13⅝" x 7¼" (346 mm x 184 mm)	1 psi @ 20 gpm (0.1 bar @ 76 Lpm)
#20 Big Blue®–3/4"	23⅜" x 7¼" (594 mm x 184 mm)	2 psi @ 15 gpm (0.1 bar @ 57 Lpm)
#20 Big Blue®–1"	23⅜" x 7¼" (594 mm x 184 mm)	1 psi @ 15 gpm (0.1 bar @ 57 Lpm)
#20 Big Blue®–1½"	23⅞" x 7¼" (606 mm x 184 mm)	1 psi @ 20 gpm (0.1 bar @ 76 Lpm)
#10 Big Clear–1"*	13½" x 7⅛" (343 mm x 181 mm)	1 psi @ 15 gpm (0.1 bar @ 57 Lpm)
#20 Big Clear–1"*	23 ¾" x 7⅛" (603 mm x 181 mm)	1 psi @ 15 gpm (0.1 bar @ 57 Lpm)

* Not Performance Tested or Certified by NSF.

Materials of Construction	BIG BLUE®	BIG CLEAR
Housing	Polypropylene	Lexan (#10), Polycarbonate (#20)
Cap	Polypropylene (HFPP)	Polypropylene (HFPP)
Button Assembly	300-series Stainless Steel, EPDM, and Polypropylene	300-series Stainless Steel, EPDM, and Polypropylene
O-Ring	Buna-N	Buna-N
Maximum Temperature	100°F (37.8°C)	100°F (37.8°C)
Maximum Pressure	#10 Big Blue® – 100 psi (6.9 bar) #20 Big Blue® – 90 psi (6.2 bar)	#10 Big Clear – 100 psi (6.9 bar) #20 Big Clear – 90 psi (6.2 bar)

CAUTION: Protect against freezing to prevent cracking of the filter and water leakage.

PENTEK
Pentair Water

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Customer Service: 800.645.0267 • Fax: 888.203.7361 • supportspecialist@pentekfiltration.com
International: 920.457.9435 • Fax: 920.457.2417 • international@pentekfiltration.com
www.pentekfiltration.com

ISO-9001 REGISTERED MANUFACTURER

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Printed in USA MR06 310053

SUBMERSIBLE DRAINAGE PUMPS
Model Numbers: D42A, D42M, D42A/B

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DAVEY

WATER PRODUCTS



D42A, D42M D42A/B

SUMP PUMPS

PRODUCT DESCRIPTION

Submersible sump pump with twin impeller design for higher pressure, up to 32m head

APPLICATIONS

- Lawn & garden irrigation
- Sump emptying to higher heads
- Treated effluent disposal
- Water transfer from wells
- Model D42A/B specially designed for non potable rainwater applications

"A" suffix models equipped with present length automatic float switch fitted for automatic operation.

FEATURES & BENEFITS

Double mechanical seal, one in oil bath on motor and extra mechanical seal on pump
- Superior reliability
- Long service life

Corrosion resistant 304 stainless steel shaft, motor shell and fasteners
- Long service life

D42A/B has cast 316 stainless steel motor caps and super tough engineered thermo plastic pump casing
- Outstanding corrosion resistance
- Long life

Centrifugal multistage twin impeller design
- Higher pressures & increased efficiency

Closed vane impellers with long engagement "D" drives
- Positive operation
- Long service life

D42A & D42M have labyrinth impeller neck rings
- Maintain pump performance
- Less susceptible to wear

D42A/B has patented independently floating neck rings
- Outstanding pump performance
- Long pump life

Corrosion resistant hard wearing polycarbonate impellers
- Long service life

Corrosion resistant stainless steel fine mesh suction strainer with large surface area
- Prevents blockages of the pump by solids

In-built automatic thermal overload
- Protects the motor in the event of blockage or voltage supply problems

HO7RNF oil resistant leads, 10 metres long with 3 pin power plug
- Easy to connect to power supply
- Longer life in dirty water

OPERATING LIMITS

	D42A,M	D42A/B
Capacities to	110lpm	130lpm
Max. total head	26m	32m
Max. submergence	12m	
Max. pumped water temperature	40°C	
Max. soft solids	1.9mm O.D.	
Outlet size (BSP)	1" F	

Suitable Fluids
Clean water of neutral pH containing up to 1% small solids. Some wear should be expected while pumping hard solids in suspension.

H/O & MFG SCORESBY Quality System™
Quality Endorsed Company
ISO 9001 Lic 10636

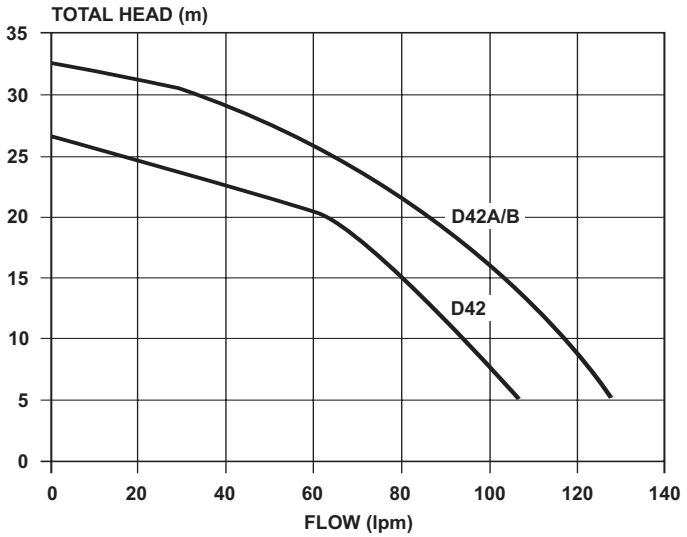
TECHNICAL SPECIFICATIONS

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MATERIALS OF CONSTRUCTION

PART	MATERIAL
Impeller	Glass filled polycarbonate
Lock nut	304 stainless steel
Pump casing	Cast iron - FC200 (D42A&M) Glass filled polycarbonate (D42A/B)
Diffuser and blanking ring	Glass filled noryl
Mechanical seal - pump	Carbon/ceramic
Mechanical seal - motor	Silicon carbide/ceramic in oil bath
Shaft seal elastomer	Nitrile rubber
Pump shaft	304 stainless steel
Orings	Nitrile rubber
Motor shell	304 stainless steel
Bottom bearing housing	Cast iron - FC200 (D42A&M) Cast 316 stainless steel (D42A/B)
Upper motor cover	Cast iron - FC200 (D42A&M) Cast 316 stainless steel (D42A/B)
Handle	304 stainless steel
Fasteners	304 stainless steel
Float & power supply leads	HO7RN-F oil resistant

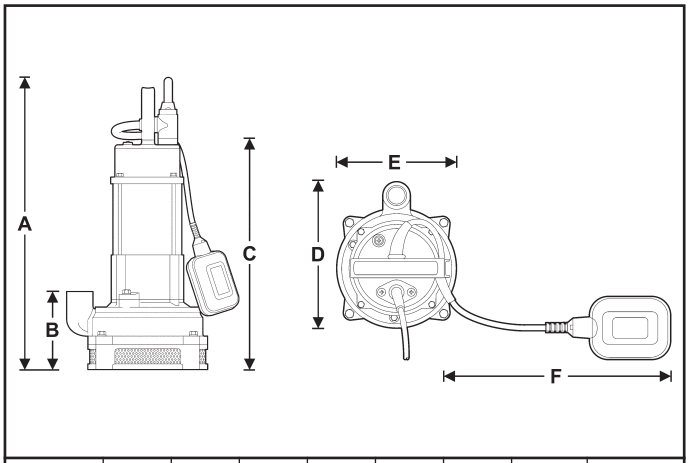
HYDRAULIC PERFORMANCE



ELECTRICAL DATA

Supply voltage	220-240V
Supply frequency	50Hz single phase
Speed	2 pole, 2850rpm
Full load current	4.0A
Locked rotor current	14A
Input power (P_1)	0.94kW
Output power (P_2)	0.60kW
IP rating	X8
Insulation class	Class F
Starting	P.S.C.
Lead	10m long

DIMENSIONS



Model	A	B	C	D	E	F	Outlet B.S.P.	Net Weight (kg)
D42A	475	130	370	235	195	330	1"F	20
D42M	475	130	370	235	195	330	1"F	19.5
D42A/B	475	130	370	235	195	330	1"F	18.5

All dimensions in mm unless otherwise stated.

INSTALLATION & PRIMING

Use a rope to position and retrieve the pump. Do not lower or retrieve the pump using the power lead as this may damage the cable entry seals, causing water leaks and unsafe operation.
Don't use this product for recirculating or filtering swimming pools, spas, etc.
While these pumps are built to high safety standards, they are not approved for installations where people will be in the water while they are operating.
Don't pump abrasive materials. Sand and grit in the water being pumped will accelerate wear, causing shortened pump life.
Keep your pump clean, particularly in situations where lint, hair or fibrous materials may get bound around the pump shaft. Regular inspection and cleaning will extend pump life.
Make room for the float switch to operate. Automatic models have a float switch to turn them on when the water level rises and turn them off again when it has been pumped down to the safe operating level of the pump. If the float switch is not free to rise and fall, correct pump operation may not be possible.
Don't run your pump dry. Non-automatic models must be switched off manually or by way of an external float/level switch when the water level is reduced to the top of the pump housing.

This literature is not a complete guide to product usage. Further information is available from your Davey dealer, Davey Customer Service Centre and from the relevant product Installation and Operating Instructions. This data sheet must be read in conjunction with the relevant product Installation and Operating Instructions and all applicable statutory requirements. Product specifications may change without notice.
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Visit Davey on-line for further information
davey.com.au

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DAVEY
WATER PRODUCTS

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Website: www.daveyusa.com
E-mail: sales@daveyusa.com

DPM128-3a/0806/WEB supersedes DPM128-3/3K/0706/SC

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24 Nov 2020

GJ Hyde & Main

September 2020

O'Hagan Contracting Limited, R D 11, Palmerston North 4481
P: 06 329 2522 | e: office@ohagancontracting.co.nz | w: www.ohagancontracting.co.nz

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On-Site Wastewater Disposal Evaluation Investigation Checklist

PART A: Contract Details

1. **Applicants Details:**

Applicants Name:	**GJ Gardner**	
Company Name:		
Property Owner Name(s)	**First Names**	**Surnames**
	D	**Hyde**
	C	**MAIN**
Nature of Applicant:	**Owner**	

2. **Consultant / Site Evaluator Details:**

Consultant/Agent Name:	**OHAGAN CONTRACTING LIMITED**
Site Evaluator Name:	**SHANE O'HAGAN**
Postal Address:	**R D 11, PALMERSTON NORTH**
Phone Number:	**Business: 06 329 2522 Fax: 03 329 2532 Mobile: 021 670 426**
Contact Person:	**SHANE O'HAGAN**
Email Address:	shane@ohagancontracting.co.nz

3. **Are there any previous existing discharge consents relating to this proposal or other waste discharge / disposal on the site?**

No

4. **List any other consents in relation to this proposal site and indicate whether or not they have been applied for or granted: If so, specify Application Details and Consent No.**

Subdivision

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Part B: Property Details

1. **Property for which application relates:**

Physical Property Address: 283a Kimberly rd

Territorial LA: Horowhenua District Council

Regional Council Horizons Regional Council

Legal Status of Activity: Permitted X Controlled ☐ Discretionary ☐

Relevant Regional Rules: 1.3.3,1.3.5,1.10

Total Property Area (m^2): 8403

Map Grid Reference of property:

Notes:

2. **Legal description of land (as shown on Certificate of Title)**

Lot No: 3 **DP No:**351707 **CT No:**

Other (specify):

PART C: Site Assessment – Surface Evaluation

(Refer TP58 – Sn 5.1 General Purpose of Site Evaluation and Sn 5.2.2(a) Site Surface Evaluation)

Note: Underline terms defined in Table 1 Attached

1. **Has a Desk Study been undertaken on this property?**

Yes

If YES, please specify the findings of the Desk Study, and if not please specify this was not considered necessary.

To collect information for this report

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2. Has a Slope Stability Assessment been carried out on the property?

No

If not, why not?

Not connersered a risk

If Yes, please give details of report (and if possible, please attach the report):

Author:

Company / Agency:

Date of Report:

Brief Description of Report findings:

3. Site Characteristics (See Table 1 Attached):

Provide descriptive details below:

Performance of Adjacent Systems

Other secondary systems in area working fine

900

Vegetation Cover:

grass

Slope Shape:

Flat plainer

Slope Angle:

Under 5 deg

Surface Water Drainage Characteristics:

south

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Flooding Potential: **No**

If YES, specify relevant flood levels on appended site plan, i.e. one in 5 year and/or 20 year and/or 100 year return period flood level, relative to disposal area.

Surface Water Separation:

100+

Site Clearances: (Provide general description and specific dimensions in PART 6 below and in Site Plan.

As per site plan attached

Site Characteristics:

Lifestyle

4. Site Geology of subject property

Geological Map Reference Number

5. What Aspects does the proposed disposal system face?

North-West

6. Site Clearances

Separation Distance from	Treatment Separation Distance (m)	Disposal Field Separation Distance (m)
Boundaries	10	1.5
Surface Water	100+	100+
Groundwater	2+	2+
Stands of Trees/Shrubs		1

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Site Clearances (Cont'd)

Separation Distance from	Treatment Separation Distance (m)	Disposal Field Separation Distance (m)
Wells, Water Bores	na	na
Embankments/Retaining Walls		
Buildings	3	20
Others (Specify)		

PART D: Site Assessment – Subsoil Investigation

(Refer TP58 – Sn 5.1 General Purpose of Site Evaluation and Sn 5.2.2(a) Site Surface Evaluation and Sn 5.3 Subsurface Investigations)

Note: Underline terms defined in Table 2 Attached

1. Please identify the soil profile determination method?

Test Pit ☐ (Depth_1_m) 1 No of Test Pits

Bore Hole x (Depth__m) No of Bore Holes

Other (Specify)

Soil Report Attached: yes

2. Was Fill Material intercepted during the subsoil investigation? No

If yes, please specify the effect of the fill on wastewater disposal

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3. Has percolation testing been carried out? **No**

If yes, please specify the method:

Test Report attached: **Yes**

4. Are surface water interception / diversion drains required? **No**

If yes, please show on site plan

5. Please state the depth of the seasonal water table:

Winter 2+

Summer 2+

Please indicate whether measured **Estimated**

6. Are there any potential short circuit paths? **No**

If yes, please explain how these have been addressed:

7. Based on results of subsoil investigation above please indicate the dispoal field soil category?

Is Topsoil present: **Yes** If so, Topsoil Depth (m):

Soil Category: Select One: Cat 3 - Medium fine & loamy sand - Good drainage

Reasons for placing in stated category:

Site soil compared to horizons one plan and training from CET site and soil investigation training

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PART E: Discharge Details

1. Water supply source for the property (Please select one) Rainwater (roof collection)

2. Calculate the maximum daily volume of wastewater to be discharged, unless accurate water meter readings are available (*Refer TP58 Table 6.1 and 6.2*)

Number of Bedrooms	3	
Design Occupancy	6	(No of people)
Per Capita Wastewater Production	165	(Litres per person per day)
Other – Specify		
Total Daily Wastewater Production	990	(Litres per day)

3. Do you propose to install:

a) Full water conservation devices? **No**

b) Water Recycling – What %? **No** **%**

If you have answered Yes, please provide additional information including the estimated reduction in water usage:

4. Is Daily Wastewater Discharge Volume more than 2000 litres: No

Note: If the answer to the above is Yes, an ARC wastewater discharge permit will be required.

5. Gross Lot Area to Discharge Ratio:

Gross Lot Area	**8403**	m^2
Total Daily Wastewater Production	990	Litres per day from above
Lot Area to Discharge Ratio	8.40	

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6. **Does this proposal comply with the Auckland Regional Council Gross Lot Area to Discharge Ratio of greater than 1.5**

   Yes

7. **Does this proposal comply with the Auckland Regional Council Gross Lot Area to Discharge Ratio of greater than 3**

   Yes

8. **Is a Discharge Consent Required?**

   No

PART F: Primary Treatment (Refer TP58 Section 7.2)

1. **Please indicate below the number and capacity (litres of all septic tanks including type (single / dual chamber grease traps) to be installed or currently existing:**

Number of Tanks	Type of Tank	Capacity of Tank (Litres)
1	Oasis 2000	8250
	Total Capacity:	**8250**

2. **Is a Septic Tank Outlet Filter to be installed?** **Yes**

If Yes, please state the type

Thylex

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PART G: Secondary and Tertiary Treatment

(Refer TP58 Section 7.3, 7.4, 7.5 and 7.6)

1. Please indicate the type of additional treatment, if any, proposed to be installed in the system:

☐ **Secondary Treatment**

x Home Aeration Plant

☐ Commercial Aeration Plant

☐ Intermittent Sand Filter

☐ Recirculating Sand Filter

☐ Recirculating Textile Filter

☐ Clarification Tank

☐ **Tertiary Treatment**

☐ Ultraviolet Disinfection

☐ Chlorination

☐ Other Specify:

PART H: Land Disposal Method (Refe3r TP58 Section 8)

1. Please indicate the proposed loading method: Pump

2. Is a high water level alarm being installed in pump chambers? Yes

3. If a pump is being used, please provide the following information:

Total Design Head	38	(m)
Pump Chamber Volume	1000	(Litres)
Emergency Storage Volume	2000	(Litres)

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4. Please identify the type(s) of land disposal method proposed for this site (please tick)
(Refer TP58 Sections 9 and 10)

- ☐ Surface Drippier Irrigation
- X Sub-surface Dripper Irrigation
- ☐ Standard Trench
- ☐ Deep Trench
- ☐ Mound
- ☐ Evapo-transpiration Beds
- ☐ Other (Please specify)

5. Please identify the loading rate you propose for the option selected in PART H, Section 4 above stating the reasons for selecting the loading rate:

Loading Rate		3	(Litres / m^2 /day)
Disposal Area	Basal		(m^2)
	Areal	330	(m^2)

Explanation: (Refer TP58 Sections 9 and 10)

Loading rates conservatively suited to soil conditions

6. What is the available reserve wastewater disposal area (Refer TP58 Table 5.3)

Reserve Disposal Area	(m^2)	175
Percentage of Primary Disposal Area	(%)	50

7. Please provide a detailed description of the design and dimensions of the disposal field and attach a detailed plan of the field relative to the property site:

Description and dimensions of Disposal Field

330m of metzerplas dripper lines .6 centres 2.10lt per hr at 1m spacings

Plan Attached: **Yes**

If not explain why not:

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PART I: Maintenance & Management (Refer TP58 Section 12.2)

1. **Has a maintenance agreement been made with the treatment and disposal system suppliers?**

   Yes

PART J: Assessment of Environmental Effects

1. **Is an assessment of environmental effects (AEE) included with the application?**

(Refer TP58 Section 4 (particularly 4.4.2), section 5 and section 11 (parts 11.1 & 11.8). Ensure all issues concerning potential effects addressed)

No

2. **Are there any specific environmental constraints?**

No

If Yes, please explain.

PART K: Is your Application Complete?

1. **In order to provide a complete application have you remembered to:**
   (Refer to TP%* Section 3.5 for summary of list of information to be covered)

   x Fully complete this Assessment Form
   x Include a location plan and a site plan (with scale bars)
   x Include a Property Title (Certificate of Title)
   ☐ Attach an Assessment of Environmental Effects (AEE)

2. **Declaration**

I hereby certify that, to the best of my knowledge and belief, the information given in this application is true and complete.

Name: Shane O'Hagan **Signature:** 

Position:site evaulator **Date:** 8/9/20

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THE GREEN WASTE SOLUTION

AN OASIS CLEARWATER WASTEWATER SYSTEM IS NOT A SEPTIC TANK. IT IS AN AERATED WASTEWATER TREATMENT SYSTEM COMPRISING FIVE STAGES OF TREATMENT, CONTAINED IN A SINGLE HIGHLY ENGINEERED, ROBUST CONCRETE UNIT.

Our **highly reliable**, low maintenance, low operating cost system has been developed and constructed in New Zealand for our conditions.

It quickly & efficiently turns all household waste water into **high quality irrigation water** – even for fruit trees!

The proven single unit concrete design, with multi chamber aeration treatment process, comes with a **10 year warranty.**

Ask us about our FREE service to help plan the location & layout of your wastewater system before you start building, it could save you a lot. With our experience and advice we'll help you use your land more effectively – for instance, driplines laid out along shelterbelts leave paddocks free for grazing!

An Oasis Clearwater aerated system efficiently treats the wastewater for **households up to a 9 bedroom dwelling.**

An Oasis Clearwater aerated system **treats and purifies** your home's wastewater by up to 95%. (Our systems use the bacteria to do all the work).

oasisclearwater.co.nz

Oasis Clearwater
ENVIRONMENTAL SYSTEMS

oasisclearwater.co.nz

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The 5 essential steps to clearwater



1 We'll visit and assess your site

We'll assess soil condition, natural drainage patterns of your land and **recommend the ideal location of our system to reduce any impact on your usable land.** We'll investigate the most appropriate area for driplines – we'll help you avoid running them where you may wish to use the land for other purposes.

OSET CERTIFIED

These standards cover the testing, manufacture, performance & management of domestic waste water systems:

AS/NZS1546:2008
AS/NZS1547: 2012
TP58
OSET Compliant



2 We'll help you choose the Oasis system that's right for you

Shortly after our site visit we will advise you which **Oasis aerated system best fits your land and lifestyle.** At this point we will check your local District Council requirements and identify if your Regional Council has any special environmental requirements for onsite systems in your area.

OASIS 2000L	OASIS 3000L
6	9
up to 6 bedroom dwelling	up to 9 bedroom dwelling

5-chambered treatment tank produces high quality, odourless water suitable for irrigation



3 We'll quote on permits, Oasis system, installation & running costs

Next, having visited your site and researched your specific council requirements, we'll give you a detailed quote covering: **the appropriate Oasis system unit for your site; drip lines and drip line field design; installation of the unit and drip line field; council permits; our low annual maintenance costs.** All these costs take into consideration the size of your home and the number of people that the Oasis system will need to efficiently service.



4 We'll co-ordinate installation

Oasis Clearwater systems are installed by fully certified and trained Oasis Clearwater distributors. This ensures site evaluation, installation and final commissioning is completed by tradespeople who are **trained in our product and understand the quality of service and care** that we as a company work to. Oasis Clearwater will project manage the installation so that all parties are aware of what's happening and when it's happening.



5 We'll service & maintain your system

Oasis Clearwater systems only require a six-monthly check-up to ensure everything is running efficiently and effectively. If something does go awry, **we have a nationwide 24-hour back-up support service you can call on.**

0800 627 472

Oasis Clearwater
ENVIRONMENTAL SYSTEMS

A division of Humes

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24 Nov 2020

O'Hagan Contracting

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SERVICE CONTRACT

I _____ request and authorise O'Hagan Contracting to do the following work:

1 Enter on to the property situated at _____
_____

2 For the purpose of servicing, maintaining, or repairing water or waste water utilities of the following type: _____
_____

3 This servicing is to occur as part of a scheduled servicing programme every **Six Months** and when requested by the customer to attend a "breakdown".

4 This servicing is to be carried out in accordance with local or Regional Council requirement related to the utility at the time of servicing. I agree that O'Hagan Contracting may supply information to the Council about the serviceability of any utility as required by present or future legislation.

5 I understand that O'Hagan Contracting will make the following charge for scheduled service visits $125.00 + GST per service. The scope of the work carried is limited to the tasks required to complete the service checklist. Any repairs **essential** to the correct function of your plant will be carried out and charged accordingly. Every attempt will be made to contact you prior to this occurring.

6 I understand that this or any service agreement or document offered by O'Hagan Contracting in no way constitutes a warranty or guarantee to the performance or serviceability of any system, plant or utility.

7 Payment terms 7 days from date of invoice. Goods remain the property of O'Hagan Contracting until paid in full.

SIGNED: _____ DATE: _____

FULL NAME: _____

POSTAL ADDRESS: _____

_____

CONTACT PHONE NO:

HOME: _____ MOBILE: _____

FAX: _____ OTHER CONTACT: _____

EMAIL: _____

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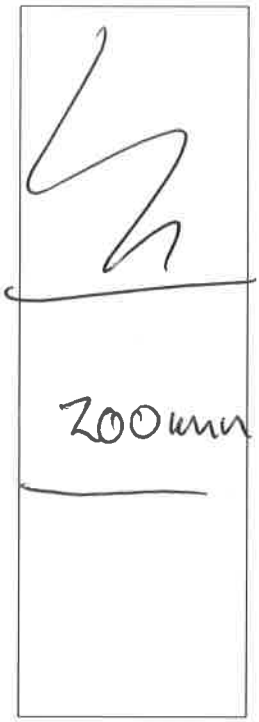
Subsoil Investigation

Customer: GT Hyde & Main

Site Address: 283a Cumberly rd Leven

Position of Borehole: Centre Bed

Profile:



- Finished Ground Level

200 mm top soil

- 500mm Below FGL

200mm Loam light

-1 Metre Below FGL

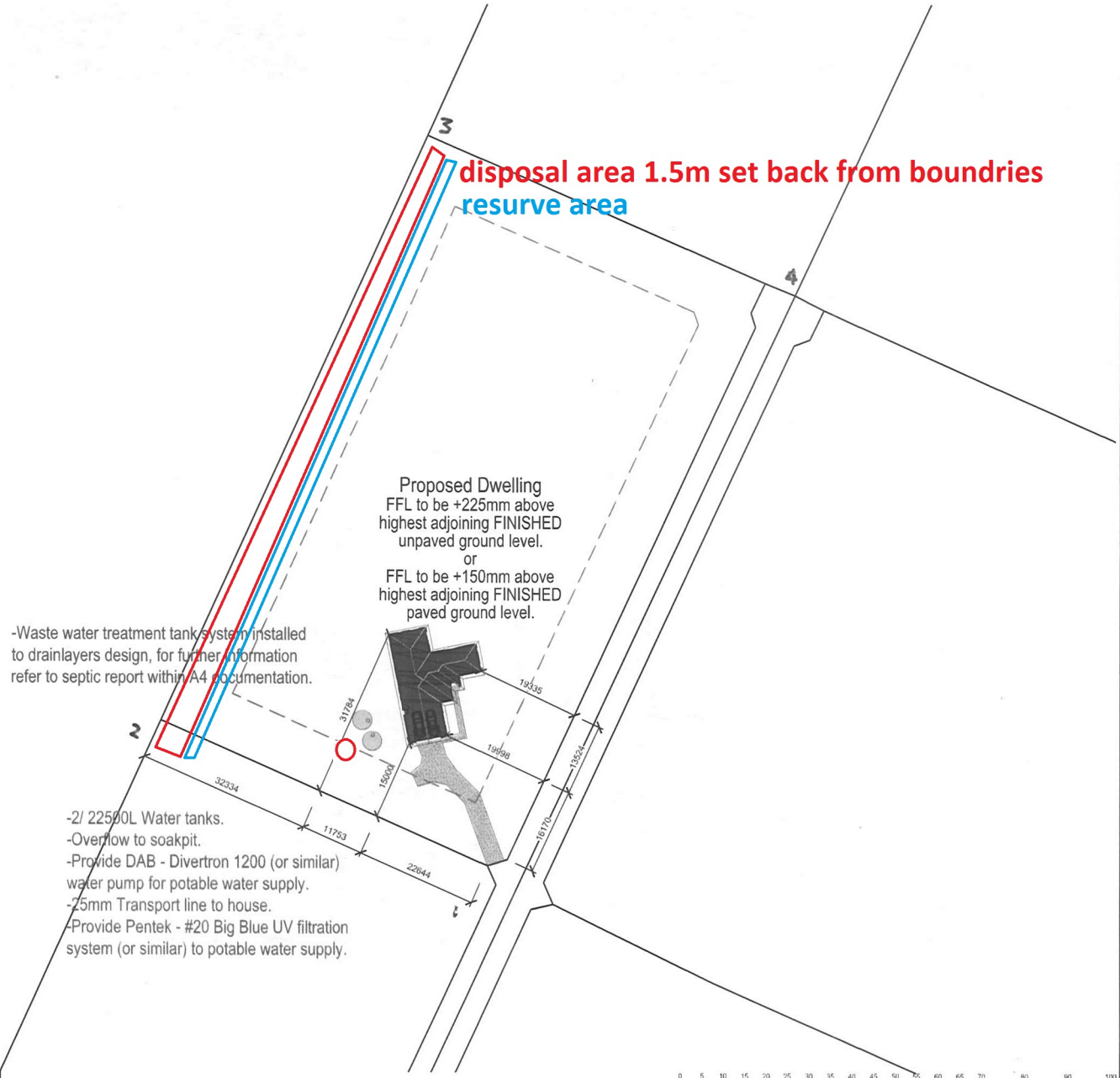
gravels

Additional Notes: Visited when wet & site was still damp. Shelter Belt protecting Bed

Depth of Ground Water: None Cm

Drainage Potental: Very good.

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Notes:

North point.

Legal Description.

Lot:	03
DP:	351707

Address.
283a Kimberly Road, Levin.

Site area calculations.

Site area:	8403 m²
Nett site area:	8403 m²
Allowable coverage:	100 %
Allowable coverage:	8403.00 m²
Subject building existing footprint:	0.00 m²
Existing accessory building area:	0.00 m²
Proposed coverage over foundation:	203.56 m²
Soffit area over DP allowance:	0.00 m²
Total coverage:	2.42 %
Total coverage:	203.56 m²

All dimensions have been taken from the foundation line to the boundary line at right angles unless stated otherwise.

Where shown, adjacent properties and boundaries are shown for illustrative purpose only. Before work commences builder to locate all boundary pegs, check all boundary lengths and building set back distances with the plans. If an inconsistency is found or pegs cannot be located a licensed cadastral surveyor should re-peg the site to ensure an accurate set out.

During construction of this project the builder in charge of the site shall carry out a site hazard evaluation. If at any stage a specific hazard to the public presents itself, builder shall ensure safety to the public by erecting site fences to prevent public access, in keeping with section F5 of the New Zealand Building Code, safety of life and property must be strictly observed.

Dwelling finished floor level:
(to comply with E1/AS1)
Finished slab floor level shall be:
- For sites at same level or above the road, set floor level at min. 150mm above the crown of the road.
- For sites below the road set floor level at no less than 150mm above the lowest point on the site boundary.

Maximum driveway gradient to be:
1 in 4 (25% or 14.04°).
Maximum gradient of transition zones across property line or into buildings:
1 in 20. (5% or 2.86°).

Issue: **Concept Plan**

ONLY PLANS WITH COUNCIL CONSENT STAMP MAY BE USED FOR CONSTRUCTION OR PREFABRICATION

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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G.J. Gardner. HOMES
New Zealand's favourite home builders

G.J. Gardner HOMES
Phone: (06) 357 8020
Fax: (06) 357 8021
Email: Trevor.Low@gjgardner.co.nz
P.O. BOX 466 Palmerston North

Proposed Residence.
D Hyde & C Main.
283a Kimberly Road, Levin.

Site plan

GENERATED:	18 / 08 / 2020 5:00:51 pm	SCALES:	A3 A/S A4 -
DRAWN:	Jonathan Barlow	REV:	1
CHECKED:	To be checked	JOB No:	GJ 20-37
LOT:	03
DP:	351707
SHEET No:	A01

Last modified by: Jonathan Paper size: ISO full bleed A3 (420.00 x 297.00 MM) File Location: Z:\00 Jobs\20-37 Main & Hyde\20-37 - Main & Hyde - con rev 2.dwg



Legend:	
Roof Access	Indicates roof space access hatch, 600x600mm min.
	Floor finished in ceramic tiles.
	Indicates extractor fan vented to soffit or exterior.
	Indicates hose tap.
	Indicates water toby.
	Indicates meter box.
	Indicates sub board & fibre / data board.
	Indicates wall with resene construction plaster refer to elevations for location
	Indicates wall with James Hardie Linea weatherboard cladding refer to elevations for location

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Notes:

Elevation Key.	North point.

Areas.	
Existing area:	0.00 m²
Proposed area (over frame):	203.56 m²
Proposed area (over foundation):	203.56 m²
Additional coverage area:	0.00 m²
Site conditions:	
Wind zone:	High
Earthquake zone:	3
Corrosion zone:	C
Snow loading:	N1
Site elevation:	< 400m

Building wrap to all exterior walls: Marshall Tekton (or competitor's equivalent), openings to be trimmed with Marshall Protecto Tape flashing tape (or competitor's equivalent), refer details for further information.

Frame height: 2420mm

All walls lined internally with 10mm Gib board,stopped to a F4 paint quality finish:
Gib Standard to non wet areas.
Gib Aqualine to wet areas.
Gib Braceline as per bracing plan.
(exceptions - garage to be lined with 10mm Triboard.)

Prenail manufacturer to allow for double studs on either side of doors, where practical, to accommodate 65mm architraves.

Any window size on this plan is unit size NOT the trim size and is in the format of: HEIGHT x WIDTH. All door sizes on this plan are Door leaf sizes: opening size = Door leaf size + 58mm

Bathroom shower:	Acrylic
Ensuite shower:	Tiled

Both with glass screens in accordance with NZS 4223. Floor linings to all wet areas to be tile unless otherwise stated.

Access routes:

Any intended access way to the building to be constructed of either profiled timber decking with the profile laid perpendicular to the access, or concrete with a broom finish (Class 5 -6) or wood float finish (Class U2). Alternatively, any other material with a tested wet slip co-efficient of not less than 0.4 when tested against D1/AS1 NZBC.

Issue: **Concept Plan**

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Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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Email: Trevor.Low@gjgardner.co.nz
P.O. BOX 466 Palmerston North

Proposed Residence.
D Hyde & C Main.
283a Kimberly Road, Levin.

Layout plan

GENERATED:	18 / 08 / 2020 5:00:55 pm	SCALES:	A3 1:100 A4 -
DRAWN:	Jonathan Barlow	REV	1
CHECKED:	To be checked	JOB No:	GJ 20-37
LOT:	03
DP:	351707
SHEET No:	A02

Last modified by: Jonathan Paper size: ISO full bleed A3 (420.00 x 297.00 MM) File Location: Z:\00 Jobs\20-37 Main & Hyde\20-37 - Main & Hyde - con rev 2.dwg

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disposal area
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disposal area 1.5 m set back

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RibRaft®

TECHNICAL MANUAL







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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.

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THIS MANUAL CONSISTS OF 3 SECTIONS:

SECTION 1 DESIGN INFORMATION

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/m^2, 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).

Note: Additional admixtures to standard RibRaft® mixes to be approved by the Firth Plant Engineer.

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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 and floor, the loaded dimensions stated in tables 8.2 and 14.10 of NZ3604:2011 shall apply, and these load bearing walls 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).

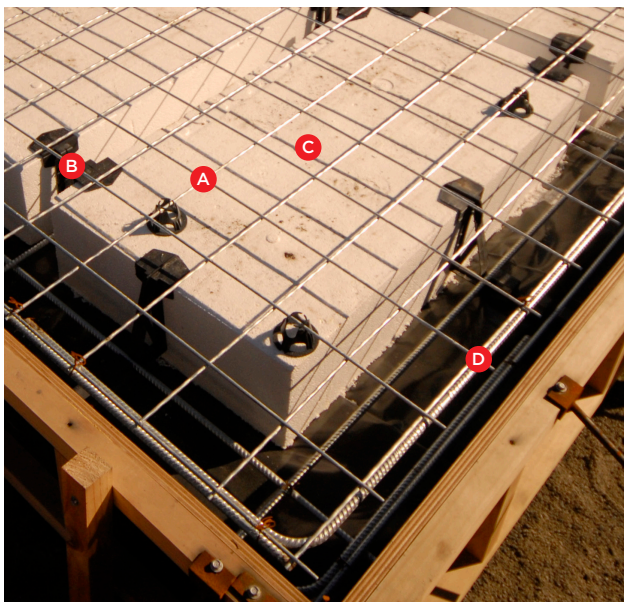
3.3 Snow Loading

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/m^2 – e.g. timber framing with weather boards and interior wall linings.
- Heavy external walls with total mass greater than 60kg/m^2 but not exceeding 290kg/m^2 – e.g. timber framing with masonry veneer or partially filled 20 series masonry blocks.
- Internal walls with total mass not exceeding 45kg/m^2 – e.g. timber framing and linings.
- Light roofs with total mass not exceeding 45kg/m^2 – e.g. ceiling linings and metal roof, including framing.
- Heavy roofs with total mass greater than 45kg/m^2 but not exceeding 85kg/m^2 – e.g. ceiling lining and concrete tiles or slates, including framing.
- Mid-floors with total mass not exceeding 60kg/m^2 – 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 100mm spacer
C Firth RibRaft® polystyrene pods D Steel reinforcing

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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

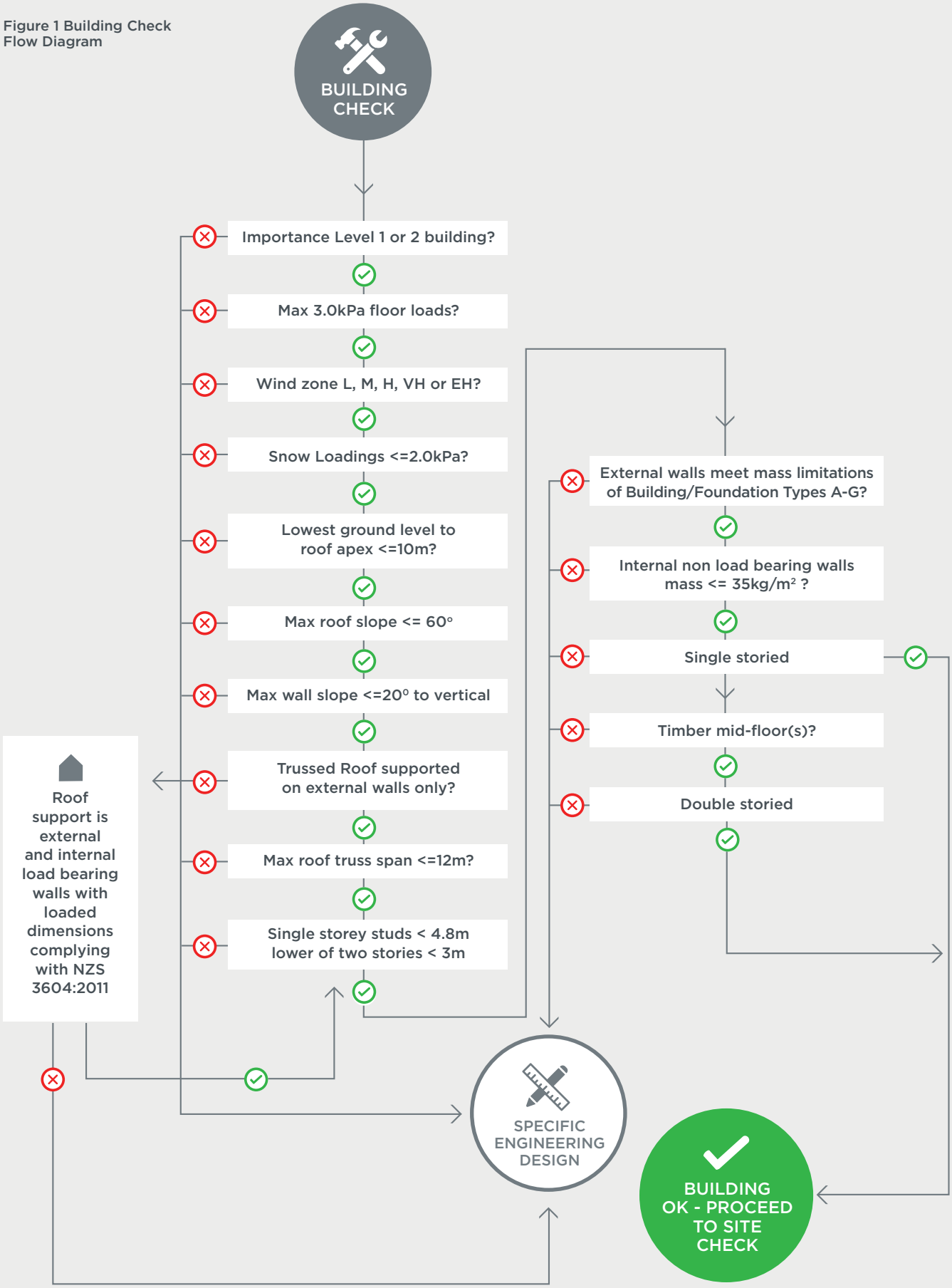
3.7 Flow Diagrams

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).

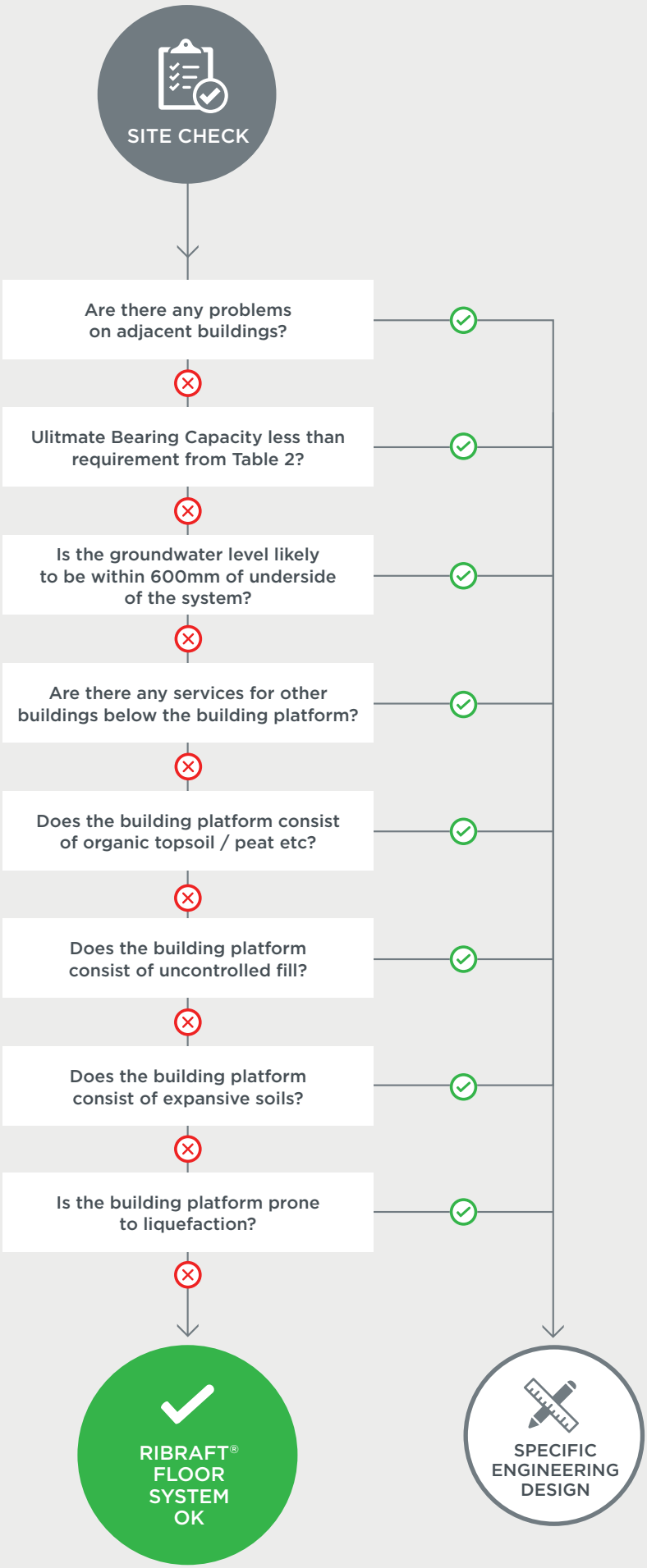
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Figure 1 Building Check Flow Diagram



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Figure 2 Building Check
Flow Diagram



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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

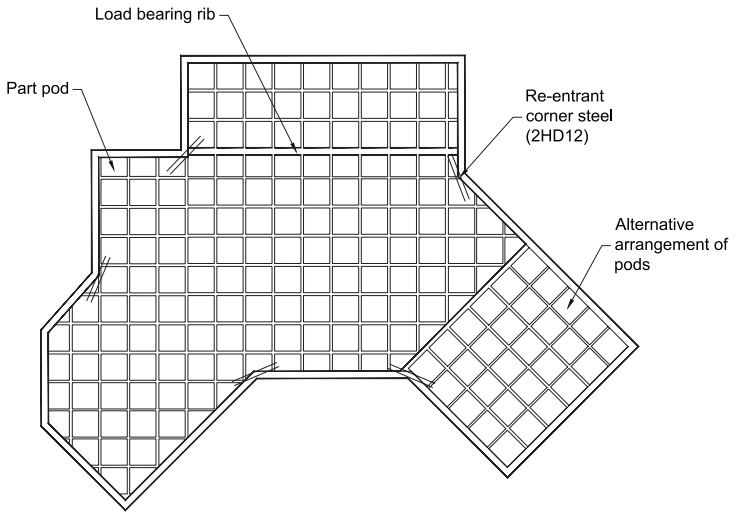
RibRaft® polystyrene pods supplied by Firth (1100 x 1100 x 220mm thick) shall be placed on levelled ground and arranged in a waffle pattern. The pods are used as void formers while the concrete is curing. These pods are an integral component of the system and shall not be substituted.

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 load bearing walls that support the roof and floors and heavy internal walls, the pods shall be cut to create a 300mm wide rib directly under the load bearing wall, 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.

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4.5 Point Loads

Truss manufacturers often support the roof trusses internally on posts or studs within a wall, which are described on the truss manufacturer's 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

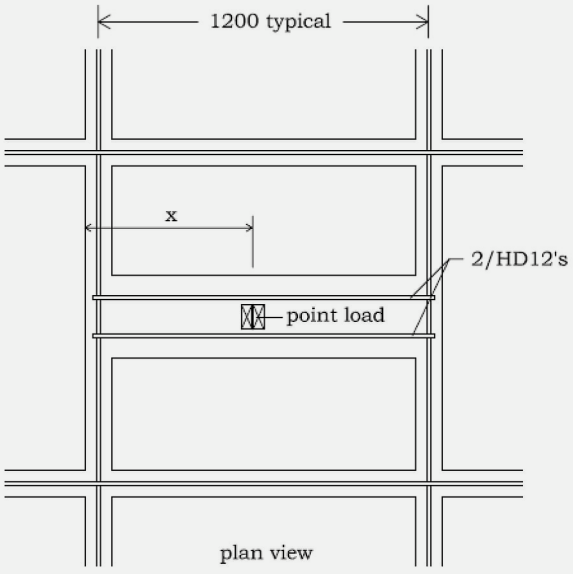
	FOUNDATION OPTIONS BELOW POINT LOAD:	
ULTIMATE LIMIT POINT LOAD REACTION	PAD OPTION, GOOD GROUND	BEAM OPTION, BEARING CAPACITY GREATER THAN 140KPA [3]
Up to 10kN	No thickening required	No thickening required
Up to 20 kN	375x375 pad[1]	300mm wide load under point load as detailed in Figure 5
Up to 30kN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

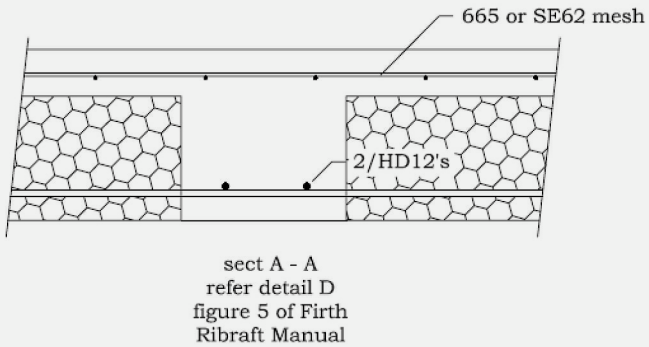
Notes
(1) Pad thickness to match depth of pods plus topping (bears on ground not polystyrene) and reinforced with 2 x D12 Bars both ways
(2) Pad thickness to match depth of pods plus topping (bears on ground not polystyrene) and reinforced with 3 x D12 Bars both ways
(3) Refer section 3.6 for confirmation 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





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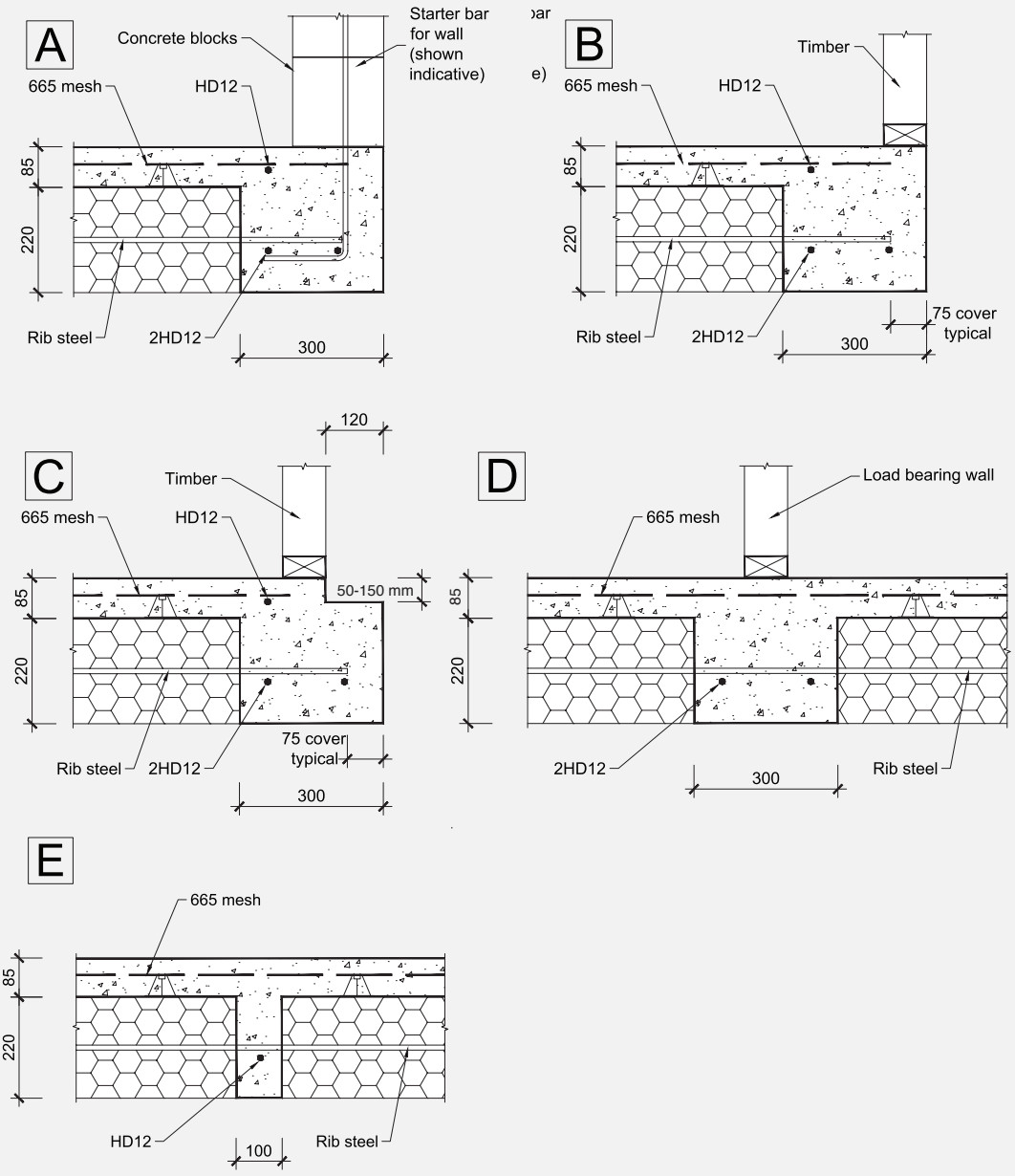
4.6 Mesh Reinforcement

The entire floor slab shall be reinforced with 665 or SE62 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



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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.

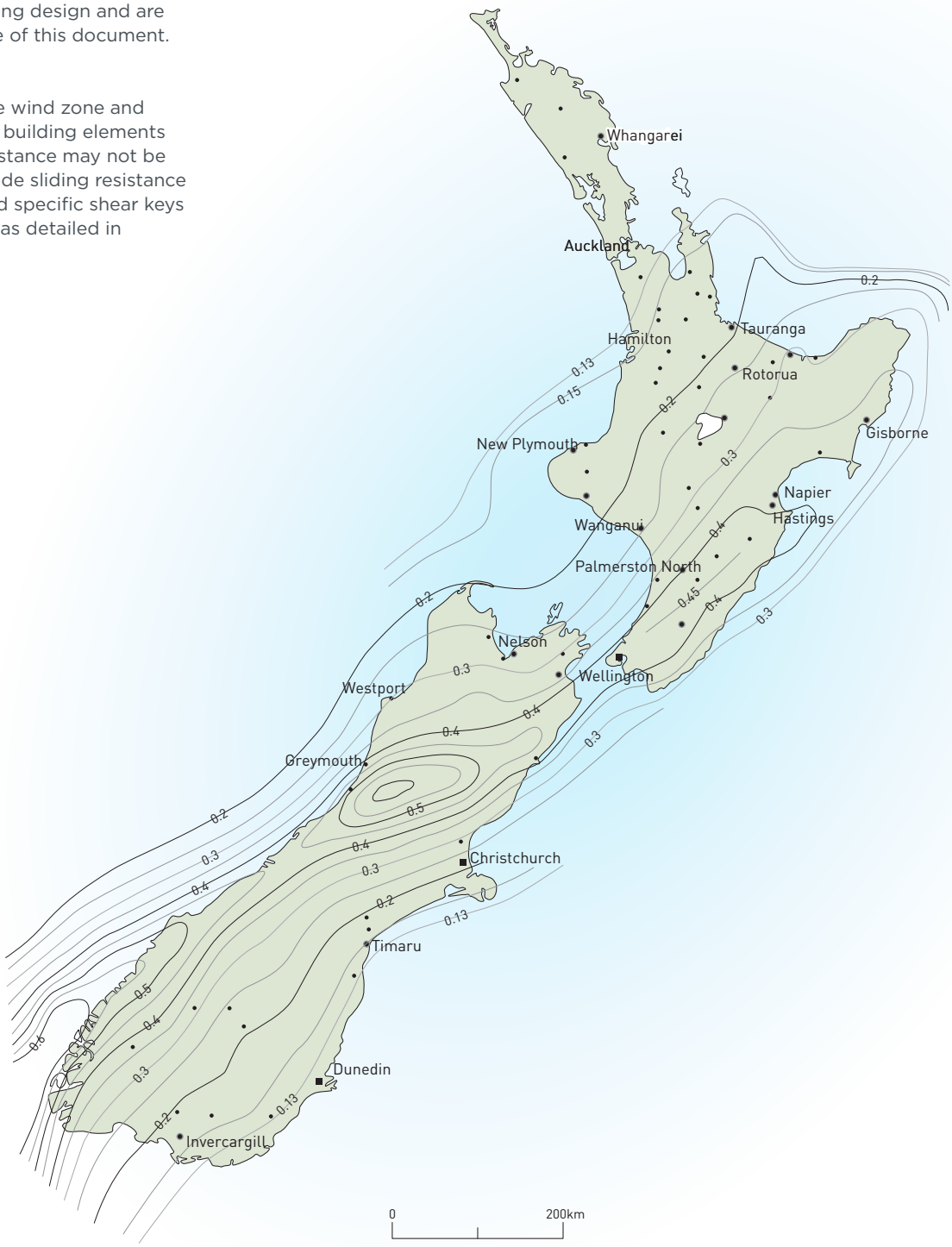


Figure 6
Seismic Hazard Factor Z to NZS 1170.5

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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 100M² 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

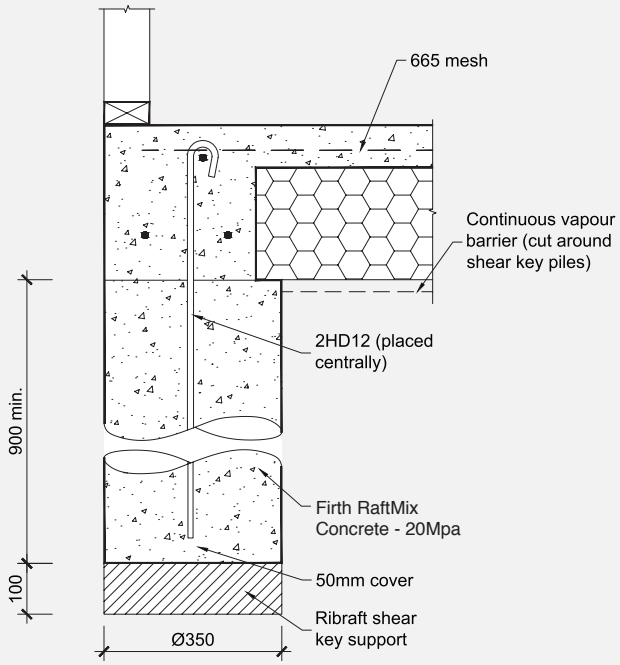
Table 4 Bracing Capacity Provided By Frictional Resistance Per 100m² Of Ground Floor Area

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



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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 180m^2 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 x 1.3 x 15 = 1853BU
The BU demand along the building = 90 x 1.3 x 12 = 1404BU

From Table 4 for a single storey light weight roof with 1.5kPa live load the capacity is 1630BU per 100m^2. Therefore for 180m^2 the capacity is 2934BU. As the capacity (2934) 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 refrerence in H1. However, more technically robust calculation methodologies exist and 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 compatable 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.

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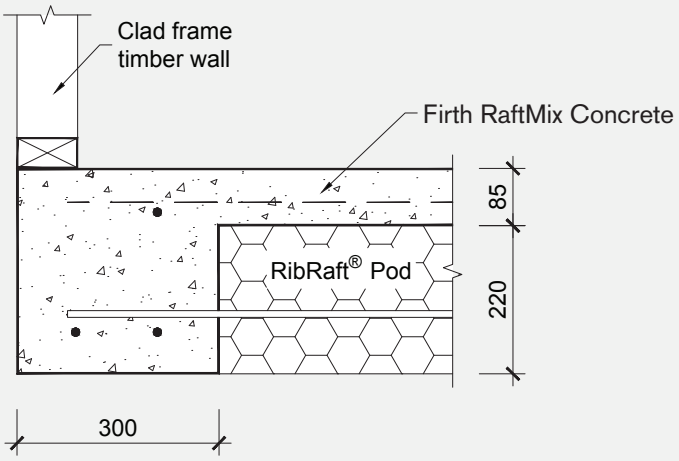


Figure 8
RibRaft® R Values For 90mm Thick Walls On The Floor Edge

	FLOOR AREA TO PERIMETER RATIO M²/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 m² °C/W	1.28	1.40	1.52	1.64	1.75	1.86	1.97	2.07	2.17	2.38	2.57

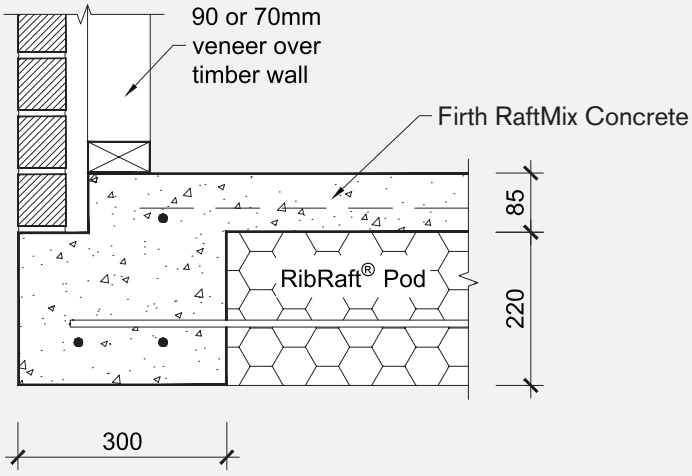


Figure 9
RibRaft® R Values For 70-90mm Thick Veneer, Cavity, and 90mm Walls.

	FLOOR AREA TO PERIMETER RATIO M²/M									
	1.25	1.50	1.75	2.00	2.25	2.5	2.75	3.0	3.5	4.00
R-Value m² °C/W	1.54	1.67	1.80	1.93	2.05	2.17	2.28	2.40	2.62	2.84

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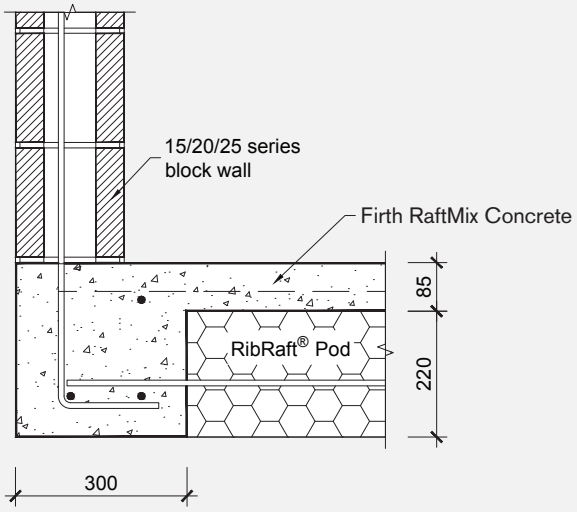


Figure 10
RibRaft® R Values For Various Thicknesses Of Masonry Walls

	BLOCK	FLOOR AREA TO PERIMETER RATIO M²/M									
		1.25	1.50	1.75	2.00	2.25	2.5	2.75	3.0	3.5	4.00
R-Value m² °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

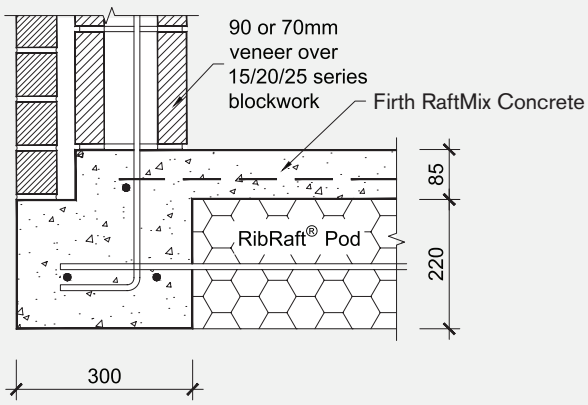


Figure 11
RibRaft® R-Values For 70-90mm Thick Veneer, Cavity, And Various Thickness Masonry Walls

	BLOCK	FLOOR AREA TO PERIMETER RATIO M²/M									
		1.25	1.50	1.75	2.00	2.25	2.0	2.75	3.0	3.5	4.00
R-Value m² °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

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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 positons 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.

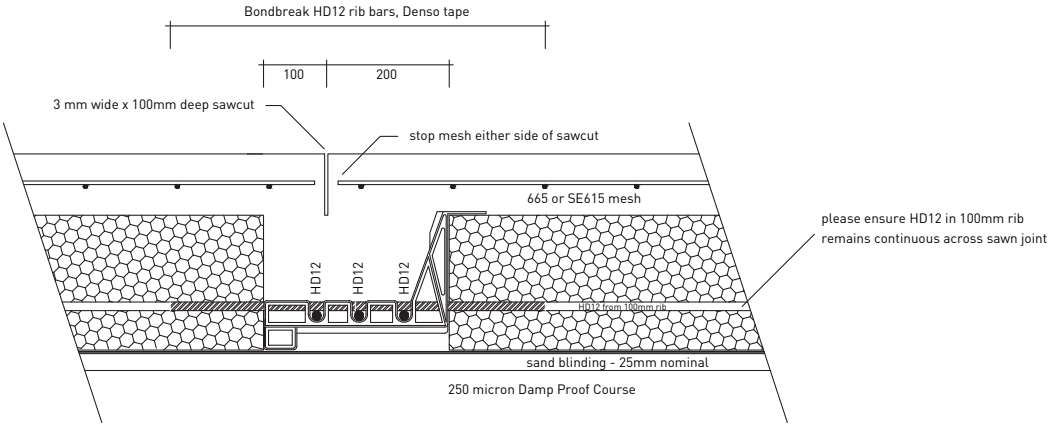
In order to limit the width of cracks at re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner – refer Figure 3.

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

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6.3 Services Detailing

Two options exist for running services, 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.

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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:

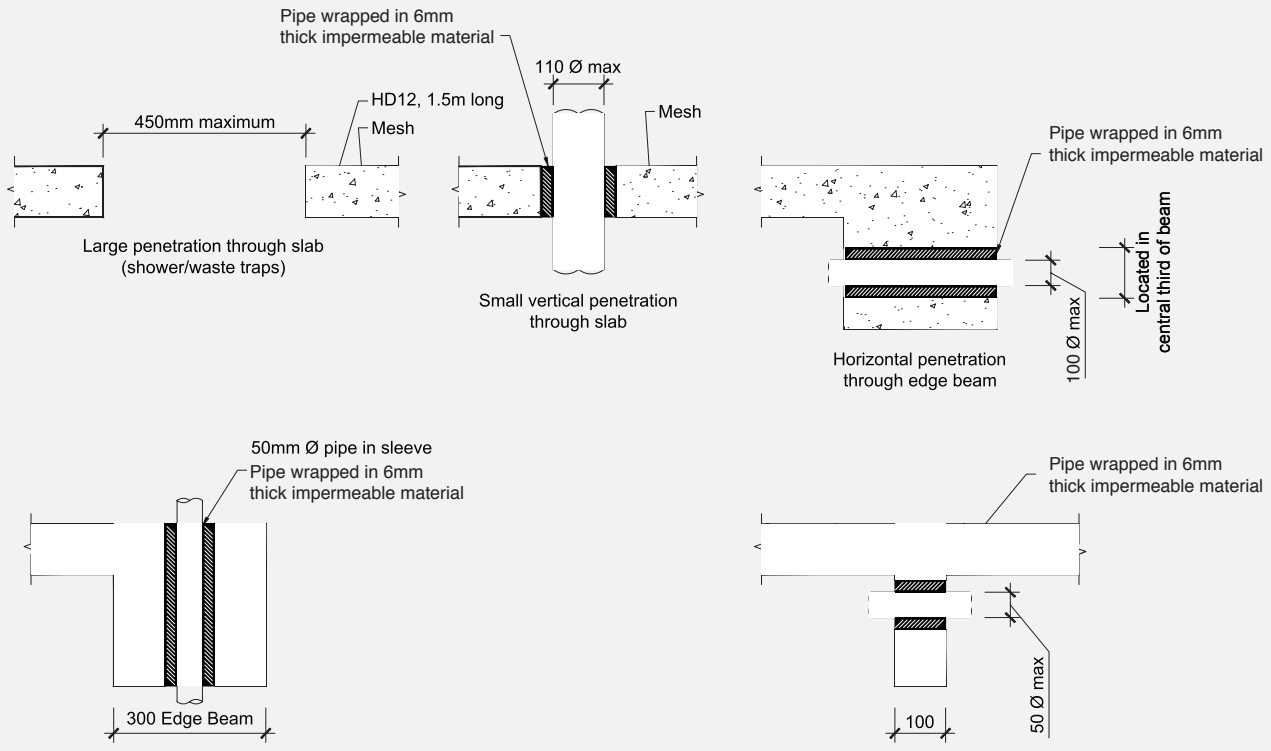
(1) For situations where a 100mm diameter pipe is required to pass vertically through the edge beam, the edge beam shall be locally increased in width to a minimum of 500mm wide. This shall be achieved by keeping flush the outside face of the edge beam and removing 200mm from the pod. The width shall remain at 500mm for a distance of 600mm beyond the service pipe. Refer to figure 14 for details for pipes passing vertically through edge beam and internal rib.

(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).

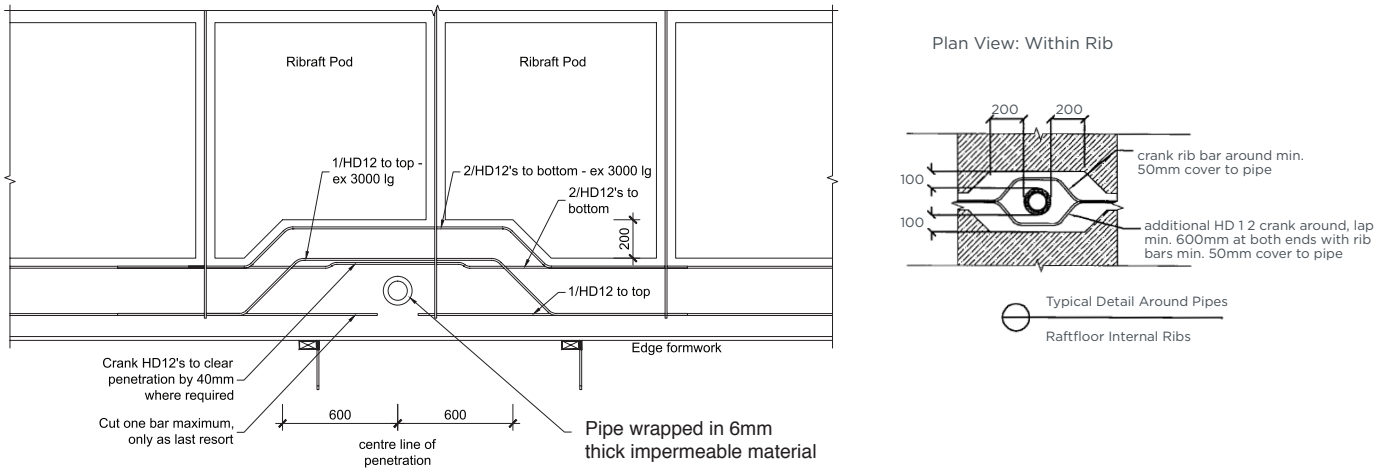
A pictorial of some of the above requirements is illustrated in Figure 13 and 14.

Figure 13 Example of Detailing Requirements For Services



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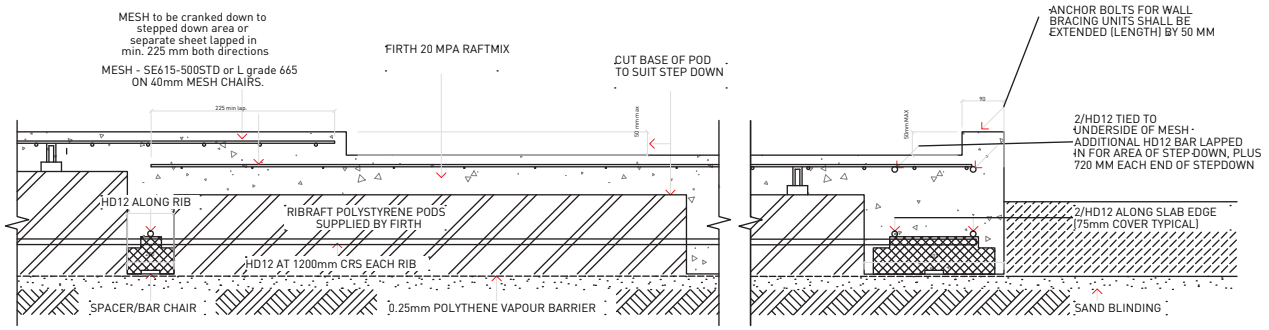
Figure 14
Localised Increase In Width At Edge Beam Where Vertical Service Up To 100mm Diameter Are Required



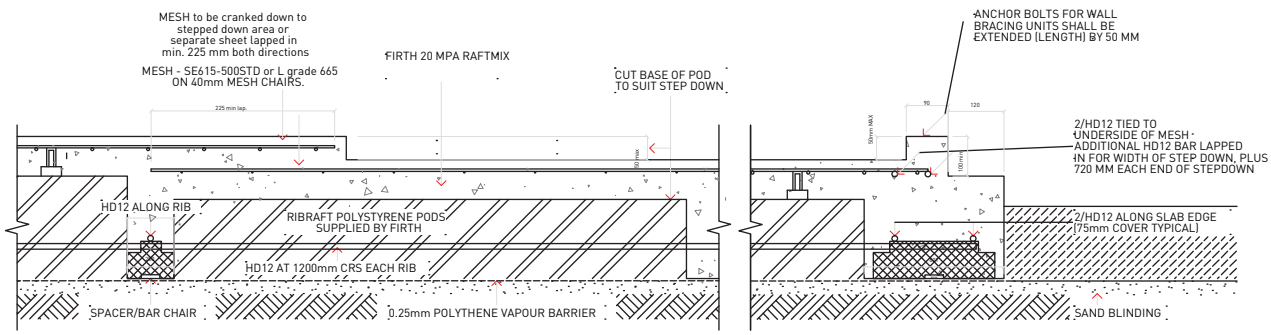
6.3.3 Recesses for Showers

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



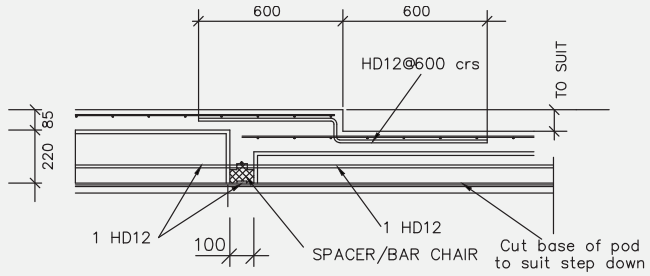
RIB RAFT FLOOR - SET-DOWN DETAIL FOR MAX. 50mm REBATED SHOWER



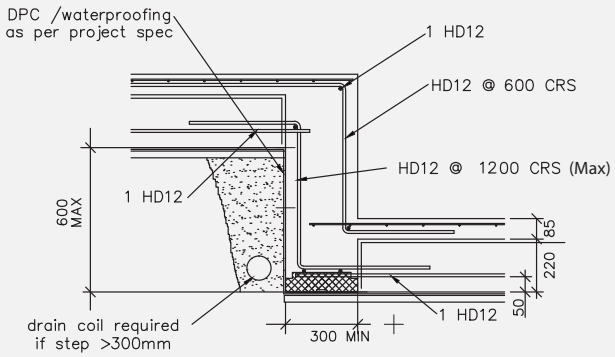
RIB RAFT FLOOR - SET-DOWN DETAIL FOR MAX. 50mm REBATED SHOWER

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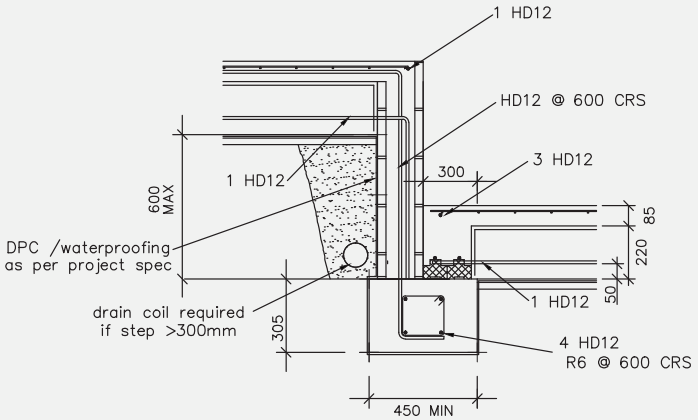
Figure 16 Details where step downs are required in the floor



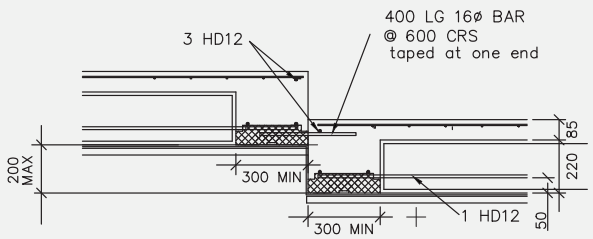
7/S2 SET–DOWN DETAIL FOR STEP UP TO 100mm
1:20



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

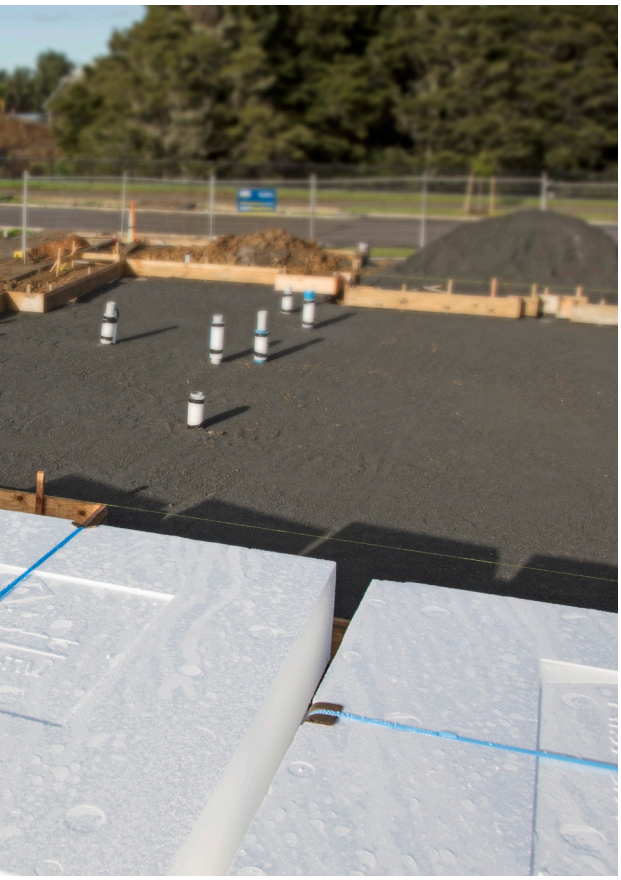
6.3.4 Step Down Of Up To 600mm In The RibRaft® Floor

Where the site topography requires a step down in the slab, steps of up to 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.

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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 INTHIS 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.

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Figure 1
Relationship
Of RibRaft®
To Sloping
Ground Surface

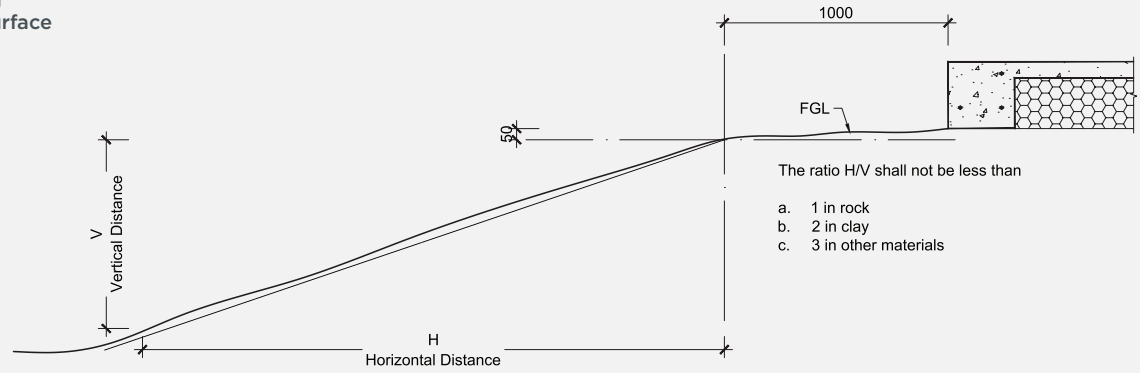


Figure 2
Temporary
Excavation
Limited

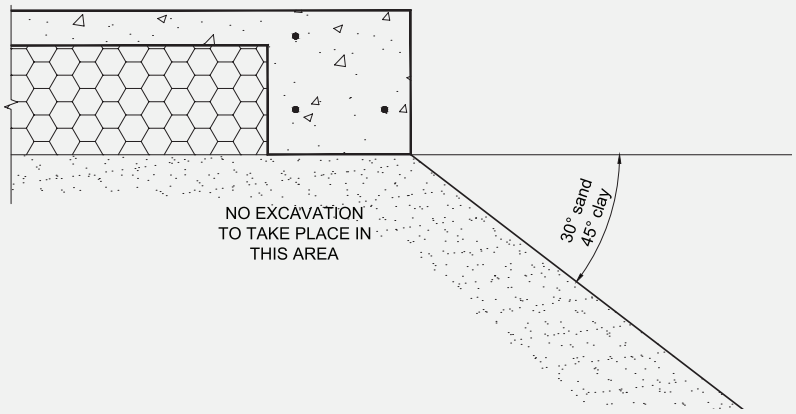
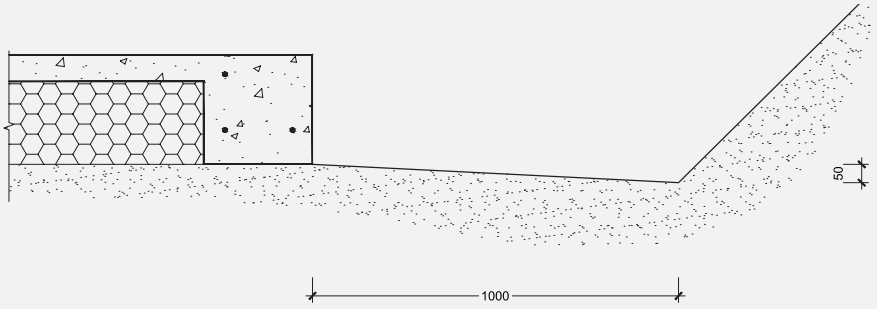


Figure 3
Site Grading



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3.0 INSTALLATION PROCEDURE

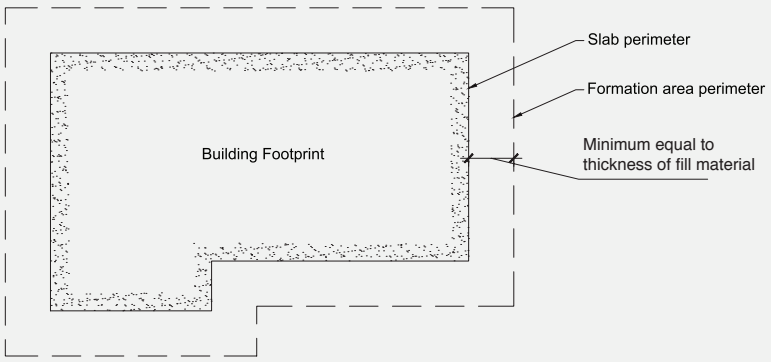
3.1 Site Preparation

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).

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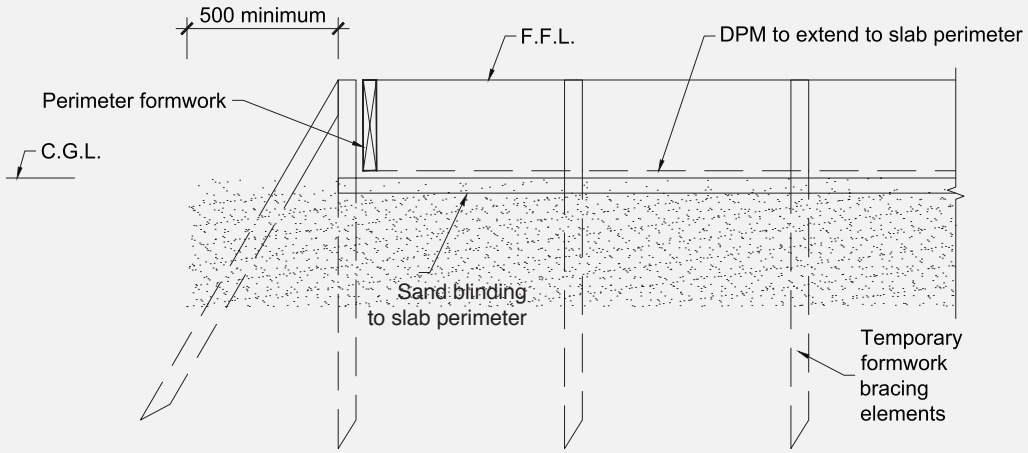
3.5 Sand Blinding

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.

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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.

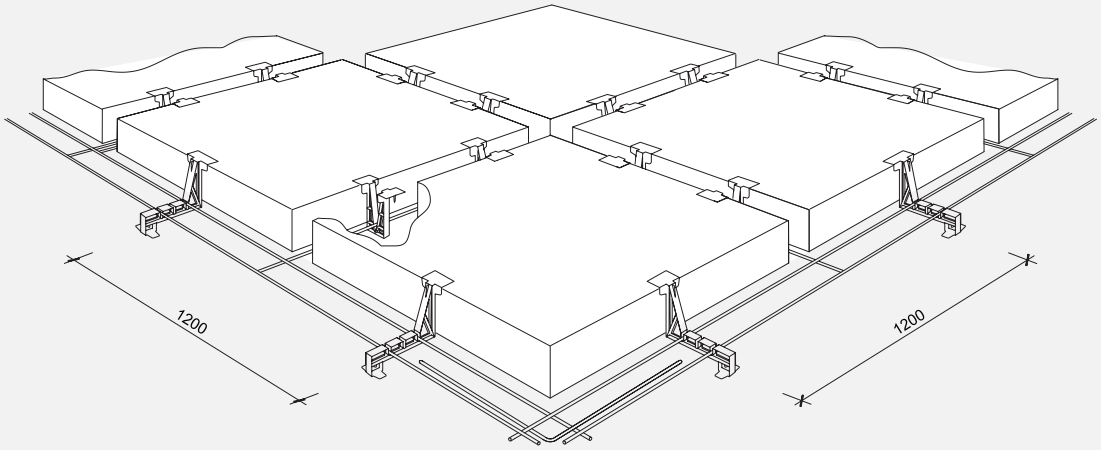
Except where a 300mm wide rib is required, each pod or part pod shall always be separated by 100mm using a minimum of one Firth approved 100mm spacer along each edge of each pod or part pod. The ribs in both directions shall form a waffle pattern throughout the slab. It is essential that the ribs and 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)



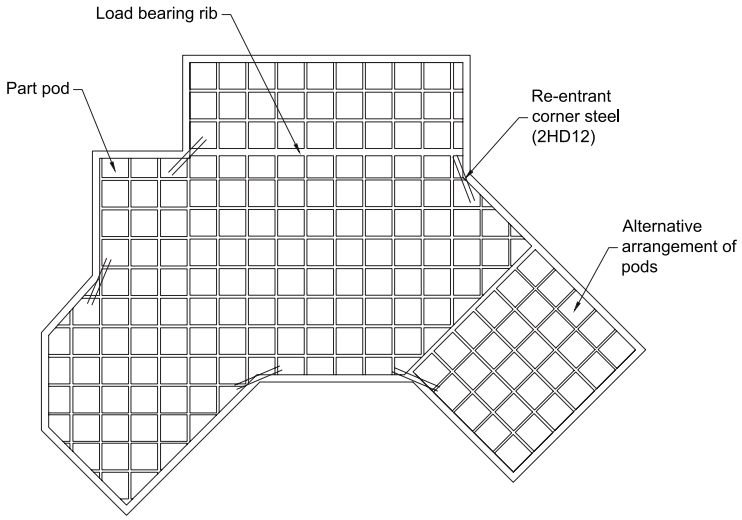


Figure 7 Typical Pod And Rib Layout

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.

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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)

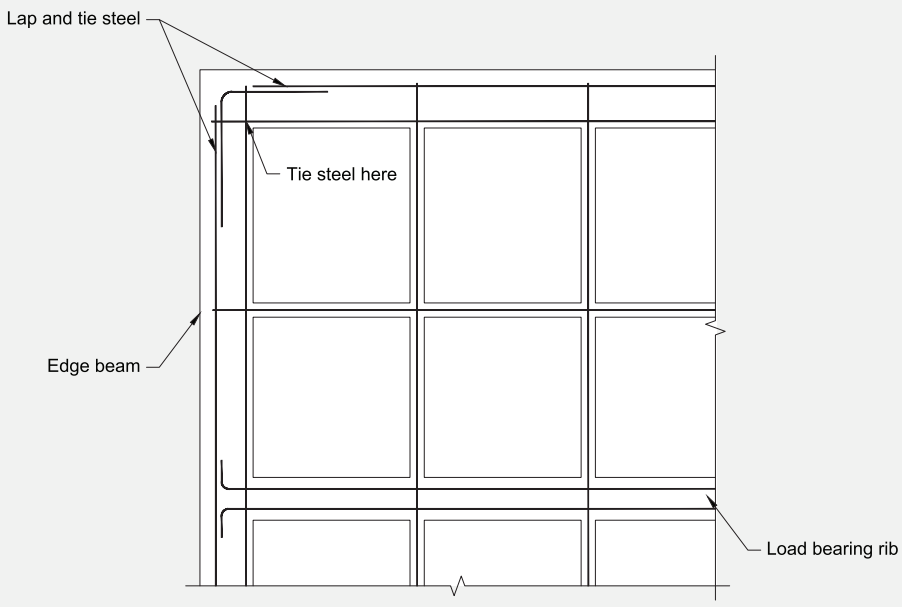


Figure 8 Corner steel layout

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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.

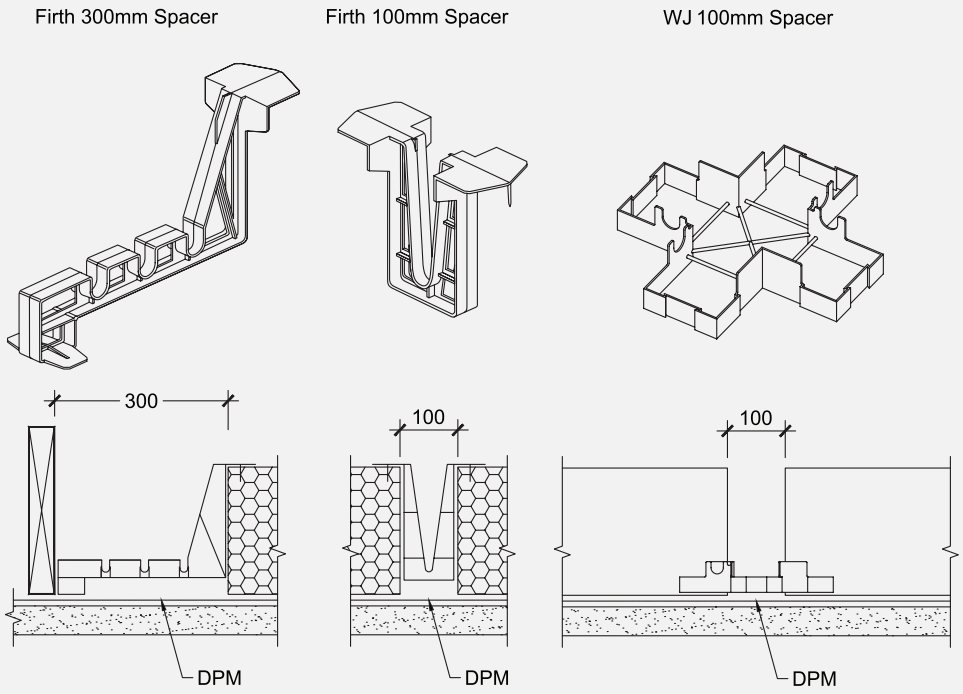
3.10.1 Placing

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.

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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	Early Age Crack Control
www.ccanz.org.nz/page/Hot-and-Cold-Weather-Concreting.aspx	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 positons 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.

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.

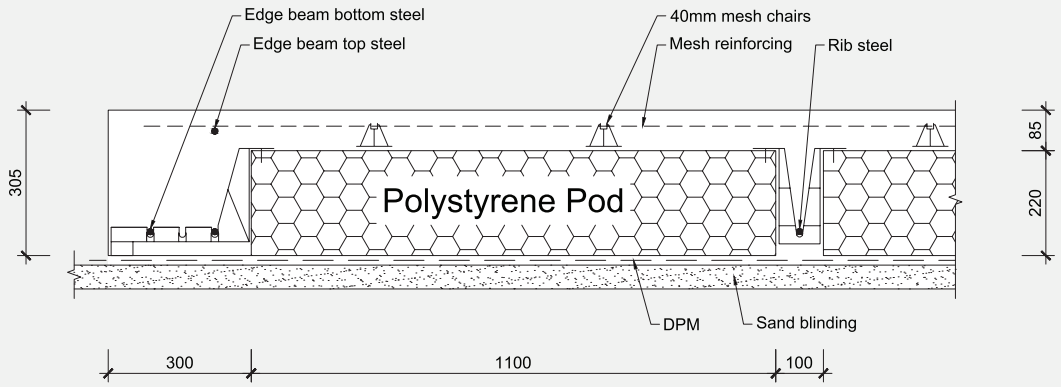
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3.11.2 Free Joints

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.

3.13 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.

3.14 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.

3.15 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.

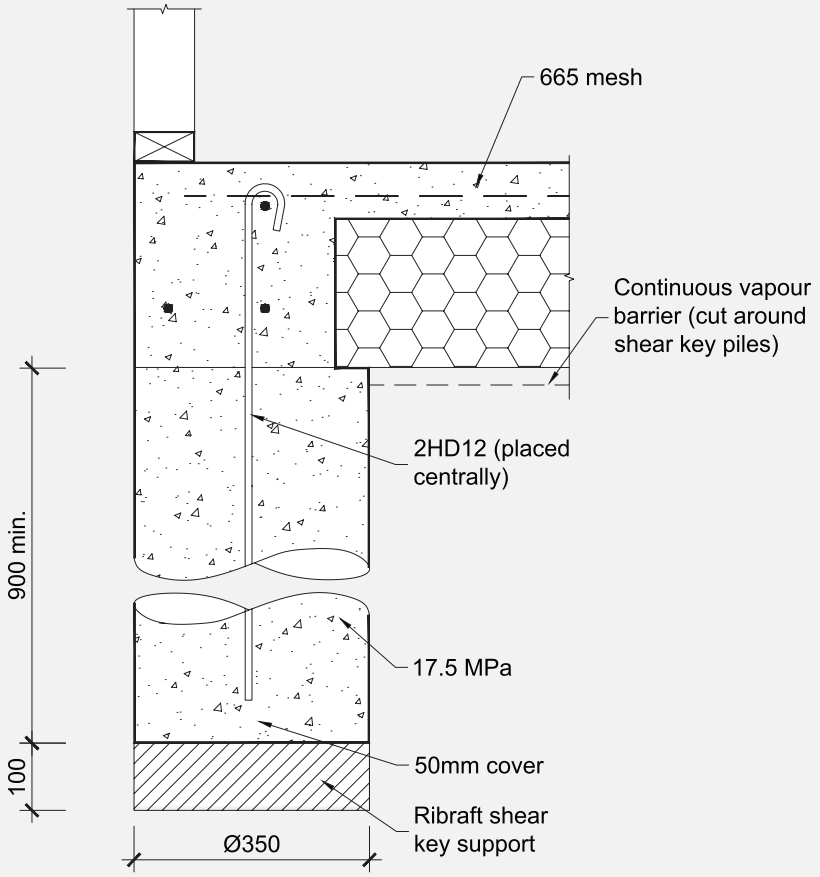
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4.0 SHEAR KEYS

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



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SECTION: VERIFICATION

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

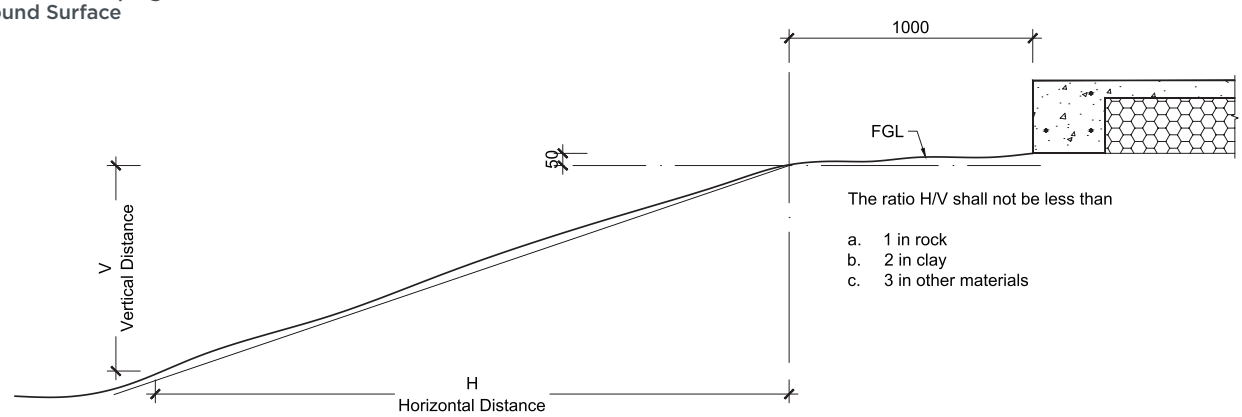
The RibRaft® foundation system has been designed to accommodate structures complying with the non specific design standards NZS3604 or NZS4229. With these types of structures the Building Control Authority specifies the inspections required and often conducts these. A similar construction verification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



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CODEMARK
CM70056

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.

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- ✓ 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

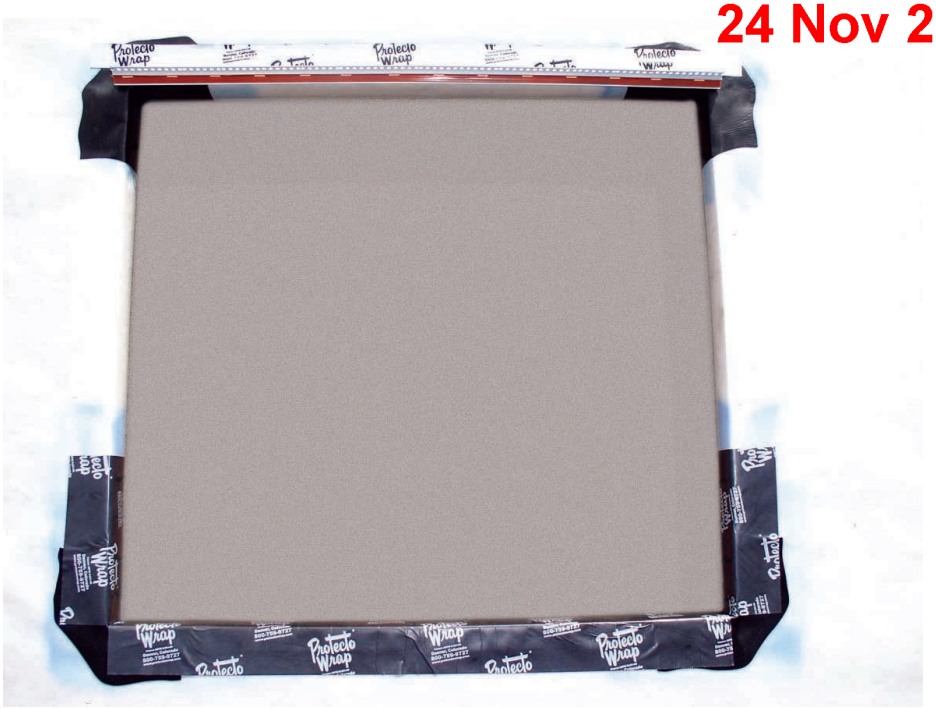
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BRANZ Appraised
Appraisal No. 444 [2017]

PROTECTO SILL WINDOW SEALING SYSTEM



Appraisal No. 444 (2017)

This Appraisal replaces BRANZ Appraisal No. 444 (2011)

BRANZ Appraisals

Technical Assessments of products for building and construction.

Product

1.1 The Protecto Sill Window Sealing System comprises Protecto Wrap Detail Tape, Protecto Wrap Sill Tape and Protecto Tak spray-on adhesive primer. The system is used around timber framed joinery openings as a secondary weather resistant barrier.

1.2 The system is installed into and around the framed joinery opening over the building wrap and exposed timber frame to cover both the face and edge of the opening framing. Protecto Wrap Sill Tape is also used at joinery heads to seal flashing upstands to the building wrap.

Scope

2.1 The Protecto Sill Window Sealing System has been appraised as a flexible flashing system for use around window and door joinery openings for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a flexible flashing system; and,
- with wall wraps compatible with the flashing tape; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

2.2 The Protecto Sill Window Sealing System has also been appraised as a flexible flashing system for use around window and door joinery openings for steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, with regards to building height and floor plan; and,
- constructed with steel framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with wall wraps compatible with the flashing tape and steel frame cladding systems; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

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Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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24 Nov 2020

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, the Protecto Sill Window Sealing System, 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 Protecto Sill Window Sealing System meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Protecto Sill Window Sealing System contributes to meeting this requirement. See Paragraphs 7.1 - 7.4 and 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Protecto Sill Window Sealing System meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 System components and accessories supplied by Marshall Innovations Limited are:

- **Protecto Wrap Detail Tape** is a black, self-adhering, un-reinforced, conformable, modified SBS (styrene-butadiene-styrene) rubberised asphalt membrane tape. The tape is covered on one side by a silicone release paper and on the other side by a protective removable film. The tape is 1.0 mm thick and is supplied in rolls 150 mm wide and 15 m long.
- **Protecto Wrap Sill Tape** is a polyethylene backed, modified SBS rubberised asphalt adhesive membrane tape. The adhesive surface of the tape is covered with a silicone release paper. The tape is 0.5 mm thick and is supplied in rolls of 200, 150 and 50 mm wide and 30 m long.
- **Protecto Tak** is a solvent based spray-on adhesive primer, coloured blue. It is supplied in 369 g cans.

Handling and Storage

5.1 Handling and storage of all materials supplied by Marshall Innovations Limited, whether on or off site, is under the control of the installer. The Protecto Sill Window Sealing System components must be protected from damage and weather. Rolls must be stored under cover, in clean, dry conditions away from direct exposure to sunlight.

Technical Literature

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

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Design Information

General

7.1 The Protecto Sill Window Sealing System meets the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.5 (b). Refer to the Technical Literature for details of the underlays that are compatible with the system. The installation method for the Protecto Sill Window Sealing System is an alternative solution to the installation method shown within NZBC Acceptable Solution E2/AS1, Figure 72.

7.2 The use of flexible flashing systems around window and door joinery openings is critical to assist the overall weathertightness performance of window and door joinery installations.

7.3 The Protecto Sill Window Sealing System is designed to prevent air leakage and water penetration around window and door openings at framing junctions (e.g. at the sill trimmer and opening stud junction), and to keep any water that gets past the cladding, or through the joinery, from direct contact with the framing.

7.4 The Protecto Sill Window Sealing System is not designed to overcome poor detailing and workmanship of the window or door joinery installation. The system must not be considered in isolation, but be considered as part of the wall cladding system. The Protecto Sill Window Sealing System is designed to be used in conjunction with air seals and joinery flashing systems, not as a substitute.

7.5 When the Protecto Sill Window Sealing System is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of the system.

Durability

8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of the Protecto Sill Window Sealing System both during normal use and maintenance of the building.

Serviceable Life

8.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, the Protecto Sill Window Sealing System is expected to have a serviceable life equal to that of the cladding.

Maintenance

9.1 No maintenance is required for the Protecto Sill Window Sealing System. Regular checks, at least annually, must be made of the junctions between the joinery and wall cladding to ensure that they are maintained weathertight and that the primary means of weather resistance for the junction e.g. flashing, sealant, etc continues to perform its function, to ensure that water will not penetrate the cladding.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to the Protecto Sill Window Sealing System 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 Where a cladding manufacturer specifies the use of generic flashing tapes around window and door joinery openings at framing junctions as part of their system, or they specify the use of flexible flashing tapes that comply with NZBC E2/AS1, Paragraph 9.1.5 (b), the Protecto Sill Window Sealing System may be used.

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Installation Information

Installation Skill Level Requirements

12.1 Installation must always be carried out in accordance with the Protecto Sill Window Sealing System Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

General

13.1 The selected building underlay must be installed in accordance with the manufacturer's instructions, and must completely cover the joinery opening. The wrap is then cut on a 45° angle away from each corner of the opening so the flaps can be folded into the opening and secured to the interior face of the timber framing.

13.2 Before the Protecto Tak adhesive primer is applied, the substrate surfaces must be clean, dry and free from any surface contaminants such as dust and grease that may cause loss of adhesion. The Protecto Tak adhesive primer must be sprayed onto the wrap and exposed timber frame along the entire length of the sill trimmer, the inside and front face of the opening studs and into the top corners of the joinery opening.

13.3 A 300 mm length of Protecto Wrap Detail Tape is installed around all four corners of the opening, keeping the tape flush with the interior face of the opening and ensuring the exposed timber framing is covered. After removing the protective film, the tape that overhangs the front of the opening is 'moulded' onto the face of the building wrap to create an airtight seal at the framing junction.

13.4 The Protecto Wrap Sill Tape is cut in individual lengths to suit the opening of the sill. The Protecto Wrap Sill Tape is installed flush with the interior face of the opening and is applied along the entire length of the sill. The overhanging tape is folded onto the face of the building underlay.

13.5 Two 300 mm lengths of Protecto Wrap Sill Tape are cut for the jambs. The tape is installed flush with the interior face of the opening and tight into the sill/jamb junction. The overhanging tape is folded onto the face of the building underlay.

13.6 Protecto Wrap Sill Tape must not be stretched. To avoid wastage, the tape can be lapped 100 mm minimum onto itself without reducing the performance of the Protecto Sill system.

13.7 If Protecto Sill is exposed to the weather or UV light for more than 90 days, then it must be replaced with new material.

Installation Temperature

13.8 The Protecto Sill Window Sealing System must not be installed at temperatures of less than 10°C.

Inspections

13.9 The Technical Literature must be referred to during the inspection of Protecto Sill Window Sealing System installations.

Basis of Appraisal

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

Tests

14.1 Cyclic and static water pressure leakage tests in accordance with AS/NZS 4284 were carried out by BRANZ on cladding systems incorporating the Protecto Sill system. The test results were reviewed by BRANZ experts and found to be satisfactory.

14.2 The adhesion of Protecto Wrap Sill Tape and Protecto Wrap Detail Tape to black bituminous Kraft building paper complying with the requirements of NZBC Acceptable Solution E2/AS1, Table 23 and selected other synthetic wall underlays have been tested by BRANZ and found to be satisfactory.

14.3 Tests have been carried out on Protecto Wrap Sill Tape in accordance with ICC Evaluation Service Criteria for Flashing Materials, AC148. The results have been reviewed by BRANZ experts and found to be satisfactory.

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Other Investigations

15.1 An assessment was made of the durability of the Protecto Sill Window Sealing System by BRANZ technical experts.

15.2 Site inspections were carried out by BRANZ to examine the practicability of installation.

15.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

Quality

16.1 The manufacture of the Protecto Sill Window Sealing System has not been examined by BRANZ, but details of the quality and composition of the materials used were obtained and found to be satisfactory.

16.2 Overseas certifications have been reviewed by BRANZ and found to be satisfactory.

16.3 The quality of supply to the market is the responsibility of Marshall Innovations Limited.

16.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and building wraps in accordance with the instructions of the designer.

16.5 The quality of installation, handling and storage on site is the responsibility of the installer in accordance with the instructions of Marshall Innovations Limited.

Sources of Information

- ICC Evaluation Service, Inc, AC148 Acceptable Criteria for Flexible Flashing Materials, July 2001.
- 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.

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BRANZ

In the opinion of BRANZ, Protecto Sill Window Sealing System is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to 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

Cheydra Percy
Chief Executive

Date of Issue:
28 February 2017

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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24 Nov 2020

Marshall Innovations
Construction Solutions

PROTECTO SILL SYSTEM SPECIFICATION

PRODUCT DESCRIPTION

The Protecto Wrap Protecto Sill System combines Protecto Wrap Detail Tape, Sill Tape and Tak Primer/Adhesive to form a flexible flashing around openings in timber and steel framed buildings.

The Tak Primer /Adhesive is applied to provide superior adhesion for the tapes. The Detail Tape is moulded into the corners of the framing opening .The Sill tape is then applied and folded out onto to the face of the opening. Head Flashing tape is used at the joinery heads to seal the flashing onto the wall underlay.

- Protecto Tak – a light blue spray on primer/adhesive used to prepare the surface for the application of the tapes. Available in a 369gm can.
- Detail Tape – a 1mm thick highly conformable tape that can be stretched and moulded to any shape. Available in 150mm wide x 15m long rolls.
- Sill Tape – a .5mm thick polyethylene backed asphalt adhesive tape.

STORAGE

Store all materials under cover, in clean dry conditions and away from direct exposure to sunlight. Do not remove the tape from the carton until ready to use and always replace in the carton for storage.

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FEATURES /BENEFITS

- A true flexible flashing system as specified by WANZWIS, E2/AS1 and the New Zealand Building Code.
- BRANZ Appraised as a flexible flashing system for use around openings in **timber and steel** framed buildings.
- Zero waste as tapes can be joined by overlapping 100mm.
- A versatile and flexible system that can be used on bevelled sills, variable jamb angles and to seal around penetrations in wall underlay.
- Can be used on all accepted wall underlays including bituminous paper.
- **Specified for use with RAB systems**. Install to RAB manufacturers specifications.

DURABILITY

On the basis that the exposure to the weather does not exceed 90 days the Protecto Sill System can expect to have a serviceable life equal to that of the cladding.

When used as a waterproofing tape over the joins in RAB board the exposure can be 90 days.

SAFETY PRECAUTIONS

The materials must be kept away from direct exposure to heat and flames. Extra precautions must be taken when using the Protecto Tak Primer/Adhesive in areas where there is insufficient ventilation. Do not breathe the fumes and avoid skin contact.

SHELF LIFE

The materials have a recommended shelf life of 1 year.

PROTECTO SILL SYSTEM Specification

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Construction Solutions

SURFACE PREPARATION

The surface to receive Protecto Tape must be clean, dry and free of any foreign matter that may adversely affect adhesion. It is recommended that the tapes be installed between 10ºC and 32ºC.

When the Protecto Wrap Sill system is used in conjunction with LOSP treated timber, the timber must be allowed to breathe for a minimum of 7 days prior to application.

The wall underlay must extend over the opening and be cut on a 45º angle away from each corner. The flaps are folded into the opening and secured to the interior face of the framing.

INSTALLATION

PRIMING

Ensure all surfaces are clean and dry. Spray a light film of Protecto Tak Primer/Adhesive to all surfaces that are to receive the Sill System tapes. The spray is coloured light blue for easy identification. Allow the Tak Spray sufficient time to cure. The spray should not pull away from the surface when touched. The curing time will vary depending on the temperature. The spray can be left uncovered for a reasonable length of time; however the tapes should be applied soon after application of the Tak Spray to avoid contamination of the prepared surface.

DETAIL TAPE

Detail Tape must be installed to all corners.

AFTER PRIMING

- Cut a 250mm length of Detail Tape.
- Remove the backing paper and fold the length in half with the exposed membrane to the outside.
- Position into the corner and smooth the first half of the tape onto the jamb. Keep the tape flush with the inside edge of the framing.
- Fold the remaining 125mm of tape across the lintel or sill and press firmly into place, particularly into the corner junction.
- Pinch the corner of the tape and pull away to free the corner of the release film.
- Remove the release film.
- Fan your fingers across the surface of the tape and using your thumb take hold of each direction of tape
- Gently pull the tape forward and around onto the face of the opening.
- Smooth the tape firmly into place to enhance adhesion.

Do not overstretch the tape. The corner will form as the tape is folded onto the face of opening.

Do not allow the detail tape to come in contact with itself.

This process is repeated for all corners of the opening.

For the top corners the installation is now complete.

SILL TAPE

Install Sill Tape in separate pieces across the sill and 200mm up the jambs.

Sill Installation

AFTER PRIMING

- Cut a length of Sill Tape slightly shorter than the length of the sill.
- Roll up the length of Sill Tape keeping the backing paper to the outside of the roll.
- Peel back 100mm of backing paper.
- Align the tape with the inside edge of the framing, keeping the overhang to the outside.
- Press the exposed end of the tape into the sill - jamb junction, adhering the Sill Tape to the top of the already installed Detail Tape.
- Continue removing the backing paper and adhering the Sill Tape along the entire length of the sill.
- Starting in the centre of the tape, fold the overhang of Sill Tape onto the face of the opening.

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24 Nov 2020

Marshall Innovations Construction Solutions

PROTECTO SILL SYSTEM Specification

SILL TAPE (Continued)

Jamb Installation

- Cut a 200mm length of Sill tape.
- Remove the backing paper.
- Align the length of Sill Tape with the inside edge of the framing and starting at the jamb - sill junction, smooth the tape onto the jamb.
- Fold the overhang of Sill Tape onto the face of the opening.

Smooth all tape firmly into place to enhance adhesion.

HEAD FLASHING TAPE

To fit the head flashing do not cut the wall underlay but fix the head flashing directly over the top of the wall underlay.

AFTER PRIMING

- Cut a length of Head Flashing Tape 100mm longer than the head flashing.
- Begin applying the Head Flashing Tape 50mm from the end of the installed head flashing. Apply the tape so that it adheres 40mm onto the head flashing and 35mm onto the wall underlay.

The Head Flashing Tape should run past each end of the head flashing by 50mm.

Smooth the tape firmly into place to enhance adhesion.

REPAIRS

Should air become trapped under the tapes at any stage of installation, smooth the trapped air to the outside of the tape.

If minor damage occurs then another piece of tape can be used for repair as long as it extends at least 100mm beyond the damaged area. If the damage is more than minor then the installed tape must be replaced.

WARRANTY

The materials used in the Protecto Sill System are warranted free of defect in manufacture for a period of 15 years. This warranty is limited to the replacement of the product only.

NOTE

Some sealants can cause damage to the tapes. Please check the compatibility with the sealant manufacturer before using any sealant that may contact the tapes.

***The building industry typically uses bitumen containing sill wraps for doors and windows. The NZBC code dictates that a sealant conforming to ISO 11600 Group F Class 25LM is to be used as the window Joint sealant. Sealants that conform to the ISO standard are NOT compatible with bitumen containing sill wraps and degradation of the sealant may occur. Even sill wraps that have a polyethylene protective film are considered as incompatible as long-term isolation of the materials is not guaranteed.**

In order to ensure a long-term seal that will meet NZBC requirements an impervious aluminium tape Danko TD830 has to be applied to the sill Tapes to provide a barrier between the tapes and the Bostik Seal n Flex1.

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Marshall Innovations
Construction Solutions

TEKTON SPECIFICATION

PRODUCT DESCRIPTION

Tekton Wall Underlay is a synthetic breather-type Wall Underlay for use as a wall underlay and air barrier under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is a coated spun-bonded polypropylene, and is approximately 0.6mm thick. Tekton Wall Underlay is supplied in rolls 2740mm x 37m and 1370mm x 37m.

FEATURES /BENEFITS

- Tekton Wall Underlay can be used in all wind zones up to and including very high and extra high with RAB Systems.
- Tekton Wall Underlay is fire retardant with a zero flammability index and can be used without restriction on all buildings, however must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the NZ Building Code.
- Tekton Wall Underlay can be installed as an air barrier to walls that are not lined, such as gable ends.
- Tekton Wall Underlay has superior water hold out - keeping framing drier while permanent cladding is installed.
- Tekton Wall Underlay has 50 year durability.
- Tekton Wall Underlay can be left exposed for up 60 days.
- Tekton Wall Underlay has optimal surfactant resistance (will not lose integrity if exposed to most soaps, detergents and cleaning chemicals).
- Tekton Wall Underlay is Branz appraised # 548 (2013)
- Tekton Wall Underlay can be used as a non-rigid backing material for stucco plaster and as a slip layer over rigid backing for stucco plaster.
- Tekton Wall Underlay is compatible with metal cavity battens.

APPLICATION RANGE

TIMBER FRAMED BUILDINGS

- With absorbent wall claddings directly fixed to the framing.
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer.
- In building wind zones up to and including very high.

STEEL FRAMED BUILDINGS

- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer.
- In building wind zones up to and including very high.

Tekton Wall Underlay can also be used on buildings subject to specific weathertightness design.

STORAGE

Tekton Wall Underlay must be stored on its end in a clean and dry environment. It is the responsibility of the installer to protect the roll from damage and weather.

SURFACE PREPARATION

Studs must be provided at a maximum of 600mm centres. Nogs must be fitted flush between the studs at a maximum of 1200mm centres. The framing must be free from any sharp protrusions that may damage the wall underlay.

TEKTON Specification

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INSTALLATION

PLACEMENT

- The branded side of the wall underlay must face away from the framing.
- The wall underlay must run horizontally.
- The wall underlay must extend from the upper side of the top plate to the underside of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs.
- Horizontal laps must be no less than 75mm with the direction of the lap ensuring that water is shed to the outside.
- End laps must be made over framing and be no less than 150mm wide.

It is preferable to tape all joins.

APPLICATION

- Position the roll of Tekton Wall Underlay against the framing with a short length of wall underlay free of the roll.
- Align the guide marks printed on the Tekton Wall Underlay with visible studs and nail /staple to the framing

Fix the wall underlay into place using 6-8mm zinc/ stainless plated staples, hot dip galvanised large head clouts or proprietary wall underlay fixings.

- Unroll the wall underlay across the framing and fix to all framing members at a maximum of 300mm centres.
- Keep the wall underlay straight and taut over the framing.
- The wall underlay should be run over any openings and these should be left covered until the windows and doors are ready to be installed. To form the openings cut the wall underlay at a 45 degree diagonal in from each corner. Fold and staple the wall underlay to the inside of the framed opening. Excess wall underlay can be trimmed.
- All openings must be detailed using a Branz appraised flexible flashing system like Super-Stick, Protecto One Piece Sill Tape or the Protecto Sill System.
- Where cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when insulation is installed.
- Tekton Wall Underlay can be added as a second layer over head flashings as per E2/AS1 or the headflashing can be sealed to the wall underlay using Protecto Head Flashing Tape.
- Any damaged areas of the wall underlay must be repaired by overlapping with new material and taping, or by taping small tears .

When fixing wall underlay in windy conditions, care must be taken due to the large sail area created by the roll widths.

WARRANTY

Tekton Wall Underlay meets the durability requirements of NZBC B2.3.1(a), 50 years and B2.3.1(b), 15 years. Tekton Wall Underlay is warranted to be free of defect in manufacture. This warranty is limited to replacement of the Tekton Wall Underlay material. Marshall Innovations NZ/AUS Ltd (the distributor) is not liable for incorrect installation or any accidental or wilful damage to the product.

TEKTON Specification

APPROVED
24 Nov 2020

BRANZ Appraised
Appraisal No. 621 [2014]

THE TEKTON® WEATHERIZATION SYSTEM

Appraisal No. 621 (2014)

This Appraisal replaces BRANZ Appraisal No. 621 (2008) issued 8 October 2008.

Amended 15 March 2018



BRANZ Appraisals

Technical Assessments of products for building and construction.

Product

1.1 The Tekton® Weatherization System consists of Tekton® Building Wrap, One Piece Sill Tape, Super Stick Tape or Protecto Sill System (flexible flashing tapes), Tekton Seam Tape and TRADE-SEAL. The system is used behind wall cladding systems and around framed joinery openings as a secondary weather resistant barrier for walls.

Scope

2.1 The Tekton® Weatherization System has been appraised for use on buildings within the following scope:

- constructed with timber framing in accordance with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
- constructed with steel framing subject to specific engineering design, with the building height and floor plan area in accordance with scope limitations of NZBC Acceptable Solution E2/AS1; and,
- with absorbent wall claddings directly fixed to frame complying with NZBC Acceptable Solution E2/AS1 or covered by a valid BRANZ Appraisal that specifies a flexible wall underlay and a flexible flashing system; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity complying with NZBC Acceptable Solution E2/AS1 or covered by a valid BRANZ Appraisal that specifies a flexible wall underlay or a rigid wall underlay with flexible underlay over and flexible flashing system; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or specific design for steel framed buildings; and,
- situated in NZS 3604 Wind Zones up to and including Very High where the flexible wall underlay is directly fixed to the frame, and up to and including Extra High where the underlay is used over rigid wall underlays.

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Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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24 Nov 2020

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, the Tekton® Weatherization System if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. The Tekton® Weatherization System meets this requirement. See Paragraphs 9.1 - 9.2

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Tekton® Weatherization System contributes to exterior walls meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Tekton® Weatherization System meets this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 System components supplied by Marshall Innovations Limited are as follows:

- **Flexible wall underlay** - Tekton® Building Wrap is a synthetic breather-type building membrane available in rolls 2740 mm wide and 37 m long or 1370 mm wide and 37 m long. The product is manufactured from coated spun bonded polypropylene.
- **Flexible flashing tape** (1) - Super Stick is a multi-layered silver polyester faced, copolymer, self-adhesive tape. The tape is supplied in rolls of 75 mm x 22.86 m, 150 mm x 22.86 m and 230 mm x 22.86 m.
- **Flexible flashing tape** (2) - Protecto Sill System comprises Protecto Wrap Detail Tape, Protecto Wrap Sill Tape and Protecto Tak spray on primer. Both the tapes are based on modified SBS rubberised asphalt and Protecto Tak is a solvent based spray on adhesive primer. Protecto Wrap Detail Tape is supplied as a 150 mm wide, 15 m long and 1.0 mm thick roll, Protecto Wrap Sill Tape is supplied as a 50, 150, 200 mm wide, 30 m long and 0.5 mm thick roll and Protecto Tak is supplied in 369 g can.
- **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.
- **Adhesive tape** - Tekton Seam Tape is a thin polypropylene joining adhesive tape, available in rolls 48 mm wide and 50 m long.

Handling and Storage

5.1 All products must be kept clean and dry at all times prior to use by storing under cover so that they are protected from the weather and damage. Rolls of Tekton® Building Wrap must be stored on end.

Technical Literature

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

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Design Information

Timber and Steel Framing

7.1 Studs must be provided at maximum 600 mm centres. Dwangs must be fitted flush between studs at maximum 1200 mm centres.

General

7.2 The Tekton® Weatherization System is intended for use behind wall cladding systems and at joinery openings as a secondary defence against water penetration into framing cavities and is intended for use as an alternative to conventional wall underlays.

7.3 The system will also provide a degree of temporary weather protection during construction. However, it will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed-in, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.

7.4 The Tekton® Weatherization System is also suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, as called up in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 (c). Refer to Table 1.

7.5 TRADE-SEAL when used with Tekton® Building Wrap, 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.

Table 1: NZBC E2/AS1 Table 23 Requirements

NZBC ES/AS1 Table 23 Wall Underlay Properties	Property Performance Requirement	Actual Property - Tekton® Builidng Wrap
Absorbency	≥ 100 g/m²	Classified as non-absorbent (see Paragraph 7.7)
Vapour Resistance	≤ 7 MN s/g	1.15 MN s/g
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	9.78 (Note 1)
Shrinkage	≤ 0.5%	0.10%
Mechanical	Edge tear and tensile strength	Edge tear: Machine direction = 228 N Cross direction = 186 N Tensile strength: Machine direction = 4.4 kN/m Cross direction = 3.9kN/m
Air Barrier	Air resistance: ≥0.1 MN s/m³	≥ 0.1 MN s/m³

Note 1: *Further testing of Tekton® Building Wrap was completed to determine the effect of the high pH level on the wall underlay and materials it is likely to come into contact with during its serviceable life. The testing confirmed that the high pH had no adverse effects on the wall underlays performance, or the performance of other materials.*

7.6 The Tekton® Weatherization System is suitable for use under wall cladding as a wall underlay system as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, except that it must not be used with non-absorbent wall claddings in direct fixed installations. Tekton® Weatherization System is suitable for use under cavity based wall claddings as a non-absorbent synthetic wall underlay system as called up in NZS 2295, Table 2.4 on steel framed buildings.

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7.7 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

7.8 When the Tekton® Weatherization System is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of the system.

Structure

8.1 The Tekton® Weatherization System is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a flexible building underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid building underlays.

Durability

Serviceable Life

9.1 The system meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years where the cladding durability requirement is 15 years. This is provided the system is not exposed to the weather for a total time of more than 60 days The products also must not be exposed to the weather or UV light at any time in service.

9.2 The exterior cladding must be maintained weathertight at all times for the Tekton® Weatherization System to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 The Tekton® Weatherization System has an AS 1530 Part 2 flammability index of 0 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 the Tekton® Weatherization System 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 The system is used to assist the control of moisture behind wall claddings by ensuring moisture which may occasionally penetrate the wall cladding is directed back to the exterior of the building.

12.2 The system is suitable for use with wall claddings complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal, and where exposed up to, and including Extra High winds as defined by NZS 3604.

Installation Information

Installation Skill Level Requirements

13.1 Installation must always be carried out in accordance with the Technical Literature and this Appraisal, by a competent tradesperson with an understanding of the wall underlays and weatherization system installation.

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System Installation

14.1 The system must be installed in accordance with NZBC Acceptable Solution E2/AS1, or when used with BRANZ Appraised wall claddings, in accordance with any instructions given in the Appraisal, along with the instructions given in the Technical Literature.

14.2 Tekton® Building Wrap building wrap must be fixed first to the external face of the timber or steel wall framing over all openings in the framing then cut and dressed into all sides of the openings.

14.3 Openings are dressed with lengths of Super Stick or Protecto Sill System Tapes where required and adhered to the Tekton Building Wrap. The tape is 'fanned' around the corners onto the face of the Tekton Building Wrap and folded over the outside edge of the opening framing. All surfaces must be clean and dry prior to the installation. *[Please Note: Super Stick requires two layers on the sill.]*

14.4 Any other components of the cladding system or joinery installation, such as sill trays, other flashings or seals should be installed as instructed by the cladding or joinery manufacturer. Note that these components, including cladding systems and joinery have not been assessed and are outside the scope of this Appraisal.

Inspections

14.5 The Technical Literature must be referred to during the inspection of Tekton® Weatherization System installations.

Basis of Appraisal

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

Tests

15.1 The following tests have been carried out on Tekton® Building Wrap by Scion: Folding strength of paper in accordance with AS/NZS 1301.423; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1 and air resistance in accordance with BS 6538-3.

15.2 The following tests have been carried out on Tekton® Building Wrap by BRANZ: Absorbency in accordance with AS/NZS 4201.6, Vapour transmission in accordance with ASTM E 96B, Shrinkage in accordance with AS/NZS 4201.3, Water barrier in accordance with AS/NZS 4201.4 and pH of extract in accordance with AS/NZS 1301.421.

15.3 Tests have been carried out on Protecto Wrap Detail Tape, Super Stick and Protecto Wrap Sill Tapes in accordance with ICC Evaluation Service Criteria for Flashing Materials, AC148 (2001). The results have been reviewed by BRANZ experts and found to be satisfactory.

15.4 Peel adhesion testing of Protecto Wrap Detail Tape, Super Stick and Protecto Wrap Sill Tapes, Tekton Seam Tape and TRADE-SEAL on the Tekton® Building Wrap has been completed by BRANZ.

Other Investigations

16.1 Durability opinions have been given by BRANZ technical experts.

16.2 Practicability of installation has been assessed by BRANZ and found to be satisfactory.

16.3 The Technical Literature from Marshall Innovations Ltd has been examined by BRANZ and found to be satisfactory.

Quality

17.1 The manufacture of products covered by this Appraisal has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of product certifications covering quality aspects associated with these products.

17.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the Tekton® Weatherization System into their design in accordance with the instructions of Marshall Innovations Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Marshall Innovations Limited.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Sources of Information

- AC 148 (2001) Acceptance criteria for flashing materials ICBO Evaluation Service Inc. July 2001
- 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.
- BS 6538-3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, Permeable Building Underlays.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 7, 01 January 2017).
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 15 March 2018.

This Appraisal has been amended to remove One Piece Sill Tape.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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BRANZ

In the opinion of BRANZ, The Tekton® Weatherization System is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to 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

Cheyldra Percy
Chief Executive

Date of Issue:
11 December 2014

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Thermakraft™

THERMAKRAFT215

THERMAKRAFT 215

Thermakraft 215 self-supporting roof and wall underlay is an absorbent, breathable underlay specifically designed for use in Domestic and Commercial buildings. Suitable as a roof and wall underlay with all cladding types, where Fire Retardancy is NOT required.

- ✓ Versatile building Underlay, designed for use in residential and commercial roof and wall applications.
- ✓ Reduces wind entry into wall and roof cavities, improving thermal efficiency of bulk insulation. Can be used as a vapour control layer, and improve thermal performance if installed and taped on the warm side of bulk insulation.
- ✓ High water resistance provides for temporary weather protection prior to installation of cladding, and acts as a secondary layer of water protection during its serviceable life.
- ✓ Highly water vapour permeable, allowing excess water vapour that may otherwise condense in the wall structure to escape.
- ✓ Lap line printed.

Self-Supporting

High Water Barrier

Breathable

Absorbent

ROOF

WALL



ROOF AND WALL UNDERLAY

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TECHNICAL SPECIFICATIONS

NZBC E2/AS1 ROOF UNDERLAY REQUIREMENTS		
NZBC E2/AS1 TABLE 23 ROOF UNDERLAY PROPERTIES	**PROPERTY PERFORMANCE REQUIREMENTS**	**PROPERTY PERFORMANCE**
Absorbency	≥ 150gsm	Pass
Vapour Resistance	≤ 7 MN.s/g	Pass
pH of Extract	≥ 5.5 and ≤ 8	Pass
Shrinkage	≤ 0.5%	Pass
Water Resistance	≥ 100mm	Pass
NZS2295:2206 CLASSIFICATION		
Flammability Index		Non Fire Retardant
Wind Zone	R2	Up to Very High
NZS2295:2006	R2	Self Support

NOTE:
For wall cavity systems, NZBC Acceptable Solution E2/AS1 Paragraph 9.1.5.5 requires where stud spacing's are greater than 450mm centres, an intermediate means of restraining the building underlay and insulation from bulging into the drained cavity shall be installed. An acceptable means of achieving this is by fixing with Thermakraft Stud Strap horizontally at 300mm centres.

Flammability Index
Thermakraft 215
is not fire retardant.

Roll Dimensions:
1250mm x 20m (25m2)
1250mm x 40m (50m2)
M2 is the roll size for actual coverage, allow for laps and joins.

Thermakraft 215 complies with the requirements of NZBC E2/AS1 Table 23. Is suitable for use in the following:

- With absorbent wall claddings directly fixed to timber and steel framing; and,
- With non-absorbent wall claddings directly fixed to timber and steel framing; and,
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity; and,
- With masonry veneer in accordance with NZS 3604; and,
- Situated in NZS3604 Building Wind Zones up to, and including 'Very High' (wall); and,
- As a ROOF underlay Self-supporting when run horizontally at pitches 3° and greater. When run vertically at pitches >3° and <10° degrees, 215 must be supported. Support recommended at very low pitches; and,
- As a roof underlay suitable for use with all Roofing materials; and
- Is suitable as an air barrier in unlined wall spaces.

DURABILITY

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

ENVIRONMENTALLY FRIENDLY PRODUCT

- Installed in accordance to the Application and Installation Guidelines.
- Run length no greater than 10 meters.
- Is not left exposed for more than (7 days) roof.
- Is not left exposed for more than (28 days) wall.
- Not recommended for use on LOSP treated timber, if used the timber must be free of solvent.
- Installed by or under guidance of Licensed Building Practitioners.
- Installed in accordance with the Roofing Code of Practice.

Thermakraft™

Customer Services
0800 806 595

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P.O Box 58-112, Botany, Auckland 2163
Phone 0800 806 595 or +64 9 273 3727
Fax +64 9 273 3726
Email info@thermakraft.co.nz
www.thermakraft.co.nz

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

Issue 1, January 2018

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Fletcher Reinforcing
Structured for strength

SUPER DUCTILE 500E™

Seismic Grade Reinforcing Mesh

SE62 Res

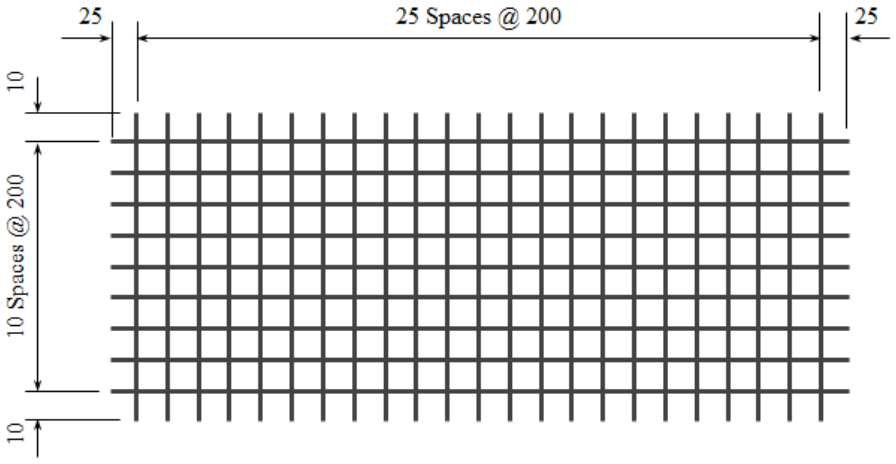
Mesh Specification

Product Description: 5.05m x 2.02m — 200 x 200 Grid R6.1 Line Wire, R6.1 Cross Wire

	Wire Dia. (mm)	Spacing (mm)	Length (mm)	No. of Wires	Overhangs (mm)		mm²/m	Wire kg/m	Weight (kg)
Longitudinal Wire	6.1 R	200	5050	**11**	**25**	**25**	**146.1**	**0.2294**	12.74
Cross Wire	6.1 R	200	2020	**26**	**10**	**10**	**146.1**	**0.2294**	12.05

GROSS SHEET WEIGHT (Kg):	24.79
MASS PER SQ METER (Kg/m²):	2.294

MESH SKETCH (not to scale)

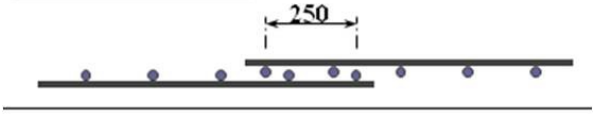


GROSS SHEET AREA (m²):	10.201
NETT COVER (m²):	8.312
Ratio STACK & TURNED (Y/N):	Y
No. OF SHEETS / BUNDLE:	25
ESTIMATED CUBIC (m³):	0.0933
BUNDLE WEIGHT (Tonnes):	0.6198

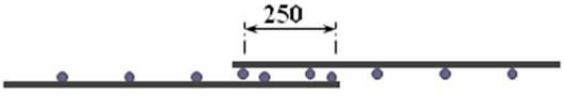
MECHANICAL PROPERTIES

Uniform Elongation %	Yield Strength		Tensile Ratio		Weld Shear Strength
	Min	Max	Min	Max	
≥ 10%	500MPa	600MPa	1.15	1.4	> 5.9

LAPPING ON ENDS



LAPPING ON SIDES



SUPER DUCTILE 500E™ Product is fully tested for Grade 500E compliance as per AS/NZS 4671:2001. All Super Ductile 500E product is Individually tagged . The tag contains the product code and the unique batch number relevant to the sheet. It is important that this tag is kept in position to allow easy identification until covered with concrete.

* All measurements/weights approximate

Fletcher Reinforcing
Structured for strength

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www.fletcherreinforcing.co.nz

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WANZ Support Bars

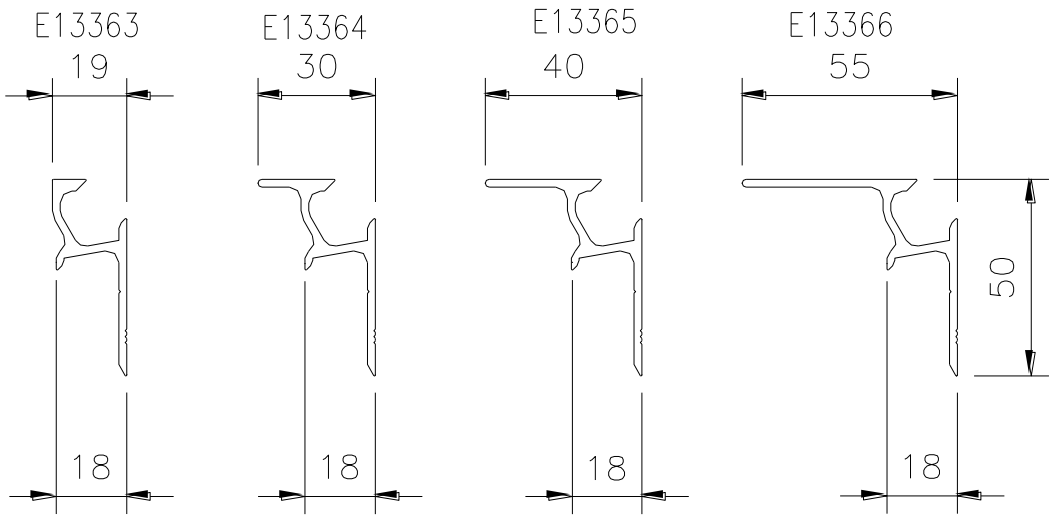
WANZ sill bars offer 6 variations that conform to E2/AS1 Amendment 6 and have been tested to BRANZ EM6.

Recommendation - All windows including full height windows up to 2.2m high use new lightweight support bars.

Recommendation - All Hinged/Bi-fold doors (max. 2 panels on any one side) up to 2.2m high use new lightweight support bar

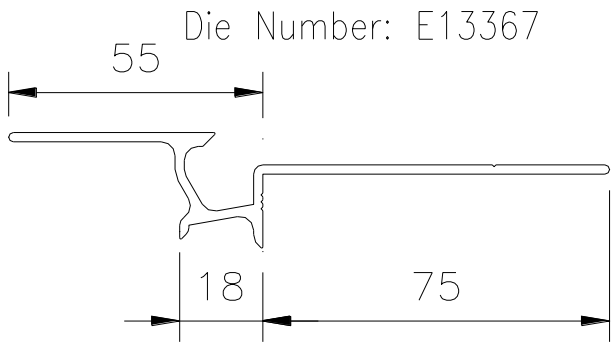
Recommendation - All Sliders/Stacker Sliders and joinery outside of the above use heavy duty support bars.

Four light weight support bars – 19, 30, 40 and 55mm deep.



These are primarily designed for windows that are fixing to timber framing. These generically have a weight carrying capacity in the region of 55-60kg/lm.

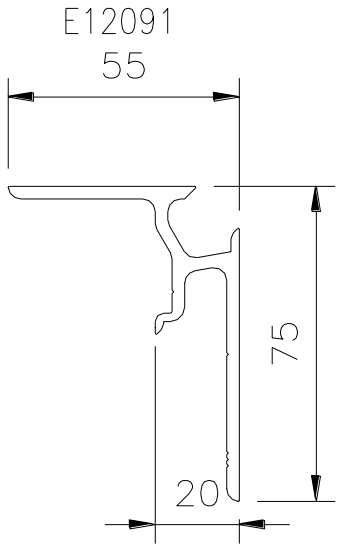
Light weight full height bar 55mm deep



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This is essentially the 55mm lightweight bar but with a horizontal fixing leg rather than a vertical as the typical bars have. Again this bar will carry 55-60kg/lm.

Heavy Duty Support Bar



55mm “old bar”. This bar was a part of the original issue and was re-introduced for two reasons:

- For situations where windows exceed the 55-60kg weight limit, or
- Primarily for fixing to concrete floor edges for full height windows. This bar has a weight bearing capacity up to approximately 150kg/lm. If this bar is required for thinner claddings the nose is ripped to the appropriate depth.

To work out the weight of joinery in kg/lineal metre use the formula below:

Height of unit X 2.5 X glass thickness

Note: This is for quick estimation purposes only as it may not reflect the actual weight of the unit as it is a combination of aluminium, glass, hardware and other components

For glass thickness: If Single Glazed unit enter thickness of glass, if Double Glazed Unit enter sum of thickness of each pane of glass e.g. 22 mm DGU made up of 4mm glass/14 mm spacer/4 mm glass, glass thickness would be 8 mm.

Beyond these limits a specifically designed solution is required.

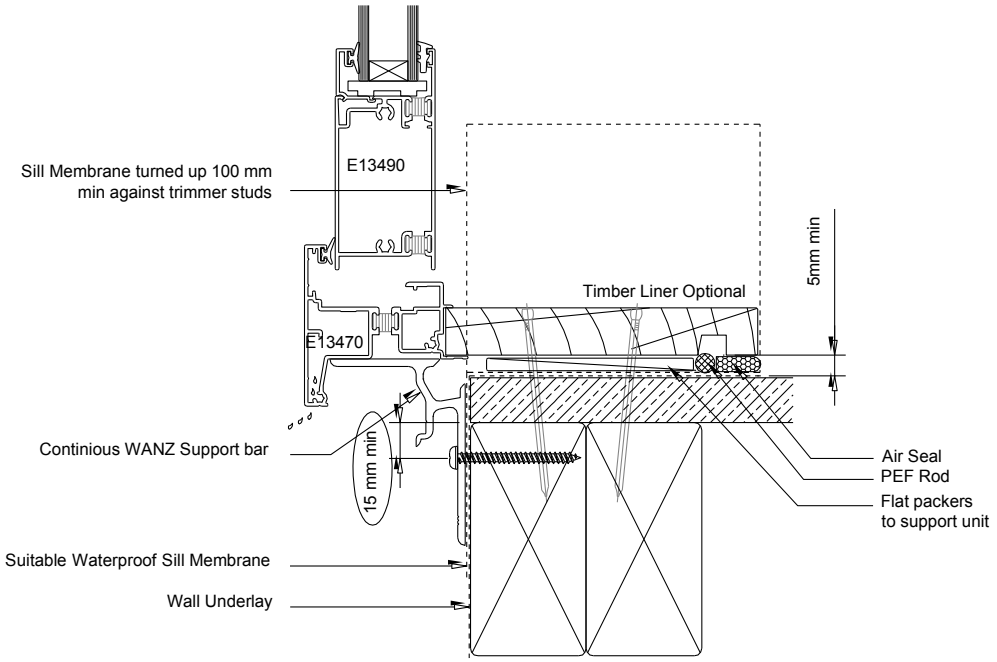
Fixing of WANZ Bars

The generic fixing method is 10g x 50mm SS screws positioned at each end of the bar and at maximum 300mm centres between.

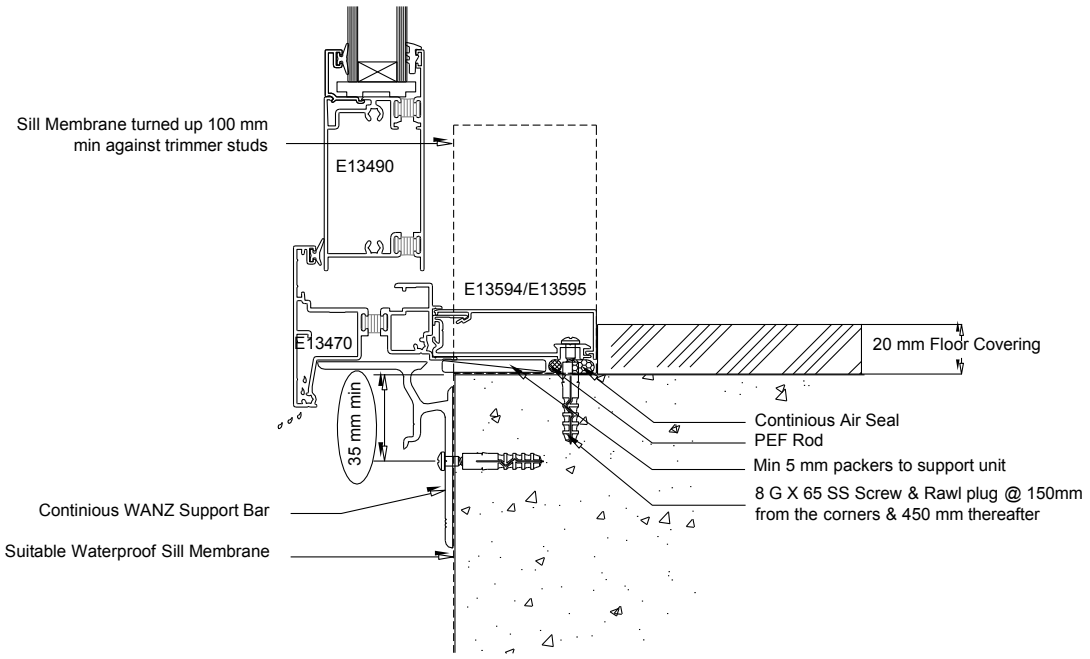
This method generally applies to the lightweight bars fixed to timber.
When fixing to concrete it is recommended that the “old bar” is used to ensure adequate edge clearances are achieved. The same fixing centres would apply but the screws would be driven into Rawl plugs or similar.

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When fixing to the edge of a timber floor the “old bar” is recommended to ensure the fixing strikes the framing and not the floor edge.



SILL DETAIL - TIMBER



SILL DETAIL - CONCRETE

The “WANZ Guide to Window Installation as described in E2/AS1 Amendment 6” http://www.wanz.org.nz/download/WANZ%20Guide%20to%20E2%20AS1%20Amd%206%20V1.3%20Dec%202014.pdf notes that 6mm masonry anchors may also be used.

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24 Nov 2020

BRANZ Appraised

Appraisal No. 484 [2018]

MAPEGUM WPS, MAPELASTIC, MAPELASTIC SMART, MAPELASTIC TURBO AND MAPELASTIC AQUADEFENSE WET AREA MEMBRANES

Appraisal No. 484 (2018)

This Appraisal replaces BRANZ Appraisal No. 484 (2012)



BRANZ Appraisals

Technical Assessments of products for building and construction.

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BRANZ

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Porirua 5240,
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Tel: 04 237 1170
branz.co.nz

Product

1.1 Mapegum WPS and Mapelastic AquaDefense are one component, liquid-applied waterproofing membranes for internal applications under ceramic or stone tile finishes.

1.2 Mapelastic, Mapelastic Smart and Mapelastic Turbo are two-component liquid applied waterproofing membranes suitable for internal applications on substrates under ceramic or stone tile finishes.

Scope

2.1 Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes have been appraised for use as waterproofing membranes for the internal wet areas of buildings, within the following scope:

- on floor substrates of concrete, flooring grade particle board, plywood, compressed fibre cement sheet and fibre cement sheet tile underlay, and on wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
- when protected from physical damage by ceramic or stone tile finishes; and,
- where floors are designed and constructed such that deflections do not exceed 1/360th of the span.

2.2 The use of Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.

2.3 Movement and control joints in the substrate must be carried through the membrane and tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and is therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.

2.4 The ceramic or stone tile finishes are outside the scope of this Appraisal.

2.5 The membranes must be installed by trained applicators, approved by Mapei New Zealand Ltd, to the conditions of the Technical Data Sheet (TDS) of the products.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years and B2.3.2. Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes meet these requirements. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Interior wet area floors and walls incorporating Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes will meet this requirement. See Paragraphs 11.1 - 11.7.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes meet this requirement and will not present a health hazard to people.

Technical Specification

4.1 Materials supplied by Mapei New Zealand Ltd are as follows:

- **Mapegum WPS** - A one-part, fast drying, polymer-based, ready-to-use, liquid-applied membrane. It is supplied as a light grey-coloured paste in 5, 10 and 25 kg buckets.
- **Mapelastic** - A two-part, flexible, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 24 kg multi-wall bags and a Part B liquid in 8 kg plastic containers. When dry, the membrane is grey in colour.
- **Mapelastic Smart** - A two-part, flexible, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 20 kg multi-wall bags and a Part B liquid in 10 kg plastic containers. When dry, the membrane is light grey in colour.
- **Mapelastic Turbo** - A two-part, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 20 kg multi-wall bags and a Part B liquid in 16 kg containers. When dry, the membrane is light grey in colour.
- **Mapelastic AquaDefense** - A one-part solvent free, ultra-quick drying synthetic resin based paste in water dispersion liquid applied membrane. It is supplied as a light blue coloured paste in 15 kg drums.
- **Mapeband and Mapeband Gaskets** - A rubber-coated polyester tape for waterproofing expansion joints and sealing around drains and pipes. Available as a tape 120 mm wide in rolls 50 m long, and also in ready-made internal and external corners (90 and 270 degrees) and pipe gaskets 118 x 118 mm and 300 x 300 mm, "T" profiles 515 mm x 315 mm and cross profiles 515 x 515 mm.
- **Mapeband PE120** - A PVC fabric tape used to reinforce wall/wall and floor/wall joints. It is only used with Mapegum WPS and Mapelastic AquaDefense. Available as a tape 120 mm wide in rolls 10 m and 50 m long, and also as preformed angles 90° and 270°.
- **Mapetex Sel** - A macro-holed non-woven fabric, used to reinforce the first and second layer of the waterproofing membranes. It is supplied as a polypropylene, white fabric in rolls 100 mm, 200 mm and 1.0 m wide x 25 m long.
- **Mapenet 150** - A glass fibre mesh used to reinforce the membranes. It is supplied as a blue mesh in rolls 1.0 m wide and 50 m long.
- **Mapeband SA** - A self-adhesive Butyl Rubber tape used to reinforce all joints. It is supplied as a 2.0 mm thick, 100 mm wide tape in rolls 25 m long.
- **Mapei Primer 3296** - A acrylic primer for absorbent surfaces. It is an opaque colour and supplied in 5 and 10 kg drums.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Handling and Storage

5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The membrane products have a shelf life of 24 months from date of manufacture in the original unopened packaging. Once opened, the products must be used within 3 months.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes are for use in buildings where an impervious waterproof membrane is required to floors and walls to prevent damage to building elements and adjoining areas.

7.2 Mapegum WPS and Mapelastic AquaDefense are designed to be used where a one-component product is preferred.

7.3 The membranes must be protected from physical damage by the application of ceramic or stone tile finishes.

7.4 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ Good Practice Guide - Tiling.

7.5 Timber framing must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

Substrates

Plywood

8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3 (CCA treated). LOSP treated plywood must not be used.

8.2 The plywood must be laid with the face grain at right angles to the floor joists. The plywood must be supported with dwangs or framing with a maximum span of 400 mm in each direction, fixed with 10g x 50 mm stainless steel countersunk head screws at 150 mm centres along the sheet edges and 200 mm through the body of the sheets.

Fibre Cement Compressed Sheet/Fibre Cement Sheet Tile Underlay

8.2 Fibre cement compressed sheet and tile underlay must be manufactured to comply with the requirements of AS/NZS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Installation must be in accordance with the instructions of the manufacturer.

Particleboard

8.3 Particleboard must be specified for the end use in accordance with NZS 3602.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Concrete and Concrete Masonry

8.4 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101, concrete slab-on-ground to NZS 3604 or NZS 4229 and concrete masonry to NZS 4229 and NZS 4230.

Wet Area Wall Linings

8.5 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588, and be suitable for use in internal wet areas.

8.6 Fibre cement sheet must be suitable for use in wet areas and comply with AS/NZS 2908.2.

8.7 Installation of plasterboard or fibre cement wall linings must be carried out in accordance with the instructions of the manufacturer.

Durability

Serviceable Life

9.1 The Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes, when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tile finishes with a design service life of 15-25 years.

Maintenance

10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the tiled areas to ensure they are sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grout and sealant.

10.2 In the event of damage to a membrane, the tiles must be removed and the membrane repaired by removing the damaged portion and applying a patch with sufficient overlap over the damaged section.

10.3 Drainage outlets must be maintained to operate effectively, and tile finishes must be kept clean.

Internal Moisture

11.1 Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes are impervious to water and when appropriately designed and installed will avoid the likelihood of water penetrating behind linings or entering concealed spaces.

11.2 Surfaces must be finished with ceramic or stone tiles. A means of compliance with NZBC Clause E3.3.3 and E3.3.4 is given in NZBC Acceptable Solution E3/AS1, Paragraph 3.1.1 (b), 3.1.2 (b) and 3.3.1 (b).

11.3 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1500 mm out from the shower rose. Floor wastes and drainage flanges must be provided and the floor must fall to the outlet.

11.4 Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of compliance for overflow is given in NZBC Acceptable Solution E3/AS1, Paragraph 2.

11.5 The waterproofing membrane must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions can be obtained from AS 3740, the BRANZ Good Practice Guide - Tiling, and flooring and wall lining manufacturers.

11.6 Where water resistant wall finishes such as prefinished sheet materials are used they must be installed as per the NZBC requirements. They must flash over the membrane a minimum of 30 mm.

11.7 BRANZ recommends the entire floor be covered by a waterproof membrane for bath, shower and spa rooms where timber and plywood floors are used.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Installation Information

Installation Skill Level Requirement

12.1 Installation of the membranes must be completed by trained applicators approved by Mapei New Zealand Ltd

12.2 Installation of substrates must always be carried out in accordance with the Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Preparation of Substrates

13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.

13.2 The relative humidity of concrete substrates must be 75% or less before membrane application. The concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 585.

13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor and wall/wall junctions must have a reinforcement installed as set out in the Technical Literature.

13.4 Refer to the product manufacturer for correct priming requirements.

Membrane Installation

14.1 Installation must not be undertaken where the substrate surface temperature is below 8°C or above 35°C.

14.2 Mapelastic, Mapelastic Turbo and Mapelastic Smart require the liquid and powder to be mixed and left to stand for 5 minutes before re-mixing, then applying. Mapegum WPS and Mapelastic AquaDefense must be thoroughly stirred before application.

14.3 The membrane must be applied in a minimum of two coats at the rates set out in the Technical Literature. Subsequent coats must be applied in an opposite direction to the previous coat. The total finished system thickness of the Mapegum WPS must be a minimum of 1.0 mm, Mapelastic AquaDefense membrane must be a minimum of 1.0 mm and the Mapelastic, Mapelastic Turbo and Mapelastic Smart Membranes must be a minimum of 2.0 mm.

14.4 Application can be made by roller (medium/long nap), brush (long bristle), or a notched steel trowel (finished with a flat steel trowel).

14.5 Reinforcement fabric or Mapeband is bedded into the wet layer between coats to provide movement protection at wall/wall and wall/floor junctions, or any other areas such as joints in the flooring substrate, floor cracks, or around penetrations in the membrane. In all other situations, reinforcement provisions as set out in this Appraisal and the Technical Literature apply.

14.6 Clean up may be undertaken with water.

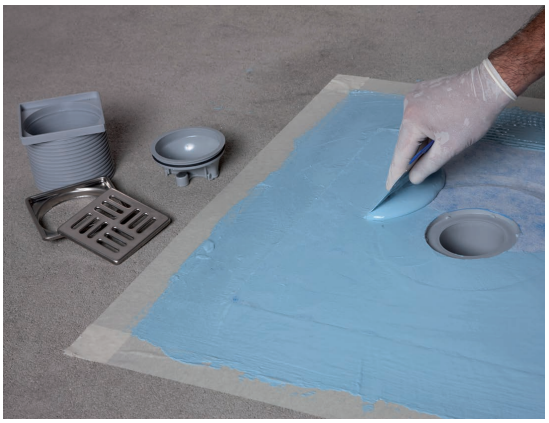
14.7 For further information refer to the product TDS.

Tiling

15.1 The membranes must be fully cured before tiling. The cured membranes must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.

15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Practice Guide - Tiling. The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or Mapei New Zealand Ltd.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.



Impregnating Drain Vertical fabric with Mapelastic AquaDefense



Application of Mapeband to a wall-floor joint with Mapelastic AquaDefense



Application of the first coat of Mapelastic AquaDefense



Application of the second coat of Mapelastic AquaDefense

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Inspections

16.1 The Technical Literature must be referred to during the inspection of membrane installations.

16.2 Critical areas of inspection are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
- Membrane curing and integrity prior to the installation of tiles including protection from mechanical damage during curing and prior to tile installation.

Health and Safety

17.1 Safe use and handling procedures for the membranes are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

Basis of Appraisal

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

Tests

18.1 The following testing has been undertaken by various organisations:

- Mapegum WPS and Mapelastic Wet Area Membranes in accordance with; EN 14891 for initial tensile adhesion strength, tensile strength after water contact, tensile adhesion strength after heat ageing, tensile adhesion strength after contact with lime water, tensile adhesion strength after contact with chlorine water, tensile adhesion strength after freeze-thaw cycles, waterproofing and crack bridging ability; DIN 53504 for tensile strength and maximum elongation after exposure to air and water immersion (Mapegum WPS only) and; Mapei internal method for water absorption after exposure and water immersion.
- Mapelastic Smart in accordance with EN 1502-4 for bond strength to concrete, freeze thaw, flexibility, static and dynamic crack bridging, water vapour permeability, impermeability to water and bond strength after water immersion, heat ageing, freeze-thaw and alkali ageing.
- Mapelastic in accordance with; EN 14891 for crack bridging after 28 days exposure to air, crack bridging after 7 days exposure to air and 21 days immersion in water, adhesion to concrete surface after 28 days exposure to air, adhesion to concrete surface after 28 days exposure to air and 21 days immersion in water; DIN 52615 for resistance to water vapour transmission and; Mapei internal method for deformability under low temperatures.
- Mapegum WPS in accordance with; EN 1384 for tensile adhesion strength after exposure and water immersion; UNI 8202/22 for water absorption after exposure and water immersion and; DIN 53505 for shore A hardness.
- Mapelastic AquaDefense in accordance with AS/NZS 4858 Appendix A including effect of heat ageing, bleach, detergent and water on tensile and elongation, water vapour transmission to ASTM E96-92 and cyclic movement resistance requirements of AS/NZS4858:2004 Appendix B. Testing to ANSI 118.10-1999 including seam strength, breaking strength, dimensional stability, resistance to fungi, static head and shear strength to ceramic tile and cement mortar. Also tensile adhesion on a plywood substrate and low temperature flexibility of the membrane.
- Mapelastic Turbo in accordance with EN1504-2 and EN14891 for water vapour permeability, capillary adsorbtion and permeability to water, permeability to water, freeze-thaw cycling, crack-bridging ability, pull off adhesion and bond strength. Also tensile adhesion on a plywood substrate.

18.2 The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

18.3 Testing of Mapegum WPS and Mapelastic has been undertaken by BRANZ for durability in accordance with AS/NZS 4858: 2004, Appendix A covering tensile strength and elongation after immersion in water, bleach, detergent, and after heat ageing.

18.4 Testing for suitability of Mapelastic over particleboard in accordance with AS/NZS 4858: 2004, Appendix C has been undertaken by BRANZ and found to be satisfactory.

Other Investigations

19.1 An assessment was made of the durability of the Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes by BRANZ technical experts.

19.2 Site inspections have been carried out by BRANZ to examine the practicability of installation and to examine completed installations.

19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

20.1 The manufacture of the membranes has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

20.2 The quality management system of the membranes manufacturer has been assessed and found to be satisfactory.

20.3 The quality of supply of the membrane system materials to the market is the responsibility of Mapei New Zealand Ltd.

20.4 Quality on site is the responsibility of the Mapei New Zealand Ltd trained applicators.

20.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing systems and substrates.

20.6 Building owners are responsible for the maintenance of the ceramic or stone tiles in accordance with the instructions of Mapei New Zealand Ltd.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products – Flat sheet.
- AS/NZS 2269: 2012 Plywood-Structural.
- AS 3958.1: 2007 Guide to the installation of ceramic tiles.
- AS/NZS 4858: 2004 Wet area membranes.
- DIN 53504 May 1994 Determination of tensile stress/strain properties of rubber.
- EN 1348: 1997/A1 Adhesives for tiles – Determination of tensile adhesion strength for cementitious adhesives.
- EN 14891 March 2003 Liquid applied waterproofing membranes for use beneath ceramic tiling – Definitions, specifications and test methods.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3602: 2003 Timber and wood-based products for use in buildings.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4229: 2013 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230: 2004 Code of Practice for the design of masonry structures.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.
- Good Practice Guide - Tiling, BRANZ, April 2015.
- UNI 8202 – 22: 1987 Building. Water proof sheets. Determination of behaviour in water.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

BRANZ

In the opinion of BRANZ, Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic Aquadefense Wet Area Membranes are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Mapei New Zealand Ltd, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

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

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
09 February 2018

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Mapeband PE 120



TECHNICAL DATA (typical values)

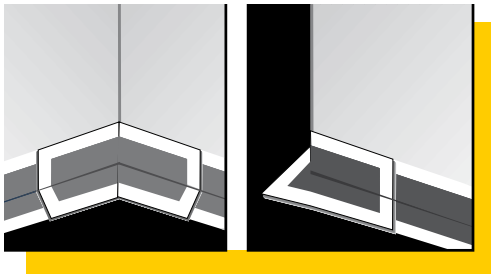
PRODUCT IDENTITY	
Thickness of tape (mm):	approx. 0.70
Resistance to water under pressure (bar):	1.5
Elongation at break (according to ISO 527-1) (%):	> 135
In service temperature range:	from -5°C to +30°C
Chemical resistance for continuous containment of the following aggressive products (7 days at +23°C):	
– hydrochloric acid (3%):	good
– sulphuric acid (35%):	good
– citric acid (100 g/l):	good
– lactic acid (5%):	good
– sodium hypochlorite (0.3 g/l):	good
– salt water (20 g/l of sea salt):	good



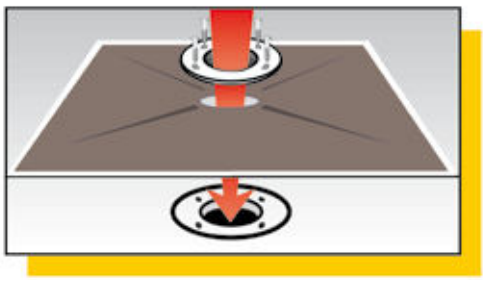
SPECIAL MAPEBAND PE 120 SHAPED PIECES



Positioning Mapeband PE 120 in an omega pattern in an expansion joint



Corner pieces



Square PVC element for flexible waterproofing and sealing of a 425 mm x 425 mm drain

It contains bis (2-ethylhexyl) phthalate - Reg. 1907/2006/CE (REACH).

PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

All relevant references for the product are available upon request and from www.mapei.com

MAPEI®

BUILDING THE FUTURE

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2052-10-2013

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MAPEI

Mapegum WPS

Fast drying flexible liquid membrane for waterproofing



WHERE TO USE

Waterproofing indoor floor and wall surfaces that are not subject to rising damp.
Flexible, anti-fracture membrane. Apply before the installation of ceramic tiles or stone material.

Mapegum WPS may be used on the following:
- plasterboard, gypsum or cementitious render, lightweight cement block and marine-plywood;
- cementitious, anhydrite, wooden and magnesite substrates and existing ceramic and natural stone after the application of **Eco Prim T** primer.

ADVANTAGES

- Product certified EC1 Plus by the GEV Institute (Gemeinschaft Emissions-kontrollierte Verlegewerkstoffe e.V) as a product with very low emission of volatile organic compounds.
- Ready to use.
- Rapid application.
- Floor coverings may be installed after just 12 hours.
- Excellent elongation properties.
- No reinforcement required.

Some application examples

- Waterproofing walls and floors in bathrooms and shower cubilces before laying ceramic tiles, natural stone and mosaic.
- Waterproofing kitchen walls and floors and work tops before laying ceramic tiles and natural stone.

TECHNICAL CHARACTERISTICS

Mapegum WPS is a ready-to-use, solvent-free, one-component, grey-coloured paste with a base of synthetic resins in water dispersion.
Mapegum WPS has a thixotropic consistency which makes it easy to apply on horizontal, sloping and vertical surfaces.
After rapid evaporation of the water content, **Mapegum WPS** forms a flexible membrane which is not sticky and which is strong enough to withstand light pedestrian traffic. It also forms an excellent surface which bonds perfectly to adhesives used for laying ceramics, marble and natural stone.
The flexibility of **Mapegum WPS** enables it to withstand normal expansion and contraction movements of the substrate due to temperature variations and vibrations.
Thanks to the flexibility of **Mapegum WPS**, it acts as an anti-fracture membrane for substrates which are subject to light cracking (< 1 mm).
Mapegum WPS is resistant to water, limewater (pH > 12), water which contains chlorides and normal household detergents and cleaning products.
Systems based on the use of **Mapegum WPS** flexible membrane, on which various types of tiles have been laid using MAPEI cementitious-based adhesives (such as **Granirapid**, **Keraflex** and **Adesilex P9**) and water dispersion adhesives (**Ultramastic III**), have been certified for use in damp environments by the following institutes:

– Säurefliesner (Germany);

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Mapegum WPS



Application of a 90° Mapeband PE 120 corner piece using Mapegum WPS



Application of Mapeband PE 120 using Mapegum WPS



Application of Mapeband PE 120 using Mapegum WPS

TECHNICAL DATA (typical values)	
PRODUCT IDENTITY	
Consistency:	paste
Colour:	light grey
Density (g/cm³):	1.45
pH:	9.0
Dry solids content (%):	73
Brookfield viscosity (mPa·s):	120,000 (rotor E - 5 revs)
EMICODE:	EC1 Plus - very low emission
APPLICATION DATA (at +23°C - 50% R.H.)	
Minimum film-forming temperature:	+5°C
Recommended application temperature range:	from +5°C to +35°C
Waiting time between the first and second coat:	approx. 60 min
Waiting time before laying coating material:	12-24 hours
Completely dry (2 mm of thickness) at +23°C:	5 hours
Completely dry (2 mm of thickness) at +5°C:	12 hours
FINAL PERFORMANCES	
Elongation at failure according to DIN 53504 (%):	200
Initial adhesion according to EN 14891-A.6.2 (N/mm²):	1.6
Adhesion after water immersion according to EN 14891-A.6.3 (N/mm²):	1.2
Adhesion after heat ageing according to EN 14891-A.6.5 (N/mm²):	1.6
Adhesion after freeze/thaw cycles according to EN 14891-A.6.6 (N/mm²):	1.0
Adhesion after immersion in basic water according to EN 14891-A.6.9 (N/mm²):	1.2
Adhesion after immersion in sodium hypochlorite solution in compliance with EN 14891-A.6.7 (N/mm²):	0.6
Crack bridging ability at +23°C according to EN 14891 A.8.2 (mm):	2.1
Impermeable to water under pressure according to EN 14891-A.7 (kPa) 7days:	no penetration
Permeable to water vapour (μ) according to EN ISO 12572:	6000

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– Sp Swedish National Testing & Research Institute (Sweden);

– Norwegian Research and Building Institute (Norway);

RECOMMENDATIONS

- Do not apply **Mapegum WPS** if the temperature is lower than +5°C.
- Create sloping surfaces where necessary to avoid the formation of puddles of water.
- Do not apply **Mapegum WPS** on damp cementitious substrates or on substrates which are subject to rising damp.
- Do not apply **Mapegum WPS** on bitumen or asphalt membranes which could bleed oil or plasticizers.
- Do not use **Mapegum WPS** on surfaces continuously immersed in liquid such as swimming pools, fountains, storage tanks, etc. Use **Mapelastic** or **Mapelastic Smart** for these types of application.
- Do not use **Mapegum WPS** to cover cracks which are subject to shearing movements.
- **Mapegum WPS** must be protected from abrasion caused by pedestrian traffic by installing ceramic tiles or stone material.

APPLICATION PROCEDURE

Preparation of the substrate

Substrates must be solid, clean, dry and free of oil, grease, old paintwork or any other material which could compromise bonding. Thoroughly clean all the mould, loose material, etc. from existing surfaces to be waterproofed (existing flooring, old bitumen membranes, asphalt, metallic surfaces, etc.) by washing and brushing them down, or by spraying water and steam.
Cementitious substrates must be stable and dry, and not subject to rising damp. Substrates which are highly absorbent or gypsum must be pre-treated with **Primer G** (usually diluted with water at a ratio of 1:1 or 1:2 to ensure thorough penetration). Wait several hours until the coating of **Primer G** is completely dry.
Anhydrite or gypsum substrates must be perfectly dry (maximum residual humidity 0.5%), sanded and treated with a coat of **Primer G** or **Primer S**. Existing substrates of ceramic tiles or natural stone must be treated with **Eco Prim T** primer before applying **Mapegum WPS**.
If a slope has to be created and the base needs to be smoothed off before spreading on **Mapegum WPS**, use one of the recommended MAPEI products.

Application of the product

Mapegum WPS may be applied by trowel, with a roller, by brush or spray (if required, dilute with up to 5% of water).
The product must be applied evenly in thin coats (approx. 1 mm maximum per coat). Wait until the first coat is dry before applying further coats crossways (1-2 hours according to temperature conditions).
The final thickness of **Mapegum WPS** must never be less than 1 mm, in order to form a consistent, flexible continuous coat. Make sure that there are no gaps caused by imperfections in the substrate.
Mapegum WPS is used as an anti-fracture membrane on cracked substrates, we recommend embedding **Mapenet 150** alkali-resistant fibreglass reinforcing mesh in the first layer of the product while it is still fresh.
To further improve both elongation at failure and crack-bridging of **Mapegum WPS**, we recommend inserting **Mapetex Sel** large-mesh non-woven polypropylene fabric.
After 12-24 hours from applying the final coat of **Mapegum WPS** (according to temperature conditions), the surface is ready for laying ceramic tiles or natural stone, etc. Use an adhesive from the MAPEI range to lay ceramic tiles and natural stone; class C2 if it is cementitious based or class D2TE if it is a water dispersion type, in accordance with Standard EN 12004.
In order to guarantee continuity in the waterproofing coat, we recommend placing **Mapeband**, alkali-resistant rubber tape with felt, between the wall and the floor and between contiguous walls before applying **Mapegum WPS**, or **Mapeband PE 120**, PVC tape.
Special **Mapeband** or **Mapeband PE 120** pieces are available to be inserted in correspondence of corners, drains and pipe-work. For drains, an alternative solution is to use the special shaped pieces from the **Drain** range.
Mapeband or **Mapeband PE 120** must be bonded to the substrate using **Mapegum WPS** and must be completely embedded in the waterproofing layers.

Laying the tiles

After applying **Mapegum WPS** wait:

- 12-24 hours on absorbent substrates;
- 4-5 days on substrates which are not absorbent.

Lay the tiles using an adhesive from the MAPEI range (such as **Keraquick,**



Application of a Mapeband PE 120 seal for through holes using Mapegum WPS



Application of a Drain Vertical fitting using Mapegum WPS



Application of Mapegum WPS with a roller

Mapegum WPS



Granirapid, **Adesilex P9**, **Keraflex** or **Ultramastic III**); the width of the joints depends on the size of the tiles to be laid. Grout the tile joints using **Ultracolor Plus**, **Keracolor FF** or **GG** plus **Fugolastic** or **Kerapoxy** or **Kerapoxy CQ**, available in a variety of colours. Expansion joints must be sealed using the special MAPEI sealants.

Cleaning
Mapegum WPS may be easily removed while still fresh from tools and surfaces with water.

CONSUMPTION
The consumption of **Mapegum WPS** is approximately 1.5 kg/m^2 per mm of thickness.

PACKAGING
Mapegum WPS is available in 5, 10 and 25 kg drums.

STORAGE
24 months in original packaging. Protect from frost.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION
Mapegum WPS is not considered a dangerous substance according to current norms and regulations regarding the classification of mixtures. The usual precautions taken when handling chemical products are recommended.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.



Installing floor covering using Keraflex Maxi S1



Installing floor covering using Ultramastic III

PRODUCT FOR PROFESSIONAL USE.

WARNING
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Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

GEV-EMICODE EC 1 PLUS very low emission

This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

GREEN INNOVATION

Our Commitment To The Environment
MAPEI products assist Project Designers and Contractors create innovative LEED (The Leadership in Energy and Environmental Design) certified projects, in compliance with the U.S. Green Building Council.

All relevant references for the product are available upon request and from www.mapei.com

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MAPEI

IN COMPLIANCE WITH EUROPEAN STANDARDS EN 12004 C2TE MAPEI CEMENTITIOUS ADHESIVE FOR CERAMIC TILES

Keraflex

GEV-EMICODE EC 1 PLUS very low emission

High-performance cementitious adhesive with no vertical slip and extended open time for ceramic tiles and stone material



CLASSIFICATION IN COMPLIANCE WITH EN 12004
Keraflex is an improved (2) slip resistant (T) cementitious adhesive (C) with extended open time (E) classified as C2TE.

*Conformity of **Keraflex** is declared in **ITT** certificates **n° 25040476/Gi (TUM)** and **ITT n° 25080239/Gi (TUM)** issued by the Technische Universität München laboratory (Germany) and in **ITT** certificates **n° 1220.12/10/R03 NPU**; **1220.14/10/R03 NPU**; **1220.11/10/R03 NPU** and **1220.13/10/R03 NPU** issued by the Istitute ITB Katowice (Poland).*

WHERE TO USE
Interior and exterior bonding of ceramic tiles (single-fired, double-fired, porcelain tiles, terracotta, klinker, etc.) stone materials and mosaics of every type on floors, walls and ceilings. Also suitable for spot bonding of insulating materials such as expanded polystyrene, rock and glass wool, Eraclit® (wood-cement panels), sound-deadening/reduction panels, etc.

Some application examples
- Bonding ceramic tiles (double fired, single fired, porcelain, clay tiles, klinker, etc.), stone materials and mosaics on the following substrates:
  – cement or mortar wall renders;
  – interior aerated concrete block walls;
  – gypsum or anhydrite after having first applied **Primer G**;
  – gypsum board;
  – underfloor heated installations;
  – cement screeds, as long as they are sufficiently cured and dry;
  – interior painted walls, as long as the paint is firmly anchored;

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Keraflex



Installation of pre-glossed marble on floors



Installation of single-fired tile on expanded foam concrete block walls



Single-fired tile on terrazzo tile of an external wall

– waterproofed membranes in **Mapelastic** or **Mapegum WPS**.

- Tile on tile of existing flooring.
- Bonding small sized tiles in swimming pools and basins.
- Bonding floors subject to heavy stress.

TECHNICAL CHARACTERISTICS

Keraflex is a grey or white powder composed of cement and graded aggregates. It contains a high quantity of synthetic resins and special admixtures created according to a formula developed in MAPEI's research laboratories. A mortar with the following features is obtained when mixed with water:

- easily workable;
- highly thixotropic: **Keraflex** can be applied on a vertical surface without slumping or letting the tiles slip, even for heavy tiles. Tiles can be installed from the top towards the bottom without using spacer pegs;
- perfect adherence to all materials normally used in building;
- hardens without appreciable shrinkage;
- extended open time.

RECOMMENDATIONS

Do not use **Keraflex:**

- on concrete subject to high shrinkage;
- on walls and floors subject to strong movement or vibration (wood, fibre-cement, etc.);
- on metal surfaces.

APPLICATION PROCEDURE

Preparing the substrate

The substrates must be flat, mechanically resistant, free of loose parts, grease, oils, paints, wax, etc. Damp substrates can slow down the setting of **Keraflex**.

Cement substrates should not be subject to shrinkage after the installation of the ceramic tiles, therefore, during spring and summer, renders must cure at least one week for each cm of thickness and cement screeds must have an overall cure time of at least 28 days, unless they are made with special binders for MAPEI screeds such as **Mapecem, Mapecem Pronto, Topcem** or **Topcem Pronto**.

Dampen with water to cool surfaces which have become heated from exposure to sunlight.

Gypsum substrates and anhydrite screeds must be perfectly dry (max. residual moisture 0.5%), sufficiently hard and free from dust. It is absolutely essential that they must be treated with **Primer G** or **Mapeprim SP**, while areas subject to extreme dampness must be primed with **Primer S**.

Preparing the mix

Mix **Keraflex** with clean water until a smooth, lump-free paste is obtained. Leave to rest approximately 5 minutes and re-stir.

Use 29-32 parts water for every 100 parts by weight of **Keraflex** grey, which is equal to 7.3-8 litres of water for every 25 kg of powder and use 30-33 parts for every 100 parts by weight of **Keraflex** white, which is equal to 7.5-8.3 litres of water for every 25 kg of powder.
Mixed this way, **Keraflex** has a pot life of approximately 8 hours.

Spreading the mix

Keraflex is applied to the substrate using a notched trowel. Choose a trowel that allows for complete coverage of the tile back.
To achieve a good adhesion, spread an initial thin layer of **Keraflex** on the substrate using the flat side of the trowel. Immediately after, apply the desired thickness of **Keraflex** using a suitable notched trowel, depending on the type and size of the tiles (see "Coverage").
For external ceramic tile floors and walls, sizes greater than 900 cm^2, floors subject to heavy loads, when applying in swimming pools and basins filled with water, spread also the adhesive on the back of the tiles (back-buttering) in order to ensure a complete coverage.

Installing the tiles

There is no need to wet the tiles before installing them. Only with very dusty backs it is recommended to dip the tiles in clean water.
Tiles should be installed under a firm pressure to ensure good coverage of the adhesive.
In normal temperatures and humidity conditions, the open time of **Keraflex** is approximately 30 minutes. Unfavourable weather conditions (strong sun, wind, high temperatures, etc.) or a highly absorbent substrate can reduce the open time, even to just a few minutes.
It is therefore necessary that careful checks be made to ensure that a skin does not form on the surface of the spread adhesive, which should stay fresh. If not, re-freshen the adhesive by re-spreading with a notched trowel.
It is not recommended to wet the adhesive with water once a skin has formed because, instead of dissolving the skin, the water will form an anti-adhesive film.
If necessary, tiles should be adjusted within 60 minutes of installation.
Tiling installed with **Keraflex** must not be washed or exposed to rain for at least 24 hours and must be protected from frost and strong sun for at least 5-7 days.

Spot-bonding insulating materials

For spot-bonding sound-deadening or insulating panels, apply **Keraflex** with a trowel or a float.

GROUTING AND SEALING

Wall joints can be grouted after 4-8 hours and floor joints can be grouted after 24 hours with the specific MAPEI cementitious or epoxy grouts, available in different colours.

Expansion joints must be sealed with the specific MAPEI sealants.

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TECHNICAL DATA (typical values) In compliance with:	– European EN 12004 such as C2TE – ISO 13007-1 such as C2TE
PRODUCT IDENTITY	
Consistency:	powder
Colour:	white or grey
Bulk density (kg/m³):	1,300
Dry solids content (%):	100
EMICODE:	EC1 R Plus - very low emission
APPLICATION DATA (at +23°C and 50% R.H.)	
Mixing ratio:	100 parts **Keraflex** grey with 29-32 parts water by weight 100 parts **Keraflex** white with 30-33 parts water by weight
Consistency of the mix:	pasty
Density of the mix (kg/m³):	1,500
pH of mix:	13
Pot life:	over 8 hours
Application temperature range:	from +5°C to +40°C
Open time (according to EN 1346):	> 30 minutes
Adjustability time:	45 minutes
Ready for grouting on walls:	after 4-8 hours
Ready for grouting on floors:	after 24 hours
Set to light foot traffic:	24 hours
Ready for use:	14 days
FINAL PERFORMANCES	
Bonding strength according to EN 1348 (N/mm²): **– initial bonding (after 28 days):** **– bonding after heat exposure:** **– bonding after immersion in water:** **– bonding after freeze/thaw cycles:**	 2.2 2.0 1.5 1.7
Resistance to alkalis:	excellent
Resistance to oils:	excellent (poor to vegetable oils)
Resistance to solvents:	excellent
Temperature when in use:	from -30°C to +90°C







Tile on tile with Keraflex grey

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Keraflex





An example of an installation of porcelain tiles - Zanchetta Shopping Centre - Treviso (Italy)



Fixing polystyrene foam slabs with Keraflex white

SET TO LIGHT FOOT TRAFFIC
Floors are set to light foot traffic after approx. 24 hours.

READY FOR USE
Surfaces are ready for use after approx. 14 days.

Swimming pools and basins can be filled after 21 days.

Cleaning
Tools and containers should be cleaned with plenty of water while **Keraflex** is still fresh. Surfaces should be cleaned with a damp cloth, before the adhesive dries.

COVERAGE
Bonding ceramic tiles
– Mosaics and small sizes in general (trowel n. 4): 2 kg/m²

– Normal sizes (trowel n. 5): 2.5-3 kg/m²

– Large sizes, exterior floors (trowel n. 6): 5 kg/m²

Spot-bonding insulating material
– Foam, etc.: approx. 0.5-0.8 kg/m²

– Gypsum board panels, cellular concrete: approx. 1.5 kg/m²

PACKAGING
Keraflex white and grey are available in 25 kg bags and in 4x5 kg boxes.

STORAGE
Keraflex can be stored 12 months in a normal environment in original packaging. The product complies with the conditions of Annex XVII to Regulation (EC) N° 1907/2006 (REACH), item 47.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION
Keraflex contains cement that when in contact with sweat or other body fluids causes an irritant alkaline reaction and allergic reactions to those predisposed. It can cause damage to eyes. It is recommended to use protective gloves and goggles and to take the usual precautions for handling chemicals. In case of contact with eyes or skin wash immediately with plenty of water and seek medical attention.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING
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Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

GEV-EMICODE EC 1 PLUS very low emission

This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

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Ultramastic III



IN COMPLIANCE WITH EUROPEAN STANDARDS EN 12004 D2TE MAPEI DISPERSION ADHESIVE FOR CERAMIC TILES

High performance, ready-to-use paste adhesive with no vertical slip and extended open time for the installation of ceramic tiles on walls and floors

CLASSIFICATION IN COMPLIANCE WITH EN 12004

Ultramastic III is a slip resistant (T) improved (2) dispersion (D) adhesive and with extended open time (E) as classified D2TE.

Ultramastic III *is CE marked, as declared in* ***ITT*** *certificate* ***N° 25040266/Gi (TUM)*** *issued by the Technische Universität München laboratory (Germany).*

WHERE TO USE

- Bonding of all types of ceramic tiles and mosaic on walls, floors and ceilings in interiors.
- Bonding of all types of ceramic tiles and mosaic on exterior walls.
- Bonding of thermal and acoustic insulating materials, decorative ceiling panels, foamed concrete blocks

onto

all substrates normally used in building.

Especially recommended for flexible and deformable non-metallic substrates.

Some application examples

Tiling over:

- Walls and floors of bathrooms and showers.
- Wood surfaces (provided they are moisture-stable, e.g. well bonded water-resistant plywood).
- Cement-based renders and substrates.
- Concrete walls, either precast or cast on site.
- Gypsum plaster or backerboard.
- Gypsum board.
- Painted wall surfaces (provided the paint is stable and the tiles absorbent).
- Existing ceramic tiles (provided one of the surfaces is absorbent).
- Large tiles on floors and walls.
- Insulating materials over renders.
- Ceramic tiles over underfloor heating systems.

TECHNICAL CHARACTERISTICS

Ultramastic III is a newly conceived adhesive in water dispersion based on special acrylic resins, selectively graded minerals and additives.

Ultramastic III is a ready-to-use easily trowellable white paste.
Its 30-minute open time (at +23°C and 50% R.H.) allows tiles to be installed safely and reliably. Tiles adhere immediately without slippage because of **Ultramastic III**'s excellent thixotropic properties.

Ultramastic III sets when its water dispersion evaporates. When hardened it has remarkable flexibility, excellent bonding strength and can withstand the vibrations and deformations of building materials.

Ultramastic III performs best when completely

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hardened. Floor and walls are ready for use when the adhesive is completely dry, whether for installations in bathrooms and showers or for use in exteriors. For the latter the walls must be sufficiently protected from rain.
Its resistance to temperature is excellent up to +90°C.

RECOMMENDATIONS

Ultramastic III is not recommended for installing tiles where water is constantly present (swimming pools, fountains) or over substrates subject to rising damp.

Do not use **Ultramastic III**:

- to install non-absorbent tiles on non-absorbent substrates;
- on metallic substrates or wooden substrates that are not moisture-stable;
- on substrates that are not thoroughly dry or those subject to constant rising damp;
- to install natural stone, especially light coloured calcareous stone (e.g. Carrara marble).

Avoid installing during very cold and very damp weather.

APPLICATION PROCEDURE

Preparing the substrate

Ultramastic III can be applied on all substrates which are sound and free of oil, grease, wax, and loose materials.

Cementitious substrates must be dry (as a rule, 1 week of curing for every cm of thickness) and not subject to rising damp.

Ultramastic III can be used on gypsum or similar surfaces without primer as long as the gypsum is solid and dry.

Ultramastic III can be used for installing absorbent ceramic tiles on walls painted with enamel, water-based paint or distemper, as long as the paint is well fastened, with a solid surface and thoroughly clean.

Spreading the adhesive

Ultramastic III should be applied to the substrate with a notched trowel.
The choice of trowel depends on the level of the substrate, the size of the tiles and the type of back. The adhesive must transfer to at least 60% of the tile in interior installations and 100% for external works.

- For mosaic tiles up to 5x5 cm, use MAPEI trowel N° 4 (consumption 1.5 kg/m²).
- For normal size ceramic tiles, use MAPEI trowel N° 5 (consumption 2.5 kg/m²).
- For uneven surfaces or tiles with highly profiled backs, use MAPEI trowel N° 6 (consumption approx. 4 kg/m²).

The open time for **Ultramastic III** is approximately 30 minutes at normal temperatures and humidity. The tiles must be set within that open time and the adhesive must be spread accordingly.

If a surface skin forms the adhesive must be removed and reapplied. Do not use at temperatures below +5°C.

Do not install outdoors in cold weather without being sure that the adhesive will dry within a few days, and never if frost threatens.

Installing the tiles

It is not necessary to wet the tiles before installing. However, when tiles are especially dusty they may be dipped in water.

The tiles should usually be installed by exerting a firm pressure to ensure transfer of the adhesive. Once in place they will not tend to slip.

Any adjustment of the tiles must be done within 40 to 45 minutes.
Tiles installed with **Ultramastic III** should not be washed down other than removing excess adhesive unless they are thoroughly dry (approx. 7 days after installation).

Bonding insulating materials

Apply **Ultramastic III** with a notched trowel or pointing trowel. The adhesive can be applied in various points or over the entire surface.
Press the materials firmly into place, staying within the open time of the adhesive.

GROUTING AND SEALING THE JOINTS

The joints should usually be grouted with **Keracolor FF** or **GG**, depending on the size, or with **Ultracolor Plus** (see “The Coloured Grouts” colour chart).

If good resistance to chemical agents is required, use **Kerapoxy**, a two-component anti-acid epoxy sealant.

For forming expansion and movement joints, use **Mapesil AC** or **Mapesil LM**, one-component silicone sealants, or **Mapeflex AC4**, a one-component acrylic sealant.

In all of the above cases the size of the joints must be planned according to the type of grout and degree of flexibility required.

READY FOR USE

Surfaces and floors are ready for use after approximately 7 days, depending on the absorption of the substrate, the temperature and relative humidity on site.

Cleaning

Ultramastic III can be cleaned from surfaces with a wet sponge while the adhesive is still wet.
Tools and hands can be easily cleaned with water while the adhesive is still wet.
When the adhesive has dried it may be removed with benzine, acetone, mineral spirits or **Pulicol 2000**, or by mechanical means.

CONSUMPTION

Bonding of ceramic tiles:

Mosaic tiles	1.5 kg/m² (N° 4 trowel)
Tiles 15x15 cm over normal render	2.5 kg/m² (N° 5 trowel)
Tiles 15x15 cm over gypsum surfaces or very smooth surfaces	1.8 kg/m² (N° 4 trowel)

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TECHNICAL DATA (typical values) In compliance with:	– european EN 12004 such as D2TE
PRODUCT IDENTITY	
Consistency:	thick paste
Colour:	white
Density (g/cm³):	1.65
pH:	9
Dry solid content (%):	83
Brookfield viscosity (mPa·s):	600
TECHNICAL CHARACTERISTICS	
Application temperature range:	from +5°C to +35°C
Open time (EN 1346):	> 30 minutes
Adjustment time:	40-45 minutes
Waiting time before grouting:	12 to 24 hours
Ready for use:	approx. 7 days, depending on the absorbency of the substrate, ambient temperature and humidity
FINAL PERFORMANCES	
a) Adhesion according to EN 1324 (N/mm²): **– initial:** **– after heat:** **– after water immersion:** **– at elevated temperature:**	 > 3 > 4 > 0.5 > 2
b) European UEAtc directive (N/mm²): **– 28 days at +23°C - 50% R.H.:**	3.2
Resistance to moisture:	excellent
Resistance to ageing:	excellent
Resistance to solvents and oils:	fair
Resistance to acids and alkalis:	fair
Resistance to temperature:	from -20°C to +90°C
Deformability:	highly deformable

Ultramastic III



Floor tiles 15x15 cm to 20x20 cm	3.5 to 4 kg/m² (N° 5 or n. 6 trowel)

Bonding of insulating materials:

Point bonding of foam	0.5 to 0.8 kg/m²
Bonding of foamed concrete, etc.	1.5 kg/m²
Total bonding on rough surfaces	2.5 kg/m²

PACKAGING

Ultramastic III is available in plastic buckets of 18, 12 and 5 kg and in 1 kg plastic containers in 12 piece packs.

STORAGE

24 months in original sealed packaging. Protect from frost.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Ultramastic III is not considered as dangerous according to the current regulation regarding the classification of mixtures. We recommend the use of protective gloves and goggles and to take the usual precautions for handling chemical products.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING

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MAPEI

IN COMPLIANCE WITH EUROPEAN STANDARDS EN 12004 R2 MAPEI REACTION RESIN ADHESIVE FOR CERAMIC TILES

IN COMPLIANCE WITH EUROPEAN STANDARDS EN 13888 RG MAPEI REACTION RESIN GROUT

Kerapoxy CQ

GEV-EMICODE EC 1 PLUS very low emission



Two-component epoxy grout, easy to apply and excellent cleanability, with a bacteriostatic agent and BioBlock® technology, ideal for grouting ceramic tiles and mosaics. Can also be used as an adhesive

CLASSIFICATION ACCORDING TO EN 13888

Kerapoxy CQ is an RG-class reactive (R) grout for tile joints (G).

Kerapoxy CQ is certified by the University of Modena (Italy) according to ISO 22196:2007 standards as a grouting mortar protected against the formation and proliferation of micro-organisms.

CLASSIFICATION IN COMPLIANCE WITH EN 12004

Kerapoxy CQ is an improved (2) reaction resin adhesive (R) classified as R2.

WHERE TO USE

Internal and external grouting of ceramic, stone material and glass mosaic floor finishes. Particularly suitable for grouting large areas where easy application and cleaning is required.
Kerapoxy CQ allows you to create floors, walls and worktops, etc. in compliance with the HACCP system and the requirements of EC Regulation No. 852/2004 regarding hygiene and foodstuffs.
Also suitable for acid-resistant bonding and rapid setting of ceramic tiles, stone materials, fibre-cement, concrete and any other building material on all types of substrates normally used in construction.

Some application examples

- Grouting materials with an uneven surface where it would be difficult to apply and clean traditional epoxy mortar.
- Grouting of floor tile finishes in the foodstuffs industry (dairies, cheese factories, abattoirs, breweries, wineries, preserves factories, etc.), shops and environments where a high level of hygiene is required (ice-cream parlours, butchers shops, fishmongers, etc.).
- Grouting of anti-bacterial tiles.
- Grouting of surfaces where a high protection against the formation and proliferation of micro-organisms is required.
- Grouting tiles on laboratory benches, kitchen worktops, etc.
- Grouting industrial floor tile finishes (galvanizing plants, tanneries, battery rooms, paper works, etc.), where high mechanical strength and a high resistance to attack by acids is required.
- Grouting swimming pools, especially recommended for pools containing spa or sea water.
- Grouting floor tile finishes in steam rooms and Turkish baths.
- Acid-resistant bonding of tiles (used as an adhesive in compliance with class R2 specification according to EN 12004 standard).
- Bonding marble doorsteps and window-sills.
- Bonding tiles in plastic reinforced by fibre glass swimming pools.
- Bonding special pieces of tiles.

Kerapoxy CQ may also be used to grout unglazed klinker, stone, polished porcelain or porcelain in contrasting colours. Always apply a small sample of the product in a trial area before using **Kerapoxy CQ** on wider surfaces.

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Kerapoxy CQ



Spreading Kerapoxy CQ using a MAPEI float



Cleaning the surface with water and single-head rotary machine with special abrasive felt discs, such as "Scotch-Brite®"



Removing excess liquid using a rubber squeegee

TECHNICAL CHARACTERISTICS

Kerapoxy CQ is a two-component, epoxy resin-based product with very low emission of volatile organic compounds, with silica sand and other special components. It has excellent resistance to acids and is very easy to clean.
Kerapoxy CQ has a bacteriostatic agent, preventing from the proliferation of bacteria and the formation of mould on the surfaces of grouts, making tiled surfaces hygienic and safe, thanks to the innovative BioBlock® technology developed as a result of MAPEI research.
When applied correctly, it produces tile joints with the following characteristics:

- excellent mechanical strength and resistance to chemicals, therefore excellent durability;
- smooth and compact, surface finish which is non-absorbent and easy to clean; guarantees a high level of hygiene and blocks the formation of mildew and mould;
- high degree of hardness, excellent resistance to heavy traffic;
- no shrinkage and, therefore, no cracking;
- uniform colour, resistant to atmospheric agents;
- excellent workability, highly improved compared with traditional epoxy mortars thanks to its creamy consistency, which guarantees faster application times and makes it easier to clean the surfaces, with less waste and easier to obtain a good finish.

RECOMMENDATIONS

- Even if it already seems clean after passing over the surface with a rubber float, always clean the surface using a Scotch-Brite® pad and water, to emulsify traces of resin on the surface which could otherwise modify the final surface finish.
- Use **Kerapoxy IEG** to grout ceramic and where floor finishes will be subject to attack by oleic acids (ham curers, sausage factories, oil mills, etc.) and aromatic hydrocarbons.
- Use a flexible sealant from the MAPEI range (such as **Mapesil AC**, **Mapesil LM** or **Mapeflex PU45**) for flexible expansion joints or for joints subject to movement.
- **Kerapoxy CQ** does not guarantee perfect bonding if the edges of the tiles are wet or contaminated with cement, dust, oil, grease, etc. during grouting.
- Do not use **Kerapoxy CQ** to grout terracotta tiles, the finish of the tiles may be altered.
- Always carry out preliminary tests before grouting stone or ground porcelain with a porous or rough surface.
- Do not add water or solvents to **Kerapoxy CQ** to increase its workability.
- Use the product at temperatures between +12°C and +30°C. However, at temperatures below +15°C application may be more difficult.
- The packages are pre-dosed and, therefore, it is not possible to make mixing errors if all the contents are mixed together. Do not rough guess the quantities when mixing the two components: hardening will be compromised if the catalysing ratio is wrong.
- If hardened and **Kerapoxy CQ** has to be removed from the joints, use an industrial hot air blower. If hardened localized residues of the product remain bonded to the tiles, use **Pulicol 2000** for cleaning.

ACID RESISTANT GROUTING APPLICATION METHOD

Preparation of the joints

The joints must be clean, free of dust and free from adhesive to at least 2/3 of the thickness of the tiles. Any adhesive or mortar which has seeped into the joints while laying the tiles must be removed while still fresh.

Before grouting, make sure the installation mortar or adhesive has set and most of the moisture has been lost.

Kerapoxy CQ is not harmed by damp from the base, but the joints must not be wet when grouting.

Preparation of the mix

Pour the catalyser (component B) into the container of component A and mix well until a smooth paste is obtained. We recommend using a low-speed electric mixer to guarantee perfect blending, and to avoid overheating of the mix which would reduce working times. Use the mix within 45 minutes of preparation.

Application

Spread **Kerapoxy CQ** over the tiled surface with a special MAPEI grout float, making sure that the joints are filled right down to the bottom. With the edge of the same float, strike off excess material.

Finish

After grouting with **Kerapoxy CQ**, floor finishes must be cleaned while the grout is still "fresh".
Cleaning of the joints may be carried out using a small amount of water and an abrasive sponge for cleaning joints (such as Scotch-Brite® or MAPEI tile-joints cleaning kit), followed by a cellulose sponge (MAPEI sponge, for example), taking care to avoid removing grout from the joints.
The sponge must be saturated with water when cleaning finishes.
The residual liquid may be removed with the same sponge, which must be replaced when it becomes too impregnated with resin, and the same technique may be used when finishing off the grouted joints.
After the finishing operation, it is very important that no traces of **Kerapoxy CQ** remain on the surface. Once hardened, it is very difficult to remove.
Therefore, rinse the sponge often with clean water during cleaning.
In the case of very large floor surfaces, finishing may be carried out by wetting the surface and using a single-head rotary machine with special abrasive felt disks such as Scotch-Brite®. Residual liquid may be drawn off using a rubber squeegee.

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CHEMICAL RESISTANCE OF FULLY CURED KERAPOXY CQ*

PRODUCT				USE	
				INDUSTRIAL FLOORING	
Group	Name	Concentration %	Laboratory benches	Permanently used (+20°C)	Sporadically used (+20°C)
Acids	Acetic acid	2.5	+	+	+
		5	+	(+)	+
		10	–	–	–
	Hydrochloric acid	37	+	+	+
	Chromic acid	20	–	–	–
	Citric acid	10	+	(+)	+
	Formic acid	2.5	+	+	+
		10	–	–	–
	Lactic acid	2.5	+	+	+
		5	+	(+)	+
		10	(+)	–	(+)
	Nitric acid	25	+	(+)	+
		50	–	–	–
	Pure oleic acid		–	–	–
	Phosphoric acid	50	+	+	+
		75	(+)	–	(+)
	Sulphuric acid	1.5	+	+	+
		50	+	(+)	+
		96	–	–	–
	Tannic acid	10	+	+	+
	Tartaric acid	10	+	+	+
	Oxalic acid	10	+	+	+
Alkalis	Ammonia in solution	25	+	+	+
	Caustic soda	50	+	+	+
	Sodium hypochlorite in solution:				
	active chlorine	6.4 g/l	+	(+)	+
	active chlorine	162 g/l	–	–	–
	Potassium	5	+	(+)	+
	permanganate	10	(+)	–	(+)
	Potassium hydroxide	50	+	+	+
	Sodium bisulphite	10	+	+	+
Saturated solutions at +20°C	Sodium hyposulphite		+	+	+
	Calcium chloride		+	+	+
	Ferric chloride		+	+	+
	Sodium chloride		+	+	+
	Sodium chromate		+	+	+
	Sugar		+	+	+
	Aluminium sulphate		+	+	+
Oils and fuels	Petrol, fuels		+	(+)	+
	Turpentine		+	+	+
	Diesel fuel		+	+	+
	Tar oil		+	(+)	(+)
	Olive oil		(+)	(+)	+
	Light fuel oil		+	+	+
	Petrol		+	+	+
Solvents	Acetone		–	–	–
	Ethylene glycol		+	+	+
	Glycerine		+	+	+
	Methylene glycol acetate		–	–	–
	Perchloroethylene		–	–	–
	Carbon tetrachloride		(+)	–	(+)
	Ethyl alcohol		+	(+)	+
	Trichloroethylene		–	–	–
	Chloroform		–	–	–
	Methylene chloride		–	–	–
	Tetrahydrofurane		–	–	–
	Toluene		–	–	–
	Carbon sulphide		(+)	–	(+)
	White spirit		+	+	+
	Benzene		–	–	–
	Trichloroethane		–	–	–
	Xylene		–	–	–
	Mercuric chloride ($HgCl_2$)	5	+	+	+
	Hydrogen peroxide	1	+	+	+
		10	+	+	+
		25	+	(+)	+

Legend: + excellent resistance (+) good resistance – poor resistance

**** Evaluated in compliance with EN 12808-1 standards***

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TECHNICAL DATA (typical values)

In compliance with:

– European EN 12004 as R2
– ISO 13007-1 as R2
– European EN 13888 as RG
– ISO 13007-3 as RG

PRODUCT IDENTITY		
	component A	**component B**
Consistency:	thick paste	gel
Colour:	available in 21 different colours	
Density (g/cm³):	1.85	0.98
Dry solids content (%):	100	100
Brookfield viscosity (mPa·s)	1,200,000	250,000
EMICODE:	EC1 R Plus - very low emission	

APPLICATION DATA (at +23°C and 50% R.H.)	
Mix ratio:	component A : component B = 9 : 1
Consistency of mix:	creamy paste
Density of mix (kg/m³):	1,600
Pot life of mix:	45 minutes
Application temperature range:	from +12°C to +30°C
Open time (as an adhesive):	30 minutes
Adjustability time (as an adhesive):	60 minutes
Set to light foot traffic:	12 hours
Ready for use:	3 days

FINAL PERFORMANCE	
Shear adhesion strength according to EN 12003 (N/mm²): **– initial:** **– after water immersion:** **– after thermal shock:**	 ≥ 2.0 ≥ 2.0 ≥ 2.0
Flexural strength (EN 12808-3) (N/mm²):	38
Compressive strength (EN 12808-3) (N/mm²):	49
Abrasion resistance (EN 12808-2):	147 (loss in mm³)
Water absorption (EN 12808-5) (g):	0.05
Resistance to humidity:	excellent
Resistance to ageing:	excellent
Resistance to solvents and oil:	very good (refer to table)
Resistance to acids and alkalis:	excellent (refer to table)
In service temperature range:	from -20°C to +100°C



Spreading Kerapoxy CQ on a wall using a MAPEI float



Kerapoxy CQ is emulsified with water, using a Scotch-Brite® pad



Cleaning and finishing with a hard cellulose sponge

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CONSUMPTION TABLE DEPENDENT ON THE SIZE OF THE TILES AND WIDTH OF THE JOINTS (kg/m²)

Size of the tile (mm)	Width of the joint (mm):			
	3	5	8	10
75 x 150 x 6	0.6	1.0	–	–
100 x 100 x 6	0.6	1.0	–	–
100 x 100 x 10	1.0	1.6	–	–
100 x 200 x 6	0.5	0.8	–	–
100 x 200 x 10	–	1.2	2.0	2.4
150 x 150 x 6	0.4	0.7	–	–
200 x 200 x 8	0.4	0.7	–	–
120 x 240 x 12	–	1.2	2.0	2.4
250 x 250 x 12	–	0.8	1.3	1.6
250 x 330 x 8	0.3	0.5	0.8	0.9
300 x 300 x 8	0.3	0.5	0.7	0.9
300 x 300 x 10	0.4	0.6	0.9	1.1
300 x 600 x 10	0.3	0.4	0.7	0.8
330 x 330 x 10	0.3	0.5	0.8	1.0
400 x 400 x 10	0.3	0.4	0.7	0.8
450 x 450 x 12	–	0.5	0.7	0.9
500 x 500 x 12	–	0.4	0.6	0.8
600 x 600 x 12	–	0.4	0.5	0.7

FORMULA FOR THE COVERAGE CALCULATION:

$$\frac{(A + B)}{(A \times B)} \times C \times D \times 1.6 = \frac{kg}{m^2}$$

A = length of tile (mm)
B = width of tile (mm)
C = thickness of tile (mm)
D = width of joint (mm)

Kerapoxy Cleaner (special cleaning solution for epoxy grout) may also be used for the final cleaning cycle and may also be used to remove thin residues of grout up to several hours after application. In this case, the product must be left to react for longer (at least 15-20 minutes).

The efficiency of **Kerapoxy Cleaner** depends on the amount of residual resin and how much time has passed since application.
Cleaning must always be carried out while the product is still "fresh" as described above.

APPLICATION PROCEDURE AS AN ADHESIVE

After mixing the two components as described above, spread the adhesive with a notched trowel. Apply the tile under firm pressure to ensure good contact. After setting, bonding becomes extremely strong and resistant to chemical agents.

SET TO LIGHT FOOT TRAFFIC

Floors may be subjected to foot traffic after 12 hours at +20°C.

READY FOR USE

3 days. After 3 days, the surfaces may also be subjected to chemical attack.

Cleaning

Tools and containers may be cleaned while the product is still fresh using plenty of water. Once **Kerapoxy CQ** has set, it may only be removed mechanically or with **Pulicol 2000**.

CONSUMPTION

The consumption of **Kerapoxy CQ** varies dependent on the size of the joints and the size and thickness of the tiles.

PACKAGING

Kerapoxy CQ is supplied in pre-dosed packages. It is contained in tubs which contain component A and a canister

Kerapoxy CQ





	WHITE	SILVER GREY	CEMENT GREY	ANTHRACITE	BLACK	JASMINE	BEIGE 2000	RICH BROWN	CAPPUCCINO	MUSTARD YELLOW	MAGNOLIA	LILAC	CHERRY RED	CROCUS BLUE	OCEAN BLUE	JADE GREEN	TORMALINE	LIME GREEN	BARDIGLIO GREY	SEA BLUE	CREAM
	100	111	113	114	120	130	132	146	147	151	160	163	165	170	173	181	182	183	282	283	290
Kerapoxy CQ	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

N.B.: Due to the printing processes involved, the colours should be taken as merely indicative of the shades of the actual product

containing component B, which must only be added at the moment it is required.
The product is available in 3 kg and 10 kg containers only for the coloured versions n. 282 - 283 - 100 - 113 - 114 - 132.

COLOURS AVAILABLE

Kerapoxy CQ is available in 21 colours.

STORAGE

Kerapoxy CQ may be stored for up to 24 months in its original packaging in a cool, dry place. Store component A at a temperature of at least +10°C to avoid crystallisation of the product, reversible by heating up.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Kerapoxy CQ component A is irritant for the eyes and skin. Both component A and B may cause sensitization in those predisposed.
Kerapoxy CQ component B is corrosive and may cause burns.
During the application it is recommended to wear protective gloves and goggles and to take the usual precautions for handling chemicals. In case of contact with the eyes and the skin wash immediately with plenty of water and seek medical attention.
Furthermore, **Kerapoxy CQ** component A and B are dangerous for aquatic life, do not dispose of it in the environment.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

Our Commitment To The Environment
MAPEI products assist Project Designers and Contractors create innovative LEED (The Leadership in Energy and Environmental Design) certified projects, in compliance with the U.S. Green Building Council.

All relevant references for the product are available upon request and from www.mapei.com

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MAPEI®
BUILDING THE FUTURE

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MAPEI

Bio Block

Mapesil AC and Primer FD

GEV-EMICODE EC 1 PLUS very low emission

CE EN 15651-1 | CE EN 15651-2 | CE EN 15651-3

– Solvent-free, acetic-crosslinking mildew-resistant silicone sealant with low modulus of elasticity, available in 30 colours and transparent.
– Adhesion enhancer for siliconic sealants.



WHERE TO USE

Mapesil AC is an acetic-crosslinking silicone sealant suitable for sealing glass, ceramic and anodised aluminium. After first having used a bonding enhancer, **Primer FD** can also be used on concrete, wood, metal, painted surfaces, plastic and rubber.

Mapesil AC is used for:
- Sealing expansion joints of ± 25% expansion of the initial size.
- Forming a perfectly elastic gasket between different elements in building, mechanical engineering, ship-building, automobile manufacturing, etc.

Some application examples
- Sealing joints in wall and floor coverings of ceramic and cement, provided they are not subject to heavy abrasion.
- Sealing joints between sinks or sanitary ware and ceramic tiles in kitchens, bathrooms and showers with colours coordinated with the grouts.
- Sealing expansion joints in swimming pools.
- Assembling compositions of glass tiles and artistic stained glass windows.
- Sealing glazing of door and window frames.
- Sealing air ducts, water pipes.
- Sealing portholes, windows, glazed frames.
- Sealing tanks, service pipes and boilers.
- Sealing materials of different thermal exposure coefficient.
- Adhesive and sealant for general use.

TECHNICAL CHARACTERISTICS

Mapesil AC is a one component, acetic crosslinking, solvent-free silicone sealant, available coloured or transparent. It is a thixotropic paste which is easily trowellable both horizontally and vertically. It crosslinks

Mapesil AC Primer FD

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Cutting the nozzle according to the size of the joints



Application of Primer FD



Application of Mapesil AC

following exposure to atmospheric humidity at ambient temperatures, and forms an elastic product with following properties:
- excellent durability. Seals remain unchanged even after many years exposure to climatic extremes, industrial pollution, sudden temperature changes and immersion in water;
- high elasticity;
- excellent bonding to glass, ceramic and anodised aluminium;
- mildew resistant;
- waterproof and permeable to vapour;
- resistant to chemical agents;
- flexible down to –40°C and resistant to temperatures at +180°C;
- easily workable;
- in compliance with ISO 11600 norm, it is classified as F-25-LM.
- in compliance with numerous international standards.
- in compliance with EN 15651-1, EN 15651-2, EN 15651-3 and CE-marking.

RECOMMENDATIONS

- Do not use **Mapesil AC** for exterior joints in exteriors between ceramic tiles and light-coloured natural stone because dirt could accumulate by the joints. Use **Mapesil LM.**
- For sealing surfaces sensitive to acids such as lime stone, use a neutral silicone sealant (e.g. **Mapesil LM**).
- The use of **Mapesil AC** is not recommended on highly plasticised material or on bituminous surfaces because of the release of substances that reduce bonding and penetrate into the sealant, altering the colour and resistance.
- The resistance of **Mapesil AC** to chemical agents is generally excellent; however, due to the numerous products and working conditions to which **Mapesil AC** can be applied, it is always advisable to test a sample test in cases of doubt.
- Do not use **Mapesil AC** to seal aquariums.
- For sealing floor joints subject to heavy traffic, use a polyurethane (e.g. **Mapeflex PU45**) or epox-polyurethane (e.g. **Mapeflex PU20**) sealant.

APPLICATION PROCEDURE

Preparing and calculating joints size

All the surfaces to receive the sealant must be dry solid and free from dust and loose particles, oils, grease, wax, old paint and rust.
In order that the seal can carry out its function, provision must be made for it to elongate and compress freely.
During application it is therefore necessary that:
- it adheres only to the side of the walls of the joint and not to the base of the joint;
- the joint is sized so that the estimated maximum extension is not greater than 25% of the initial width (calculated at +20°C);
- when the width of the joint is 10 mm, the thickness must be equal to the width; for widths between 11 and 20 mm the thickness must always be equal to 10 mm; for widths greater than the thickness must be equal to half the width.

To control the depth of the joint and to prevent **Mapesil AC** from adhering to the base, the bottom of the joint should be filled with a sized **Mapefoam**, a polyethylene cord.

Application of Primer FD

Where the use of **Primer FD** is necessary, it must be applied with a small brush onto the appropriate areas of the joints and left to dry for several minutes to allow the solvent to evaporate. Then apply **Mapesil AC**.

Application of Mapesil AC

Mapesil AC is packed in cartridges of 310 ml; to use, cut the cartridge above the end of the thread and screw on the nozzle, which should be cut at 45° to produce a hole corresponding to the size of the joint. Insert the cartridge into the gun and extrude the sealant.
The surface of **Mapesil AC** must be finished off with a damp tool, preferably moistened with soapy water, before a superficial film has formed.

Crosslinking

When exposed to air and humidity, **Mapesil AC** crosslinks and becomes elastic. The speed at which **Mapesil AC** crosslinks depends only slightly on temperature, but is fundamentally linked to humidity in the atmosphere.
The graph shows the cross linking at +23°C and 50% humidity in the atmosphere.

Cleaning

To clean partially cross-linked **Mapesil AC** from tools and contaminated surfaces, common solvents may be used (e.g. ethyl acetate, petrol, toluene). Once cross-linking is complete, silicone rubber can only be cleaned mechanically.

COVERAGE

Mapesil AC:
Coverage of **Mapesil AC** varies depending on the width of the joints. Some examples of coverage for end joints and triangular joints are shown in the chart.

Primer FD: 100 g/m².

PACKAGING

Mapesil AC: 310 ml cartridges.

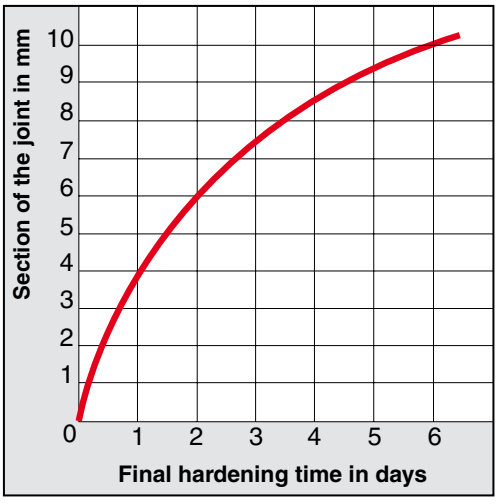
Primer FD: 0.9 kg and 0.2 kg bottles.

COLOURS

Mapesil AC is available in 30 colours from the “MAPEI COLOURED GROUTS” range plus transparent.

STORAGE

Mapesil AC can be stored 24 months in a dry cool place in original cartridges.



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MAPESIL AC - TECHNICAL DATA (typical values)

In compliance with:	BS 5889 type B - ASTM C920 TT –S-00230 C - TT –S-001543 A DIN 18540, T. 2, KLASSE E ISO 11600, F-25-LM EN 15651-1 EN 15651-2 EN 15651-3
PRODUCT IDENTITY	
Type:	thixotropic paste
Colour:	transparent + 30 colours
Density (g/cm³):	1.03
Dry solids content (%):	100
EMICODE:	EC1 Plus - very low emission
APPLICATION DATA (at +23°C and 50% R.H.)	
Application temperature range:	from +5°C to +50°C
Extrusion speed from a 3.5 mm nozzle at a pressure of 0.5 N/mm² (g/minute):	120
Time for formation of skin (minutes):	10
Shrinkage during vulcanisation (%):	3.5
Speed of vulcanisation (mm):	4 in 1 day 10 in 7 days
FINAL PERFORMANCES	
EN 15651-1: sealant for façade joints in interior and exterior, even with cold temperature:	F-EXT-INT-CC
Class:	25 LM
EN 15651-2: sealant for glazing, even with cold temperature:	G-CC
Class:	G 25 LM
EN 15651-3: sealant for sanitary fittings:	S
Class:	XS 1
Tensile strength – according to DIN 53 504-S3A (N/mm²):	1.6
Elongation at breaking point – according to DIN 53 504-S3A (%):	800
Tear strength (ASTM D 624, Die C) (N/mm):	4
Shore-A-Hardness (DIN 53 505):	20
Density at +25°C (DIN 53 479) (g/cm³):	1.02
Permeability to water vapour (DIN 53 122, 2 mm sheet) (g/m²/day):	23
Modulus of elongation measured according to ISO 8339 METHOD A (N/mm²): **– at 25% elongation:** **– at 50% elongation:** **– at 100% elongation:**	 0.20 0.27 0.35
Maximum movement allowed (%):	25
Resistance to water:	excellent
Resistance to ageing:	excellent
Resistance to atmospheric agents:	excellent
Resistance to chemical agents, acids and dilute alkali:	good
Resistance to soap and detergents:	excellent
Resistance to solvents:	limited
Resistance to temperature:	from –40°C to +180°C

PRIMER FD - TECHNICAL DATA (typical values)

PRODUCT IDENTITY	
Consistency:	transparent liquid
Color:	yellowish
Density (g/cm³):	0.92
Brookfield viscosity (mPa·s):	1-2 (rotor 1 - rpm 100)



Smoothing the joint with soapy water and a small brush



Sealing ceramic tile floor with Mapesil AC



Sealing sanitary ware

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Mapesil AC Primer FD





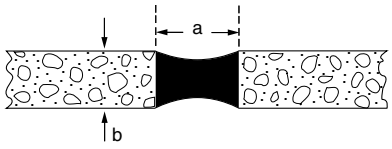
Sealing U-profile glass



Sealing aluminium window frame with Mapesil AC

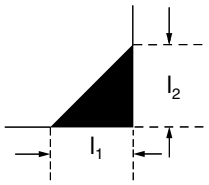
COVERAGE TABLE (linear metres per cartridge)

END JOINT



Joint size in mm (a x b)	Linear metres per cartridge
5x5	12
10x5	6
10x10	3
15x10	2
20x10	1.5
25x10	1.25
30x15	0.7
40x20	0.4

TRIANGULAR JOINT



Joint size in mm (l_1 x l_2)	Linear metres per cartridge
5x5	25
10x10	6
10x15	3
10x20	1.5

Primer FD, when stored in a cool and dry place (at a temperature not higher than +25°C) has a storage life of 6 months.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapesil AC is not considered as dangerous according to the current regulation regarding the classification of mixtures. We recommend the use of protective gloves and goggles and to take the usual precautions for handling chemical products. For further and complete information about the safe use of our product please refer to our latest version of the Material Safety Data sheet.

PRODUCT FOR PROFESSIONAL USE.

Primer FD is easily inflammable. We recommend storing it away from naked flames and sparks, to avoid smoking, to prevent the build up of electrostatic energy and to work in well ventilated areas. It irritates the eyes and skin, may cause drowsiness and dizziness and is harmful if inhaled, swallowed or enters the respiratory system. Suspected of affecting fertility.
When applying the product, we recommend the use of protective gloves to prevent dry, chapped skin, safety goggles, and to take the usual precautions for handling chemical products. If the product comes into contact with the eyes or skin, wash immediately with plenty of clean water and seek medical attention. In case of poor ventilation, we recommend wearing the mask with filters. Do not use in the presence of pregnant women. For further and complete information about the safe use of our product please refer to our latest version of the Material Safety Data sheet.

PRODUCT ONLY FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product report correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical applications: for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application: in every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our web site www.mapei.com

GEV-EMICODE EC 1 PLUS very low emission

This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

GREEN INNOVATION

Our Commitment To The Environment
MAPEI products assist Project Designers and Contractors create innovative LEED (The Leadership in Energy and Environmental Design) certified projects, in compliance with the U.S. Green Building Council.

All relevant references for the product are available upon request and from www.mapei.com

	WHITE	MOON WHITE	MANHATTAN 2000	SILVER GREY	MEDIUM GREY	CEMENT GREY	ANTHRACITE	BLACK	JASMINE	VANILLA	BEIGE 2000	SAND	SILK	GOLDEN DUST	MUD	CORAL RED	CARAMEL	BROWN	TERRACOTTA	CHOCOLATE	TERRA DI SIENA	VOLCANO SAND	YELLOW	MAGNOLIA	VIOLET	CROCUS BLUE	TURQUOISE	SPACE BLUE	TORNADO	JADE GREEN	TRANSPARENT
	100	103	110	111	112	113	114	120	130	131	132	133	134	135	136	140	141	142	143	144	145	149	150	160	162	170	171	172	174	181	999
Mapesil AC	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●

N.B.: Due to the printing processes involved, the colours should be taken as merely indicative of the shades of the actual product

MAPEI®
BUILDING THE FUTURE

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401-9-2014 (GB)

Dektite Aluminium

APPROVED
24 Nov 2020

The best solution for stone chip and pressed metal tiles

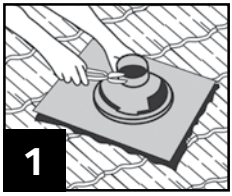
- ✔ The base is 99.9% pure grade aluminium making it strong, malleable and easy to install.
- ✔ Environmentally friendly, ideal where potable water is collected.
- ✔ The best solution for stone chip and pressed metal tiles.
- ✔ EPDM withstands temperatures from -50°C to 115°C and up to 150°C intermittently.

Code	Base (mm)	Pipe (mm)	Pitch	Colour
TFA 12-70	500 x 600	12-70	0-45°	BLACK (EPDM)
TFA 50-170	600 x 600	50-170	0-45°	
TFA 110-220	764 x 764	110-200	0-45°	
TFA 160-300	600 X 900	160-300	0-45°	
TFA 300-450	965 x 965	300-450	0-45°	

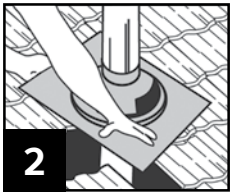




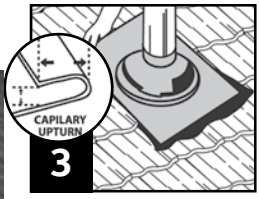
Installation Instructions:



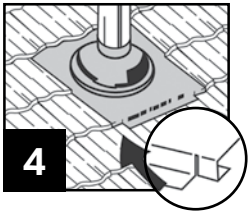
Trim Dektite cone to suit pipe size using sharp tin snips.



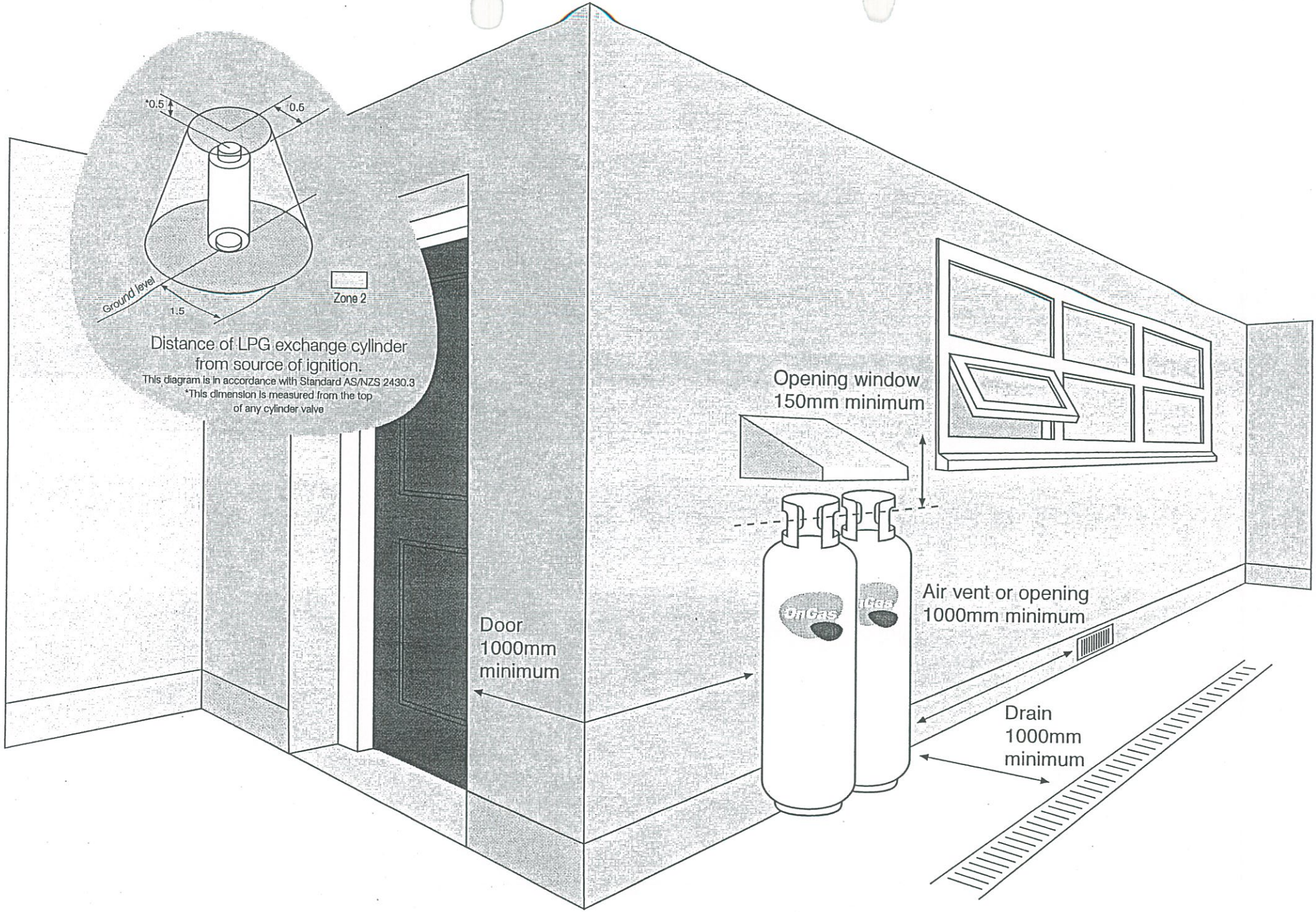
After lubricating the flue with water, slide Dektite down to the tile level.



Form an anti-capillary fold then place upper edge of base under up-stream tiles.



Dress base to profile, cut tabs on the bottom corners and fold under to stop wind lift .



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D Hyde & C Main.

Proposed Residence.

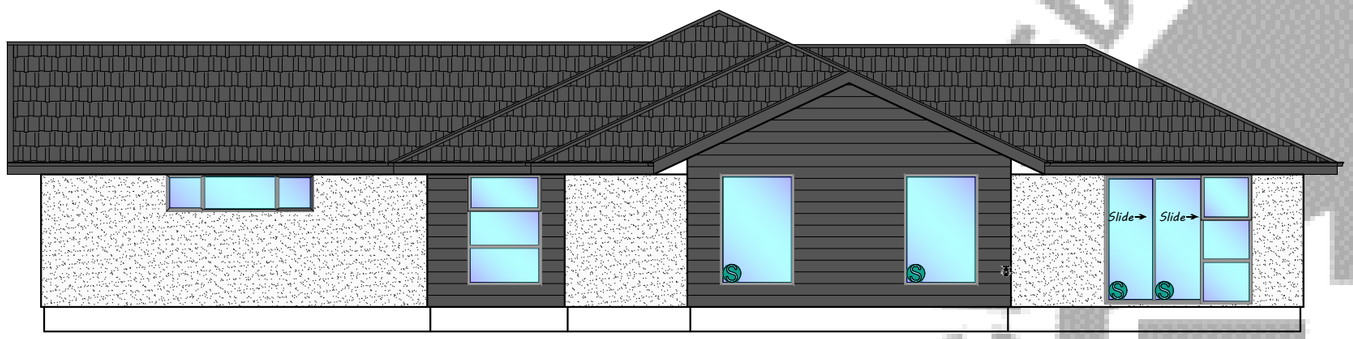
283a Kimberley Road, Levin.

JOB COPY

THESE PLANS MUST BE RETAINED ON SITE

ALL WORK TO FULLY COMPLY WITH THE BUILDING CONSENT DOCUMENTS. ANY VARIATIONS SUBMITTED FOR CONSIDERATION AS AN AMENDMENT BEFORE COMMENCEMENT

THE ENGINEER SHALL SUPERVISE THE SPECIFIC ENGINEERING DESIGN SUBMIT A PS4 SITE NOTES ON COMPLETION BEFORE ISSUANCE OF THE CODE COMPLIANCE CERTIFICATE



A3 Documentation

A01	Site plan
A02	Layout plan
A03	Dimension floor plan
A04	Elevations
A05	Drainage plan
A06	Foundation plan
A07	Foundation setout
A08	Bracing plan
A09	Framing plan
A10	Beam & uplift fixing plan
A11	Roof plan
A12	Fire safety, thermal, lighting& ventilation plan
A13	Section Z-Z
A14	Construction details
A15	Construction details 2
A16	Metal tile details
A17	Resene construction details
A18	Resene construction details 2
A19	Resene construction details 3
A20	Resene construction details 4
A21	Resene construction details 5
A22	James Hardie Linea detail
A23	James Hardie Linea details 2
A24	James Hardie Linea details 3
A25	James Hardie Linea details 4
A26	James Hardie Linea details 5
A27	James Hardie Linea details 6
A28	Wet area details
A29	Wet area details 2
A30	Wet floor shower details
A31	Bath details
T01	Buildable truss layout
T02	Slab thickening plan
T03	Truss fixing plan
S0	General notes
S0.1	Typical steel detailing
S1	Raft floor plan & details
D1	Typical pipe details

SITING TO BE CONFIRMED BY SURVEY PEGS

Drawing Enquiries Contact:

Jonathan Barlow
Architectural Designer

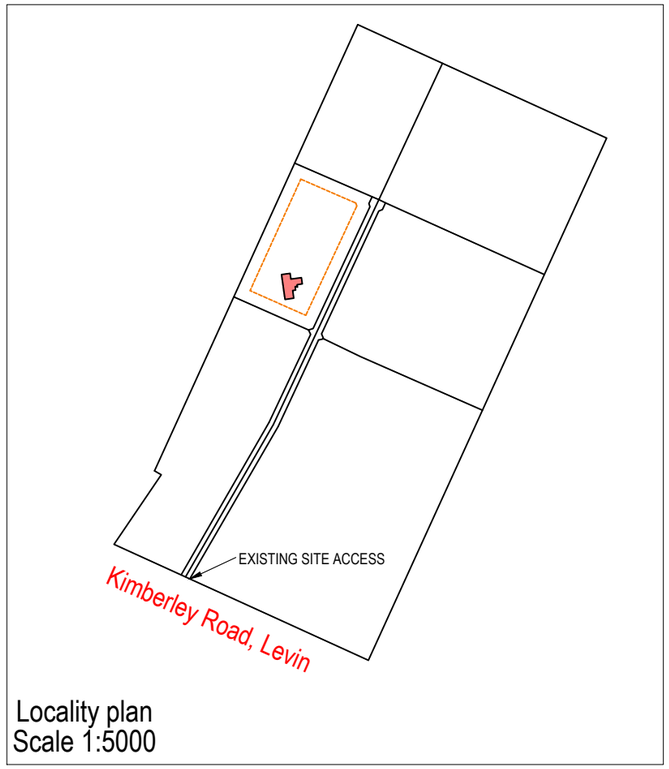
T: 06 359 2844
F: 06 354 5085
E: Jonathan@plans.co.nz

HOROWHENUA DISTRICT COUNCIL APPROVED SUBJECT TO COMPLIANCE WITH THE BUILDING CONSENT DOCUMENTATION

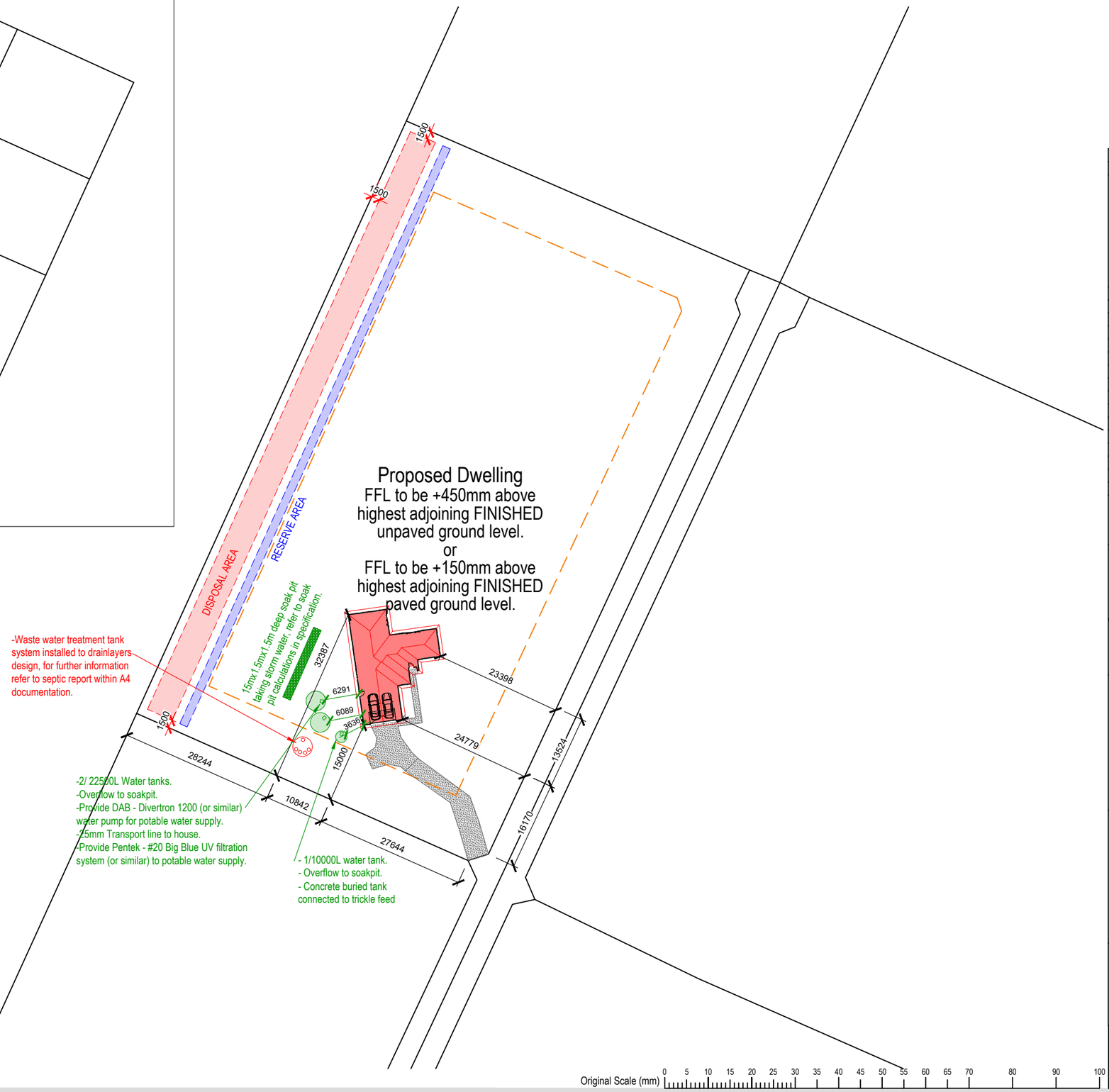
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Locality plan
Scale 1:5000

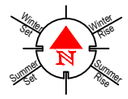


Site plan
Scale 1:800

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

Notes:

North point.



Legal Description.	
Lot:	03
DP:	351707
Address.	
283a Kimberley Road, Levin.	
Site area calculations.	
Site area:	8403 m²
Nett site area:	8403 m²
Allowable coverage:	100 %
Allowable coverage:	8403.00 m²
Subject building existing footprint:	0.00 m²
Existing accessory building area:	0.00 m²
Proposed coverage over foundation:	203.56 m²
Soffit area over DP allowance:	1.00 m²
Total coverage:	2.43 %
Total coverage:	204.56 m²

All dimensions have been taken from the foundation line to the boundary line at right angles unless stated otherwise.

Where shown, adjacent properties and boundaries are shown for illustrative purpose only. Before work commences builder to locate all boundary pegs, check all boundary lengths and building set back distances with the plans. If an inconsistency is found or pegs cannot be located a licensed cadastral surveyor should re-peg the site to ensure an accurate set out.

During construction of this project the builder in charge of the site shall carry out a site hazard evaluation. If at any stage a specific hazard to the public presents itself, builder shall ensure safety to the public by erecting site fences to prevent public access, in keeping with section F5 of the New Zealand Building Code, safety of life and property must be strictly observed.

Dwelling finished floor level:
(to comply with E1/AS1)
Finished slab floor level shall be:
- For sites at same level or above the road, set floor level at min. 150mm above the crown of the road.
- For sites below the road set floor level at no less than 150mm above the lowest point on the site boundary.

Maximum driveway gradient to be:
1 in 4 (25% or 14.04°).
Maximum gradient of transition zones across property line or into buildings:
1 in 20. (5% or 2.86°).

Issue: **Consent**

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Fax: (06) 357 8021
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P.O. BOX 466 Palmerston North

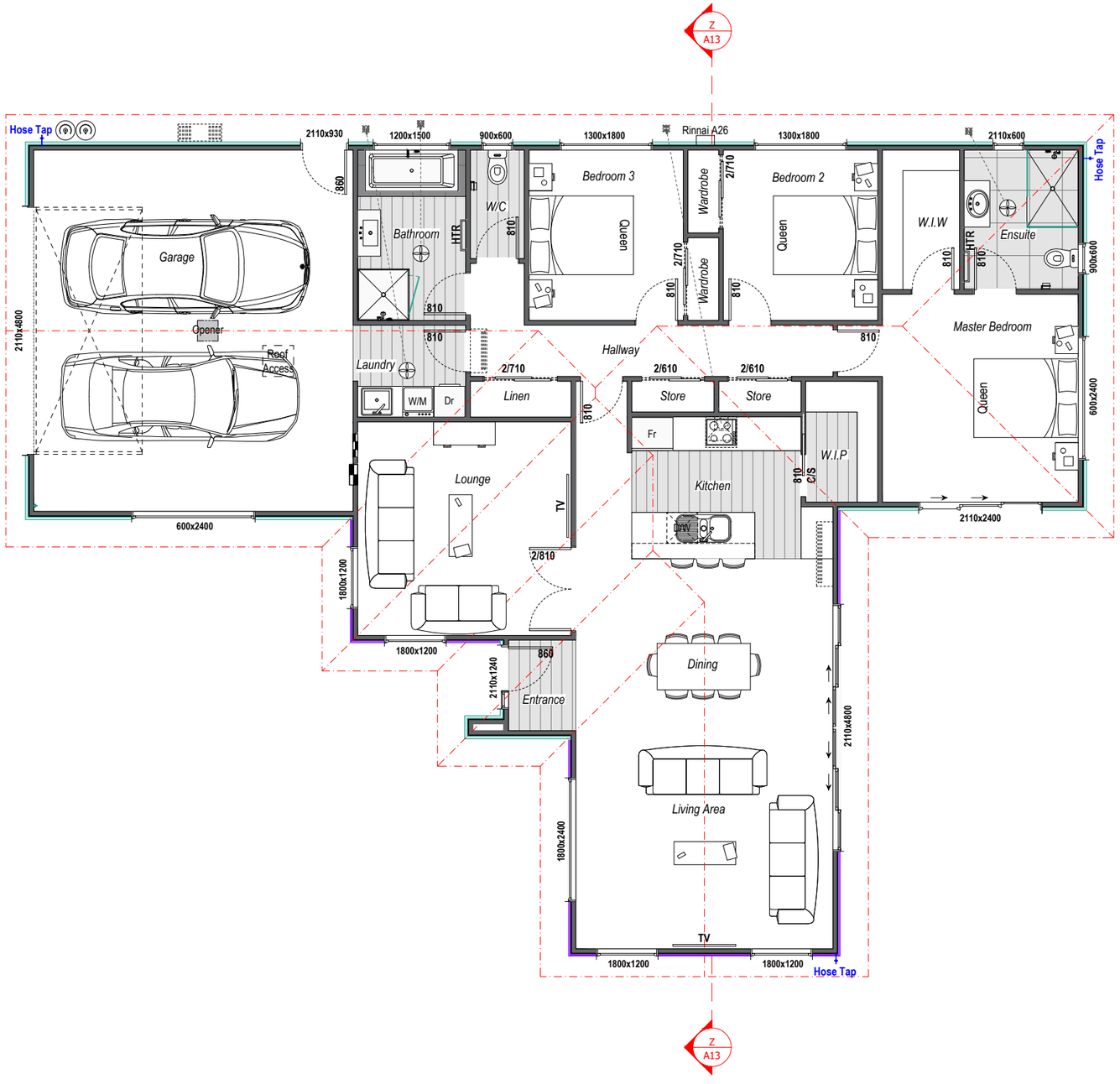
Proposed Residence.
D Hyde & C Main.
283a Kimberley Road, Levin.

Site plan

GENERATED: 24 / 11 / 2020 9:26:37 am		SCALES: A3	A/S A4 -
DRAWN: Jonathan Barlow	REV 1	JOB No:	GJ 20-37
CHECKED: Jeff LBP-111561		SHEET No:	A01
LOT: 03 DP: 351707			

Last modified by: Rebecca Paper size: ISO full bleed A3 (420.00 x 297.00 MM) File Location: Z:\00 Jobs\20-37 Main & Hyde\20-37 - Main & Hyde - WD1.dwg

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Legend:

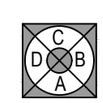
Roof Access	Indicates roof space access hatch, 600x600mm min.
	Floor finished in ceramic tiles.
	Floor finished in 100% impervious type vinyl plank flooring.
	Indicates extractor fan vented to soffit or exterior.
	Indicates meter box.
	Indicates sub board & fibre / data board.
	Indicates wall with resene construction plaster refer to elevations for location
	Indicates wall with James Hardie Linea weatherboard cladding refer to elevations for location

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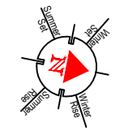
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Notes:

Elevation Key.



North point.



Areas.

Existing area:	0.00 m²
Proposed area (over frame):	203.56 m²
Proposed area (over foundation):	203.56 m²
Additional coverage area:	1.00 m²

Site conditions:

Wind zone:	High
Earthquake zone:	3
Corrosion zone:	C
Snow loading:	N1
Site elevation:	< 400m

Building wrap to all exterior walls:
Marshall Tekton (or competitor's equivalent), openings to be trimmed with Marshall Protecto Tape flashing tape (or competitor's equivalent), refer details for further information.

Frame height: 2420mm

All walls lined internally with 10mm Gib board,stopped to a F4 paint quality finish:
Gib Standard to non wet areas.
Gib Aqualine to wet areas.
Gib Braceline as per bracing plan.
(exceptions - garage to be lined with 10mm Triboard.)

Prenail manufacturer to allow for double studs on either side of doors, where practical, to accommodate 65mm architraves.

Any window size on this plan is unit size NOT the trim size and is in the format of: HEIGHT x WIDTH.
All door sizes on this plan are Door leaf sizes: opening size = Door leaf size + 58mm

Bathroom shower:	Acrylic
Ensuite shower:	Tiled

Both with glass screens in accordance with NZS 4223. Floor linings to all wet areas to be tile unless otherwise stated.

Access routes:

Any intended access way to the building to be constructed of either profiled timber decking with the profile laid perpendicular to the access, or concrete with a broom finish (Class 5 -6) or wood float finish (Class U2). Alternatively, any other material with a tested wet slip co-efficient of not less than 0.4 when tested against D1/AS1 NZBC.

Issue: **Consent**

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Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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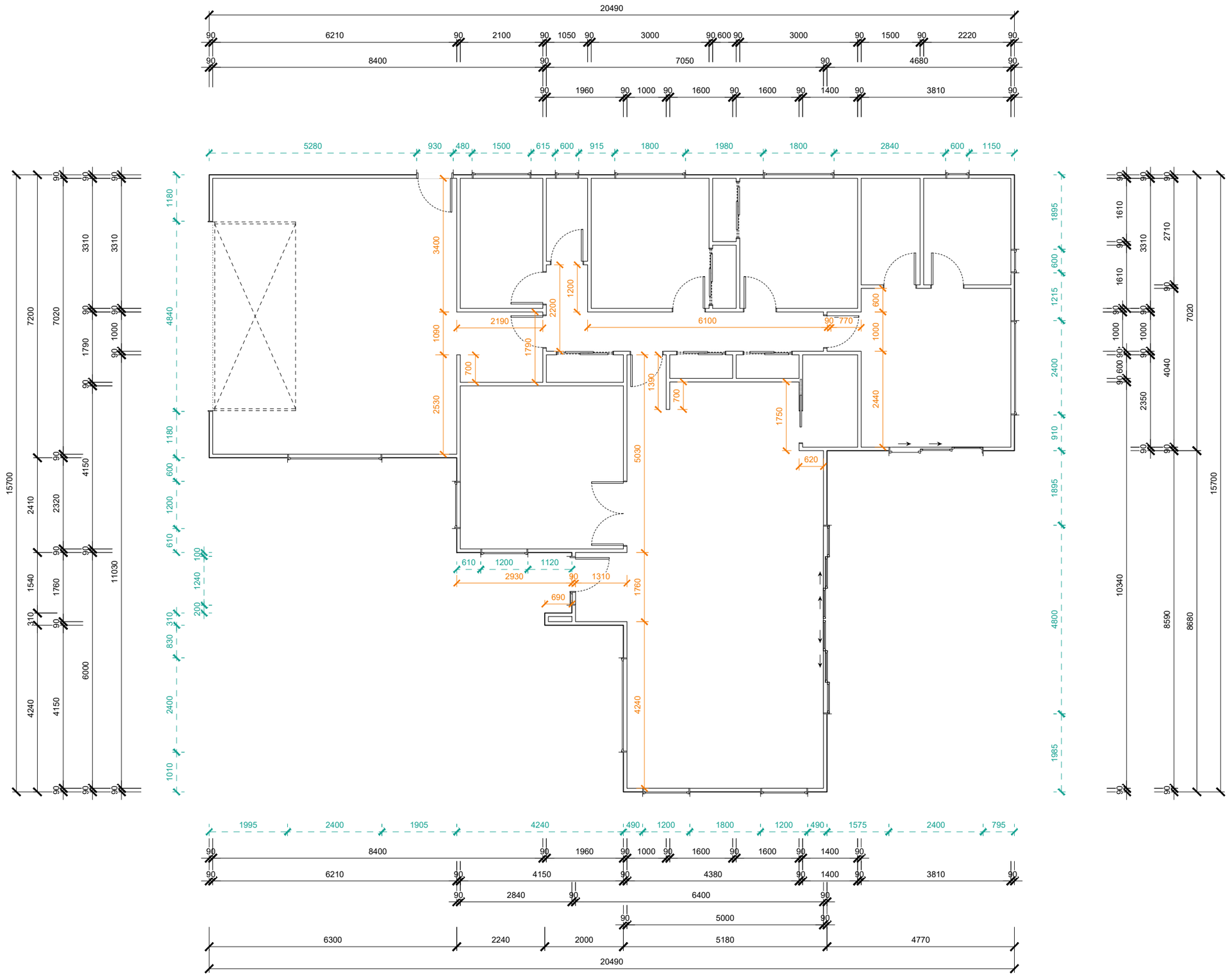
Proposed Residence.
D Hyde & C Main.
283a Kimberley Road, Levin.

Layout plan

GENERATED: 20 / 11 / 2020 10:19:12 am
SCALES: A3 1:100 A4 -
DRAWN: Jonathan Barlow
CHECKED: Jeff LBP-111561
REV: 1
JOB No: GJ 20-37
LOT: 03 DP: 351707
SHEET No: A02

Last modified by: Jonathan Paper size: ISO full bleed A3 (420.00 x 297.00 MM) File Location: C:\Users\jonathan\AppData\Local\Temp\20-37 - Main & Hyde - WD2.dwg

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Notes:

Dimensions show framing size unless otherwise stated. All dimensions are to be checked on site prior to construction or prefabrication.

Internal / additional dimensions

Window setout

General dimensions

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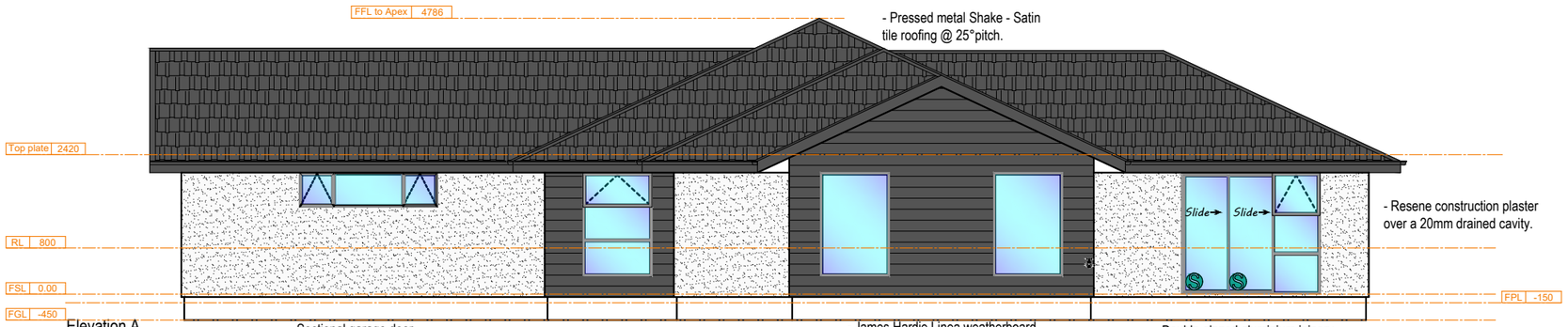
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Dimension floor plan

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DRAWN: Jonathan Barlow	REV 1	JOB No: GJ 20-37	
CHECKED: Jeff LBP-111561		SHEET No: A03	
LOT: 03 DP: 351707			

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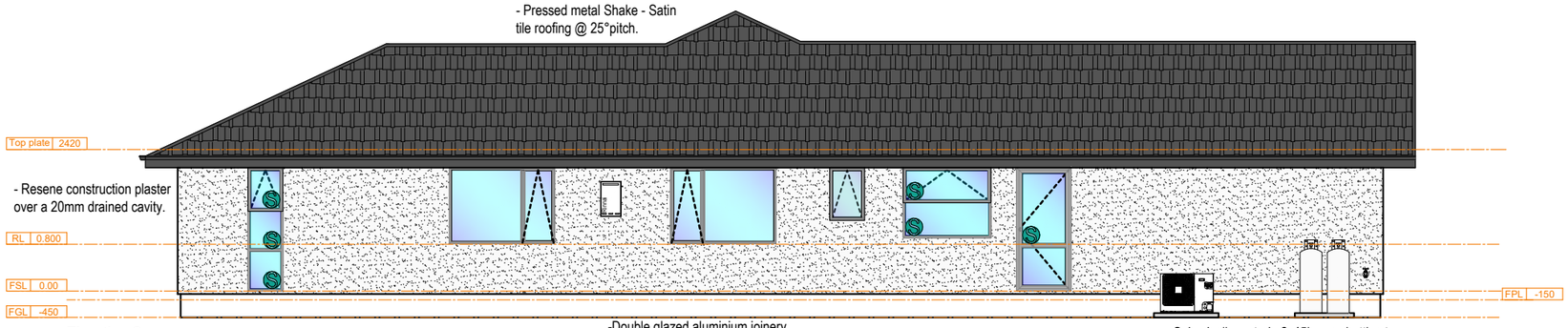
Elevation A
Scale 1:100

- Sectional garage door.
- James Hardie Linea weatherboard installed over a 20mm drained cavity.
-Double glazed aluminium joinery.
-Glazing thickness within all IGU's to comply with NZS:4223.



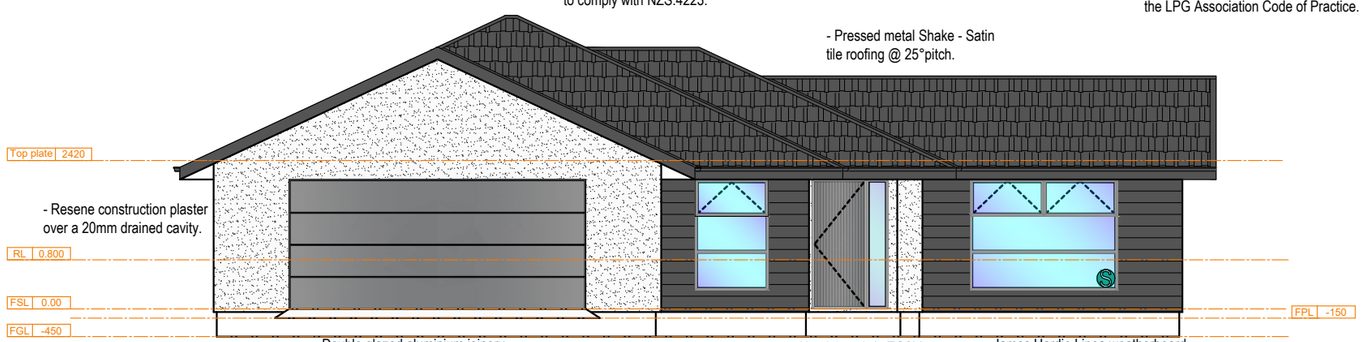
Elevation B
Scale 1:100

-Double glazed aluminium joinery.
-Glazing thickness within all IGU's to comply with NZS:4223.
- James Hardie Linea weatherboard installed over a 20mm drained cavity.



Elevation C
Scale 1:100

-Double glazed aluminium joinery.
-Glazing thickness within all IGU's to comply with NZS:4223.
- Seismically restrain 2x45kg gas bottles to the building with chain in accordance with the LPG Association Code of Practice.



Elevation D
Scale 1:100

-Double glazed aluminium joinery.
-Glazing thickness within all IGU's to comply with NZS:4223.
- Aluminium Axis TG&V entrance door.
- James Hardie Linea weatherboard installed over a 20mm drained cavity.

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

Notes:

No infringement/s in terms of height recession, if applicable worse case recession plane has been shown on elevations.

Where no window schedule has been provided, refer to elevations for window style and bracing plan for trim sizes.

If window layouts are changed during construction, refer to window manufacturer's PS1 for safety glazing requirements (where applicable the window manufacturer may select where safety glazing is required).

Risk matrix has been calculated on the worst case and will apply to all elevations.

Risk Matrix:	L	M	H	VH	EH		Score
Wind zone	0	0	1	2	2		1
Number of storeys	0	1	2	4	-		0
Roof/wall intersection design	0	1	3	5	-		0
Eaves width	0	1	2	5	-		1
Envelope complexity	0	1	3	6	-		3
Deck design	0	2	4	6	-		0
						Total:	5

Legend:	
FSL	Finished Slab Level.
FPL	Finished Paved Level.
FGL	Finished filled unpaved Ground Level
Ⓢ	Window pane to be glazed with safety glass in accordance with NZS 4223.3 2016
Ⓡ	Indicates restrictor stay preventing opening more than 100mm

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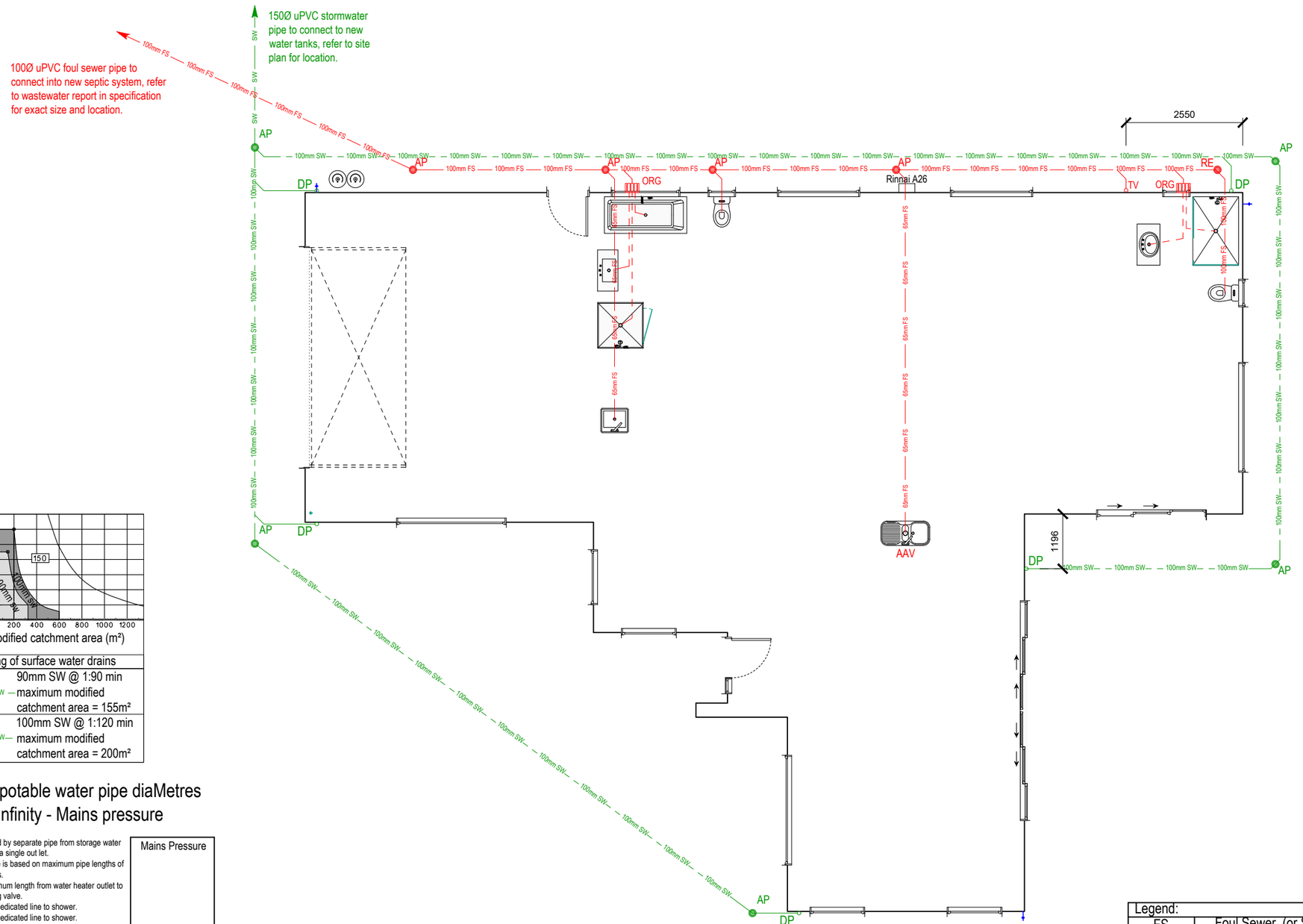
Proposed Residence.
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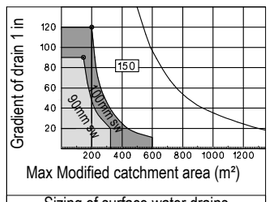
Elevations

GENERATED: 24 / 11 / 2020 9:26:44 am
SCALES: A3 1:100 A4 -
DRAWN: Jonathan Barlow
CHECKED: Jeff LBP-111561
REV: 1
JOB No: GJ 20-37
LOT: 03 DP: 351707
SHEET No: A04

Last modified by: Rebecca Paper size: ISO full bleed A3 (420.00 x 297.00 MM) File Location: Z:\00 Jobs\20-37 Main & Hyde\20-37 - Main & Hyde - WD1.dwg

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Sizing of surface water drains
90mm SW @ 1:90 min maximum modified catchment area = 155m²
100mm SW @ 1:120 min maximum modified catchment area = 200m²

Nominal potable water pipe diaMetres - Rinnai Infinity - Mains pressure

Notes:
(1) if supplied by separate pipe from storage water heater to a single out let.
(2) This table is based on maximum pipe lengths of 20 Metres.
(3) 2m maximum length from water heater outlet to tempering valve.
(4) 15mm if dedicated line to shower.
(5) 10mm if dedicated line to shower.

	Mains Pressure
Pipes to Shower	20mm (5) (15mm Optional) (1)
Pipes to sink/laundry (2)	20mm
Pipes to bath (2)	15mm
Pipes to basins (2)	10mm

In a household unit the developed length of the pipe-run from the water heater to the kitchen sink outlet shall be minimized, to the sizes noted below.

Nominal Pipe size (mm)	10mm	15mm	20mm
length (m)	25m	12m	7m

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Legend:	
FS	Foul Sewer. (or Sanitary Sewer)
SW	Storm Water.
DP	80mm Down Pipe.
AAV	Air Admittance Valve.
TV	Terminal Vent.
GT	Gully Trap.
ORG	Overflow Relief Gully.
AP	Access Point, inspection bend.
RE	Rodding eye brought to surface.

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

Notes:		
Potable water supply: All potable water supply pipes installed to G12 AS/1. Pipes to be polybutylene. All water supply pipe work outside the buildings thermal envelope and / or subject to UV light degradation is to be insulated with closed cell foam tubing or other another insulation product in accordance with NZS 4305.		
Water tank to house water supply pipe:	25MM	
Potable water pump: (or competitor's equivalent.) DAB - Divertron 1200		
Potable water Filter: (or competitor's equivalent.) Pentek - #20 Big Blue		
Surface water: All surface water works to be conducted to E1/AS1		
Hard stand areas (paving etc) to fall away from building, direct to either noted sumps connected to on site storm water system. Or toward garden / grassed areas for site soakage. Ensure surface water is contained on site.		
Gas fitting: All gas fitting works to G10/AS1 or AS/NZS5601.1 & AS/NZS 5601.2 - Suitably qualified gas fitter to complete works and provide energy works certificate on completion.		
Rinnai Infinity continuous flow A26 water heating unit, installed in factory recess kit. To be set to a maximum temperature of 55°C to all sanitary fixtures.		
Plumbing & Drainage: All plumbing drainage works on this plan are to G13/AS3 via AS/NZS 3500.2. suitably qualified drain layer to complete works and provide as built plan on completion.		
Plumbing fixture wastes: Plumber to confirm final kitchen & bathroom fixture waste layout prior to pre-pipe, confirm waste positions from kitchen design & main contractor before commencing.		
All pipe sizes mentioned below are minimum call sizes, they may be up sized for convenience or economic reasons.		
Pipe type:	Call size	Fall
Fixture to gully (PVC)	40mm	1:40
Gully to main drain (PVC)	100mm	1:60
WC to main drain (PVC)	100mm	1:40
Non soil fixture to main drain (PVC)	65mm	1:40
Main drain (PVC)	100mm	1:60
Terminal vent unless otherwise stated:	80mm	-
Where successive pipes pass though a foundation wall, (e.g. into a gully) pipes to be separated by a minimum of 25mm.		
Provide a tap over any ORG or gully trap with no fixture waste pipes terminating over them		
NOTE: All downpipes are to be located 250mm from external corners unless otherwise stated.		
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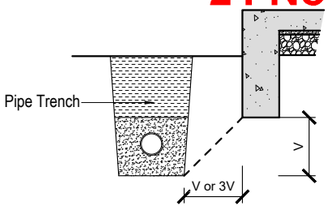
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Drainage plan

GENERATED: 20 / 11 / 2020 10:19:31 am
SCALES: A3 1:100 A4 -
DRAWN: Jonathan Barlow
CHECKED: Jeff LBP-111561
REV: 1
JOB No: GJ 20-37
LOT: 03 DP: 351707
SHEET No: A05

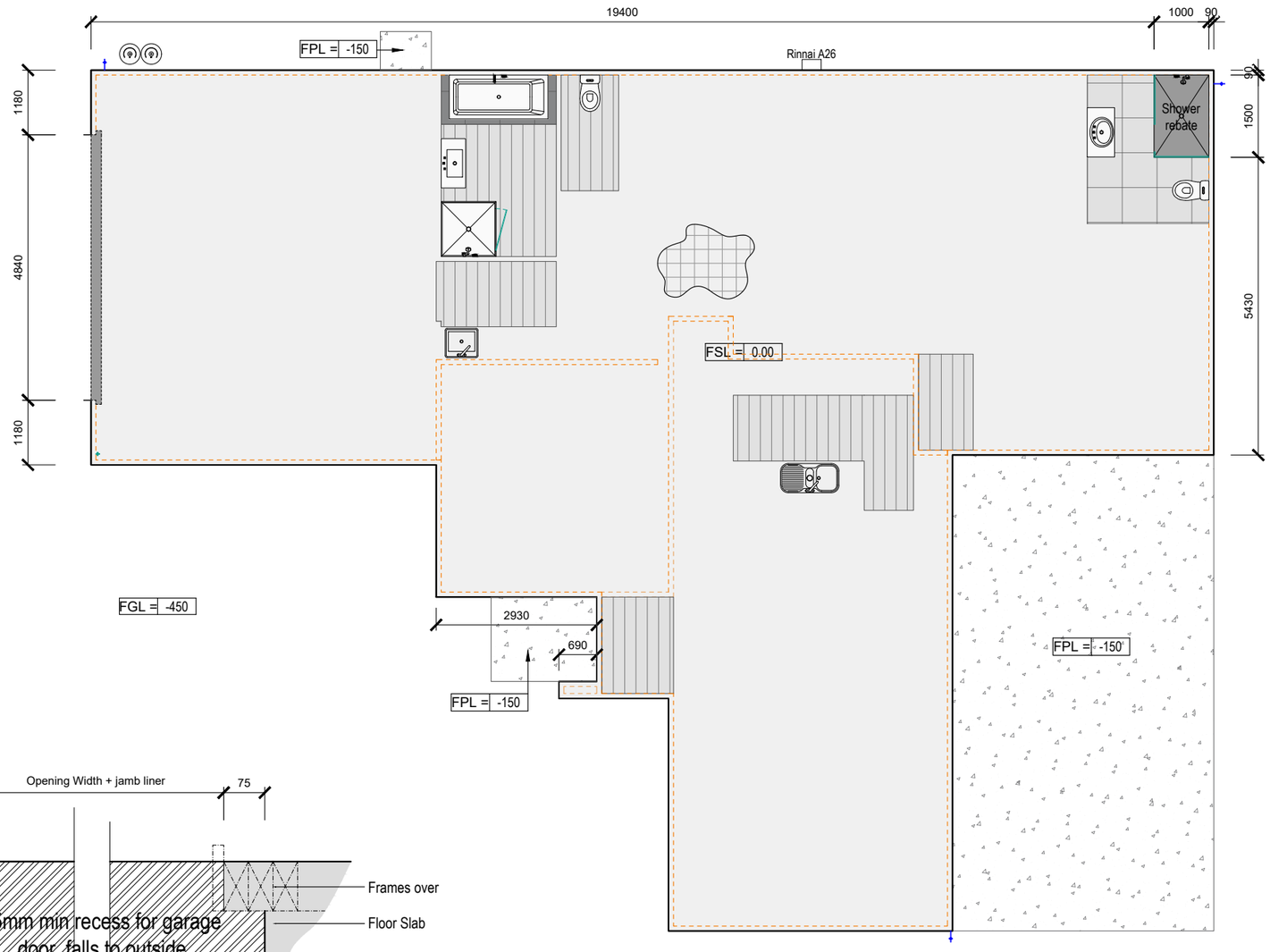
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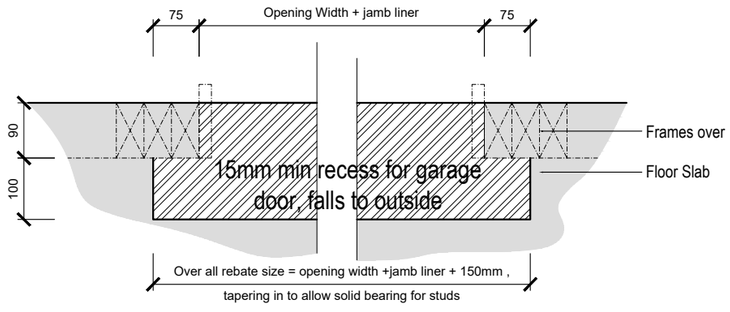
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Minimum horizontal distance between trench and foundation wall to be:
"V" if drain will be left open for less than 48 hours.
OR
"3V" if trench to be left open for longer than 48 hours.

Distance of Pipe trench to building foundation detail
Scale 1:30





Garage Door Rebate Detail
Scale 1:10

Notes:		
Foundation slab area:	203.56	m²
Foundation slab perimeter:	73.76	m
Foundation overall area:	203.56	m²
Foundation overall perimeter:	73.76	m
Cladding weight:	Light	
Roofing weight:	Light	
Concrete Strength:	SED MPa	

All house foundation / slab concrete to be:
RAFT MIX
to compressive strengths specified within Engineer designed Firth Rib Raft Floor system for house.Refer to engineers calc's and plans for all information relating to the foundation and slab, any foundation elements shown on the architectural drawings are illustrative only.
Damp proofing of Slab: (supervised by designer)

Slab to be on 250 micron black polythene DPM (lap joints 150mm and seal with PVC tape). Seal all penetrations to slab to DPM with a PVC Tape bandage. DPM so be seated on a 25mm sand blinding layer to protect DPM.

Legend:

	Area with tile / vinyl floor finish over, avoid saw cuts if possible.
	Indicates paving forming compliant access to the building, indicated area is the minimum extent of paving to be installed only.
	Indicates roof loads imposed on foundation from truss system above, see truss design for further information on loadings.

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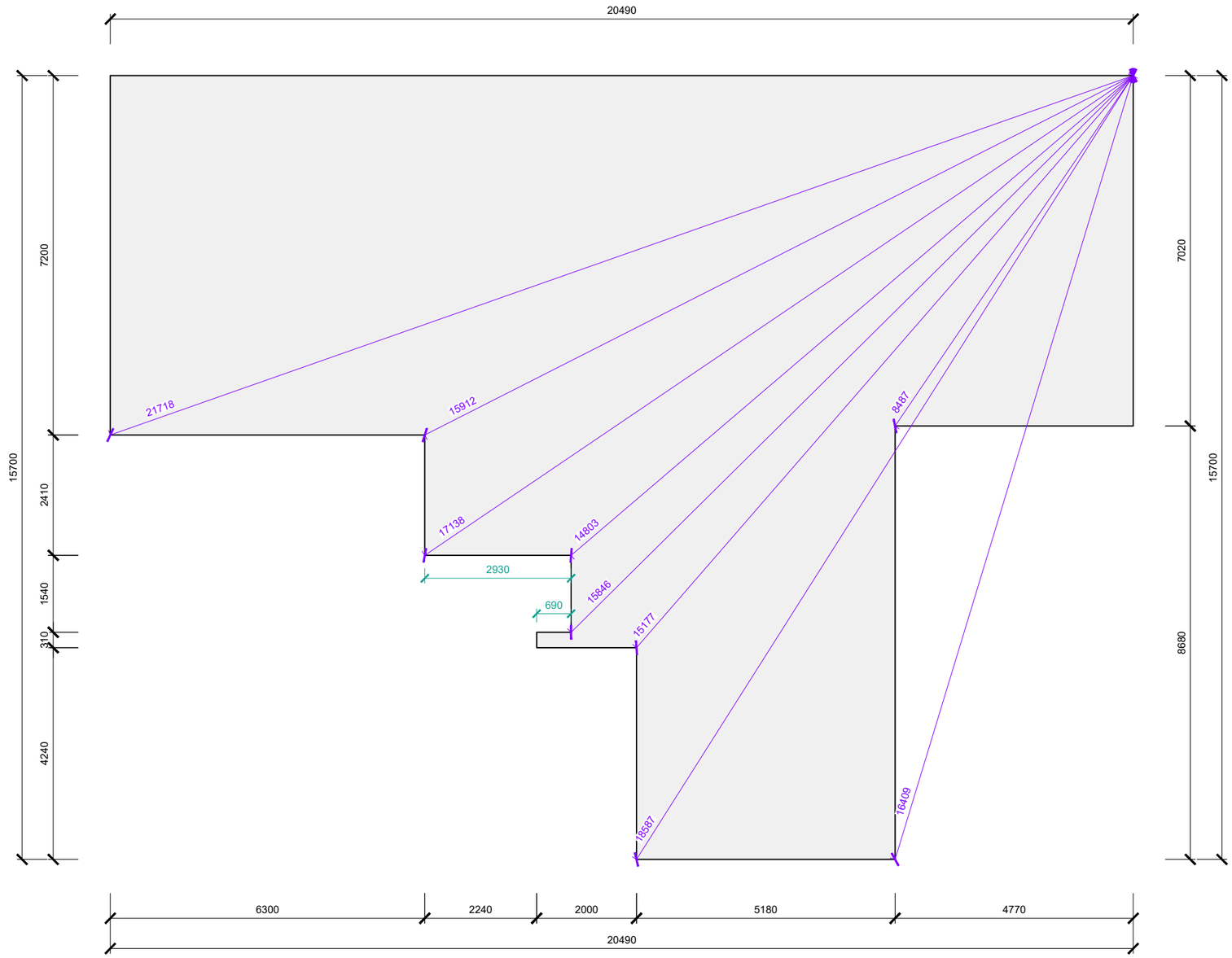
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Foundation plan

GENERATED:	24 / 11 / 2020 9:26:53 am	SCALES: A3	1:100 A4 -
DRAWN:	Jonathan Barlow	REV	JOB No: GJ 20-37
CHECKED:	Jeff LBP-111561	1	SHEET No: A06
LOT: 03	DP: 351707		

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Notes:

Additional dimensions

Overall set out dims

General setout dimensions

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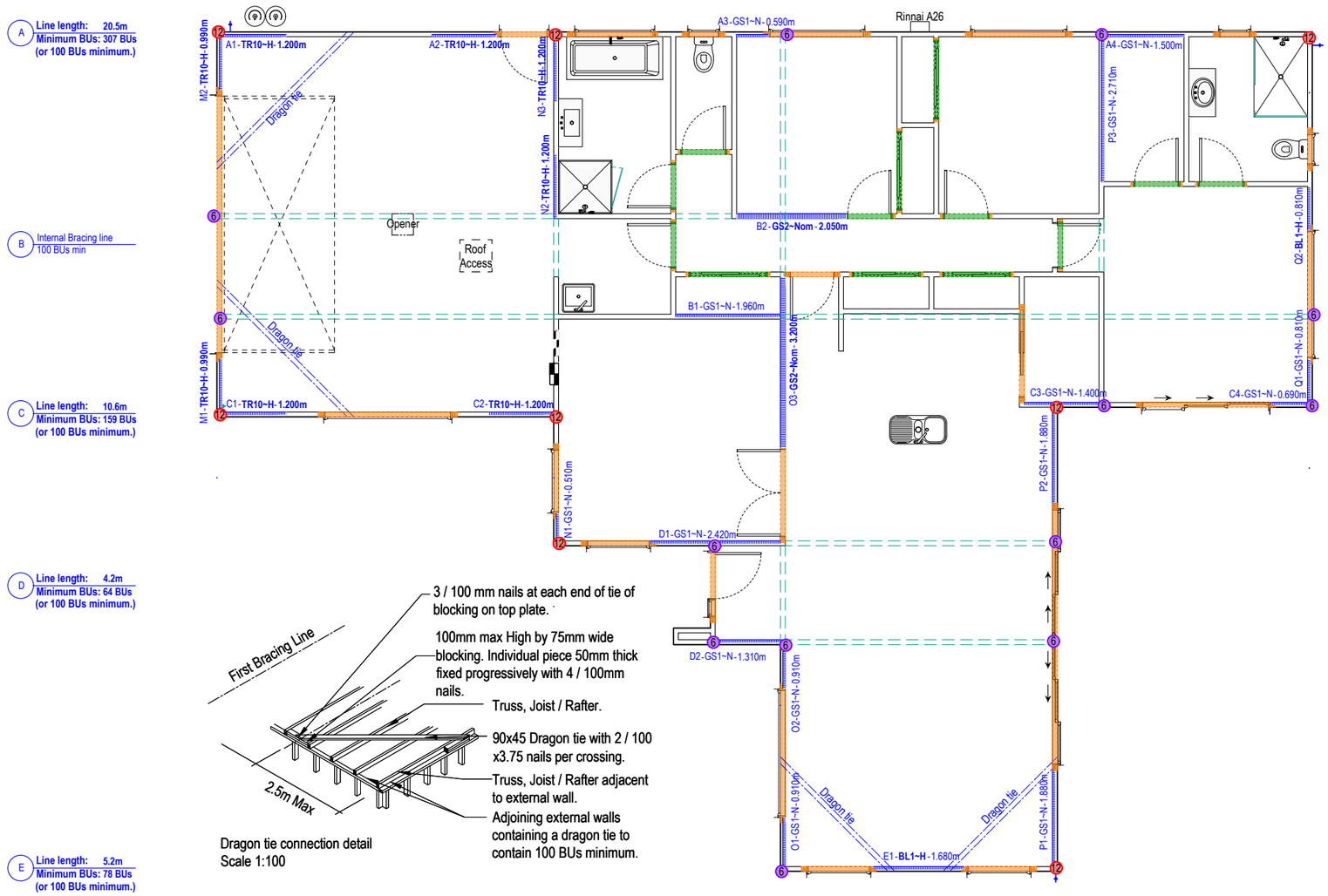
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Foundation setout

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DRAWN: Jonathan Barlow	REV 1	JOB No: GJ 20-37	
CHECKED: Jeff LBP-111561		SHEET No: A07	
LOT: 03 DP: 351707			

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Specified	Permitted Alternative Gib Plasterboard Products.						
	Gib Standard	Gib Ultraline	Gib Braceline/ Noiseline	Gib Aqualine	Gib Toughline	Gib Fyreline 10mm	Gib Fyreline 13mm- 19mm
Gib Standard		OK	OK	NOTE 2	OK	NOTE 1 & 3	NOTE 1,2 & 3
Gib Braceline / Noiseline.	X	X			OK	X	

Note 1 The fastener type and length must be as required for relevant FRR system using perimeter fixing pattern illustrated for the relevant bracing specification.
Note 2 The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern as illustrated for the relevant specification applies to all four corners of the element.
Panel hold down fixings are required.
Note 3 Traditional wall framing layouts (See figure 1 - Gib Bracing Systems August 2016) where a Fire Resistance Rating (FRR) is required.

Notes:	
Bracing parameters:	
Building area:	203.56m²
Wind zone:	High
Earthquake zone:	3

Building braced to Gib Bracing Systems August 2016.

Braces shall be installed on the side of the wall indicated on the plan with the below symbol, braces to be installed to manufacturer's installation specifications, refer to A4 documentation for installation specifications.

External ply braces to be within the building envelope and fixed with galvanised nails in accordance with Ecoply fixing specification.

Each wall containing bracing shall be connected at top plate level, either directly, or through a framing member, to external wall/s at right angles to the braces. Top plate connection capacity along the line shall be as follows:

1) Walls containing between 1 & 125 bracing units require connection to one external with a 6kN connection.

2) Walls containing between 126 & 250 bracing units require connection to two external walls with a 6kN connection.

3) Walls containing more than 250 bracing units require connection to two externals walls each having a kN rating of not less than 2.4kN per 100 bracing units in the wall.

Legend:

	Indicates brace location.
	Indicates framing member at top plate level (truss, rafter) or if neither in location provide additional member (additional ribbon board) for distribution/ restraint of bracing loads.
6 12	Indicates kN capacity required at top plate to external wall junction (or additional framing member to external wall junction.) Ensure any joints to top plate or framing member in the same line have a 6kN capacity joint minimum.
	Indicates 90x35 SG6 Min Dragon tie @ 45° angle, max distance from corner of frame to dragon tie = 2.5m. Refer to details for fixing requirements.

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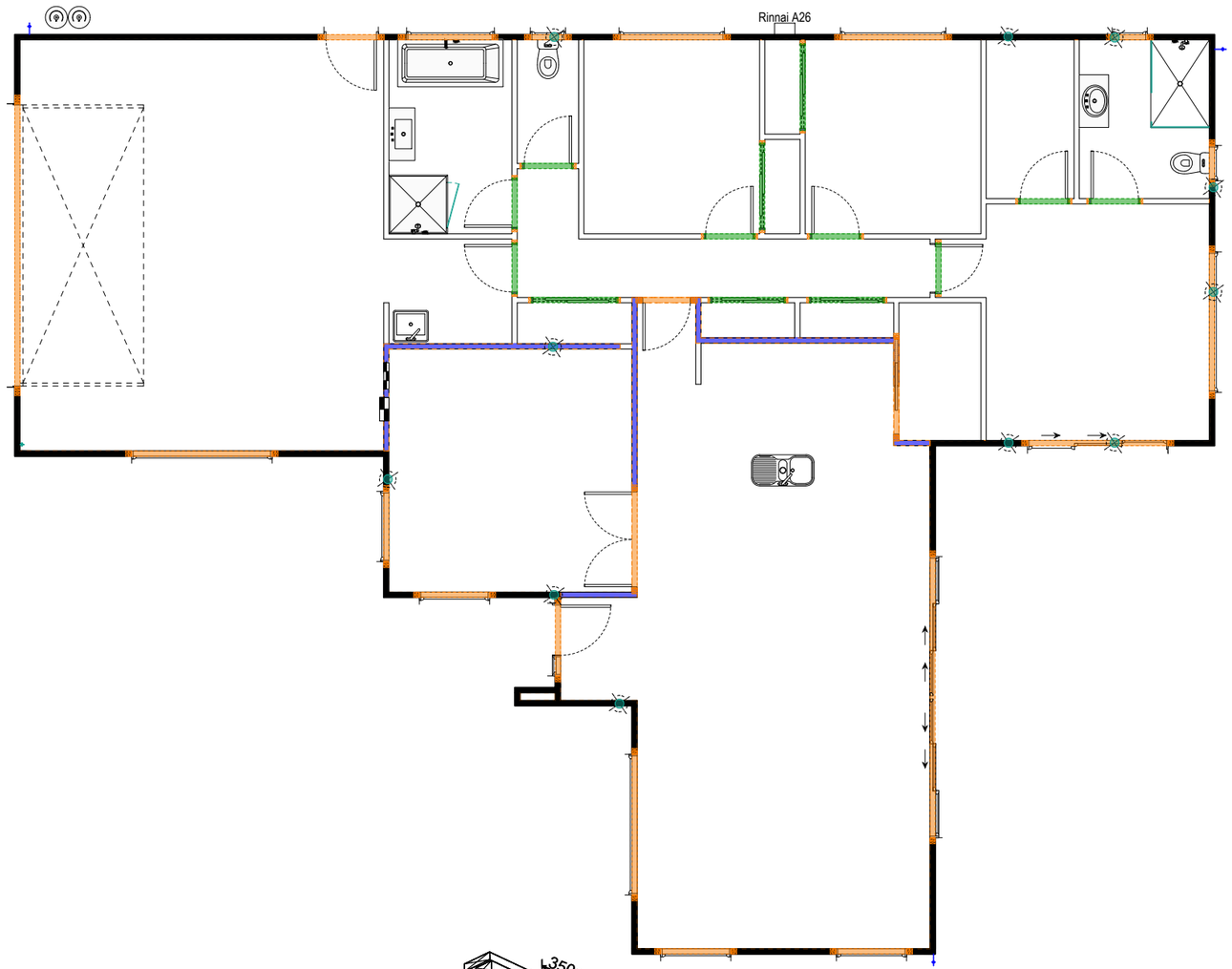
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Bracing plan

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Legend:

	Exterior load bearing walls: - 90x45 SG8 H1.2 studs Frame height: 2420mm Studs: @ 600mm c/c Dwangs @ 800mm c/c
	Internal load bearing walls: - 90x45 SG8 H1.2 studs Frame height: 2420mm Studs: @ 600mm c/c Dwangs @ 800mm c/c
	Internal non-load bearing walls: - 90x45 SG8 H1.2 studs Frame height: 2420mm Studs: @ 600mm c/c Dwangs @ 800mm c/c

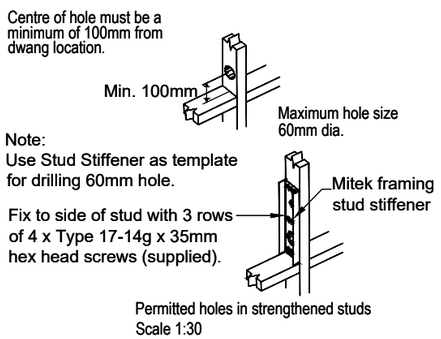
90x45 SG8 H1.2 top plate + additional 90x35 SG8 H1.2 Top plate laid over. Top plate fixing varies, see bracing plan for fixing details.
(allows 6m between bracing lines)

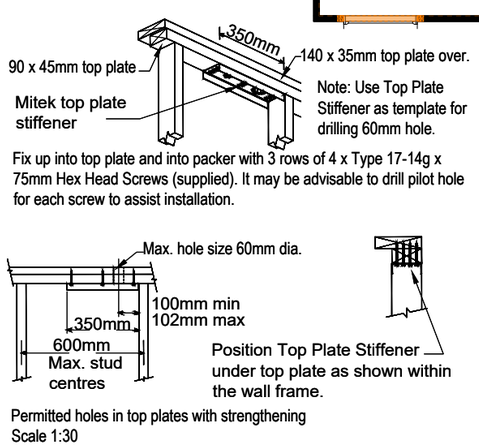
90x35
90x45

General framing fixings:
Bottom plate to stud fixing 3/90x3.15mm power driven nails. (end nailed.)
Dwang/nog to stud fixing 2/90x3.15mm power driven nails. (end nailed.)
Top plate to stud fixing 3/90x3.15mm power driven nails. (end nails, not including additional fixings as required by truss design.)
Second top plate to 140x35 top plate fixing 3/90x3.15mm nails at 500mm c/c max.

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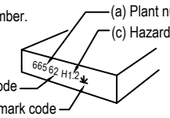
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Timber Preservatives and Identifying Timber:

The sequence of the information in the brand shall be:
(a) plant number.
(b) preservative code number.
(c) hazard class number.



Timber Preservatives Note:
Where H3.1, H3.2, H4 or H5 timber treatment is required, CCA (Copper Chromium Arsenic) preservative code 01 must only be used. Galvanised fixings can be used with CCA treated timber.

If alternative preservatives such as ACQ (Alkaline Copper Quaternary) preservative code 90 or CA (Copper Azole) preservative code 58 are instead used, Stainless Steel 304 or 316 fixings must always be used to timbers with these alternative preservatives and NOT galvanised steel fixings.

Timber framing treatment levels:
Treatment levels to comply with NZBC clause B2/AS1 Durability, NZS3602:2003 Timber and Wood-based Products for Use in Building and NZS3640:2003 Chemical Preservation of Round and Sawn Timber.
This table is a summary of the minimum treatment level requirements only.
Higher levels may be used in any situation.

Building element	Treatment
- Roof framing, trusses and ceiling joists. - Interior wall framing. - Interior exposed beams radiata pine. - Exterior wall framing.	H1.2
- Enclosed framing within skillion roofs - Exterior wall framing and parapets - Lower interior load bearing wall framing or enclosed beam and post under an exterior wall. - Subfloor framing - Enclosed framing within flat or low pitch roofs. (<10°)	H1.2
- Cladding cavity battens (caution: LOSP cavity battens must not be in contact with butyl rubber/EPDM membranes e.g. enclosed decks)	H3.1
- Framing for enclosed decks, balconies and balustrades, - Enclosed post and beam or wall trimming studs and lintels under enclosed decks, - Exposed decking and external above ground post and beams, stairs and balustrades.	H3.2
- Piles and posts in ground	H5

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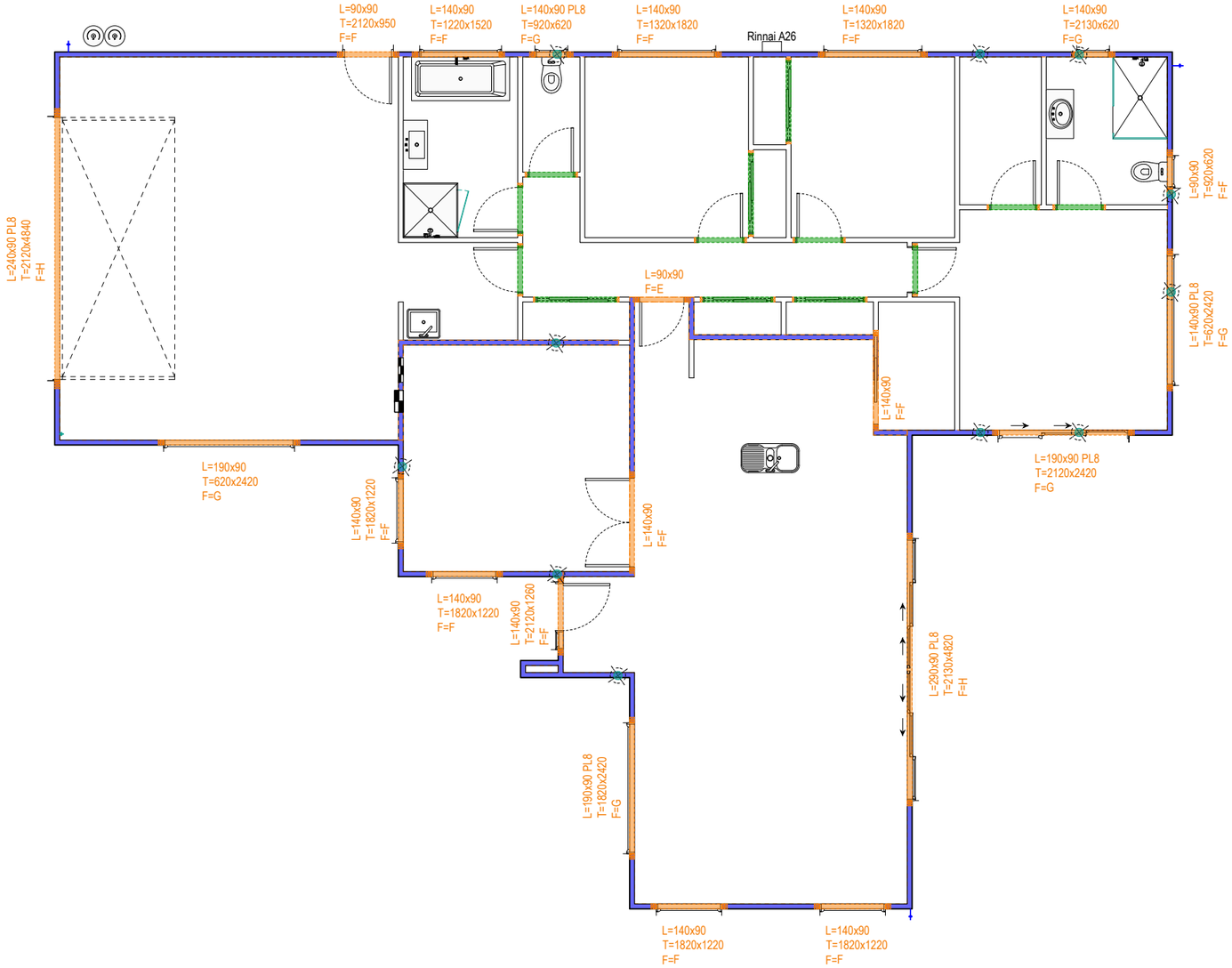
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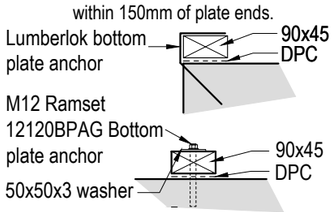
Framing plan

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DRAWN:	Jonathan Barlow	REV	1
CHECKED:	Jeff LBP-111561	JOB No:	GJ 20-37
LOT:	03	DP:	351707
		SHEET No:	A09

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Notes:
Unless otherwise specified all lintels to be Structural Grade 8 (SG8). Any SG8 lintel may be substituted for built up members sized and laminated with 90x3.15 dia nails @ 270mm c/c max along the member. In accordance with 2.4.4.7 NZS3604:2011(eg. 90x90 = 2/90x45.)
All trim sizes to be site measured before manufacturing windows.
Drained cavity cladding systems: Designer has allowed a nominal 20mm trim to all openings height and width.
Lintel & top plate fixing types as defined in Lumberlok site guide 2018 edition.
Load bearing wall bottom plates - 90x45 SG8 H1.2 min bottom plate, plate on bituminous DPC fixed to perimeter of slab with Lumberlok bottom plate anchors + 1/ 75x4mm dia concrete nail adjacent, within 150mm of every plate end and @ 900c/c max. Internal load bearing and/or walls with bracing elements associated exceeding 70BUs/m to be fixed to slab with 120mm TruBolts @ 900mm c/c with 50x50x3 washers and within 150mm of plate ends. 
Bottom plates of internal non load bearing walls to be fixed to slab with Ramset HD875 Drive pins @ 600mm c/c MAX (or other proprietary powder actuated 75mm drive pin & washer set that meets the requirements of NZS 3604:2011 7.5.12.4)

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Legend:	
L=	Lintel size.
T=	Trim size **(Height x Width)** window rough opening size
F=	Lintel fixing for uplift restraint.
L# (L1)	Reference to member number on design calculations or selection table within A4 docs.
Window head height: 'hard to soffit' (approx box height 2110mm = approx lintel base height of 2120mm.) Figures based on a 190mm colourseel fascia, Confirm exact fascia profile/dimensions used to determine exact box height for full height joinery on site prior to manufacture.	
	Top plate fixing : 4.7kN ("Type B") Bottom plate fixing : 120mm M12 TruBolts (M12 Ramset 12120BPAG Bottom plate anchor) All bottom plate fixings within 150mm of every plate end and @ 900c/c. Any bolts to be fitted with 50x50x3 galv washers + Additional hold downs required by any specified bracing panels and / or lintel fixings.
	Top plate fixing: 0.7kN ("Type A") Bottom plate fixing : Ramset HD875 Drive pins @ 600mm c/c MAX (or other proprietary powder actuated 75mm drive pin & washer set that meets the requirements of NZS 3604:2011 7.5.12.4) + Additional hold downs required by any specified bracing panels and / or lintel fixings.
	Indicates lintel or beam over taking roof or floor load, see plan for sizing and fixing requirements.
	Indicates 90x45 SG8 H1.2 trimmer over opening on flat, fixed at each end with 3/90x3.15 nails
	Indicates load point of a concentrated load above (girder truss or ridge beam etc.)
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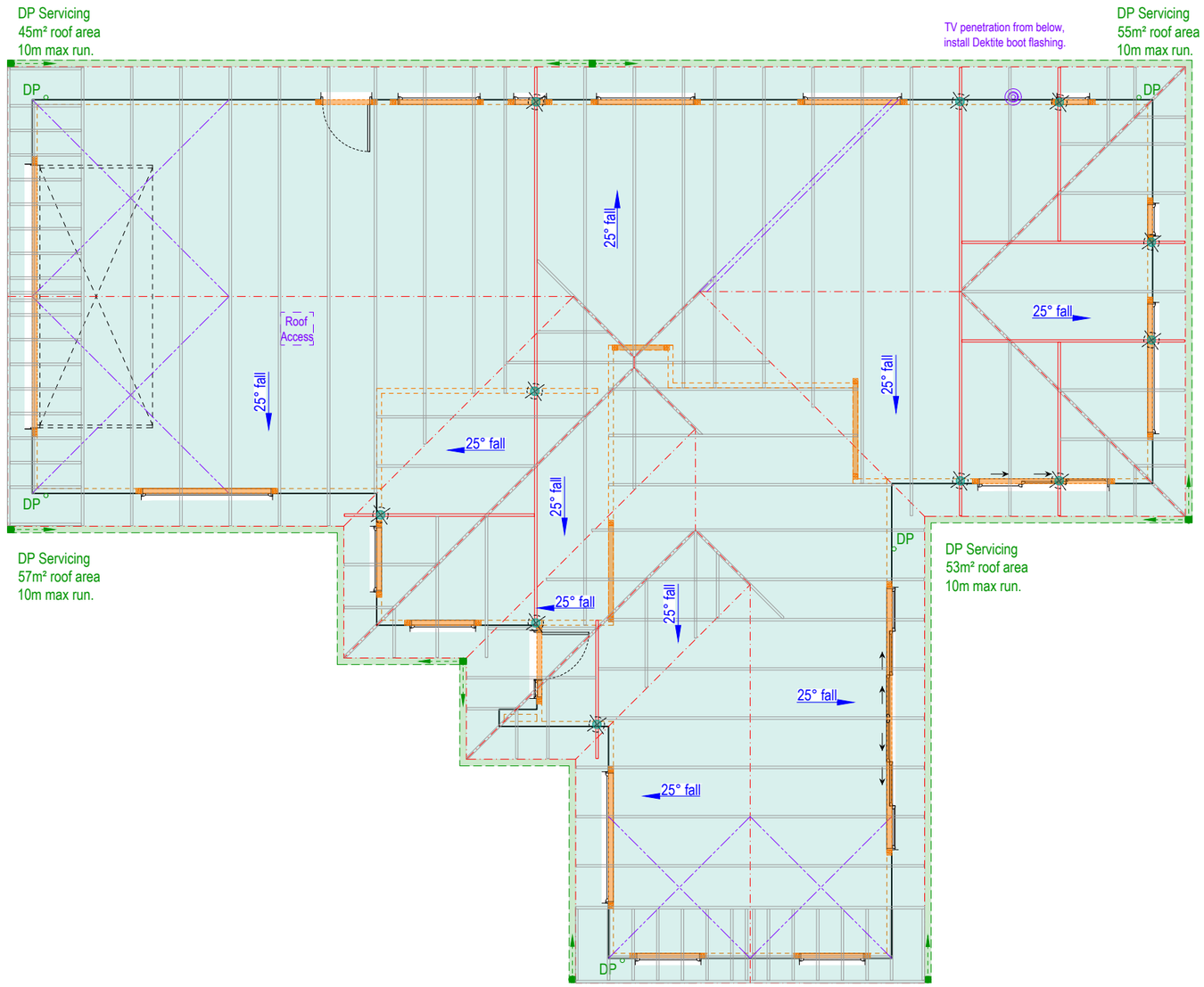
Beam & uplift fixing plan

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DRAWN: Jonathan Barlow CHECKED: Jeff LBP-111561	REV 1	JOB No: GJ 20-37	
LOT: 03 DP: 351707		SHEET No: A10	

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Purlin and tile batten fixing: (NZS3604: 2011 fixing options:)	
Capacity:	Fixing Requirements:
~~0.55kN~~	~~1 / 90mm x 3.15 dia. power driven nail or 1 / 100mm x 3.75 dia. hand driven nail~~
0.8kN	2 / 90mm x 3.15 dia. power driven nail or 2 / 100mm x 3.75 dia. hand driven nail
2.4kN	1 / 10g self drilling screw, 80mm long
4.7kN	2 / 90 x3.15 dia. power driven skewed nails or 2 / 100mm x 3.75 dia. hand driven nail PLUS 2 wire dogs
5.5KN	1/14 g type 17 screw 100mm long
7.0kN	2 / 90 x3.15 skewed nails or 2 / 100mm x 3.75 dia. hand driven nail PLUS strap fixing - (see figure 10.6 NZS3604: 2011)
(MiTek purlin and tile batten fixings from site guide 2018 edition (alternative solution)	
Capacity:	Fixing Requirements:
~~0.55kN~~	~~90mm x 3.15 dia. power driven nail. or 100mm x 3.75 dia. hand driven nail.~~
0.8kN	2/90mm x 3.15 dia. power driven nail. or 2/100mm x 3.75 dia. hand driven nail.
2.4kN	1/80mm x 10 gauge Lumberlok blue screw.
3.45kN	~~Purlin on flat ~~ 2 / 80mm x 10 gauge Lumberlok blue screws. ~~Purlin on edge ~~ 2 / 100x3.75mm skewed nails.
5.5kN	PLUS 2 wire dogs. 2 / 90 x3.15 power driven skewed nails. or 2 / 100mm x 3.75 dia. hand driven nail. PLUS 1 Ct200. or 1 pair of CPC40.



Legend:	
DP	80mm Down Pipe
	Indicates fall to spouting.
	Indicates internal & external load-bearing wall
	Indicates load point of a concentrated load above (girder truss or ridge beam etc.)
	Indicates opposing LumberLok 0.91mm x 25mm G300 Z275 galvanised steel strip brace fixed with 11/30mm x 3.15mm diameter flathead LumberLok galv product nails at each end.
	Indicates 90x19mm (min thick) timber plane brace, fixed with 3/ 90x3.15mm diameter nails per crossing, refer to details for end fixing.

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Notes:		
Wind zone:	High	
Snow loading:	N1	
Site elevation:	< 400m	
Roof pitch:	25°	
Soffits:	600mm	
Barges:	450mm	
Bottom chord restraints:	600mm c/c	
Roofing weight:	Light	
Roof plan area:	247.27	m²
Roof plan perimeter:	76.58	m

Roof's structure to be trusses @ 900mm c/c to manufacturer's design and fixing specification.

Gib Rondo Battens @ 600mm c/c fixed with 2 / #6 Gib grabber scavenger head self tapping screws, one each side directly though the flange of the batten per crossing of truss bottom chord (minimum 30mm penetration into truss bottom chord). Battens act as bottom chord restraints, ceiling to be lined with 13mm gib board stopped to a F4 paint quality finish.

Boxed soffit framing:
90x45 SG8 H1.2 soffit stringer against house, nailed to every stud with 2/90x3.15mm power driven nails.
90x45 SG8 H1.2 boxed soffit framing at 600mm c/c fixed at each end with 2/90x3.15 dia power driven nails.

Metal tile roofing: Pressed metal Shake - Satin Roofing on 50x40 SG6 min H1.2 tile battens @ 370mm c/c fixed for uplift restraint with a 0.8kN fixing (or greater) to to entire roof
- Tile batten fixing:
2 / 90mm x 3.15 dia. power driven nails.
Roof to have self supporting breather type building paper to roof to be Thermakraft 215 (or other equivalent product).
Lay building paper perpendicular to roof pitch. (laid across roof).

All roof penetrations to be flashed with appropriately sized EDPM dektite boot flashings.

Capacity of external gutter. (m²) - measured one side of downpipe

Gutter size (mm²)	Roof pitch (degrees)			
	0-25	26-35	36-45	46-55
125mm OG (Old Gothic) 5800mm²	48	40	32	26
¼ Round quad 6200mm²	55	47	37	31
125mm box gutter 7500mm²	66	56	46	36
½ Round 7700mm²	70	59	48	39

Maximum plan area of roof served by gutter (m²)

Capacity of downpipes.

Down pipe size	Roof pitch (degrees)			
	0-25	26-35	36-45	46-55
65mm dia	60	50	40	35
80mm dia	85	70	65	50
100mm dia	155	130	110	90

Maximum plan area of roof served by gutter (m²)

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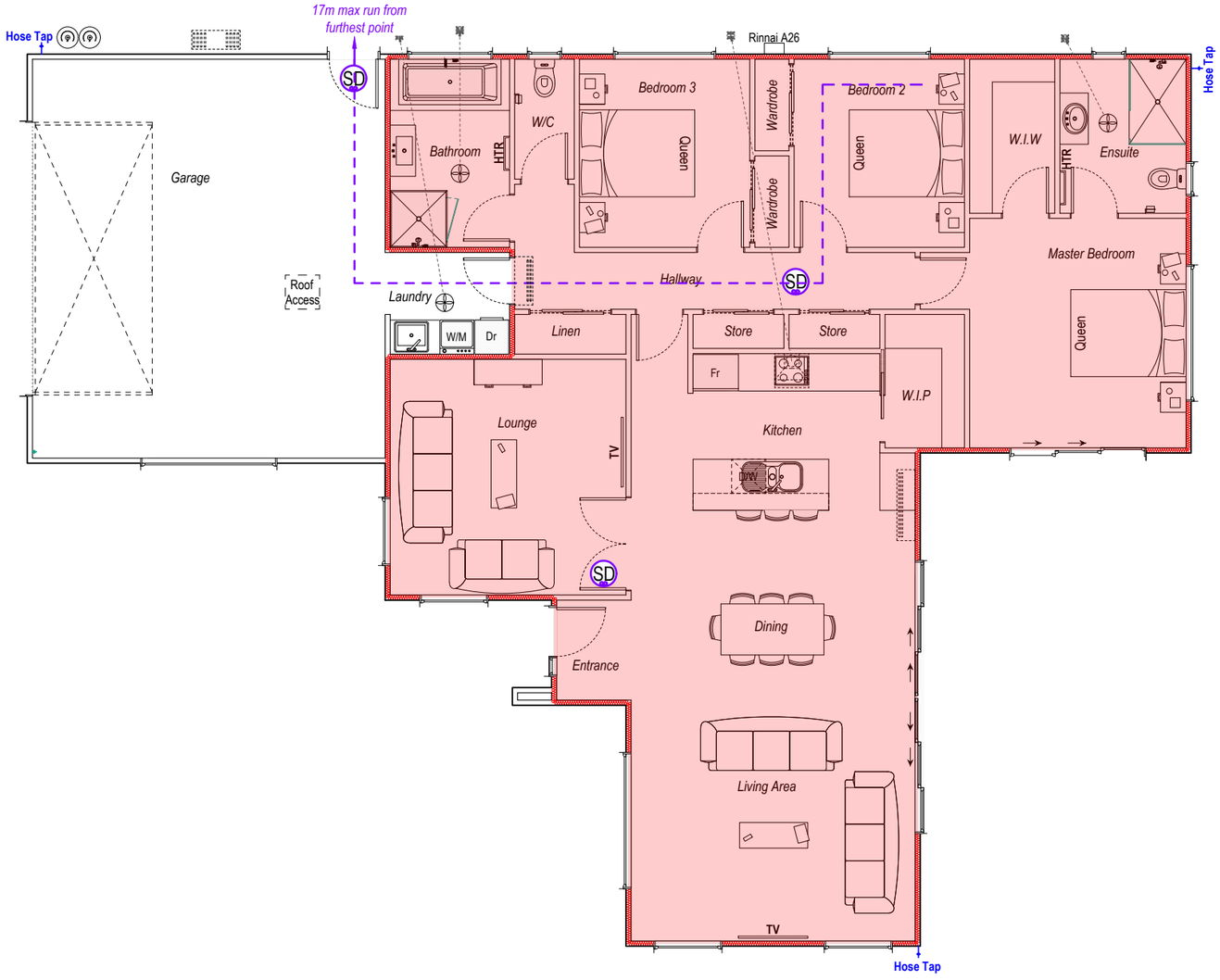
Proposed Residence.
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Roof plan

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CHECKED: Jeff LBP-111561
LOT: 03 DP: 351707
SCALES: A3 1:100 A4 -
REV: 1
JOB No: GJ 20-37
SHEET No: A11

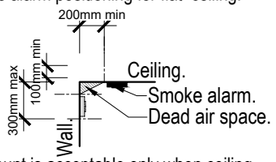
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Lighting & ventilation schedule					
Room name	Room area	10% Light requirement	Light achieved	5% Ventilation required	Ventilation achieved
Bedroom 1	16.16	1.62	5.06	0.81	4.39
Bedroom 2	9.93	0.99	1.98	0.50	.78
Bedroom 3	9.93	0.99	1.98	0.50	.78
Lounge	17.22	1.72	2.46	0.86	1.32
Kit / Liv / Din	53.55	5.35	16.19	2.68	9.4
Bathroom	6.95	0.70	1.59	0.35	.89
Ensuite	6.02	0.60	1.05	0.30	.4
WC	2.22	0.22	.49	0.11	.49
Total glazing area:			30.800000		
Note: Kitchen / Living / Dining are open plan.					
	Indicates area where 10% light area is not a requirement.				

Smoke alarm positioning for flat ceiling.



Wall mount is acceptable only when ceiling mount is unavailable, wall mount zone between 100mm & 300mm from ceiling.
Note: Exposed beams or other projections in ceiling plane shall be treated as a walls.

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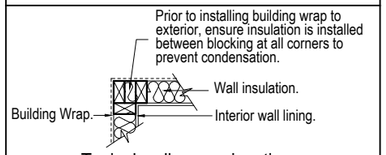
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Notes:		
Thermal / glazing calculations:		
External wall perimeter: (excl garage & measured @ inside face of thermal envelope)	63.80	m
House stud height:	2420	mm
Total glazed area:	30.80	m²
Total wall area:	154.40	m²
Wall area less glazing:	123.60	m²
% of wall area glazed:	19.95	%

The combination of the use of the above minimum R-Values, double glazed window joinery and the fact the window area on the East, West and South walls is less than 30% of the total wall area. By default this design complies with H1 via the schedule method.

No insulation to external garage walls or ceiling above garage, insulate internal garage walls between garage and house.

Insulation with greater R-Values than stated above can be installed provided the insulation is not compressed in any way and there is a 25mm air gap above ceiling insulation.



Typical wall corner junction.

Recessed luminaires shall be one of the following types, as specified in AS/NZS 60598.2.2:
a) IC-F, or b) IC, or c) CA-80 or d) CA-135.
Full compliance can only be achieved if the installation of the luminaire is in accordance with AS/NZS 60598.2.2

Lighting along all access routes to have a minimum illuminance of 20 lux at floor level in accordance with G8/AS1 NZBC.

Legend:

	Indicates worst case DEP Length (escape length)
SD	Indicates Type 1 Domestic Smoke alarm, either hard wired or 10yr battery operated. Smoke alarm to be installed on the ceiling and have hush button. Position so test button is readily accessible for monthly testing.
	Indicates ceiling insulation: R3.2 Pink Batts ceiling insulation (or equivalent / greater R-Value).
	Indicates wall insulation: R2.4 Pink Batts insulation (or equivalent / greater R-Value).

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Fire safety, thermal
lighting & ventilation plan

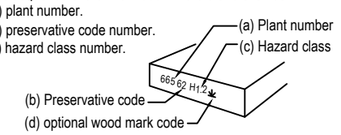
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Timber Preservatives and Identifying Timber:

The sequence of the information in the brand shall be:
(a) plant number.
(b) preservative code number.
(c) hazard class number.



Timber Preservatives Note:
Where H3.1, H3.2, H4 or H5 timber treatment is required, CCA (Copper Chromium Arsenic) preservative code 01 must only be used. Galvanised fixings can be used with CCA treated timber.

If alternative preservatives such as ACQ (Alkaline Copper Quaternary) preservative code 90 or CA (Copper Azole) preservative code 58 are instead used, Stainless Steel 304 or 316 fixings must always be used to timbers with these alternative preservatives and NOT galvanised steel fixings.

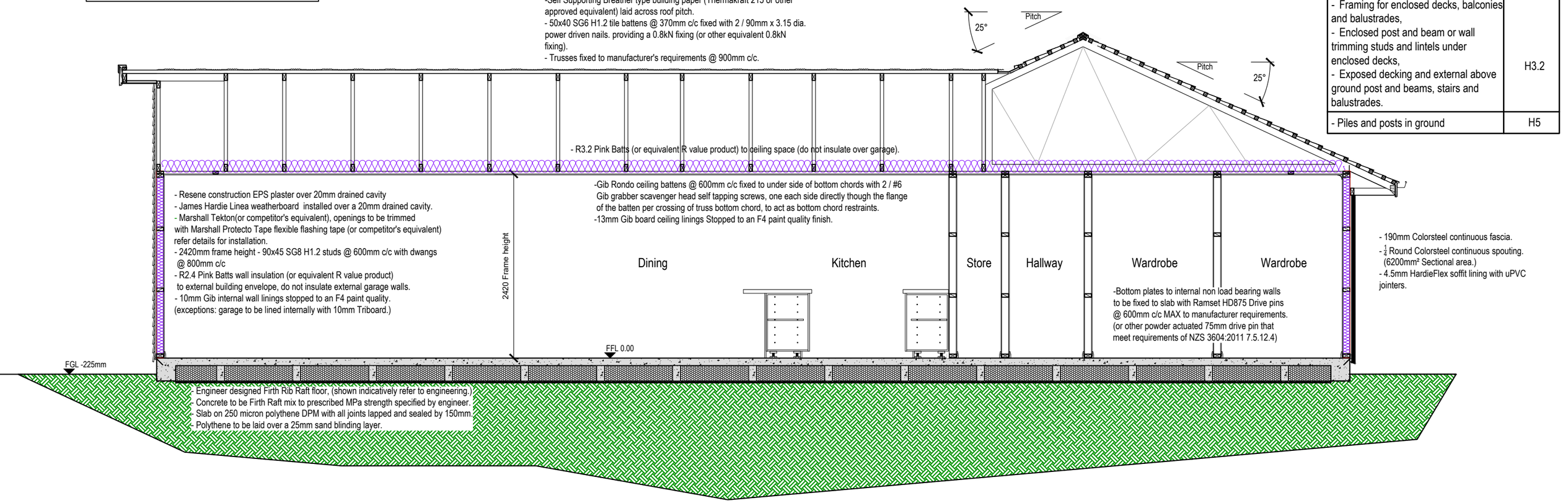
Cladding systems on a cavity:

Where stud spacing is greater than 450mm an intermediate means of restraining the building wrap and insulation shall be installed using either:
a) 75mm galvanised mesh.
b) Polypropylene tape @ 300mm c/c
c) Galvanised wire stapled @ 300mm c/c to dwangs over the building wrap.
d) Vertical cavity battens @ 300mm c/c.

Timber framing treatment levels:

Treatment levels to comply with NZBC clause B2/AS1 Durability, NZS3602:2003 Timber and Wood-based Products for Use in Building and NZS3640:2003 Chemical Preservation of Round and Sawn Timber.
This table is a summary of the minimum treatment level requirements only.
Higher levels may be used in any situation.

Building element	Treatment
- Roof framing, trusses and ceiling joists. - Interior wall framing. - Interior exposed beams radiata pine. - Exterior wall framing.	H1.2
- Enclosed framing within skillion roofs - Exterior wall framing and parapets - Lower interior load bearing wall framing or enclosed beam and post under an exterior wall. - Subfloor framing - Enclosed framing within flat or low pitch roofs. (<10°)	H1.2
- Cladding cavity battens (caution: LOSP cavity battens must not be in contact with butyl rubber/EPDM membranes e.g. enclosed decks)	H3.1
- Framing for enclosed decks, balconies and balustrades, - Enclosed post and beam or wall trimming studs and lintels under enclosed decks, - Exposed decking and external above ground post and beams, stairs and balustrades.	H3.2
- Piles and posts in ground	H5



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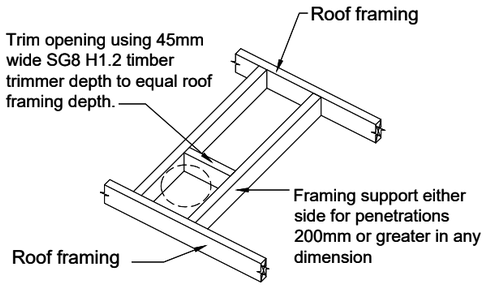
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Section Z-Z

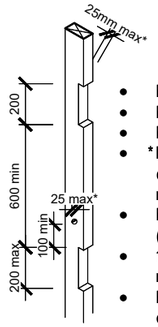
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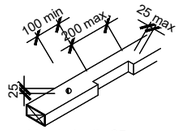


Roof penetration support detail
Scale 1:30



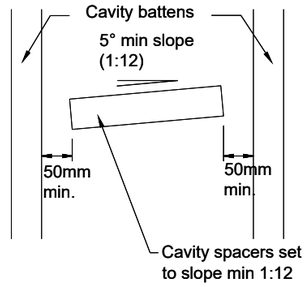
- Max hole dia 25mm
- Max notch depth 25mm
- Max notch height 200mm
- * For 90mm wide studs the depth of notches and diameter of holes may be increased to 35mm where no more than 3 consecutive are drilled or notched.
- Notches in studs to be spaced 600mm apart (independent of edge containing the notch).
- 100mm min offset between a hole in a stud and a notch in a stud
- **NOTE: trimming studs may not have any holes or notches with the middle third of their length.**

Permitted holes and notches in un strengthened studs
Scale 1:30



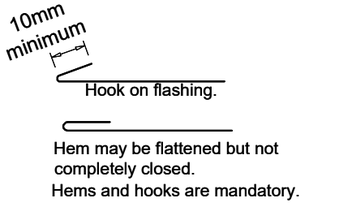
- Max hole dia 25mm
- Max notch depth 25mm
- Max notch length 200mm
- 100mm min offset between a hole in a plate and a notch in a plate
- If the above is not complied with, strengthening with 8.7.5.1 of the NZS3604 must be installed

Permitted holes and notches in top plates not requiring strengthening
Scale 1:30

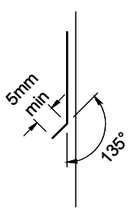


Note: Spacing of cavity spacers will vary to suit individual cladding fixings.

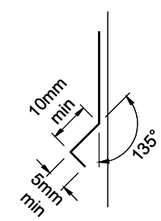
Cavity batten spacer detail
Scale 1:10



Hem may be flattened but not completely closed.
Hems and hooks are mandatory.



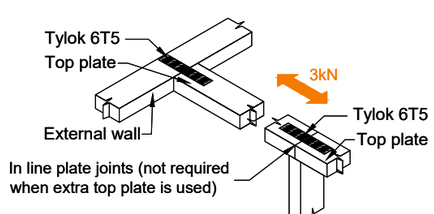
'Kick-out' at bottom edge of vertical flashing.



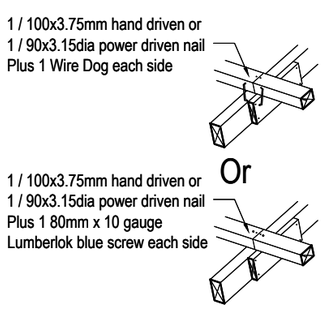
Birdsbeak at bottom edge of vertical flashing.

Hems and hooks may be omitted off flashing upstands on condition the upstand dimensions are increased by 25mm

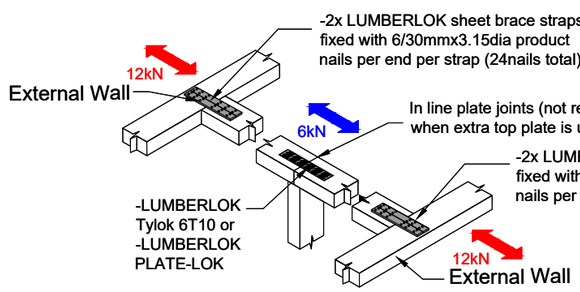
Typical metal flashing edge treatments
Scale 1:10



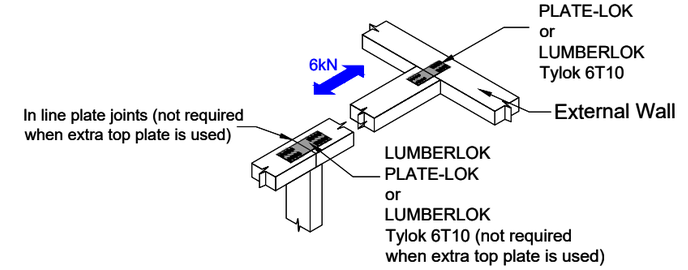
3kN in line top plate connection
(unbraced wall or wall with less than 100BUs in wall)
Scale 1:20



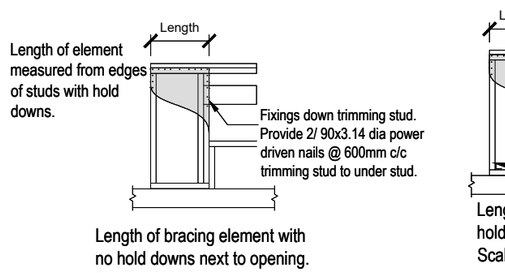
Joining purlins up to 2.7Kn fixing requirement
Scale 1:30



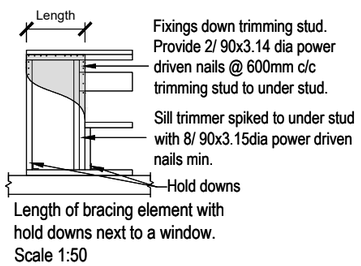
12kN double T junction top plate connection.
(250 to 500 BUs in wall)
Scale 1:20



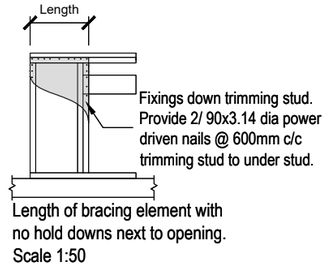
6kN Single T junction top plate connection.
(100 to 125 BUs in wall)
Scale 1:20



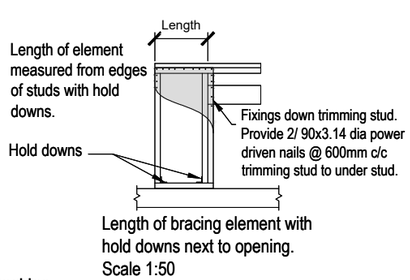
Length of bracing element with no hold downs next to opening.
Scale 1:50



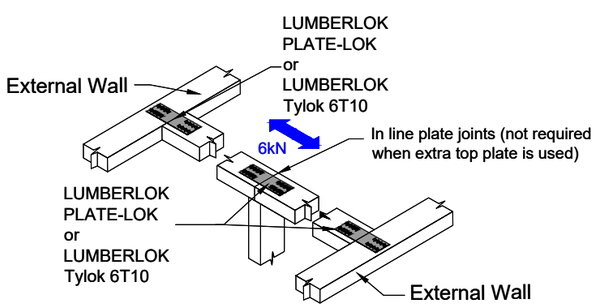
Length of bracing element with hold downs next to a window.
Scale 1:50



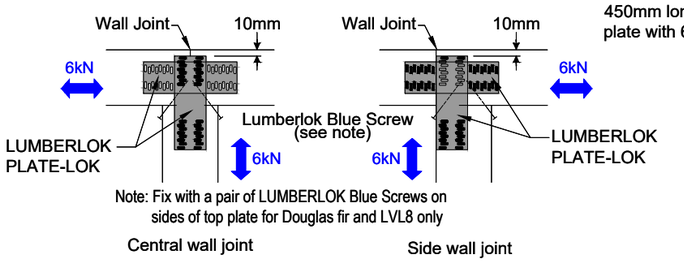
Length of bracing element with no hold downs next to opening.
Scale 1:50



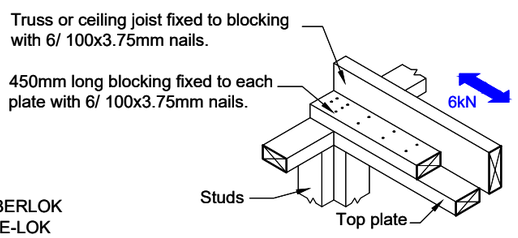
Length of bracing element with hold downs next to opening.
Scale 1:50



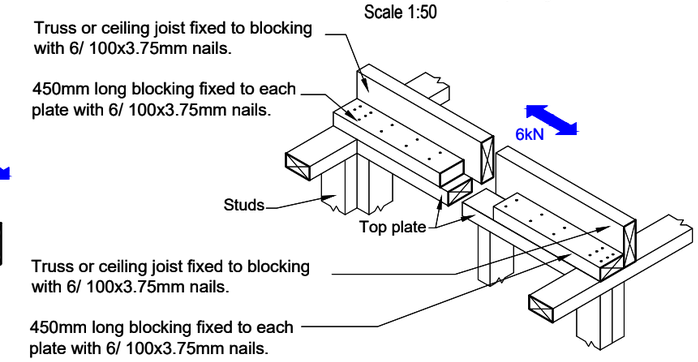
6kN double T junction top plate connection.
(126 to 250 BUs in wall)
Scale 1:20



6kN Top plate T junctions when external wall joins at junction.
Scale 1:20



6kN single T junction connection through a roof framing.
(up to 125 bracing units in wall)
Scale 1:20



6kN double T junction connection through a roof framing.
(125 to 250 BUs in wall)
Scale 1:20

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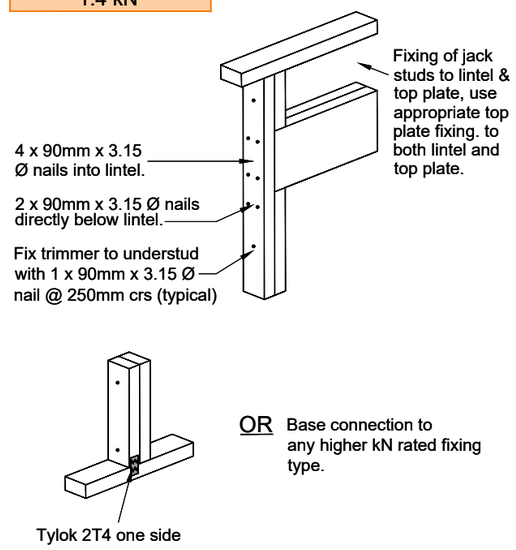
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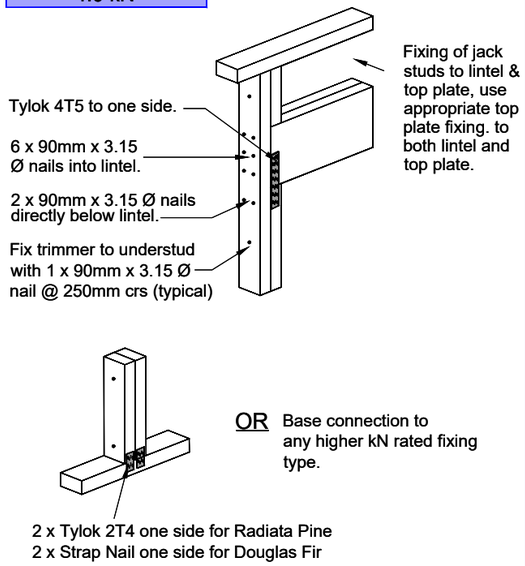
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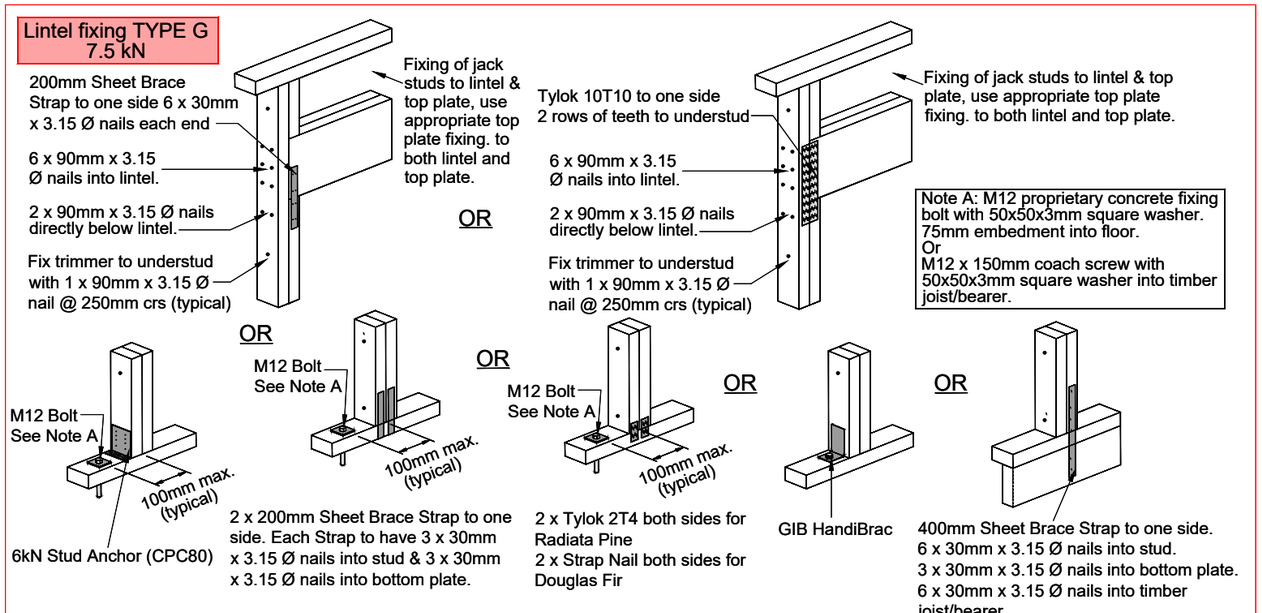
Lintel fixing TYPE E 1.4 kN



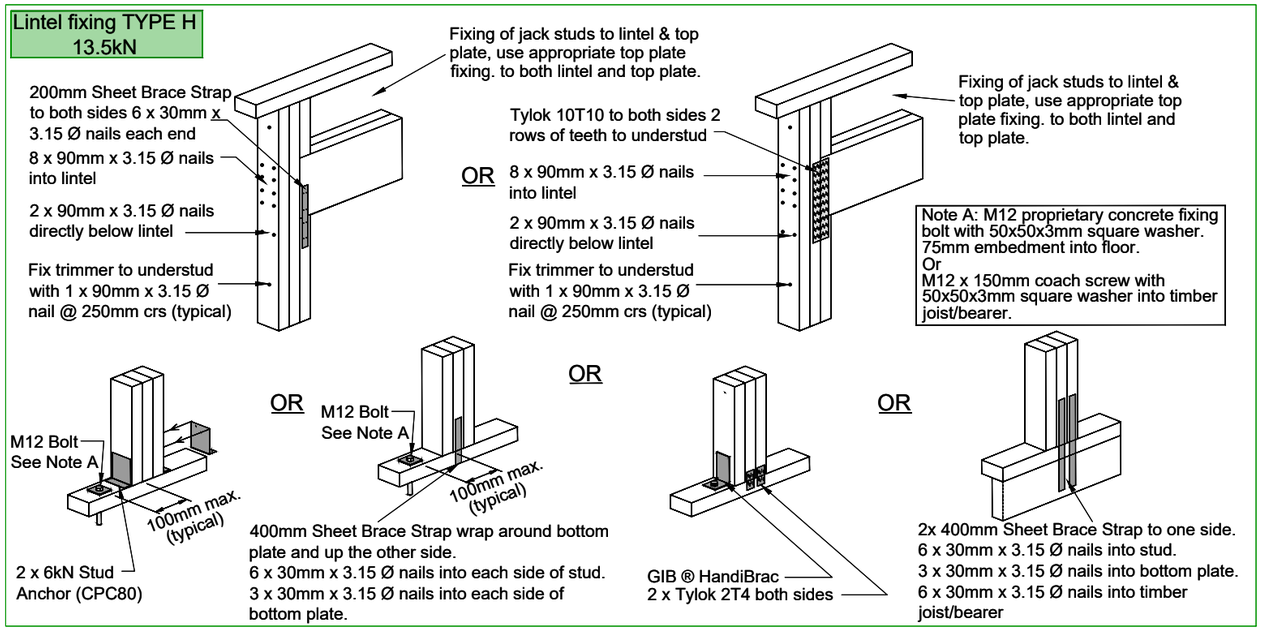
Lintel fixing TYPE F 4.0 kN



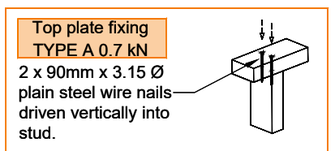
Lintel fixing TYPE G 7.5 kN



Lintel fixing TYPE H 13.5kN

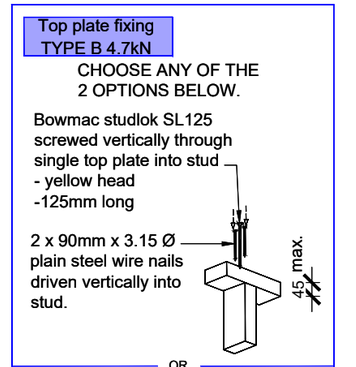


Top plate fixing TYPE A 0.7 kN



Top plate fixing TYPE B 4.7kN

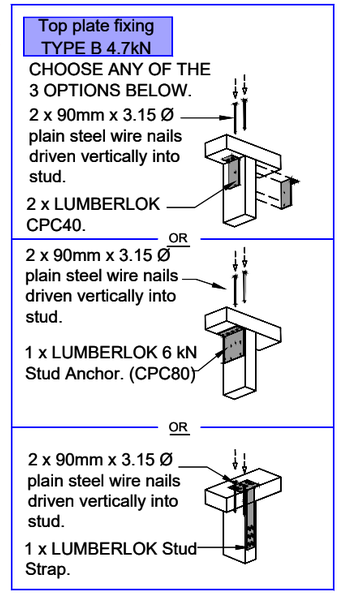
CHOOSE ANY OF THE 2 OPTIONS BELOW.



OR

Top plate fixing TYPE B 4.7kN

CHOOSE ANY OF THE 3 OPTIONS BELOW.



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Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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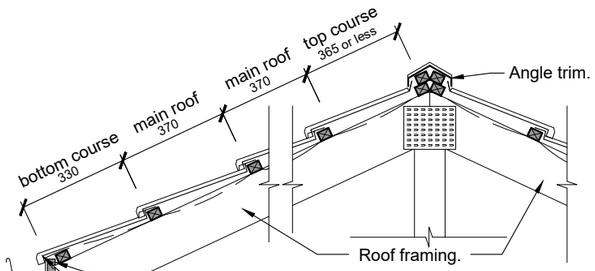
Proposed Residence.
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283a Kimberley Road, Levin.

Construction details 2

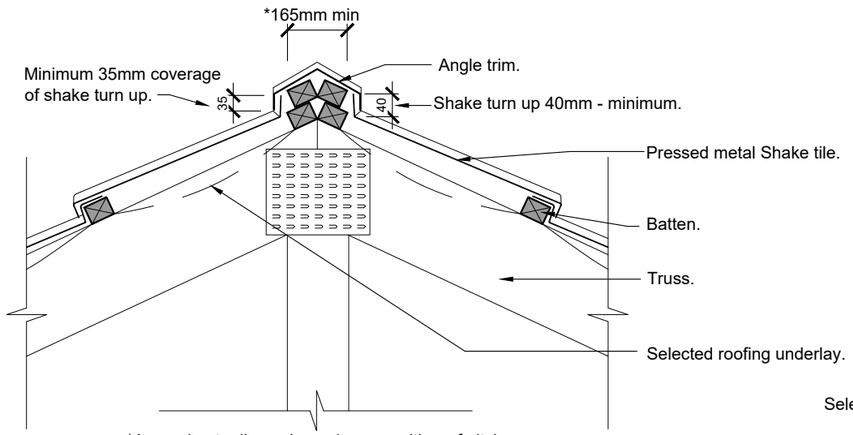
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CHECKED: Jeff LBP-111561
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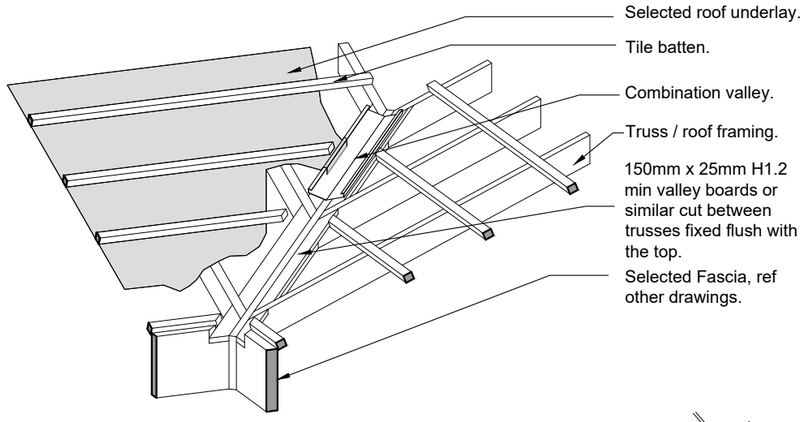
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24 Nov 2020



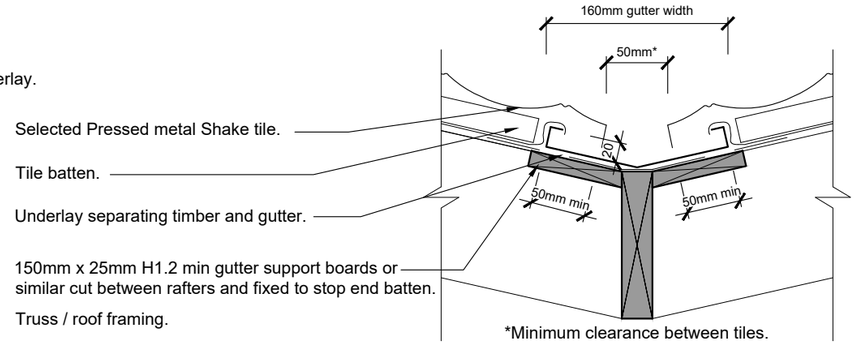
Pressed metal Shake tile batten set out - angle capping.
Scale 1:20



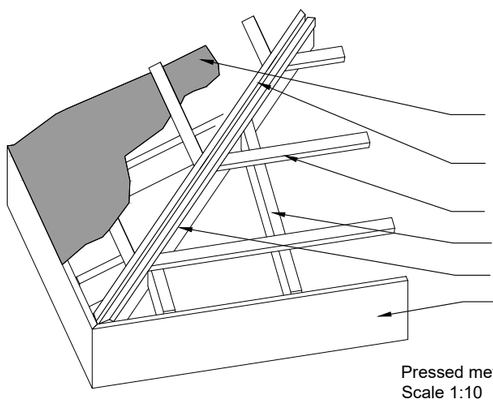
Pressed metal Shake tile ridge / hip flashing - angle capping.
Scale 1:10

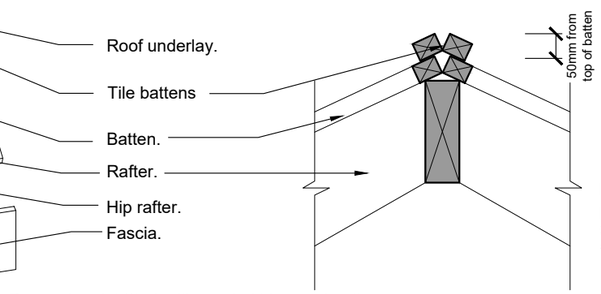


Metal tile valley construction detail.
Scale 1:10

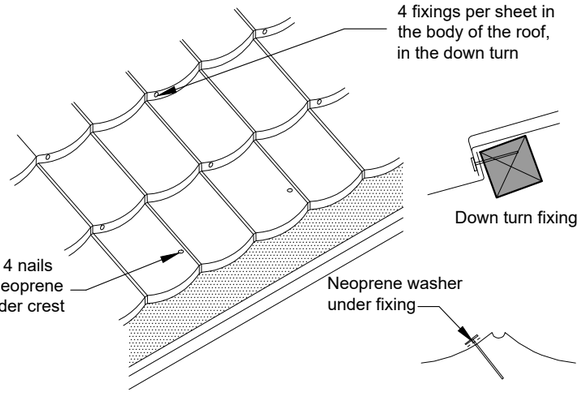


Metal tile valley.
Scale 1:10

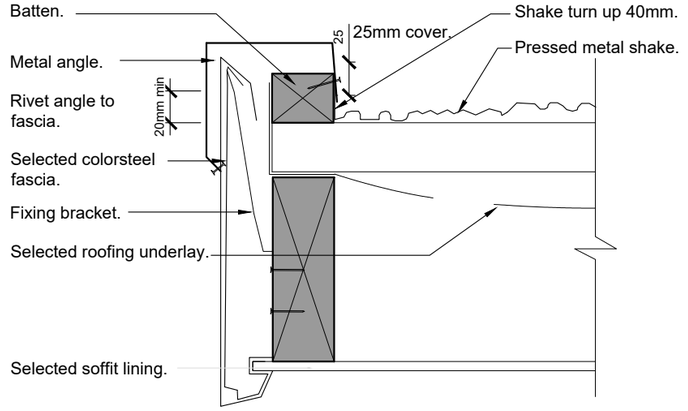




Pressed metal Shake tile angled hip construction.
Scale 1:10



Pressed metal Shake tile fixing detail
Scale 1:6



Pressed metal Shake metal fascia barge detail - Angle capping.
Scale 1:5

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Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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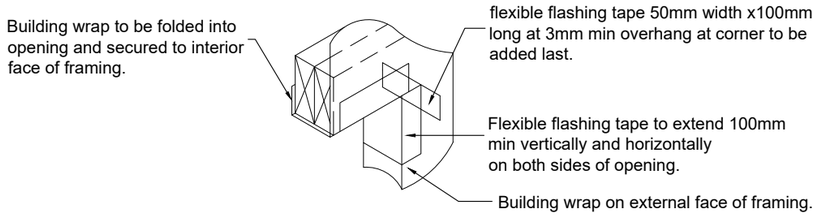
Metal tile details

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CHECKED: Jeff LBP-111561
REV: 1
JOB No: GJ 20-37
SHEET No: A16
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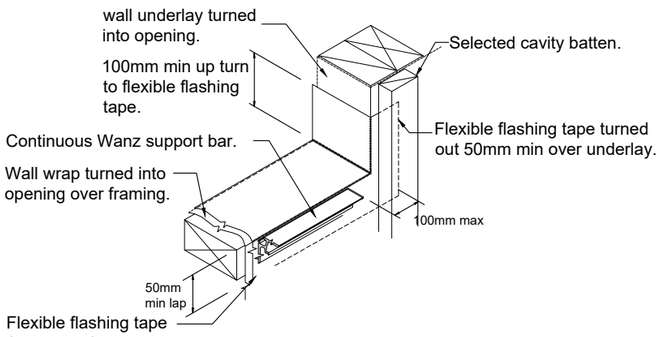
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Note:
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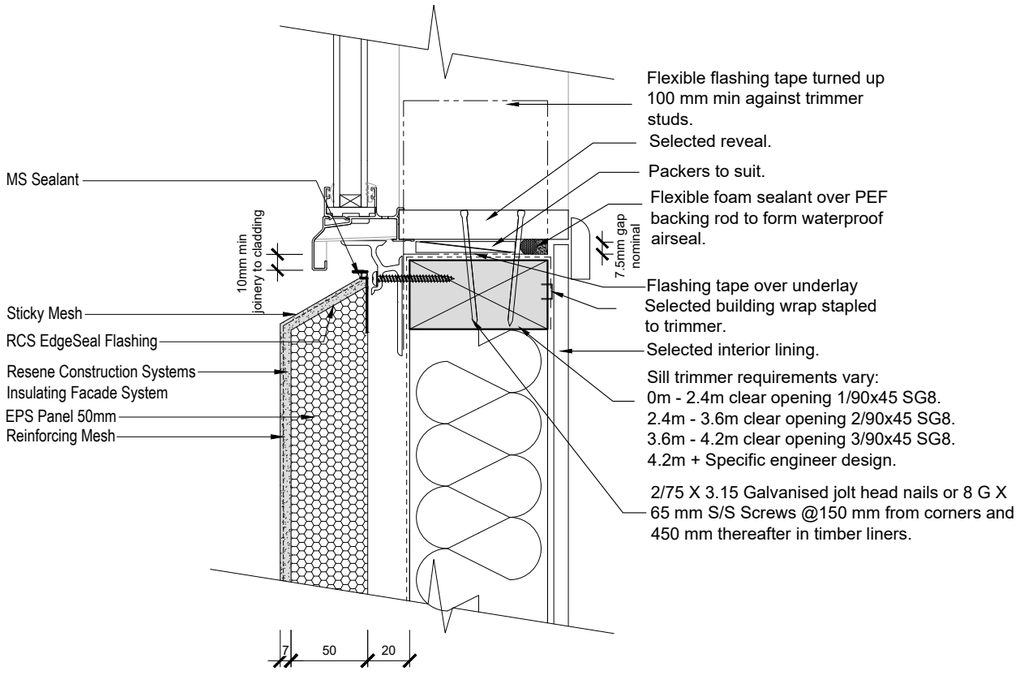


Flashing tape installation head

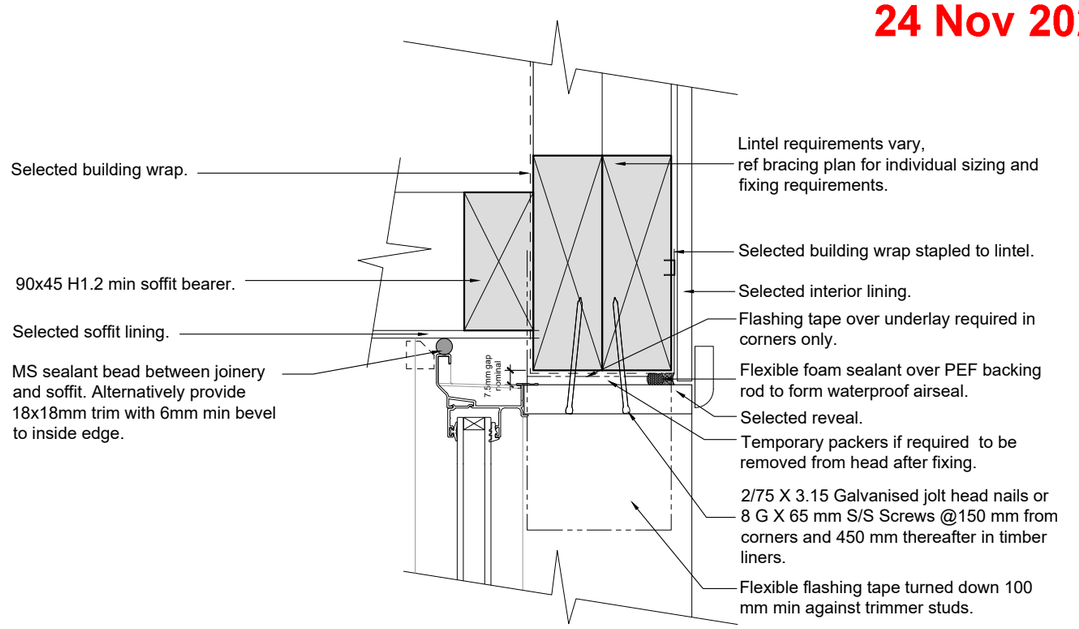
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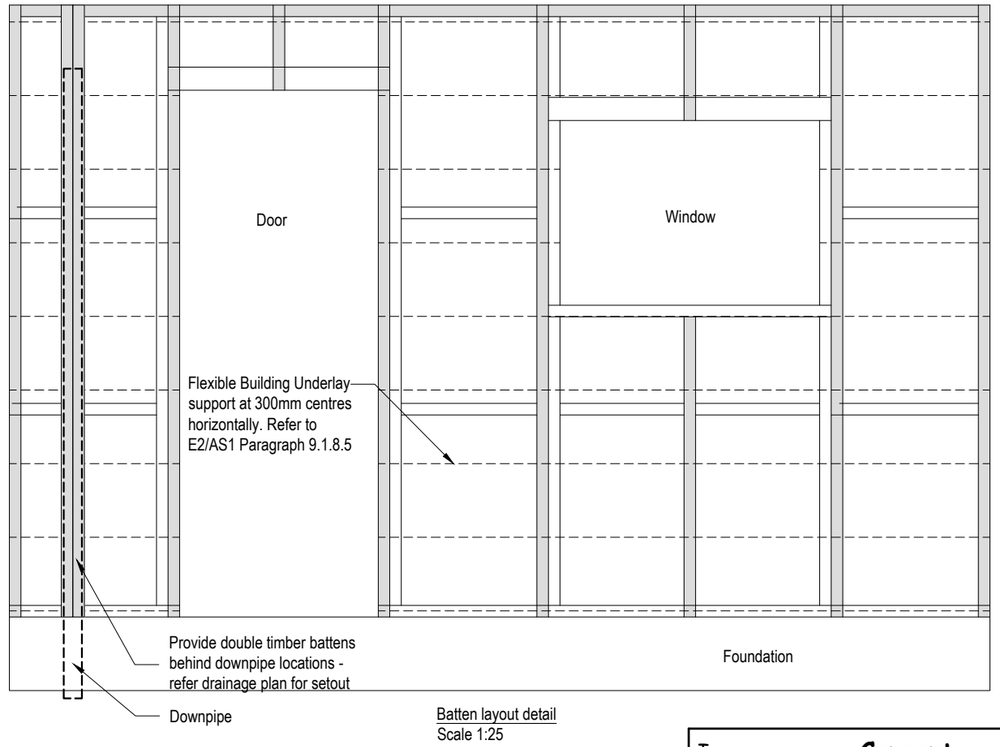
Flashing tape installation sill.



Rockcote window sill detail
Scale 1:4



Rockcote window head hard to soffit detail
Scale 1:4



Batten layout detail
Scale 1:25

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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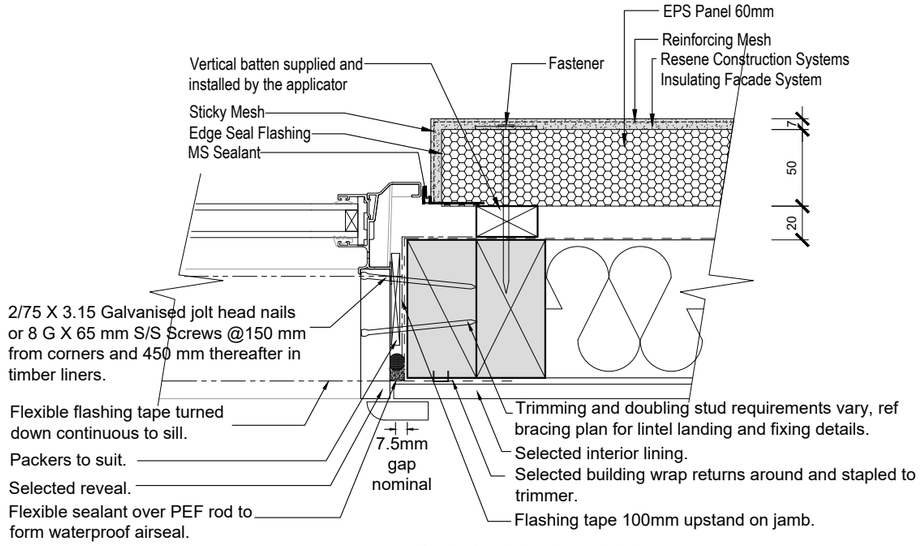
Resene construction deatils

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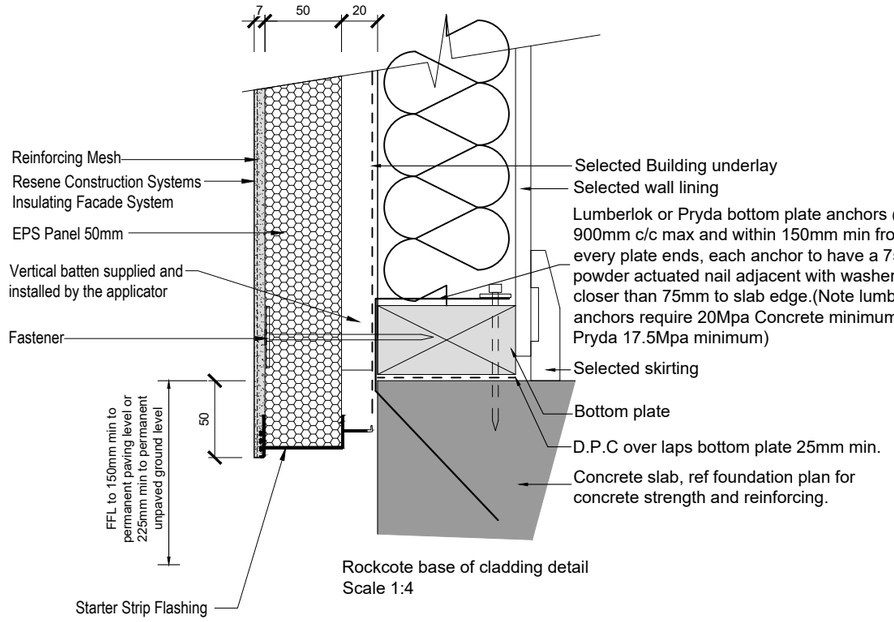
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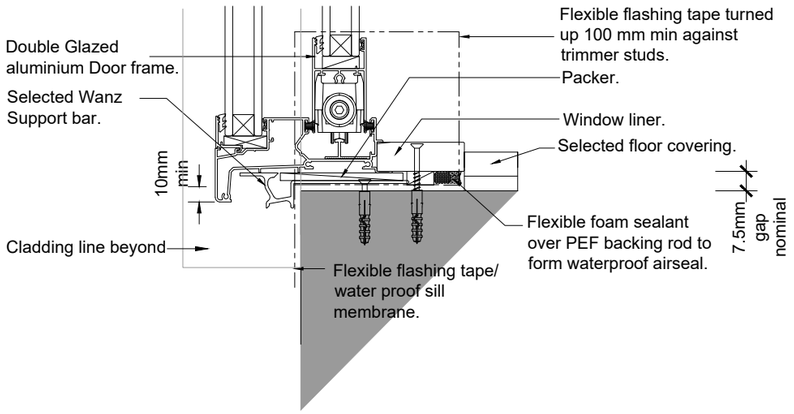
Allow a 25mm Gap between the back of the joinery and external facing timber framing to allow the jamb flashing to fit.



Rockcote window jamb detail
Scale 1:4



Rockcote base of cladding detail
Scale 1:4



Rockcote door sill detail
Scale 1:4

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Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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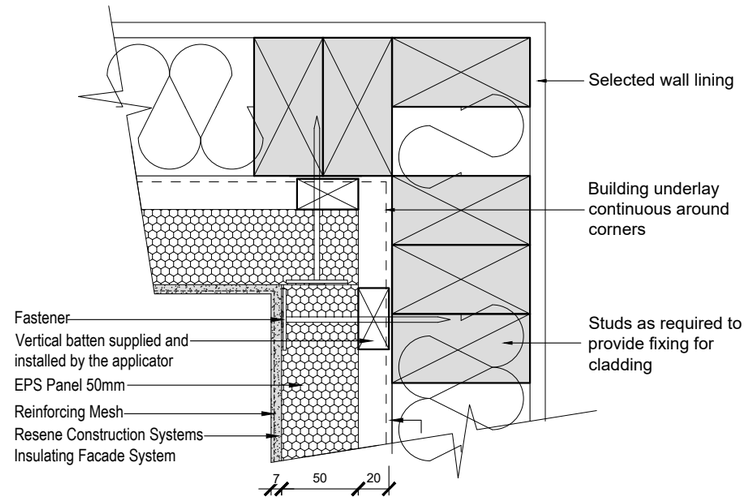
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Resene construction deatils 2

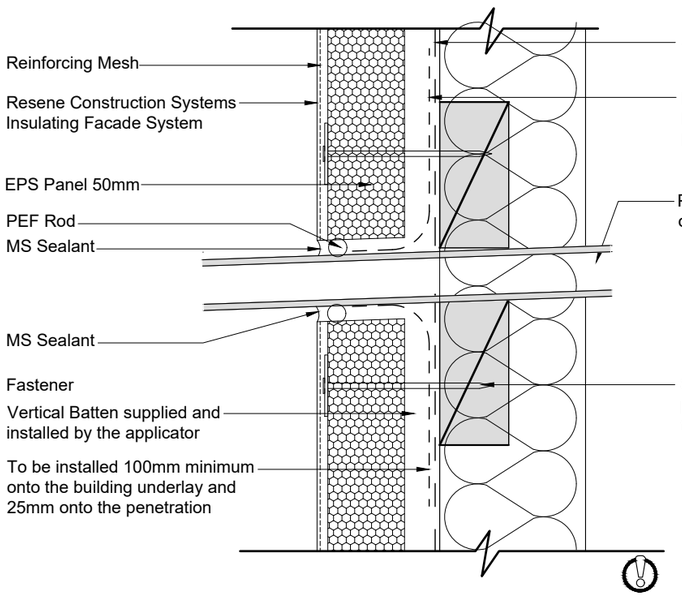
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SHEET No: A18

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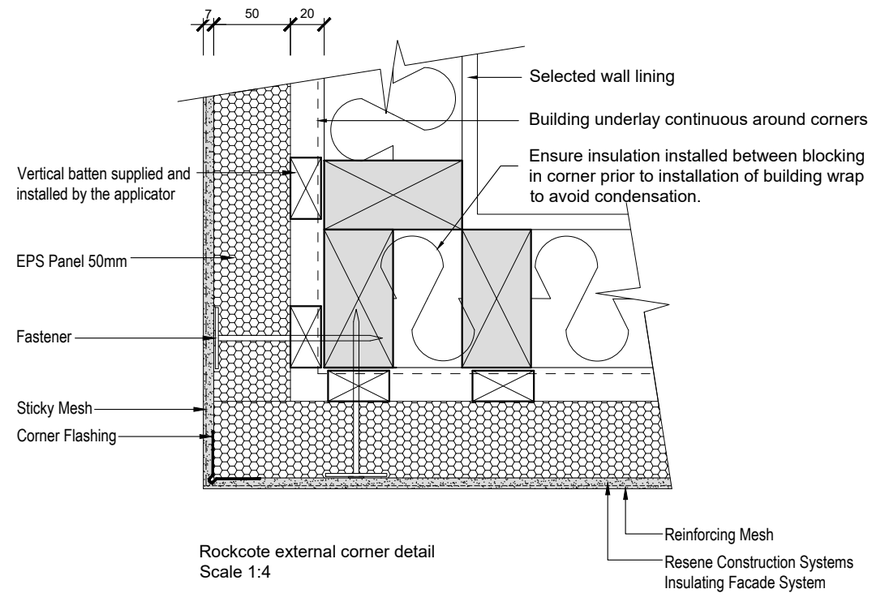
Rockcote internal corner detail
Scale 1:4



Rockcote pipe penetration detail.
Scale 1:4

The responsibility for the penetration is the responsibility of the main contractor, where possible and practical use a flange.

It is important that there is adequate support for the penetration in the form of timber packing. The penetration should be angled slightly away from the cladding so any moisture is diverted away from the cladding.



Rockcote external corner detail
Scale 1:4

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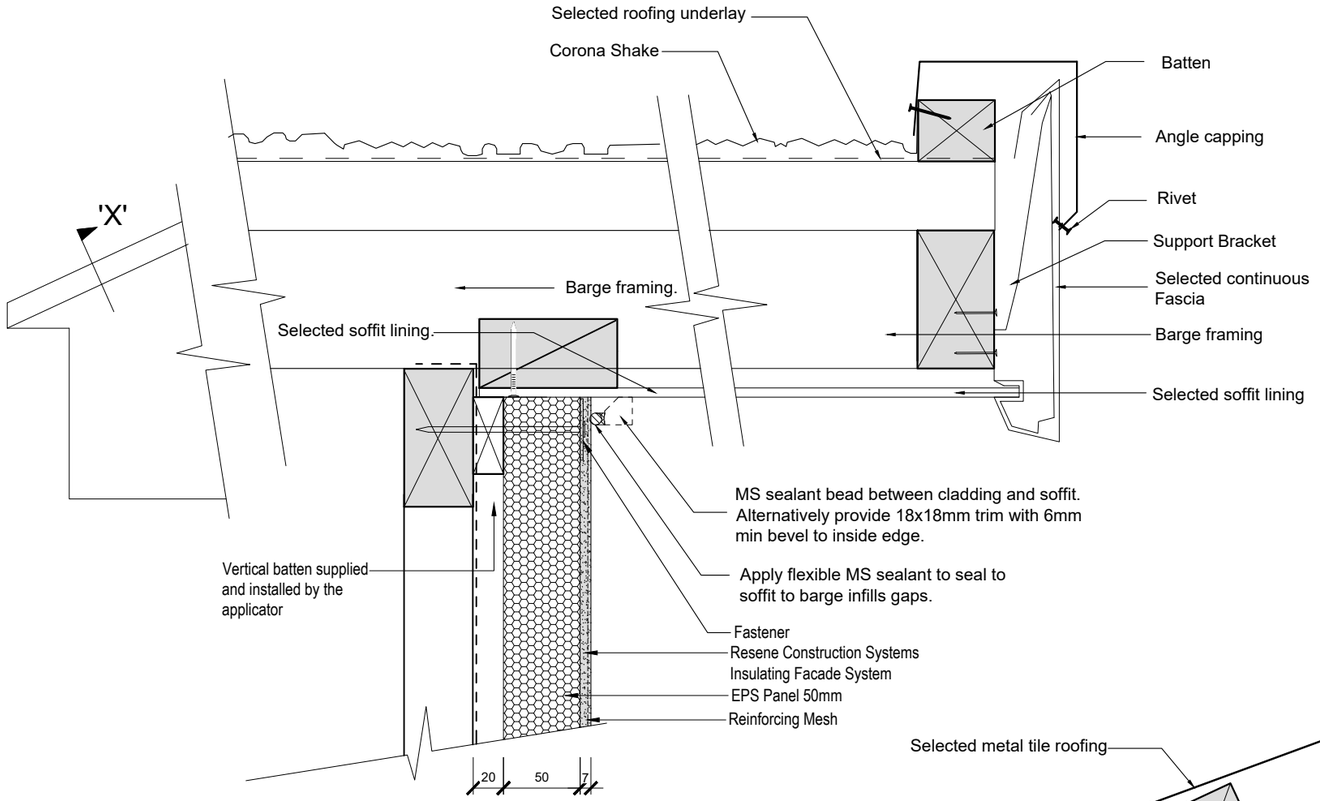
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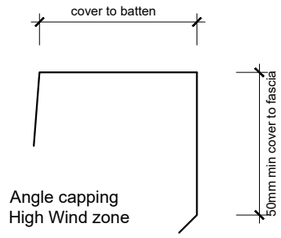
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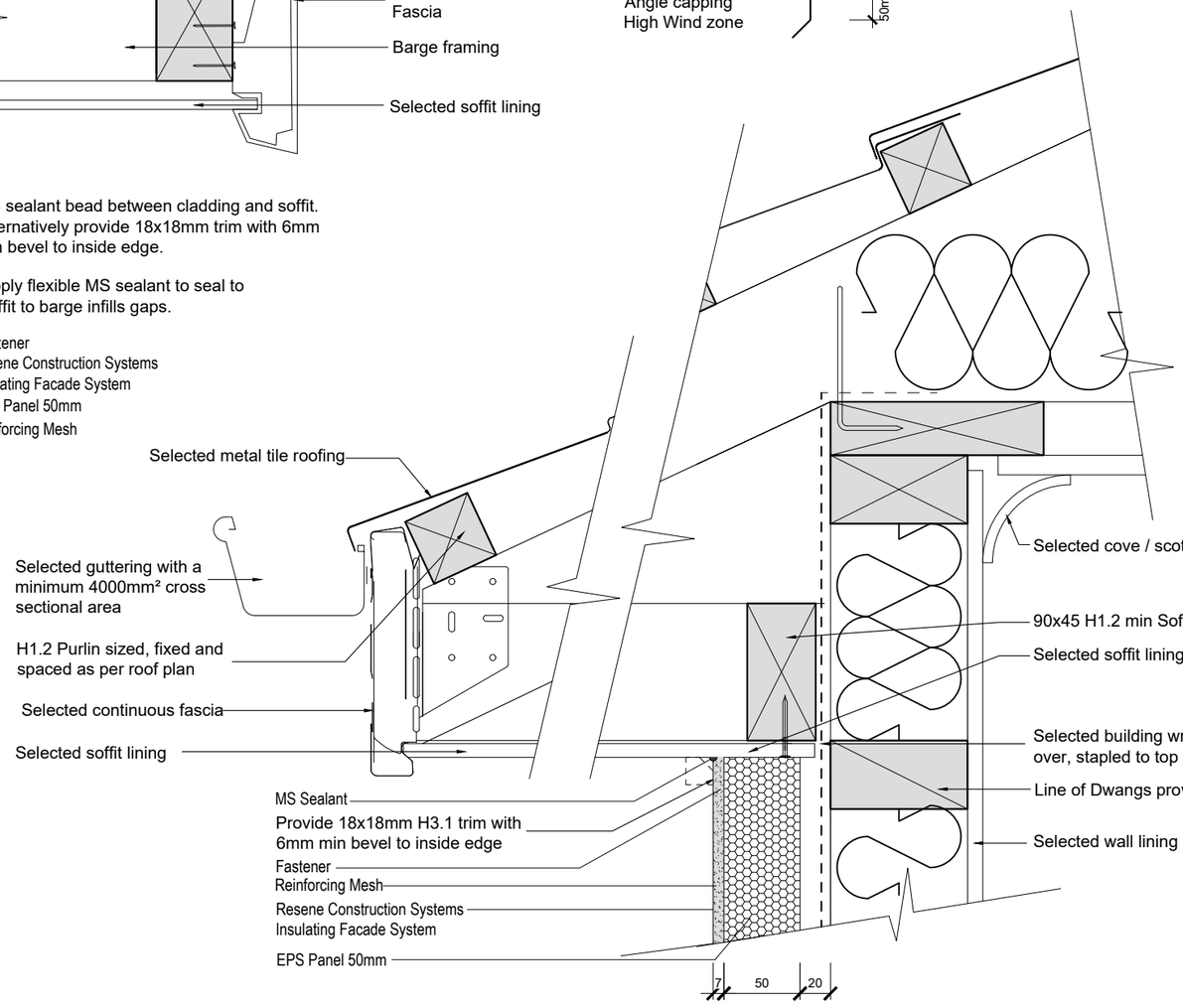
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Rockcote raking soffit detail
Scale 1:4





Rockcote soffit junction detail
Scale 1:4

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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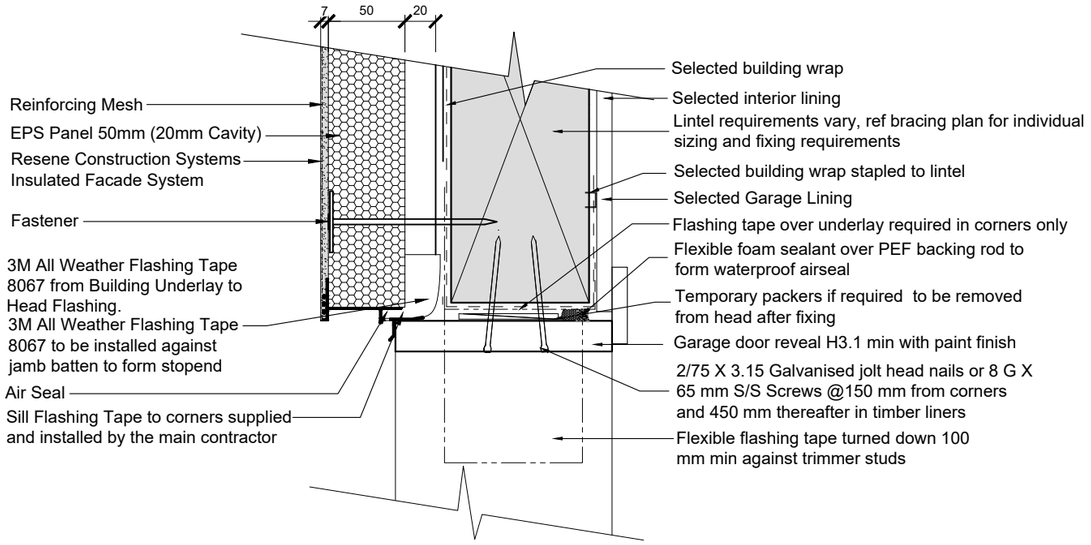
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Resene construction deatils 4

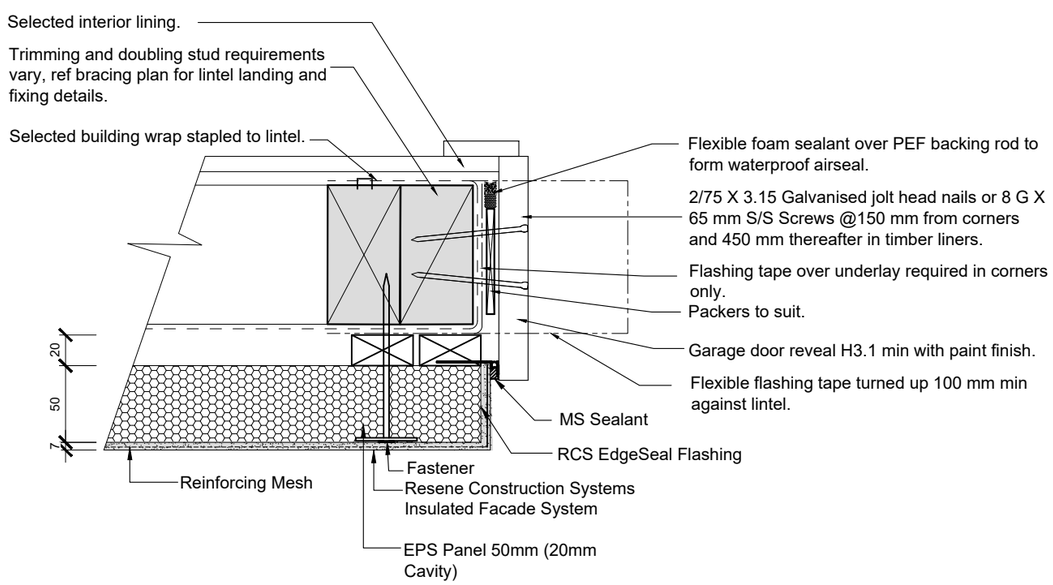
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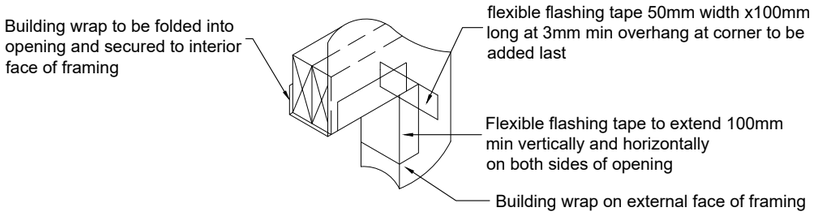


Rockcote garage door head flashing detail
Scale 1:4



Rockcote garage door jamb flashing detail
Scale 1:4

Note:
cladding omitted for clarity, refer cladding specific details for further information



Flashing tape installation head

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Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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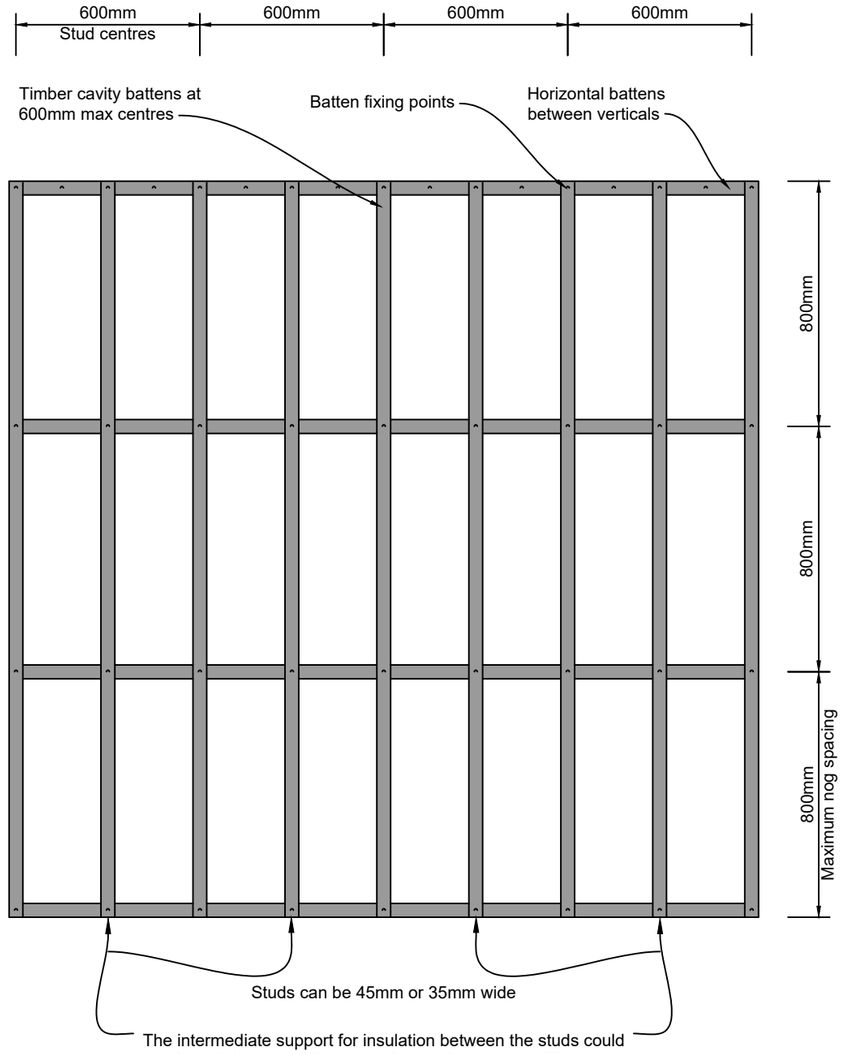
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Resene construction deatils 5

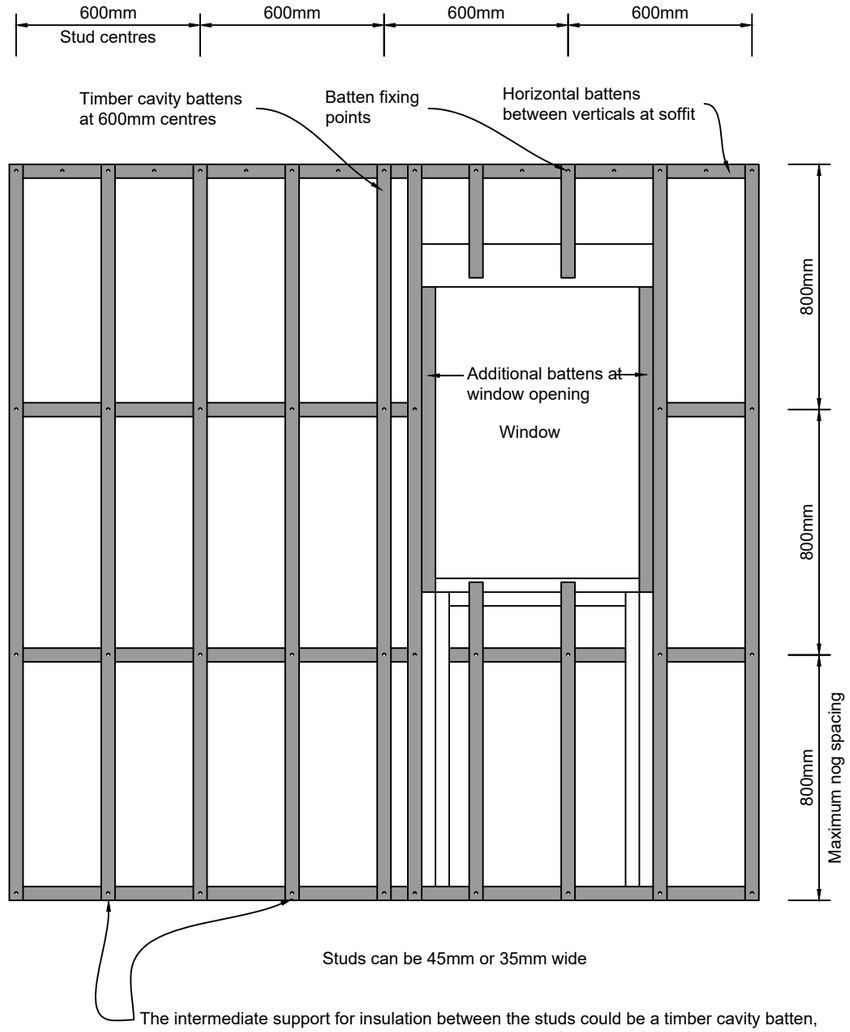
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SHEET No: A21

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Timber cavity batten fixing - studs @ 600crs
Scale 1:20



Timber cavity batten layout at window / opening - studs @ 600crs
Scale 1:20

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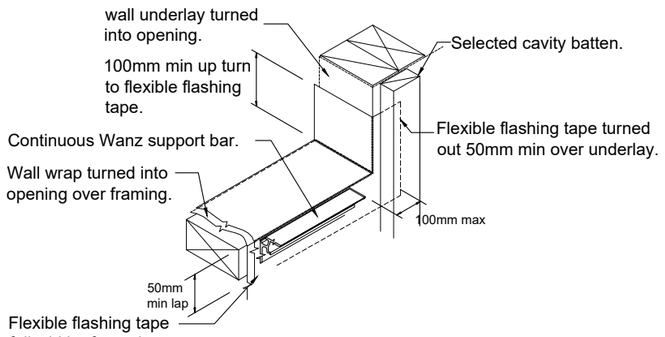
James Hardie Linea details

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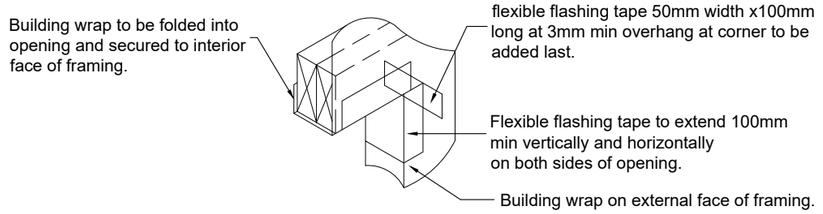
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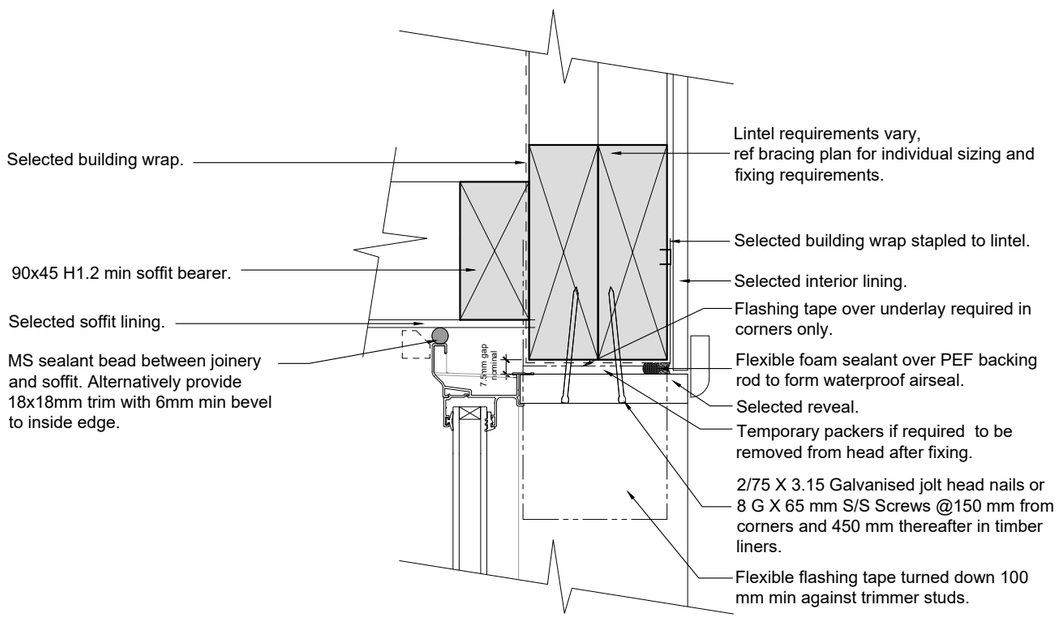


Flashing tape installation sill.

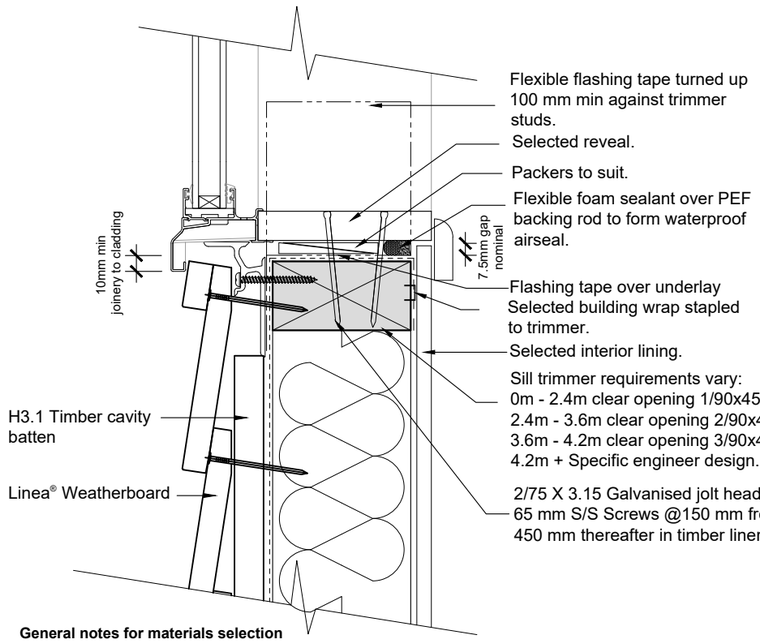
Note:
cladding omitted for clarity, refer cladding specific details for further information.



Flashing tape installation head



Linea Weatherboard window head hard to soffit detail
Scale 1:4



General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC clause E2/AS1.
2. Flexible underlay must comply with acceptable solution E2/AS1.
3. Flashing tape must have proven compatibility with the selected flexible underlay / James Hardies rigid air barrier and other materials with which it comes into contact.
4. Sill support bars must comply with EM6, E2/VM1 and B2/AS1

Refer to the manufacturer or supplier for technical information for these materials.

Linea Weatherboard window sill detail
Scale 1:4

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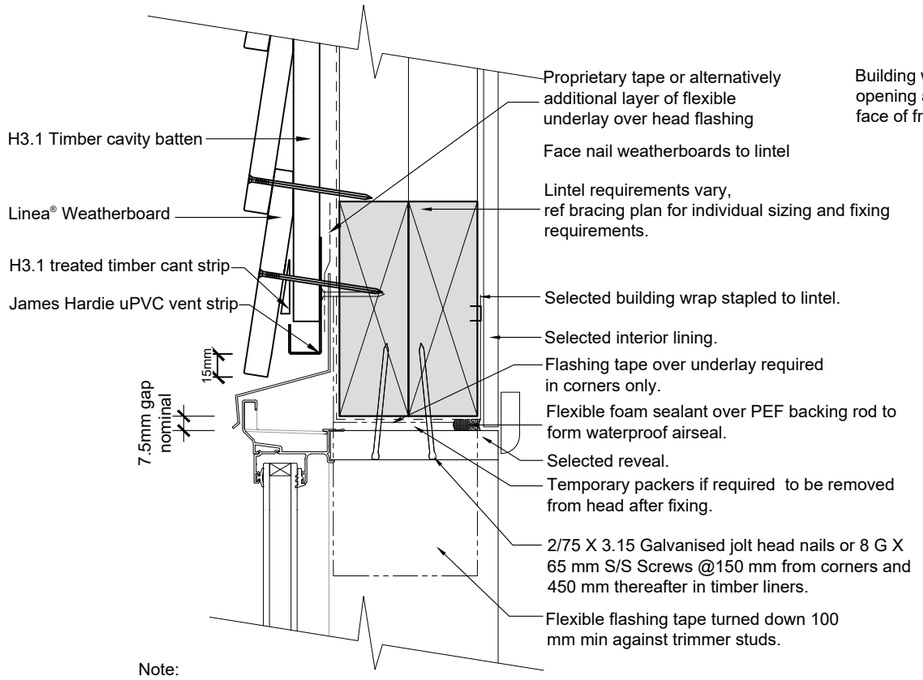
Proposed Residence.
D Hyde & C Main.
283a Kimberley Road, Levin.

James Hardie Linea details 2

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DRAWN: Jonathan Barlow
CHECKED: Jeff LBP-111561
REV 1
JOB No: GJ 20-37
LOT: 03 DP: 351707
SHEET No: A23

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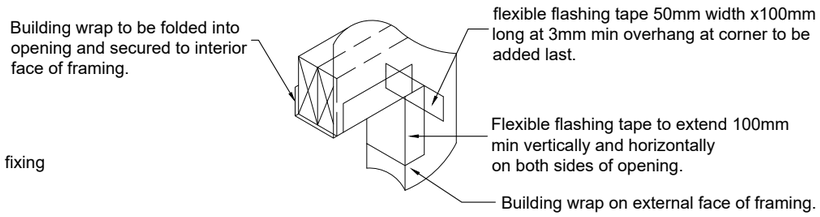
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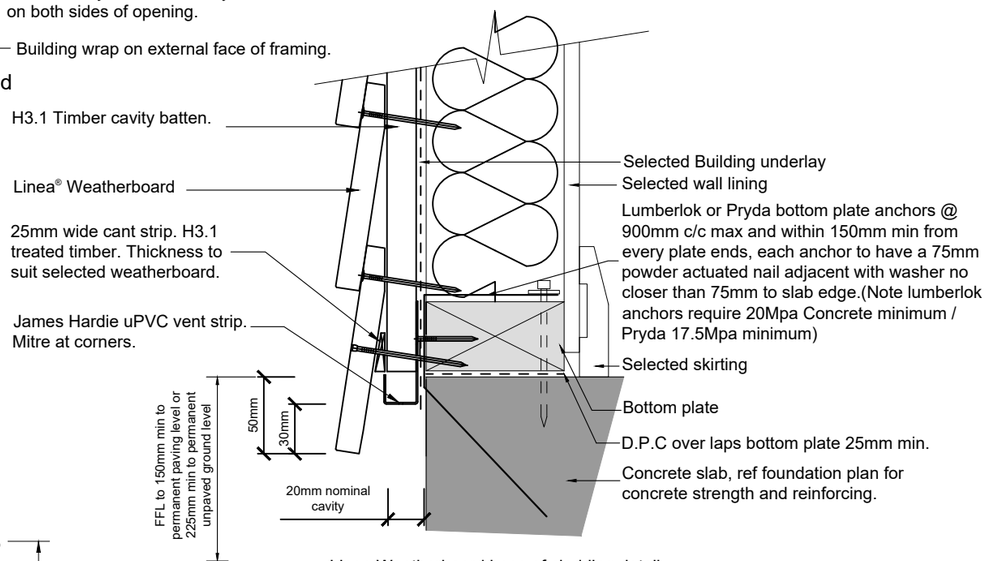
Note:
- When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening.
- Sealant must be installed between head flashing and flashing and trim in VH and EH wind zones and SED projects.
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1

Linea Weatherboard window head detail
Scale 1:4

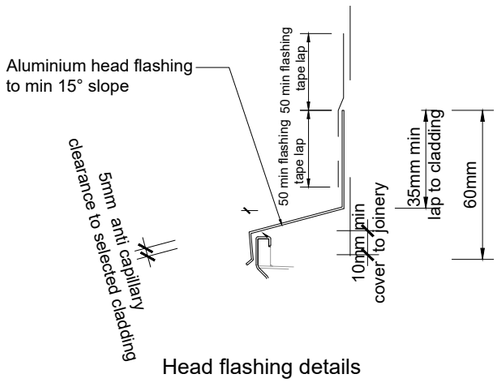
Note:
cladding omitted for clarity, refer cladding specific details for further information.



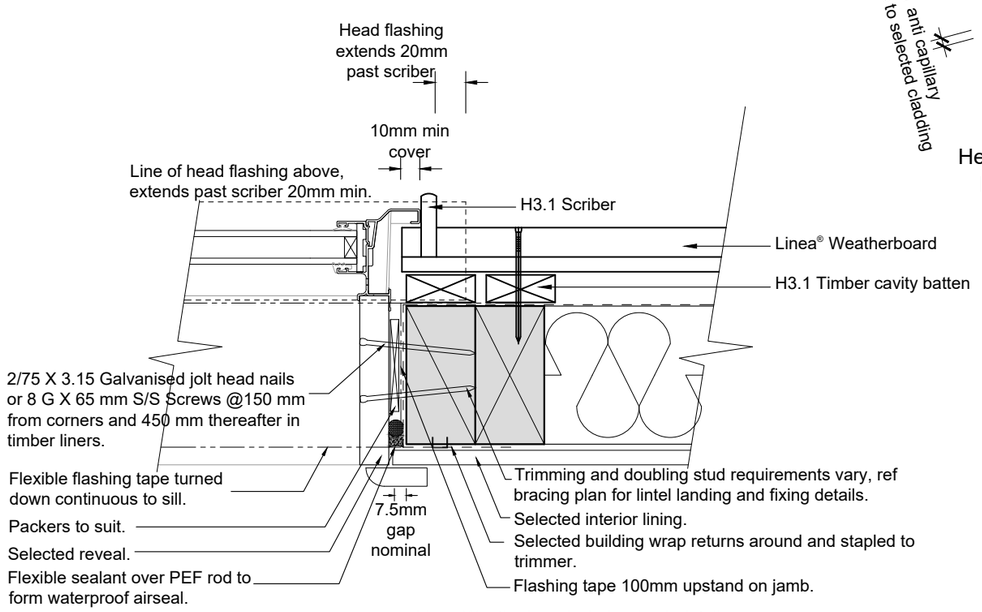
Flashing tape installation head



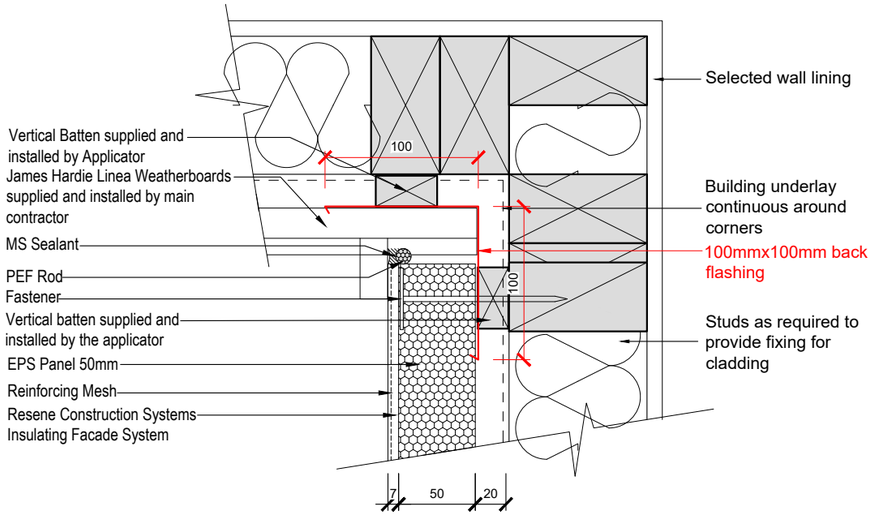
Linea Weatherboard base of cladding detail
Scale 1:4



Head flashing details
High wind zone



Linea Weatherboard window jamb detail
Scale 1:4



Rockcote to James Hardie Linea internal corner junction detail
Scale 1:4

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

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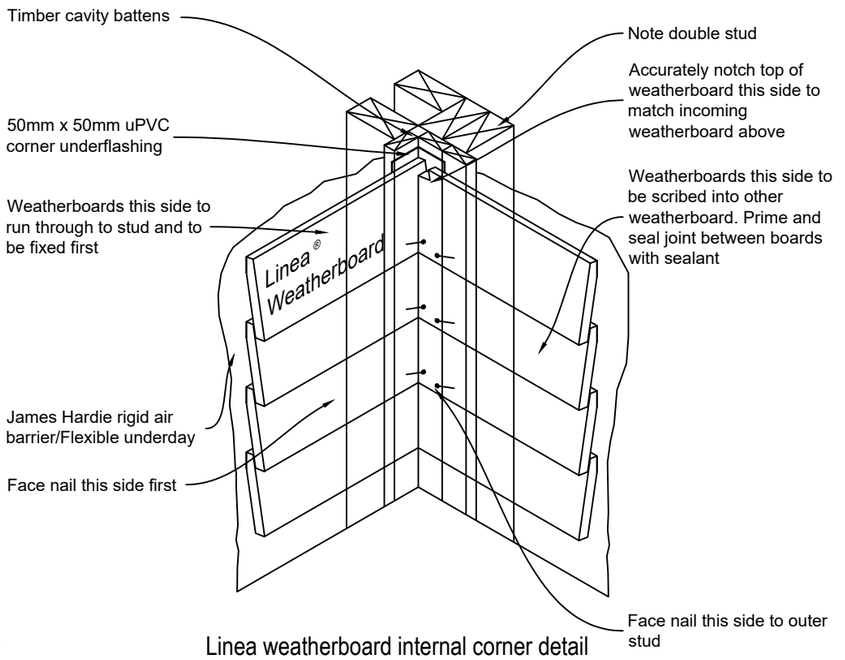
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James Hardie Linea details 3

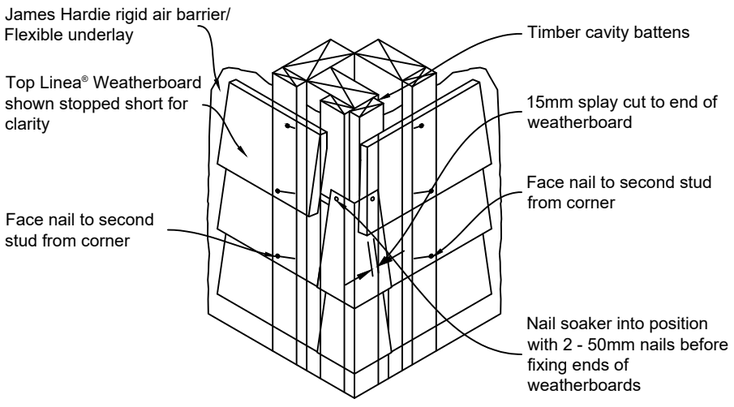
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Linea weatherboard internal corner detail
Scale 1:10



Soaker material	Nail material
Copper	Copper or phosphor bronze
Aluminium	Hot dip galvanised
Stainless steel	Stainless steel

Linea weatherboard external corner soaker detail
Scale 1:10

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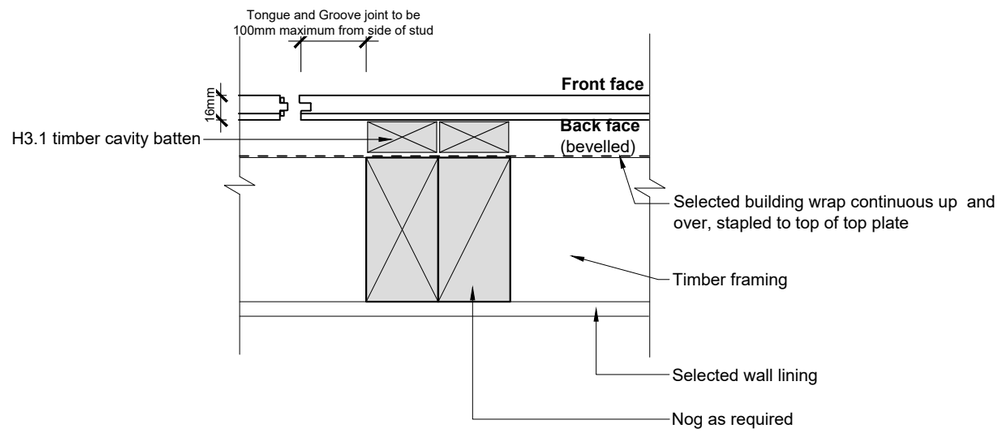
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James Hardie Linea details 4

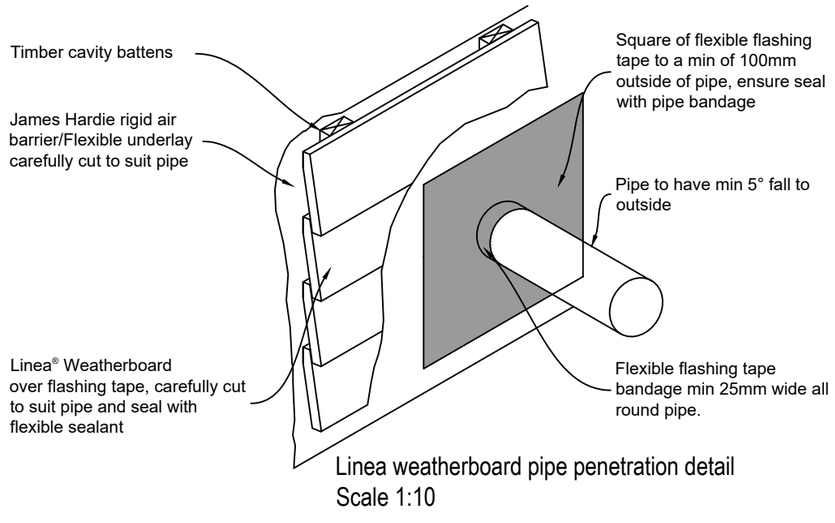
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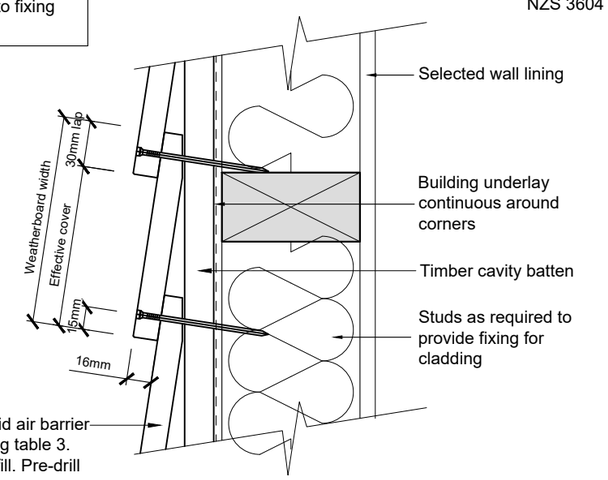
Linea Weatherboard timber cavity fixing detail
Scale 1:4



Linea weatherboard pipe penetration detail
Scale 1:10

Linea® Weatherboards to be face fixed at corners and down window and door openings using jolt head nails at 90° to face, punch 2mm below surface and fill. Refer to fixing table 3

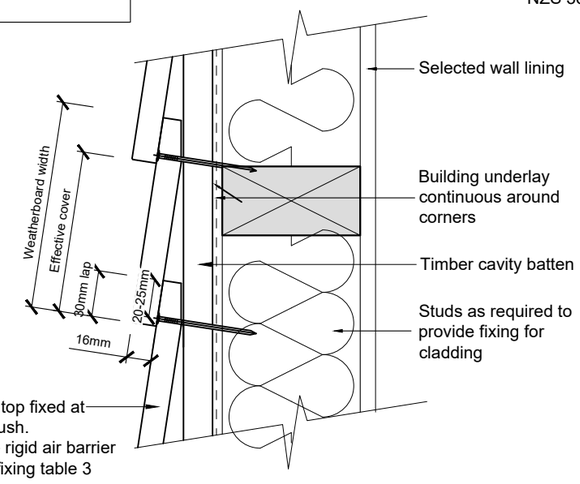
Framing to NZS 3604



Exposed Nailing

Linea® Weatherboards to be face fixed at corners and down window and door openings using jolt head nails at 90° to face, punch 2mm below surface and fill. Refer to fixing table 3

Framing to NZS 3604



Concealed Nailing

Linea Weatherboard timber cavity fixing detail
Scale 1:4

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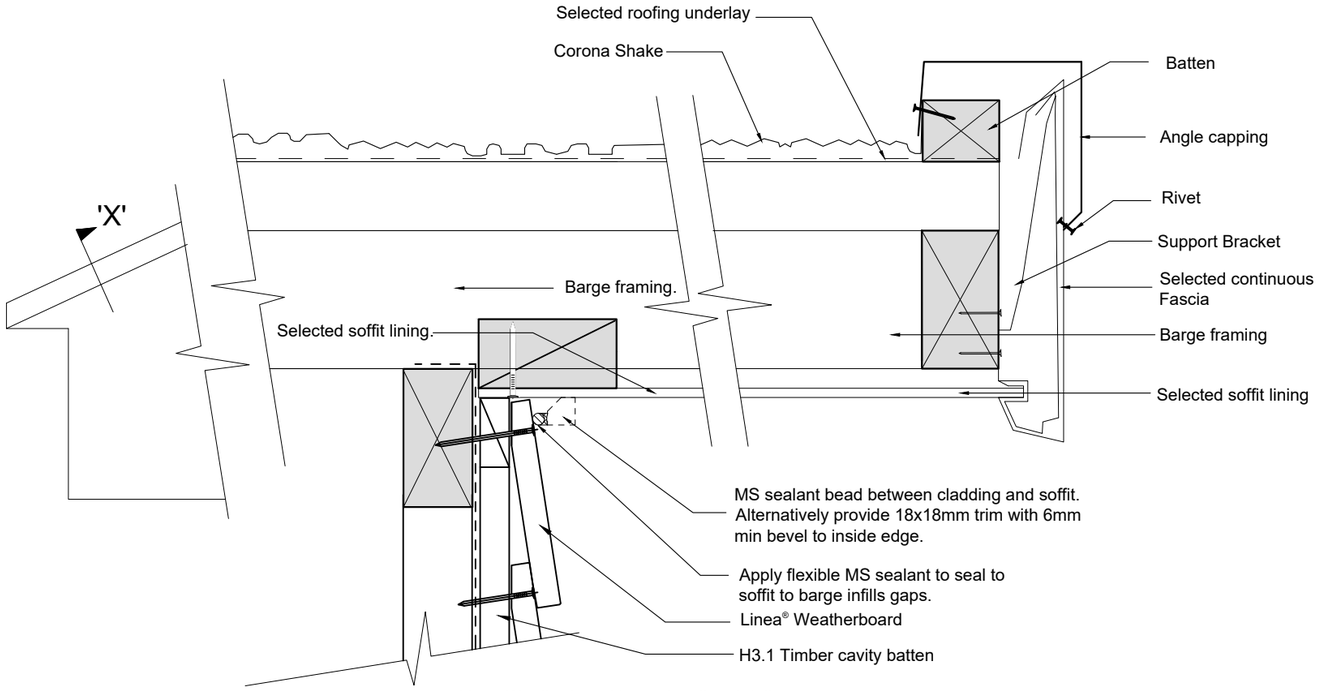
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James Hardie Linea details 5

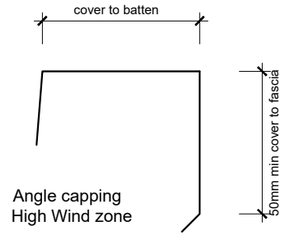
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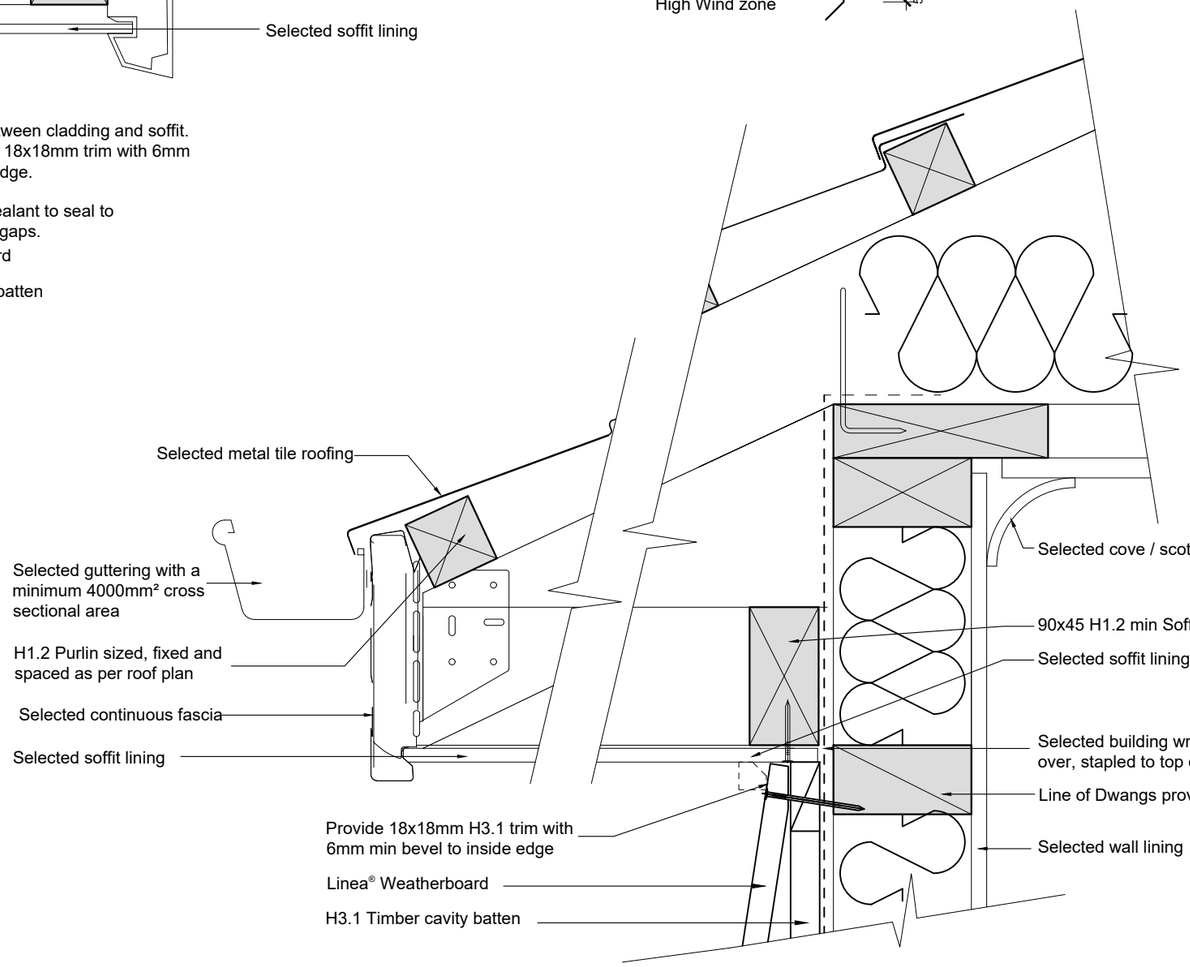
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Linea Weatherboard barge junction detail
Scale 1:4





Linea Weatherboard soffit junction detail
Scale 1:4

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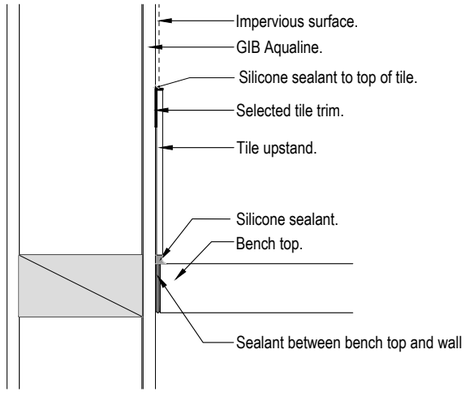
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James Hardie Linea details 6

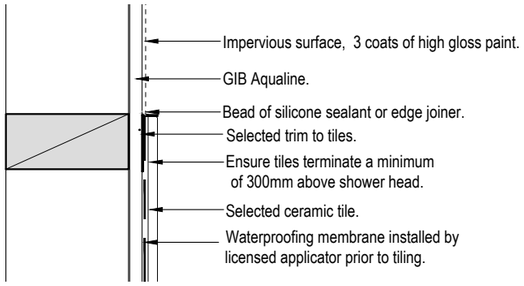
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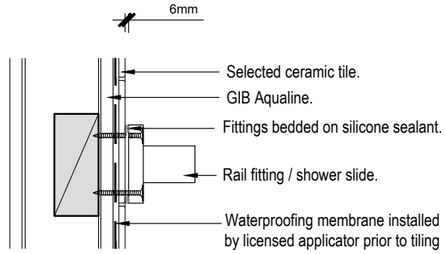
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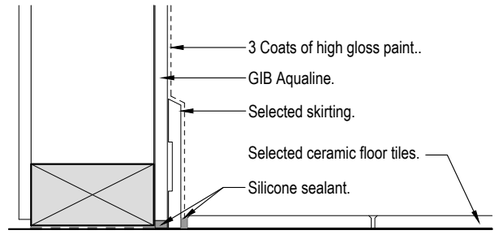
Bench to wall junction. (Wet areas.)
Scale: 1:5



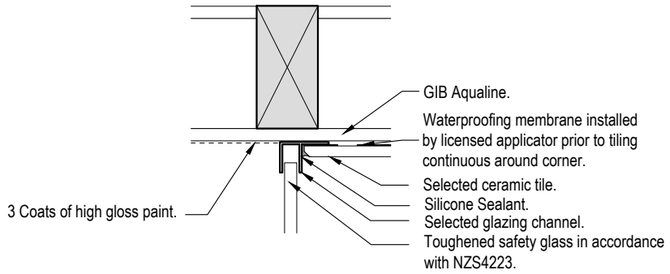
Tiled shower junction to wall.
Scale: 1:5



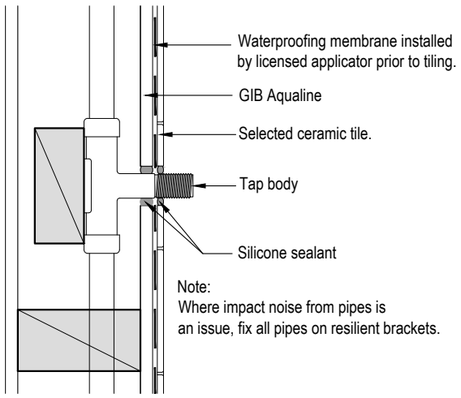
Rail / slide fixing detail.
Scale: 1:5



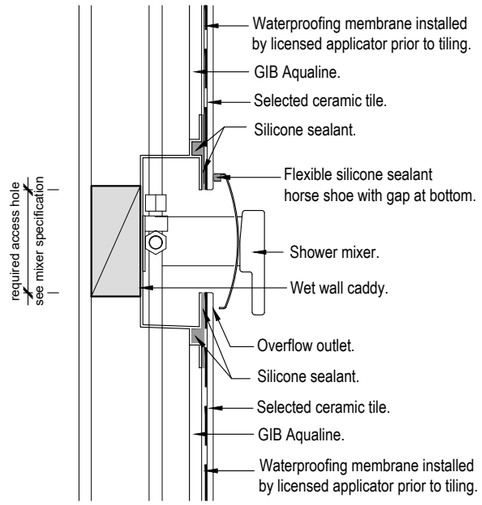
Tiled floor to painted wall junction. (Wet areas.)
Scale: 1:5



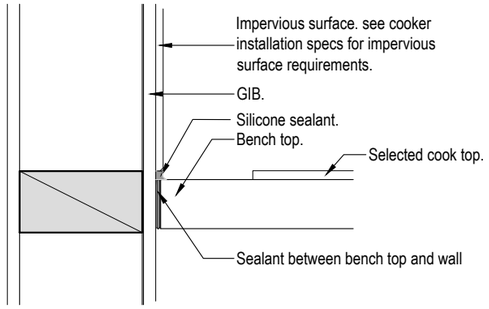
Tiled shower glass to painted wall junction.
Scale: 1:5



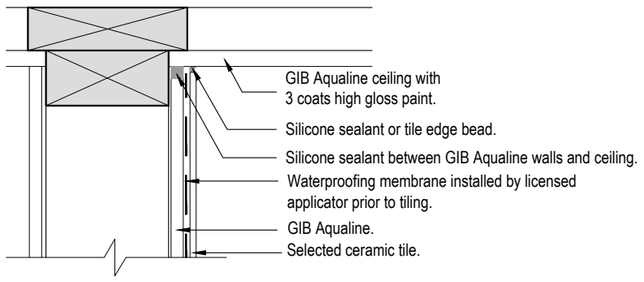
Tiled wall pipe penetration.
Scale: 1:5



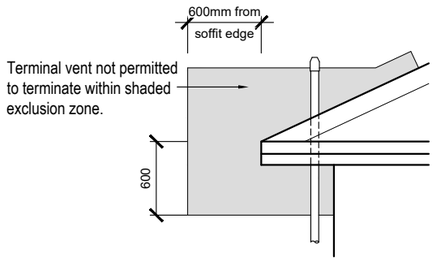
Wet wall caddy with tiled walls.
Scale: 1:5



Bench to wall junction. (At cook top.)
Scale: 1:5



Tiled wall to ceiling junction.
Scale: 1:5



Terminal vent location detail
Scale 1:50

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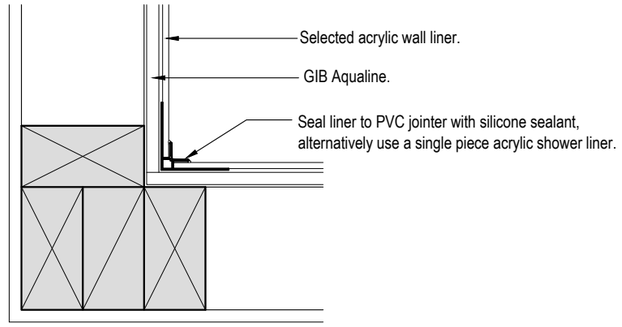
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Wet area details

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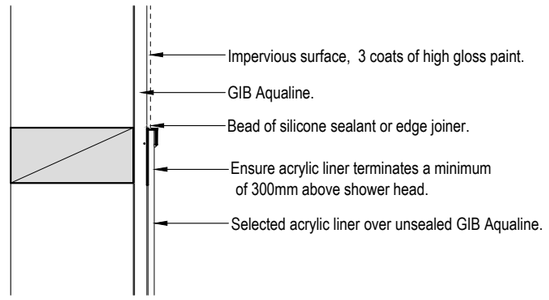
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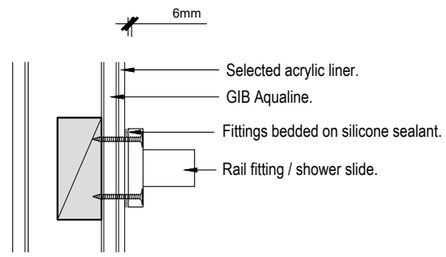


* Note: Nogs are required behind horizontal plasterboard sheet joints in shower areas.

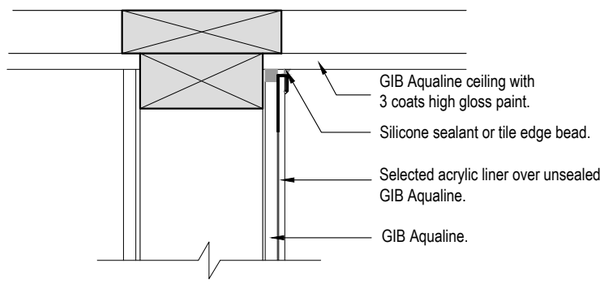
Acrylic shower internal corner junction.
Scale: 1:5



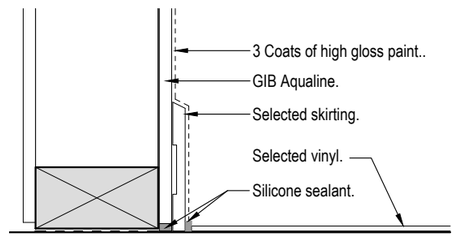
Acrylic shower liner top junction to wall.
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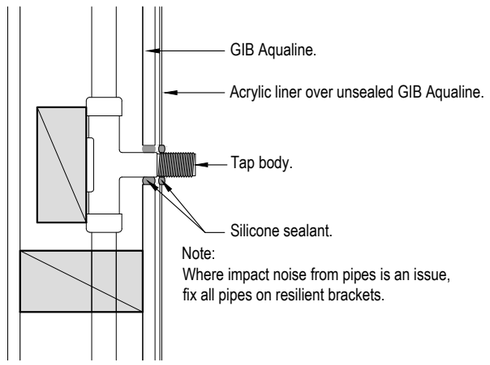
Rail / Slide fixing detail.
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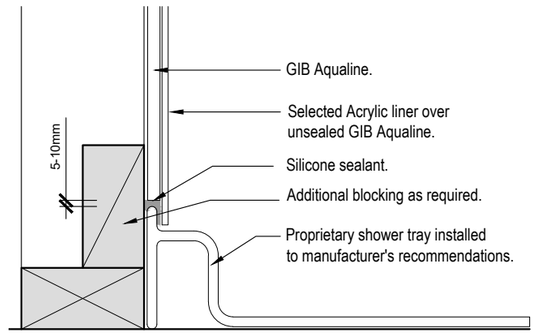
Acrylic liner wall to ceiling junction.
Scale: 1:5



Vinyl floor to painted wall junction. (Wet areas.)
Scale: 1:5



Acrylic liner wall pipe penetration.
Scale: 1:5



Acrylic shower base to acrylic liner junction.
Scale: 1:5

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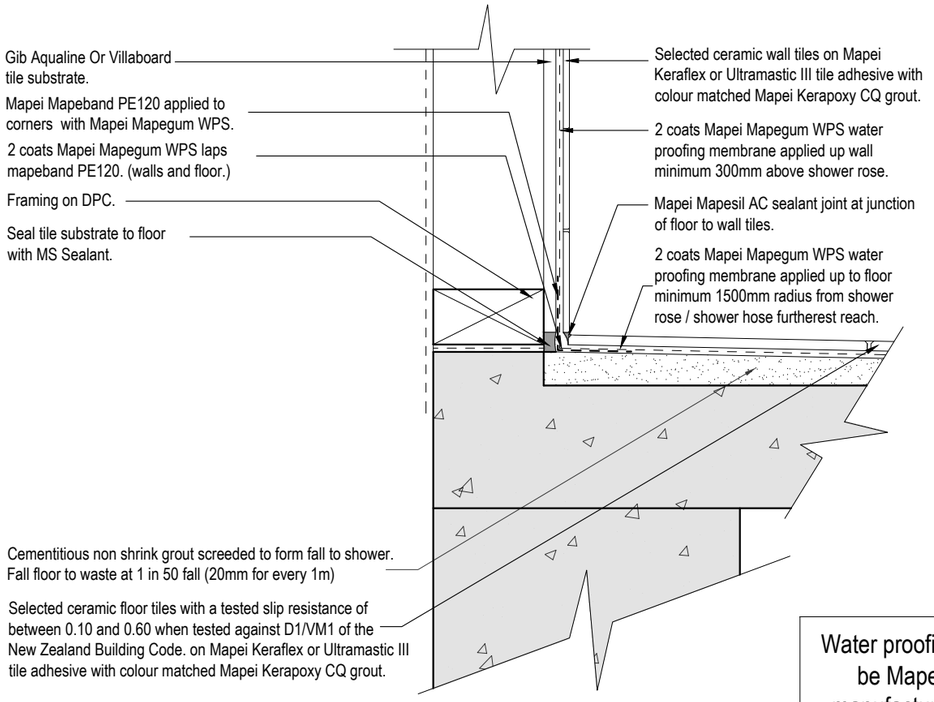
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Wet area details 2

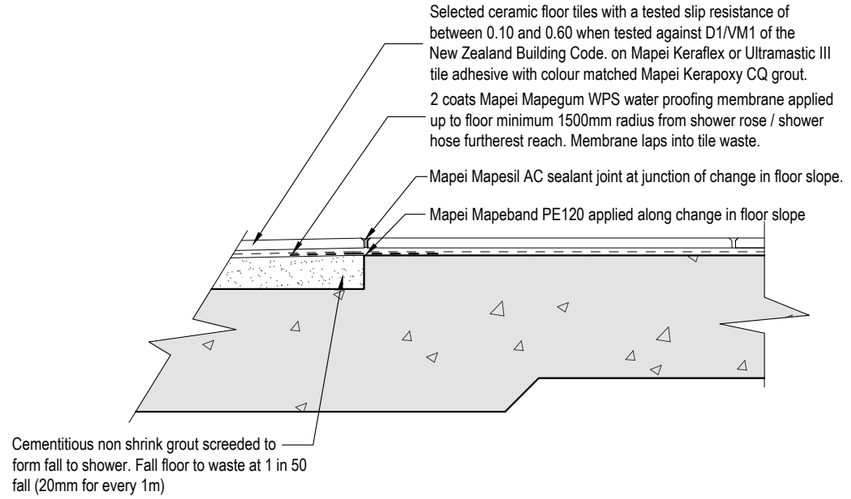
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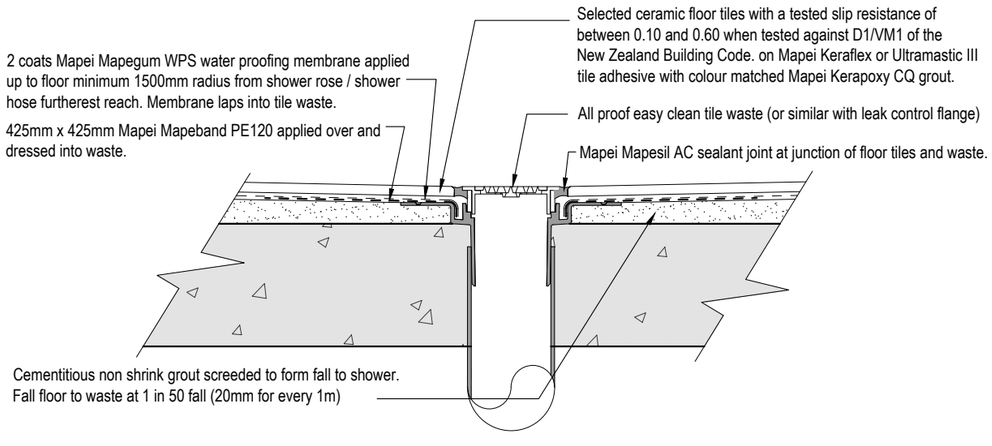


Tiled shower floor to wall junction detail (slab edge)
Scale 1:5

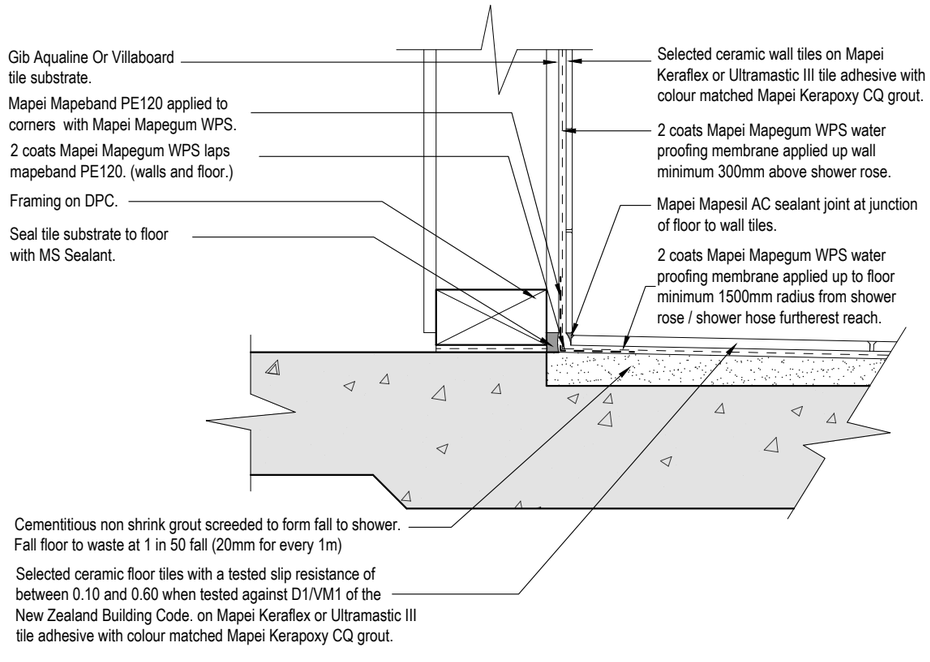


Tiled shower change in floor slope junction detail
Scale 1:5

Water proofing membrane where specified to be Mapei Mapegum WPS installed to manufacturer's recommendations, or other fully compatible waterproofing system covered by licensed waterproofers PS3 for waterproofing works, which should be provided on completion of water proofing works.



Tiled shower waste junction detail
Scale 1:5



Tiled shower floor to wall junction detail (mid slab)
Scale 1:5

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G.J. Gardner Homes
Manawatu / Horowhenua.

G.J. Gardner. HOMES
New Zealand's favourite home builders

G.J. Gardner HOMES
Phone: (06) 357 8020
Fax: (06) 357 8021
Email: Trevor.Low@gjgardner.co.nz
P.O. BOX 466 Palmerston North

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

Issue: **Consent**
ONLY PLANS WITH COUNCIL CONSENT STAMP MAY BE USED FOR CONSTRUCTION OR PREFABRICATION

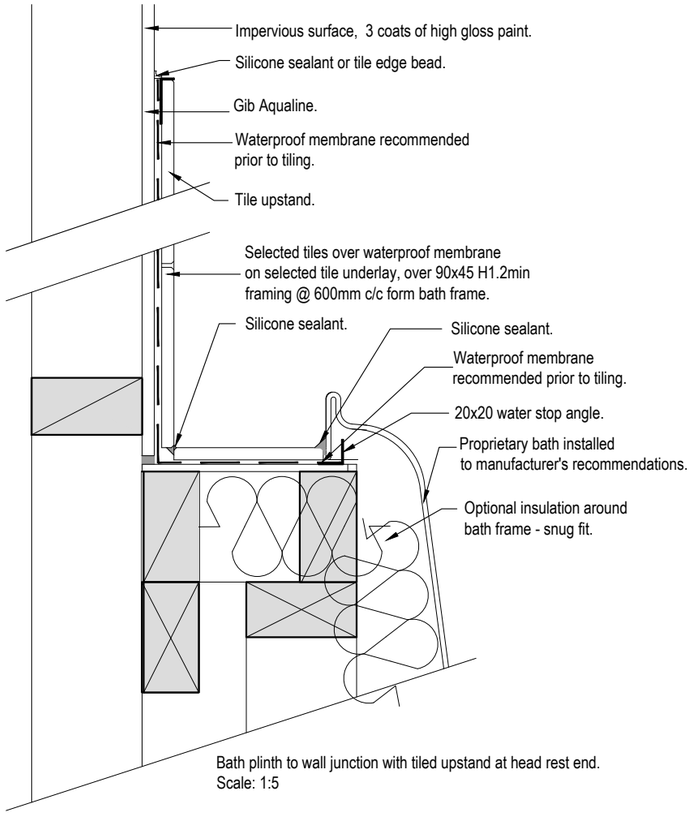
Proposed Residence.
D Hyde & C Main.
283a Kimberley Road, Levin.

Wet floor shower details

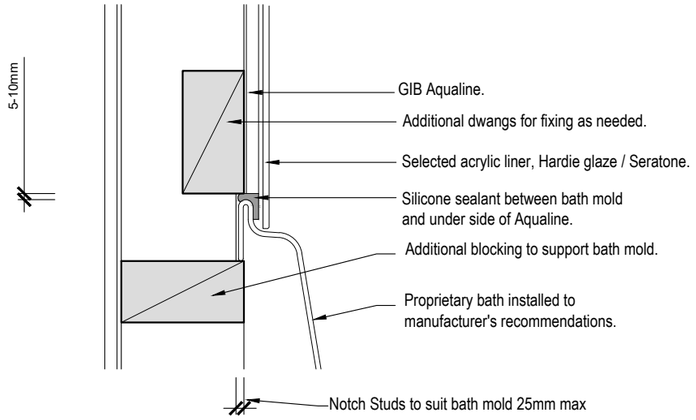
GENERATED: 20 / 11 / 2020 10:22:59 am
SCALES: A3 a/s A4 -
DRAWN: Jonathan Barlow
CHECKED: Jeff LBP-111561
REV: 1
JOB No: GJ 20-37
LOT: 03
DP: 351707
SHEET No: A30

Last modified by:
Paper size:
File Location:

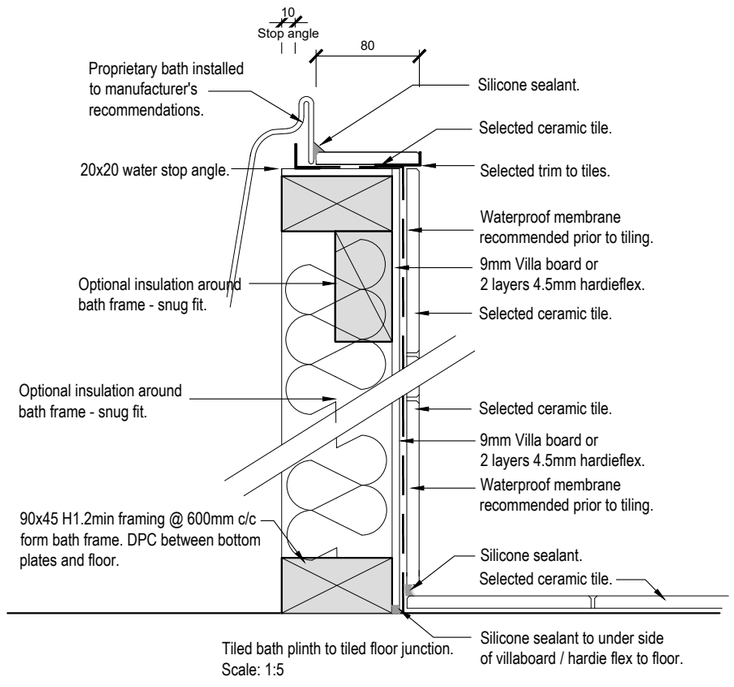
APPROVED
24 Nov 2020



Bath plinth to wall junction with tiled upstand at head rest end.
Scale: 1:5



Bath to wall junction with acrylic wall liner.
Scale: 1:5



Tiled bath plinth to tiled floor junction.
Scale: 1:5

Original Scale (mm) 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 80 90 100

Issue: **Consent**

ONLY PLANS WITH COUNCIL CONSENT STAMP MAY BE USED FOR CONSTRUCTION OR PREFABRICATION

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G.J. Gardner HOMES
Phone: (06) 357 8020
Fax: (06) 357 8021
Email: Trevor.Low@gjgardner.co.nz
P.O. BOX 466 Palmerston North

Proposed Residence.
D Hyde & C Main.
283a Kimberley Road, Levin.

Bath details

GENERATED: 20 / 11 / 2020 10:23:07 am
SCALES: A3 a/s A4 -
DRAWN: Jonathan Barlow
CHECKED: Jeff LBP-111561
REV: 1
JOB No: GJ 20-37
LOT: 03 DP: 351707
SHEET No: A31

Last modified by: Jonathan Paper size: A3 File Location: D:\CORONA\20-36 Karaitiana & Lagan\20-36 WD's.dwg

Form 5 - Building Consent
Section 51, Building Act 2004

Building Consent No: 20200581

The Building

Street Address: 283A Kimberley Road Levin Rural
Legal Description: Lot: 3 DP: 351707
Valuation Number: 1484020513

The Owner

Name: Dylan James Hyde & Courtney Ivy Hyde

Street Addess/Registered Office: [redacted]

Phone Number: Mobile: [redacted]

Email: [redacted]

First Point of Contact

The first point of contact for communications with the building consent authority,

Name: G J Gardner Homes Manawatu/Horowhenua

Street Addess/Registered Office: PO Box 466, Palmerston North

Phone Number: Landline: 06 357 8020

Email: jonathan@plans.co.nz

Building Work

The following building work is authorised by this building consent:

Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage

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

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

This Building Consent is subject to the following conditions:

1. Section 90, Building Act 2004 – Agents authorised by the BCA are entitled, at all times to inspect :
   a) land on which building work is being or proposed to be carried out; and
   b) building work that has been or is being carried out; and
   c) any building.

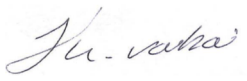
Compliance Schedule

A compliance schedule is not required for the building.

Attachments

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

Approved Plans and Specifications
Required items letter
Tax Invoice



Building Advisory Officer

On behalf of Horowhenua District Council

Date: 26 November 2020

26 November 2020

Courtney Ivy Main & Dylan James Hyde
[redacted]

Dear Sir/Madam

Building Consent

Building Consent Number: 20200581
Address: 283A Kimberley Road Levin Rural
Description: Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage

Your Building Consent application has now been issued and pages 2 and 3 of this letter provides important information relating to your issued consent. We recommend you familiarise yourself with this information.

Attached is an invoice for fees and charges associated with this consent. The invoice is based on an estimate of the number inspections required. Once the final inspection has been completed and passed, the number of inspections that have been completed is reconciled with the number of inspections that were invoiced and the difference is either refunded or invoiced. Charges are based on the number of inspections completed and not the number of visits to the site.

Please note that no inspections can be booked for any work related to this Building Consent until full payment of the invoice has been made. Inspections can be booked by phoning 06 366 0927.

Your Building Consent is issued under Section 51 of the Building Act 2004 is enclosed.

If you have any further queries, please do not hesitate to contact our Customer Support Officers on 06 366 0927.

Yours faithfully

Customer Support Officer

Encl: Invoice and Building Consent issued under S51 of the Building Act 2004

Building Consent Information Sheet

This document provides important information relating to your issued Building Consent

1. **What do I need to know about my Building Consent?**
   All work must comply with the Building Act 2004.

   Please advise the Building team if there is a change to the first point of contact for your project.

   If your building consent has been issued subject to a Section 37 notice, you cannot start work until the required resource consent has been granted.

   The building consent shall lapse if the building work has not commenced within 12 months of issue, or any further period allowed by the Building Consent Authority. Once a building consent is lapsed and has no effect a new building consent application must be made in order to carry out the work.

2. **What are Project Information Memorandums (PIM) and Planning Checks?**
   Depending on the complexity of your project a PIM or Planning Check may have been carried out. PIM and Planning Checks identify requirements from specific Council departments that relate to your project. They may stipulate actions required prior to commencing any work. For example:

   Planning – under the Resource Management Act 1991 (RMA) Resource Consent may be needed e.g. for building too close to boundaries, height restrictions, yard coverage, heritage/historic conditions etc which do not meet the requirements of the District Plan.

   Engineering – details on land stability. An engineer's report may be required if there are stability issues etc.

   Drainage – specific requirements in relation to drains in common, water courses, Council drains, private property drainage etc.

   Roading – footpath repairs, crossings etc

   If the PIM or planning check identifies that a resource consent is required for your project, a Section 37 notice will be issued. If your building consent has been issued subject to a Section 37 notice, you cannot start work until the required resource consent has been granted.

3. **What do I need to know about my Plumber, Drainlayer or Gasfitter?**
   The Horowhenua District Council has an obligation pursuant to the Plumbers, Gasfitters and Drainlayers Act 2006 that provides only Certifying/Licensed Plumbers, Gasfitters and Drainlayers who hold current licence can work on sanitary plumbing, gasfitting and drainlaying.

   The Act clearly identifies it is an offence to knowingly employ, permit or pay any person to do any sanitary plumbing, gasfitting or drainlaying contrary to the provisions of the Act. Plumbers, Gasfitters or Drainlayers must hold a licence for the current licensing period, 1 April to 31 March in any year. People who do not hold a current licence should not be working at any sanitary plumbing, gasfitting or drainlaying.

   People who hold limited certificates in terms of the Plumbers, Gasfitting and Drainlayers Act 2006 must be working under supervision of a Certifying Plumber, Gasfitter or Drainlayer.

4. **What is a Site Inspection Record?**
   The items marked with an '☑' or '☒' are indications of the required inspections. These items, when completed, need to be signed by the inspector.

   Failure to obtain inspections during construction could result in difficulties obtaining a Code Compliance Certificate.

The Site Inspection Report is to be retained on site until the final inspection is completed.

A re-inspection fee **may** be charged for the following if the Building Advisory Officer arrives and:

1. The work is not ready for the inspection or has failed to reach the required standard.
2. Owner/agent/plans and consent documents not on site.
3. Inspection not cancelled in sufficient time to notify inspector.
4. Boundaries not located or proved.

Note: Owner/Agent to provide access to all areas to be inspected.

5. Code Compliance Certificate

Information about how to apply for a Code Compliance Certificate (CCC), can be found on Council's website.

Section 93(2) of the Building Act 2004 states any building consent that is two years old requires the Building Consent Authority (BCA) to decide if a Code Compliance Certificate can be issued. Applicants will be sent a reminder letter at 23 months from the building consent grant date if a Code Compliance Certificate has not been applied for. If no response is received in relation to this letter and if compliance cannot be established the applicant will be advised by letter the reasons why we have made a decision to refuse to issue a Code Compliance Certificate at this stage. The consent will be given a status of 'Archived'. Additional fees will be charged for further site inspections and administration costs incurred.

6. What do I need to know about Heating Application Installations?

Your heater must be installed as per the Approved Building Consent documents.

We recommend you **do not** light your heater until it has been inspected. For free standing units **the ceiling plate shall be detached** with access provided to the ceiling space. If a wet back is fitted access **must** also be provided to the hot water cylinder and tempering device.

If you require further information or clarification as to your responsibilities, please contact a Building Advisory Officer on 06 366 0927.

23 November 2020

G J Gardner Homes
PO Box 466
Palmerston North Central
Palmerston North 4440

Dear Sir/Madam

Building Consent Number: 20200581
Address: 283A Kimberley Road, Levin Rural
Description: New Residential Dwelling

The plans and specifications have been checked, and it is noted that they do not comply fully with the New Zealand Building Code.

You are advised that the Building Consent cannot be granted until the following information has been provided and approved.

BUILDING
1. E1 - Please specify the FFL as a minimum of 450mm above general ground level to comply with the consent notice. Please revise and update architectural drawings.

We have suspended your application and will not proceed any further until the above information is received.

To facilitate a speedy outcome, please provide the following;

- A cover letter identifying solutions to each RFI item & reference to modified documents – *page/sheet no*
- Clear notation on modified documents to indicate the revised changes – *via bubble/cloud, underline, colour, points etc.*
- Address the response to recordsprocessing@horowhenua.govt.nz
- In the subject line please specify: **RFI Response** – *(Building Consent number)* – *(site address)* – **Attn: Junior Vaikai**

Please be advised that failure to supply the required information within 2 months will result in Horowhenua District Council refusing this application in its entirety under Section 50 of the Building Act 2004. Processing fees incurred to this point will be invoiced.

If you have any queries, please contact me.

Yours faithfully

Junior Vaikai
Building Advisory Officer

16 November 2020

G J Gardner Homes
PO Box 466
Palmerston North Central
Palmerston North 4440

Dear Sir/Madam

Building Consent Number: 20200581
Address: 283A Kimberley Road, Levin Rural
Description: New Residential Dwelling

The plans and specifications have been checked, and it is noted that they do not comply fully with the New Zealand Building Code.

You are advised that the Building Consent cannot be granted until the following information has been provided and approved.

BUILDING
1. E1 - Please specify the FFL as a minimum of 450mm above general ground level to comply with the consent notice. Please revise and update architectural drawings.
2. Please consider submitting a new set of plans as the colours used in the provided plans may prove difficult to read on site.
3. B1 - Please revise bracing elements in bracing line E to coincide with what is shown in the bracing calculations. Please revise and update architectural drawings.
4. F2 - Please specify adequate safety glazing to windows shown in 'Elevation A' in the living area. Please revise and update architectural drawings.
5. G13 - Please show the 40mm waste to the laundry doesn't exceed the allowable lengths as per AS/NZS 3500.2. Please revise and update architectural drawings.
6. G13 - Horizons Regional Council's approval of the onsite effluent disposal system has not yet been obtained.

We have suspended your application and will not proceed any further until the above information is received.

To facilitate a speedy outcome, please provide the following;
- A cover letter identifying solutions to each RFI item & reference to modified documents – *page/sheet no*
- Clear notation on modified documents to indicate the revised changes – *via bubble/cloud, underline, colour, points etc.*
- Address the response to recordsprocessing@horowhenua.govt.nz
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Please be advised that failure to supply the required information within 2 months will result in Horowhenua District Council refusing this application in its entirety under Section 50 of the Building Act 2004. Processing fees incurred to this point will be invoiced.

If you have any queries, please contact me.

Yours faithfully

Junior Vaikai
Building Advisory Officer

28 October 2020

Courtney Ivy Main & Dylan James Hyde
[redacted]

Dear Sir/Madam

Acknowledgement of Receipt of Building Consent Application and/or Project Information Memorandum: 20200581

Thank you for your application for the proposed construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage at 283A Kimberley Road Levin Rural.

Your application has been lodged onto our system on 22/10/2020, and the following number has been allocated to the application for future reference 20200581.

We are currently checking your application to ensure we have all the information we require to properly assess your proposal, and a decision should be made within 20 working days from the date of lodgement, unless further information is required.

If you have any further enquiries relating to this matter, do not hesitate to contact us on 06 366 0927 quoting the above allocated number.

Yours sincerely

Customer Support Officer – Building

Building Consent - Form 2 - 20200581

Submission Details

Submission Ref	HORO042426
Status	CCC - Received
Consent Number	20200581
Submitter	Plans.co.nz (Rebecca Wimms)
Date Issued	Thu 26 Nov 2020, 4:39 PM
Building Consent Authority	Horowhenua District Council
Site Address	283A Kimberley Road, Levin Rural
Building Complexity	R1
Date Submitted	Tue 20 Oct 2020, 11:43 AM
Legal Description	Lot: 3 DP: 351707

Council Details

Council Property ID	37306
Agent Contact ID	391211
Owner Contact ID	440360

Building Consent - Form 2

Application for project information memorandum and/or building consent – Form 2

Section 33 or section 45, Building Act 2004

What Are You Applying For

Select the appropriate box(es) to indicate what type of application you are submitting. You may need to select more than one box. *

☑ Building Consent	☐ Project Information Memorandum (PIM)
☐ Building Consent using a National Multiproof Approval	☐ Staged Building Consent

What Building Work Are You Doing

What type of building work are you doing *

◉ Residential	○ Multi-Residential	○ Commercial / Industrial

Residential *

☑ New detached dwelling	☐ Plumbing works	☐ Major alterations / additions - any work that includes altering or attaching to the exterior of a building
☐ Minor alterations - any internal work that does not include altering the exterior of the building	☐ Garage / detached carport	☐ Seismic strengthening
☐ Other		

Select all applicable boxes. If your building work is not listed, select Other and provide details.

Where Is The Building Work

What is the street address *

283A Kimberley Road, Levin Rural

Legal Description *

LOT 3

Deposited Plan

DP 351707

Building Name

Location of building within site/block including near street access

Are you building in a zone that requires a land-use Resource Consent *

○ Yes	◉ No

Is the subdivision of an existing site involved *

○ Yes	◉ No

Does the building or site have any cultural or heritage significance, or is it a marae? *

○ Yes	◉ No

Who Owns The Building Or Land

Owner name *

Dylan Hyde & Courtney Main

Owner title

Owner email address *

[redacted]

Owner contact number *

[redacted]

Owner mobile number

Owner mailing address *

[redacted]

Proof of Ownership

The Building (Forms) Regulations 2004 requires evidence of ownership to be provided, proof of ownership less than 3 months old ensures the ownership is current.

Proof of ownership *

- ⊙ Record of Title
- ○ Other

A Record of Title (RT) is the most common and preferred type of proof of ownership, however other forms of proof of ownership maybe able to be used. Please check with the Building Consent Authority (BCA) or Council you are applying to if other types of proof of ownership will be accepted, before selecting other and submitting the application.

Request a Record of Title (RT) from the Building Consent Authority (BCA) or Council *

- ⊙ Yes
- ○ No

Please check with the Building Consent Authority (BCA) or Council that you are applying to, if they provide this service before requesting a RT directly from them.

Who Is The Applicant

Is the application being made on behalf of the owner *

- ⊙ Yes
- ○ No

Agent Contact Information

Please note that the nominated first point of contact must be in New Zealand.

Who is the first point of contact for further correspondence *

- ○ Owner
- ⊙ Agent
- ○ Other

Who should the invoice be sent to? *

- ○ Owner
- ⊙ Agent
- ○ Other

Payee name for the invoice *

Palmer & Low Construction Ltd t/a GJ Gardner Homes Manawatu/Horowhenua

Agent name *

GJ Gardner Homes Manawatu/Horowhenua

Agent title

Agent email address *

jonathan@plans.co.nz

Agent contact number *

063578020

Agent mobile number

Agent mailing address *

PO Box 466
Palmerston North

Who's Involved In The Build

Select who's involved *

☑ Licensed Building Practitioner	☐ Other

If there are others involved in the build who aren't licensed building practitioners please provide their details by selecting the other option.

Licensed Building Practitioner/s

Name *

Jeff Twigge

Email address

jonathan@plans.co.nz

Contact number

063592844

Mailing address

583 Roberts Line
RD 10
Palmerston North 4470

Licensed Building Practitioner *

Designer

Other

If the licensed building practitioner type was not listed please provide details

License class *

Design 1
Design 2
Design 3
Site 1
Site 2
Site 3
Carpentry
Roofing
External Plastering
Brick and Block Laying

Select one or more licence classes in the list

Licensed Building Practitioner registration number *

111561

What Are The Specifics Of The Site

What is the wind zone *

○ Low	○ Medium	◉ High
○ Very High	○ Extra High	○ Specific Design

What is the exposure zone *

○ Low (B)	◉ Medium (C)	○ High/Sea spray (D)

Does the proposed building work cover two or more allotments *

○ Yes	◉ No

Are there public drains on the site *

○ Yes	◉ No

Is the site subject to natural or created hazards such as erosion, subsidence, flooding, slips, cut and fill or contamination *

○ Yes	◉ No

Are there any alterations to land contours (e.g. earthworks) *

○ Yes	◉ No

Are there new or altered connections to public utilities *

○ Yes	◉ No

Are there new or altered locations and/or external dimensions of buildings *

◉ Yes	○ No

Is there new or altered access for vehicles *

○ Yes	◉ No

Is the building work over or adjacent to any road or public place *

○ Yes	◉ No

Does the building work involve the disposal of storm-water or wastewater *

◉ Yes	○ No

Is the building work over any existing drains or sewers or in close proximity to wells or water mains *

○ Yes	◉ No

Are there any other matters known to the applicant that may require authorisation from the territorial authority *

○ Yes	◉ No

What Are The Details Of The Building Work

Provide a full description of the building work *

Construct new 3 bedroom residential dwelling with attached garage.

Estimated value of the building work (including GST) *

$ 493804

What is the intended life of the building *

◉ 50+ years	○ Limited Life

Proposed Use

You must select at least one of the following seven proposed use 'types'. Where you select Housing, Communal residential or Communal non-residential, you must also specify a proposed use 'sub type'

☑ **Housing**

Housing selections *

☑ Detached dwellings	☐ Multi-unit dwelling	☐ Group dwelling

☐ **Outbuildings**

☐ **Ancillary**

Will the building work affect an existing building and/or parts of an existing building *

○ Yes	◉ No

Total number of floor levels *

1

Levels below ground (if applicable)

Total floor area *

203.56 m2

Please provide measurements in square metres i.e. if the building is 220m2 please put 220

Is the building used for anything other than a single household unit? *

○ Yes	◉ No

Does the project include Restricted Building Work *

◉ Yes	○ No

Are you applying for Owner/Builder exemption to complete the Restricted Building Work *

○ Yes	◉ No

IMPORTANT – PLEASE READ

MEMORANDUM FROM LICENSED BUILDING PRACTITIONER: CERTIFICATE OF DESIGN WORK - FORM 2A

Is required to be submitted as part of your Building Consent application where restricted building work is part of the design.

To complete the Memorandum from Licensed Building Practitioner: Certificate of Design Work - Form 2A you can save and close this form at any stage before submitting, and add the form by clicking on the form Tab.

Alternatively, you can complete the form separately as a PDF document by clicking on the following link.

Please Note: you will need to attach the Memorandum from Licensed Building Practitioner: Certificate of Design Work - Form 2A to the **Architectural Specifications** document in the **"Have You Attached All Required Documentation"** section of this form.

Link to – Memorandum from Licensed Building Practitioner: Certificate of Design Work - Form 2A – PDF Version

Have you discussed this project with the Building Consent Authority prior to applying?

○ Yes	◉ No

Does the building work involve a swimming pool?

○ Yes	◉ No

Does the building work involve any Recladding?

○ Yes	◉ No

What Clauses Of The Building Code Does Your Work Comply With

☑ * **I understand that this application is to be assessed against Acceptable Solutions, unless otherwise stated in this section.**

Please tick to indicate your agreement

☑ **B - Building Code**



☑ **B1 - STRUCTURE**

Buildings will withstand likely loads, including wind, earthquake, live and dead loads (people and building contents).

☑ **B2 - DURABILITY**

Confirming the use of materials that will remain functional for the minimum periods specified (5, 15 or >50 years).

Provide any additional information

Provide details of Verification Method/s being used

Include relevant code clauses and means of compliance

Provide details of Alternative Solution/s being used

Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)

☑ **C - Building Code**



☑ **C1 - OBJECTIVES OF CLAUSES C2 TO C6**

Safety objectives for people, other property and firefighting applied to clauses C2 to C6 of the Building Code.

☑ **C2 - PREVENTION OF FIRE OCCURRING**

Safe design and installation of fixed appliances using controlled combustion and other fixed equipment.

☑ **C3 - FIRE AFFECTING AREAS BEYOND THE SOURCE**

Fire affecting areas beyond the source: vertical or horizontal fire spread, Material Group Numbers, surface finishes.

☑ **C4 - MOVEMENT TO A PLACE OF SAFETY**

Fire warnings, visibility of escape routes (smoke obscuration), automatic fire sprinkler systems, means of escape.

☐ **C5 - ACCESS AND SAFETY FOR FIREFIGHTING OPERATIONS**

Access and safety for firefighting operations: access, hazards information and unobstructed paths.

☑ **C6 - STRUCTURAL STABILITY**

Structural stability during fire: buildings remain stable during fire (likelihood of failure or collapse).

Provide any additional information

Provide details of Verification Method/s being used

Include relevant code clauses and means of compliance

Provide details of Alternative Solution/s being used

Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)

☑ **D - Building Code**



☑ **D1 - ACCESS ROUTES**

Safety of entry/exit to the building and the safety of any internal or external stairs.

☐ **D2 - MECHANICAL INSTALLATION FOR ACCESS**

Safety provisions for people using or servicing mechanical installations in buildings, such as lifts or escalators.

Provide any additional information

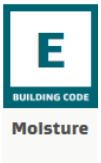
Provide details of Verification Method/s being used

Include relevant code clauses and means of compliance

Provide details of Alternative Solution/s being used

Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)

☑ **E - Building Code**



☑ **E1 - SURFACE WATER**

Disposal of rainwater from external surfaces and confirmation surface water cannot enter the building.

☑ **E2 - EXTERNAL MOISTURE**

External roof, wall claddings and external openings will prevent external moisture from causing undue dampness or damage.

☑ **E3 - INTERNAL MOISTURE**

Surfaces in wet areas must be impervious, easily cleaned, and have ventilation to meet conditions for health and safety.

Provide any additional information

Provide details of Verification Method/s being used

Include relevant code clauses and means of compliance

Provide details of Alternative Solution/s being used

Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)

☑ **F - Building Code**



☐ **F1 - HAZARDOUS AGENTS ON SITE**

Identifying and neutralising any hazardous agents or other contamination of the building site.

☑ **F2 - HAZARDOUS BUILDING MATERIALS**

Safety for glass and glazing methods, asbestos and materials that give off noxious fumes.

☐ **F3 - HAZARDOUS SUBSTANCES AND PROCESSES**

Safety from hazardous substances where stored, handled or used or where hazardous processes are undertaken.

☐ **F4 - SAFETY FROM FALLING**

Safe design of all barriers inside and outside the building.

☑ **F5 - CONSTRUCTION AND DEMOLITION HAZARDS**

Providing protection of people and other property during construction and demolition.

☐ **F6 - VISIBILITY IN ESCAPE ROUTES**

Safety features for escape routes during failure of the main lighting.

☑ **F7 - WARNING SYSTEMS**

Provides early warning systems to alert people to an emergency.

☐ **F8 - SIGNS**

Providing identification of escape routes, hazards, emergency-related safety features and accessible facilities.

☐ **F9 - RESTRICTING ACCESS TO RESIDENTIAL POOLS**

Restricting access by young children to residential pools.

Provide any additional information

Provide details of Verification Method/s being used

Include relevant code clauses and means of compliance

Provide details of Alternative Solution/s being used

Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)

☑ **G - Building Code**



☑ **G1 - PERSONAL HYGIENE**

Providing sufficient sanitary fixtures (toilets, showers and basins) for sanitation.

☑ **G2 - LAUNDERING**

Providing sufficient laundry facilities.

☑ **G3 - FOOD PREPARATION AND PREVENTION OF CONTAMINATION**

Providing sufficient safe and hygienic facilities for food storage and preparation

☑ **G4 - VENTILATION**

Requires ventilation to all occupied spaces.

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Habitable spaces with sufficient space for activity, accessible facilities and controlled internal temperature.

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Prevention of undue noise transmission in building elements between occupancies or common spaces in household units.

☑ **G7 - NATURAL LIGHT**

Providing sufficient natural light for occupied spaces and appropriate visual awareness of the outside for occupants.

☑ **G8 - ARTIFICIAL LIGHT**

Requires buildings to have sufficient artificial light to safeguard people from injury.

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Requires the safe use and distribution of electricity.

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Requires the safe distribution of hot, cold or toxic substances.

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Requires the safe installation of gas-fueled appliances.

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Requires the safe supply, storage, reticulation and delivery of hot and cold water.

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Requires the safe disposal of foul water to prevent illness and the loss of amenity due to odour and accumulated matter.

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Requires the safe and hygienic collection, treatment and disposal of industrial liquid waste to avoid contamination.

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Provides for the safe and hygienic collection, holding prior to disposal of solid waste.

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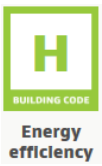
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☑ **H - Building Code**



☑ **H1 - ENERGY EFFICIENCY**

Provides for the efficient use of energy and sets physical conditions for energy performance.

Provide any additional information

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☐ **Specific Buildings - Building Code**



What Specified Systems Are In The Building

Does your building work involve or affect any Specified Systems (SS)? *

○ Yes	◉ No

Have You Attached All Required Documentation

Document Categories for Residential Applications

The following doument categories are associated to a residential application:

- **Architectural Plans**
- **Architectural Specifications**

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☑ ***I have the appropriate documentation prepared for a residential application and I have combined the documents into the appropriate categories**

The document upload selections will be provided once you have ticked this selection.

I have structural engineering requirements associated to the application. *

◉ Yes	○ No

If you have structural plans, specifications and supporting documents associated to your application please click 'Yes'.

Do you have supporting documentation associated to the application. *

○ Yes	◉ No

If you have supporting documentation that can't be merged into the main categories please click "Yes" and you will be able to add additional documents.

Residential Document Upload

Architectural Specifications - Architectural_Specifications.pdf
Architectural Plans - Architectural_Plans.pdf

Residential Structural Document Upload

Structural Plans - Structural_Plans.pdf
Structural Specifications - Structural_Specifications.pdf

Submitter Declaration

Submitter Name	Rebecca Wimms
Date	20/10/2020

I understand that by ticking the following boxes, I am agreeing to the following statements:

☑ ***As the agent I confirm that I am submitting this application on behalf of and with the authority of the owner and confirm that all the information within the application is, to the best of my knowledge, true and correct.**

☑ ***I request that you issue a building consent for the building work described in this application.**

Project Information Memorandum
Planning Check (Sheet A)

This is a **PLANNING CHECK** ☒ or **PIM** ☐ **Date Lodged: 22/10/2020**

Application Details - *To be completed by SS Staff*

Applicant:	Courtney Ivy Main & Dylan James Hyde
Mailing Address:	[redacted]
Phone No:	

Project

PIM Number:	100/20200581
BC Application No:	100/20200581
Description of Work:	Construction of a new three bedroom, two bathroom dwelling with separate toilet, two living areas and attached double garage

Site Details

Site Address:	283A Kimberley Road Levin Rural
Legal Description:	Lot: 3 DP: 351707
Site Area:	0.8403 square metres more or less
Valuation No:	1484020513
Damage Indemnity	Yes ☐ Not applicable ☐

Consent Notices/Encumbrances Yes ☒ No ☐

Consent Notices & Easements identified on copy of Certificate of Title

Access and facilities:		
Is this a Schedule 2 Building as defined by s.118-120 of the Building Act 2004?	Yes ☐	No ☒
Earthquake Risk Building:	Yes ☐	No ☒
Heritage Building:	Yes ☐	No ☒
Evacuation Plan Required:	Yes ☐	No ☒
Section 73 Certificate: (Natural Hazards) REQUIRED	Yes ☐	No ☒
Section 75 Certificate: (2 or more lots) REQUIRED	Yes ☐	No ☒

Planning Assessment – Horowhenua District Plan

ZONE: Rural	**DESIGNATION:** None	
OVERLAY AREA: None		

Rules	**Complies**		
	Yes	**No**	**N/A**
Permitted Activity in zone	X		
Height Standard	X		
Day lighting Standard			X
Building Setbacks - **Water tanks** - **Noise insulation (properties abutting Kiwirail corridor and State Highways)** - **Intensive Farming/Plantation Forestry**	X X		
Dwelling Separation Standard			X
Accessory Buildings			X
Site Coverage			X
Vehicle Access	X		
Vehicle Parking and Manoeuvring	X		

Other::			
Identified Hazards			
Council is aware of the following:	**Yes**	**No**	**Tick if Consent required** ☐
Potential Inundation (Ponding)		X	**Comments:**
Presence of Hazardous Contaminants/Hail sites		X	
Strathnaver Coastal Hazard Area		X	
Flood Hazard Area		X	
Earthworks/construction Moutoa Floodway		X	
Other:			
Natural/Special Feature Protection			
Planning maps indicate site is within or contains:	**Yes**	**No**	**Tick if Consent required** ☐
Outstanding Natural Feature or Landscape		X	**Comments:**
Strathnaver Coastal Natural Character Area		X	
High Amenity Landscape Domain		X	
Heritage Value		X	
Notable Tree(s)		X	

Planning Assessment Summary		
Resource Consent	**Yes** ☐ **No** ☒	
If obtained enter RC No:		
RC Section 37 Building Act 2004 Certificate:	**Yes** ☐	**No** ☒
Entranceway Required	**Yes** ☐	**No** ☒
Attachments:		
Notes: Planning Check Ok No Sec 37 Required Time: 15 mins		
Check Completed by: Candy Black		**Dated:** 30/10/2020
Copy Passed to Support Services	**Yes** ☒	**No** ☐
Health		

WARNING: Information provided in this document is based solely on historical records held by Horowhenua District Council. The accuracy of the information provided has not been checked. Use of this information for any purpose what so ever is at the discretion of the user. Horowhenua District Council accepts no responsibility for any loss or hurt, which may be suffered due to that use.

Building Consent - Form 2 - HORO042426

Submission Details

Submission Ref	HORO042426
Status	Accepted
Building Complexity	R1
Date Submitted	Tue 20 Oct 2020, 11:43 AM
Building Consent Authority	Horowhenua District Council
Site Address	283A Kimberley Road, Levin, Levin 5571
Submitter	Plans.co.nz (Rebecca Wimms)

Building Consent - Form 2

Application for project information memorandum and/or building consent – Form 2

Section 33 or section 45, Building Act 2004

What Are You Applying For

Select the appropriate box(es) to indicate what type of application you are submitting. You may need to select more than one box. *

☑ Building Consent	☐ Project Information Memorandum (PIM)
☐ Building Consent using a National Multiproof Approval	☐ Staged Building Consent

What Building Work Are You Doing

What type of building work are you doing *

◉ Residential	○ Multi-Residential	○ Commercial / Industrial

Residential *

☑ New detached dwelling	☐ Plumbing works	☐ Major alterations / additions - any work that includes altering or attaching to the exterior of a building
☐ Minor alterations - any internal work that does not include altering the exterior of the building	☐ Garage / detached carport	☐ Seismic strengthening
☐ Other		

Select all applicable boxes. If your building work is not listed, select Other and provide details.

Where Is The Building Work

What is the street address *

283A Kimberley Road, Levin

Legal Description *

LOT 3

Deposited Plan

DP 351707

Building Name

Location of building within site/block including near street access

Are you building in a zone that requires a land-use Resource Consent *

○ Yes ◉ No

Is the subdivision of an existing site involved *

○ Yes ◉ No

Does the building or site have any cultural or heritage significance, or is it a marae? *

○ Yes ◉ No

Who Owns The Building Or Land

Owner name *

Dylan Hyde & Courtney Main

Owner title

Owner email address *

main.hyde@gmail.com

Owner contact number *

021 605 460

Owner mobile number

Owner mailing address *

6 Queenwood Road
Levin

Proof of Ownership

The Building (Forms) Regulations 2004 requires evidence of ownership to be provided, proof of ownership less than 3 months old ensures the ownership is current.

Proof of ownership *

◉ Record of Title ○ Other

A Record of Title (RT) is the most common and preferred type of proof of ownership, however other forms of proof of ownership maybe able to be used. Please check with the Building Consent Authority (BCA) or Council you are applying to if other types of proof of ownership will be accepted, before selecting other and submitting the application.

Request a Record of Title (RT) from the Building Consent Authority (BCA) or Council *

◉ Yes ○ No

Please check with the Building Consent Authority (BCA) or Council that you are applying to, if they provide this service before requesting a RT directly from them.

Who Is The Applicant

Is the application being made on behalf of the owner *

◉ Yes	○ No

Agent Contact Information

Please note that the nominated first point of contact must be in New Zealand.

Who is the first point of contact for further correspondence *

○ Owner	◉ Agent	○ Other

Who should the invoice be sent to? *

○ Owner	◉ Agent	○ Other

Payee name for the invoice *

Palmer & Low Construction Ltd t/a GJ Gardner Homes Manawatu/Horowhenua

Agent name *

GJ Gardner Homes Manawatu/Horowhenua

Agent title

Agent email address *

jonathan@plans.co.nz

Agent contact number *

63578020

Agent mobile number

Agent mailing address *

PO Box 466
Palmerston North

Who's Involved In The Build

Select who's involved *

☑ Licensed Building Practitioner	☐ Other

If there are others involved in the build who aren't licensed building practitioners please provide their details by selecting the other option.

Licensed Building Practitioner/s

Name *

Jeff Twigge

Email address

jonathan@plans.co.nz

Contact number

063592844

Mailing address

583 Roberts Line
RD 10
Palmerston North 4470

Licensed Building Practitioner *

Designer

Other

If the licensed building practitioner type was not listed please provide details

License class *

- Design 1
- Design 2
- Design 3
- Site 1
- Site 2
- Site 3
- Carpentry
- Roofing
- External Plastering
- Brick and Block Laying

Select one or more licence classes in the list

Licensed Building Practitioner registration number *

111561

What Are The Specifics Of The Site

What is the wind zone *

○ Low	○ Medium	◉ High
○ Very High	○ Extra High	○ Specific Design

What is the exposure zone *

○ Low (B)	◉ Medium (C)	○ High/Sea spray (D)

Does the proposed building work cover two or more allotments *

○ Yes	◉ No

Are there public drains on the site *

○ Yes	◉ No

Is the site subject to natural or created hazards such as erosion, subsidence, flooding, slips, cut and fill or contamination *

○ Yes	◉ No

Are there any alterations to land contours (e.g. earthworks) *

○ Yes	◉ No

Are there new or altered connections to public utilities *

○ Yes	◉ No

Are there new or altered locations and/or external dimensions of buildings *

◉ Yes	○ No

Is there new or altered access for vehicles *

○ Yes	◉ No

Is the building work over or adjacent to any road or public place *

○ Yes	◉ No

Does the building work involve the disposal of storm-water or wastewater *

◉ Yes	○ No

Is the building work over any existing drains or sewers or in close proximity to wells or water mains *

○ Yes	◉ No

Are there any other matters known to the applicant that may require authorisation from the territorial authority *

○ Yes	◉ No

What Are The Details Of The Building Work

Provide a full description of the building work *

Construct new 3 bedroom residential dwelling with attached garage.

Estimated value of the building work (including GST) *

$ 493804

What is the intended life of the building *

◉ 50+ years	○ Limited Life

Proposed Use

You must select at least one of the following seven proposed use 'types'. Where you select Housing, Communal residential or Communal non-residential, you must also specify a proposed use 'sub type'

☑ **Housing**

Housing selections *

☑ Detached dwellings	☐ Multi-unit dwelling	☐ Group dwelling

☐ **Outbuildings**

☐ **Ancillary**

Will the building work affect an existing building and/or parts of an existing building *

○ Yes	◉ No

Total number of floor levels *

1

Levels below ground (if applicable)

Total floor area *

203.56 m2

Please provide measurements in square metres i.e. if the building is 220m2 please put 220

Is the building used for anything other than a single household unit? *

○ Yes	◉ No

Does the project include Restricted Building Work *

◉ Yes	○ No

Are you applying for Owner/Builder exemption to complete the Restricted Building Work *

○ Yes	◉ No

IMPORTANT – PLEASE READ
MEMORANDUM FROM LICENSED BUILDING PRACTITIONER: CERTIFICATE OF DESIGN WORK - FORM 2A

Is required to be submitted as part of your Building Consent application where restricted building work is part of the design.

To complete the Memorandum from Licensed Building Practitioner: Certificate of Design Work - Form 2A you can save and close this form at any stage before submitting, and add the form by clicking on the form Tab.

Alternatively, you can complete the form separately as a PDF document by clicking on the following link.

Please Note: you will need to attach the Memorandum from Licensed Building Practitioner: Certificate of Design Work - Form 2A to the **Architectural Specifications** document in the **"Have You Attached All Required Documentation"** section of this form.

Link to – Memorandum from Licensed Building Practitioner: Certificate of Design Work - Form 2A – PDF Version

Have you discussed this project with the Building Consent Authority prior to applying?

○ Yes	◉ No

Does the building work involve a swimming pool?

○ Yes	◉ No

Does the building work involve any Recladding?

○ Yes	◉ No

What Clauses Of The Building Code Does Your Work Comply With

☑ ***I understand that this application is to be assessed against Acceptable Solutions, unless otherwise stated in this section.**

Please tick to indicate your agreement

☑ **B - Building Code**



☑ **B1 - STRUCTURE**

Buildings will withstand likely loads, including wind, earthquake, live and dead loads (people and building contents).

☑ **B2 - DURABILITY**

Confirming the use of materials that will remain functional for the minimum periods specified (5, 15 or >50 years).

Provide any additional information

Provide details of Verification Method/s being used

Include relevant code clauses and means of compliance

Provide details of Alternative Solution/s being used

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☑ **C - Building Code**



☑ **C1 - OBJECTIVES OF CLAUSES C2 TO C6**

Safety objectives for people, other property and firefighting applied to clauses C2 to C6 of the Building Code.

☑ **C2 - PREVENTION OF FIRE OCCURRING**

Safe design and installation of fixed appliances using controlled combustion and other fixed equipment.

☑ **C3 - FIRE AFFECTING AREAS BEYOND THE SOURCE**

Fire affecting areas beyond the source: vertical or horizontal fire spread, Material Group Numbers, surface finishes.

☑ **C4 - MOVEMENT TO A PLACE OF SAFETY**

Fire warnings, visibility of escape routes (smoke obscuration), automatic fire sprinkler systems, means of escape.

☐ **C5 - ACCESS AND SAFETY FOR FIREFIGHTING OPERATIONS**

Access and safety for firefighting operations: access, hazards information and unobstructed paths.

☑ **C6 - STRUCTURAL STABILITY**

Structural stability during fire: buildings remain stable during fire (likelihood of failure or collapse).

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☑ **D - Building Code**



☑ **D1 - ACCESS ROUTES**

Safety of entry/exit to the building and the safety of any internal or external stairs.

☐ **D2 - MECHANICAL INSTALLATION FOR ACCESS**

Safety provisions for people using or servicing mechanical installations in buildings, such as lifts or escalators.

Provide any additional information

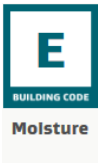
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☑ **E - Building Code**



☑ **E1 - SURFACE WATER**

Disposal of rainwater from external surfaces and confirmation surface water cannot enter the building.

☑ **E2 - EXTERNAL MOISTURE**

External roof, wall claddings and external openings will prevent external moisture from causing undue dampness or damage.

☑ **E3 - INTERNAL MOISTURE**

Surfaces in wet areas must be impervious, easily cleaned, and have ventilation to meet conditions for health and safety.

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☑ **F - Building Code**



☐ **F1 - HAZARDOUS AGENTS ON SITE**

Identifying and neutralising any hazardous agents or other contamination of the building site.

☑ **F2 - HAZARDOUS BUILDING MATERIALS**

Safety for glass and glazing methods, asbestos and materials that give off noxious fumes.

☐ **F3 - HAZARDOUS SUBSTANCES AND PROCESSES**

Safety from hazardous substances where stored, handled or used or where hazardous processes are undertaken.

☐ **F4 - SAFETY FROM FALLING**

Safe design of all barriers inside and outside the building.

☑ **F5 - CONSTRUCTION AND DEMOLITION HAZARDS**

Providing protection of people and other property during construction and demolition.

☐ **F6 - VISIBILITY IN ESCAPE ROUTES**

Safety features for escape routes during failure of the main lighting.

☑ **F7 - WARNING SYSTEMS**

Provides early warning systems to alert people to an emergency.

☐ **F8 - SIGNS**

Providing identification of escape routes, hazards, emergency-related safety features and accessible facilities.

☐ **F9 - RESTRICTING ACCESS TO RESIDENTIAL POOLS**

Restricting access by young children to residential pools.

Provide any additional information

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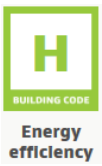
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I have structural engineering requirements associated to the application. *

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If you have structural plans, specifications and supporting documents associated to your application please click 'Yes'.

Do you have supporting documentation associated to the application. *

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Residential Document Upload

Architectural Specifications - Architectural_Specifications.pdf
Architectural Plans - Architectural_Plans.pdf

Residential Structural Document Upload

Structural Plans - Structural_Plans.pdf
Structural Specifications - Structural_Specifications.pdf

Submitter Declaration

Submitter Name	Rebecca Wimms
Date	20/10/2020

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RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R. W. Muir
Registrar-General
of Land

Identifier	**212276**
Land Registration District	**Wellington**
Date Issued	20 November 2007

Prior References
WN37C/796

Estate	Fee Simple
Area	8403 square metres more or less
Legal Description	Lot 3 Deposited Plan 351707

Registered Owners
Dylan James Hyde and Courtney Ivy Main

Interests

Subject to Section 8 Coal Mines Amendment Act 1950

7622076.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 20.11.2007 at 9:00 am

7622076.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 20.11.2007 at 9:00 am

7622076.4 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 20.11.2007 at 9:00 am

Appurtenant hereto is a right of way, and a right to supply electricity, telecommunications and water created by Easement Instrument 7622076.8 - 20.11.2007 at 9:00 am

The easements created by Easement Instrument 7622076.8 are subject to Section 243 (a) Resource Management Act 1991

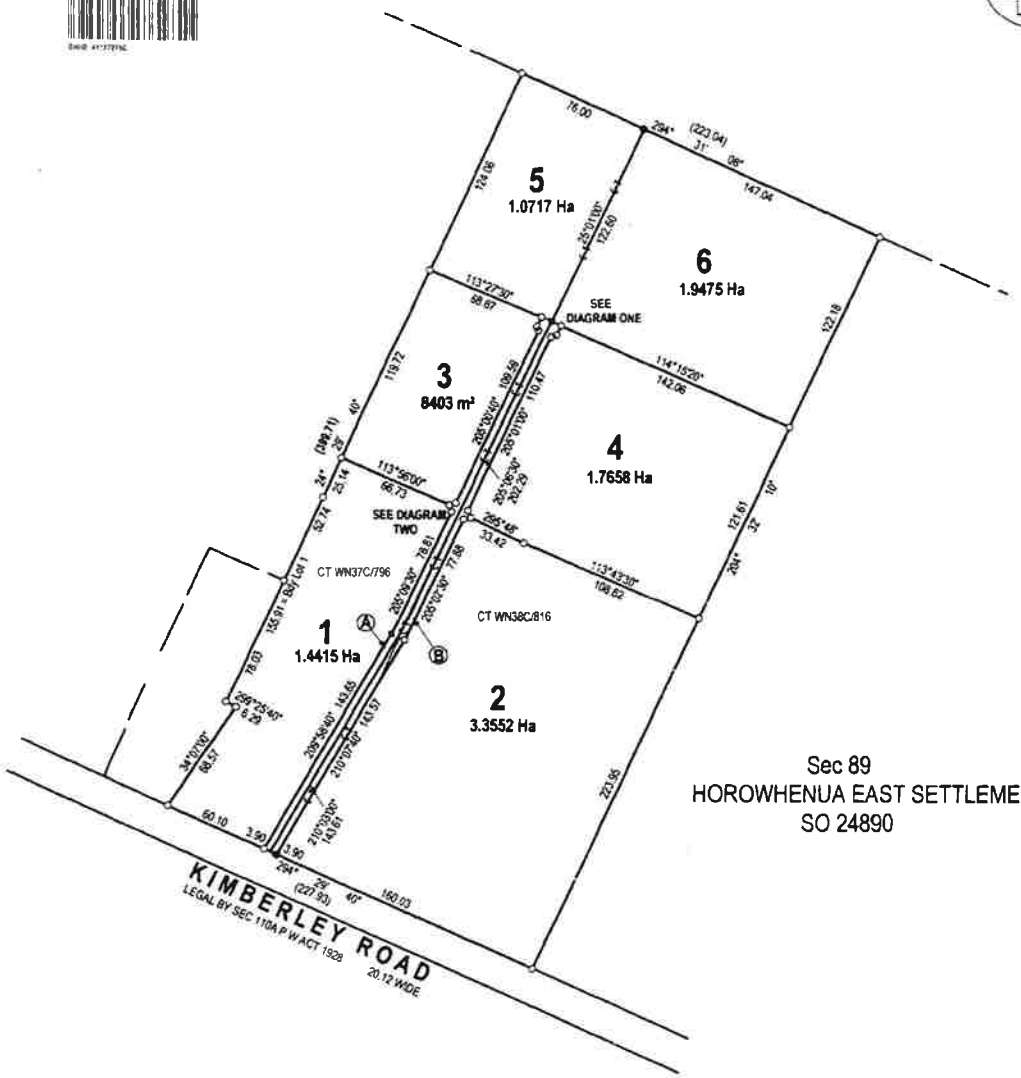
Appurtenant hereto is a right of way, a right to convey water, electricity, telecommunications and computer media, a right to convey gas, a right to drain water and sewage created by Easement Instrument 11533748.5 - 27.8.2019 at 1:27 pm

The easements created by Easement Instrument 11533748.5 are subject to Section 243 (a) Resource Management Act 1991

Land Covenant in Covenant Instrument 11533748.7 - 27.8.2019 at 1:27 pm

11813500.3 Mortgage to ANZ Bank New Zealand Limited - 3.8.2020 at 12:31 pm

LT 351707 (Title Plan)



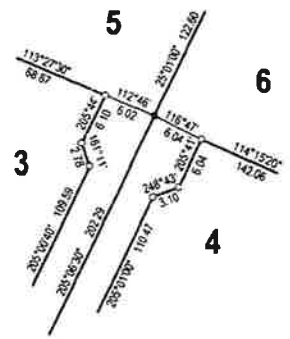


DIAGRAM ONE
Not to Scale

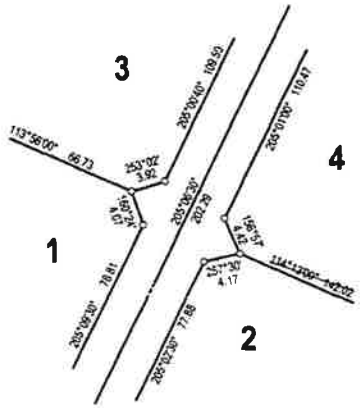


DIAGRAM TWO
Not to Scale

Approvals

I hereby certify that this plan was approved by the Horowhenua District Council pursuant to Section 223 of the Resource Management Act 1991. Subject to the granting or reserving of the easements setout in the memorandum hereon.

Dated this 6th day of April 2005

Authorised Officer/s

RS 964, Swanson, G B

MEMORANDUM OF EASEMENTS

SHOWN	PURPOSE	SERVIENT TENEMENT	DOMINANT TENEMENT
A	Right of Way	Lot 5	Lots 3, 4 & 6
B	Right to supply Water, Electricity, & Telecommunications	Lot 6	Lots 3, 4 & 5

New C'sT Allocated
Lot 1 - 212274 Lot 2 - 212275 Lot 3 - 212276
Lot 4 - 212277 Lot 5 - 212278 Lot 6 - 212279

Total Area	10.4220 Ha
Comprised In	CT WN38C/816 & WN37C/796
Class of Survey	Class II

I, Geoffrey Michael Truebridge, being a person entitled to practice as a Licensed Cadastral Surveyor, certify that :-

a) The surveys to which this dataset relates are accurate, and were undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor-General's Rules for Cadastral Survey 2002/2;

b) This dataset is accurate, and has been created in accordance with that Act and those rules.

Signed 7/04/05 Date

Field Book Reg 43 (1) Traverse Book ____ p ____
Reference Plans

Examined ____ Correct ____

Approved as to Survey by Land Information New Zealand on 28/4/2005

Deposited by Land Information New Zealand on 20/11/2007

File 2706 (Swanson - Kimberley)
Received 11/4/05
Instructions

DP 351707

LAND DISTRICT Wellington
SURVEY BLK. & DIST.
NZMS 261 SHT RECORD MAP No

Lots 1 to 6 being a subdivision of Lot 1 DP 68179 and Part Lot 2 DP 44847

TERRITORIAL AUTHORITY Horowhenua District
Surveyed by *TRUEBRIDGE ASSOCIATES LIMITED*
Scale 1:2000 Date February 2005

HOROWHENUA DISTRICT COUNCIL

The Subdivision of Lot 1 DP 68179 & Part Lot 2 DP 44847

Rural Subdivision No. 964

CONO 7622076.4 Consen
Cpy – 01/01, Pgs – 001, 19/11/07, 16:32
DocID: 411929948

CONSENT NOTICE

In the matter of the plan LT 351707 and pursuant to Section 221(1) of the Resource Management Act 1991, I hereby certify that the Horowhenua District Council has consented to the subdivision of Lot 1 DP 68179 & Part Lot 2 DP 44847 on condition that :

"A consent notice shall be registered against the titles of the Lots 1, 2,3,4,5 and 6 requiring that the owner of these lots shall provide approval from the Regional Authority for any onsite effluent disposal system to be installed at the time of building consent application. Any such system shall comply with the requirements of the Regional Authority in terms of discharge standards and system siting. The owner may have a qualified drainage engineer design a site specific system, however approval from the Regional Authority must still be provided at the time of building consent and be to the satisfaction of the Regulatory Services Manager."

Dated at Levin this 10th day of September 2007

Pieter Vorster
Planning Manager
Environmental and Regulatory Services

From:	Harold Barnett
To:	Rod Smillie; Building Processing; Candy Black; Planning Enquiries; Shane@ohagancontracting.co.nz; "Grant Forrest"; "jonathon.barlow@plans.co.nz"; "Rebecca | Plans.co.nz"
Cc:	Joanne Allardice
Subject:	HRC's 'approval of design' for the Shane O'Hagan designed onsite wastewater system for Dylan Hyde and Courtney Main's proposed three-bedroom G J Gardner Homes dwelling at 283A Kimberley Road, Levin (Lot 3 DP 351707)
Date:	Friday, 20 November 2020 3:06:47 pm
Attachments:	HYDE D & MAIN C 283A Kimberley Road LEVIN Lot 3 DP 351707 Oasis 2000.doc

Hello Rob, Candy, Shane, Grant, Jonathon and Rebecca
Attached is HRC's 'approval of design' for the Shane O'Hagan (O'Hagan Contracting Ltd) designed onsite wastewater system for Dylan Hyde and Courtney Main's proposed three-bedroom G J Gardner Homes dwelling on 8403m^2 property at 283A Kimberley Road, Levin (Lot 3 DP 351707). An Oasis 2000 aerated wastewater treatment system will produce up to 990L of secondary quality effluent per day that will be dosed into at least 330m^2 of land application area (LAA) comprising 330m of subsurface PCDI line. The design areal loading rate is 3mm/day.
Please note that the Oasis 2000 AWTS and the LAA are required to be installed by a registered drain-layer (as per the O'Hagan Contracting Design Report and G J Gardner Homes Site Plan) and the system maintained thereafter with six-monthly inspections under a Service Contract between the property owner and O'Hagan Contracting Ltd.
Ngā mihi
Harold
HAROLD BARNETT Environmental Scientist
DDI 06 952 2831 MOB 021 2277 153

This email is covered by the disclaimers which can be found by clicking here.

Horizons is the trading name of the Manawatu-Wanganui Regional Council
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www.horizons.govt.nz

DATE: Fri 20 Nov 2020	**TO:** Rob Tyler, Candy Black, Shane O'Hagan, Grant Forrest, Jonathon Barlow and Rebecca Wimms
TIME SENT :	**ORGANISATION :** Horowhenua DC, O'Hagan Contracting Ltd and plans.co.nz
SENDER : Harold Barnett	**FAX NUMBER :** 06 366 0983

We are transmitting 4 page(s) including this one.
If you do not receive all pages in a legible condition please call back as soon as possible.

MESSAGE: **FILE NO: RAI 2.01**

Dear Rob, Candy, Shane, Grant, Jonathon and Rebecca

RS Nos 964 NEW WASTEWATER SYSTEM – DYLAN HYDE & COURTNEY MAIN DWELLING
283A KIMBERLEY ROAD, LEVIN LOT 3 DP 351707 VAL14840/205.13 AREA 8403m^2

Ref: The O'Hagan Contracting Onsite Wastewater Disposal Evaluation Investigation Checklist for the Hyde and Main property was forwarded to Horizons on 8 September 2020.

This property has resulted from the subdivision of Lot 1 DP 68179 and Part Lot 2 DP 44847 into six lots. HDC Rural Subdivision No 964 Consent Notice, dated 10 September 2007, requiring a 450mm above ground level floor level for the dwelling, a restricted-flow water connection and on-site wastewater management on the new lots. Any new wastewater system needs to have the Regional Council's written approval prior to the issuance of PIM and Building Consent. Site specific design by qualified designer complying with the Regional Rules (One Plan) and the HDC's *Minimum Requirements for On-site Effluent disposal within the Horowhenua* was necessary and then installation by a registered drainlayer. Thereafter, system performance needed to avoid adverse effects on groundwater, human health, environment and nuisance to neighbouring properties. To ensure this, the system needed maintenance under Service Contract with the supplier or agent involving 6-monthly inspections. Copies of the Inspection sheets are to be forwarded to HDC following each inspection.

The onsite wastewater system is designed by Shane O'Hagan using an Oasis Clearwater 2000 aerated wastewater treatment plant (AWTS). A brief description of the system and comments follow:

Dwelling A three-bedroom G J Gardner Homes dwelling with a 6-person design occupancy proposed on this 8403m^2 property located 3.8km south of central Levin. There is access to HDC's trickle-feed potable water but access to the reticulated sewerage system at this location.

Wastewater Six-persons x 165L/head = 990L/day; Water source – HDC trickle feed / two 22,5000L water tanks.

Soil The soil at this site is mapped as a Kawhatau stony silt loam (76b) in Horizons Local Maps database (regional scale) with a LUC of 3s2 and described as well-draining. This soil suite is a yellow-brown shallow and stony soil associated with intergrades between yellow-grey earths and yellow-brown earths that are developed from stony alluvium formed on medium height alluvial terraces throughout the region. The soil profile at the LAA is 200mm of silty loam topsoil overlying 200mm of a light loam then gravels to at least 1m (Shane O'Hagan visit of 8 September 2020). Shane has assessed drainage at the land application site as Category 2 – well-draining, with a LTAR of 12 - 15 litres of secondary treated wastewater per square metre per day (AS/NZS 1547:2000). Groundwater is not an issue as assessed as greater than 2m year round. The wastewater application rate at this location should be at a conservative rate with an evaporation component for sustainable wastewater assimilation.

System The Oasis Clearwater Series 2000 AWTS is a five-stage wastewater treatment system with a nominal operating capacity of 7,450L and the ability to treat up to 2000 litres of domestic wastewater per day. The holding capacity of the plant is 9,400L. The system includes 2-stage primary treatment in separate chambers - primary (3,500L) and secondary (750L); this is followed by aerobic digestion (2150L), clarification incorporating a Zabel A300 high performance filter and a pump-out or holding chamber (1050L). The plant is capable of consistently producing high quality (secondary standard) effluent. The plant has an alarm that indicates high water level, air interruption or pump failure and a days emergency storage The AWTS will be located approximately 3-4m to the south-west of the dwelling – see G J Gardner Homes Site Plan that shows the locations of the wastewater infrastructure.

Land Application Area (LAA) The design 330m^2 LAA has been calculated using a daily effluent volume of 990L / day and an application rate of 3mm/m^2/day. The LAA needs to comprise at least 330m of Metzerplas ADI pressure compensating drip irrigation (PCDI) line - three 110m lengths (centre loaded or similar configuration) of PCDI lines set in rows 1m apart are to be located along the western property boundary (see G J Gardner Site O'Hagan Site Plan). The lines are to be installed at 100-150mm depth. The drip line will have 2.1 litres/hour capacity emitters spaced at 600mm intervals.

The LAA is required to be 1.5m inside the boundary with the area planted with appropriate small trees and grasses to aid the uptake water and nutrients and be fenced. A 50% reserve area is mandatory.

Hydraulic Loading The design application rate is 3mm/m^2/day – this is HRC's permitted activity rate. This rate is considered appropriate for the well-draining soil at this location and provides mitigation for the potential cumulative effects of an increasing number of rural subdivisions.

Notes

I wish to stress some important points with regard to the location, day-to-day management and ongoing maintenance of the wastewater treatment system and the land application area.

- The LAA is required to be 20m away from natural watercourses including ephemeral drains and neighbouring LAA's where possible. Also, there needs to be at least 900mm of vertical separation between the high winter water table and the level of the PCDI lines.
- The LAA is required to be fenced to deter / exclude heavy stock, vehicles and children from infrastructure damage and public health perspectives, and be planted with appropriate small tress and grasses to enhance the uptake of nutrients and water. The plants need to be in a healthy condition to perform this task.
- The home owner is required to have a **Service Contract** with the O'Hagan Contracting allowing for 6-monthly inspections at their cost, to ensure the AWTS and LAA are operating efficiently.
- An 'As-built' plan of the on-site wastewater system together with a copy of the Service Contract and regular Inspections Reports are to be lodged with the Horowhenua DC following the installation of the treatment plant and on the completion of each inspection.
- The disposal of strong chemicals (cleaners, solvents etc.) and gross solids (nappies, sanitary products and solids from kitchen-waste grinders) into the wastewater system is not desirable; and
- Finally household water usage should be minimised where possible.

Conclusion / Acceptance of design

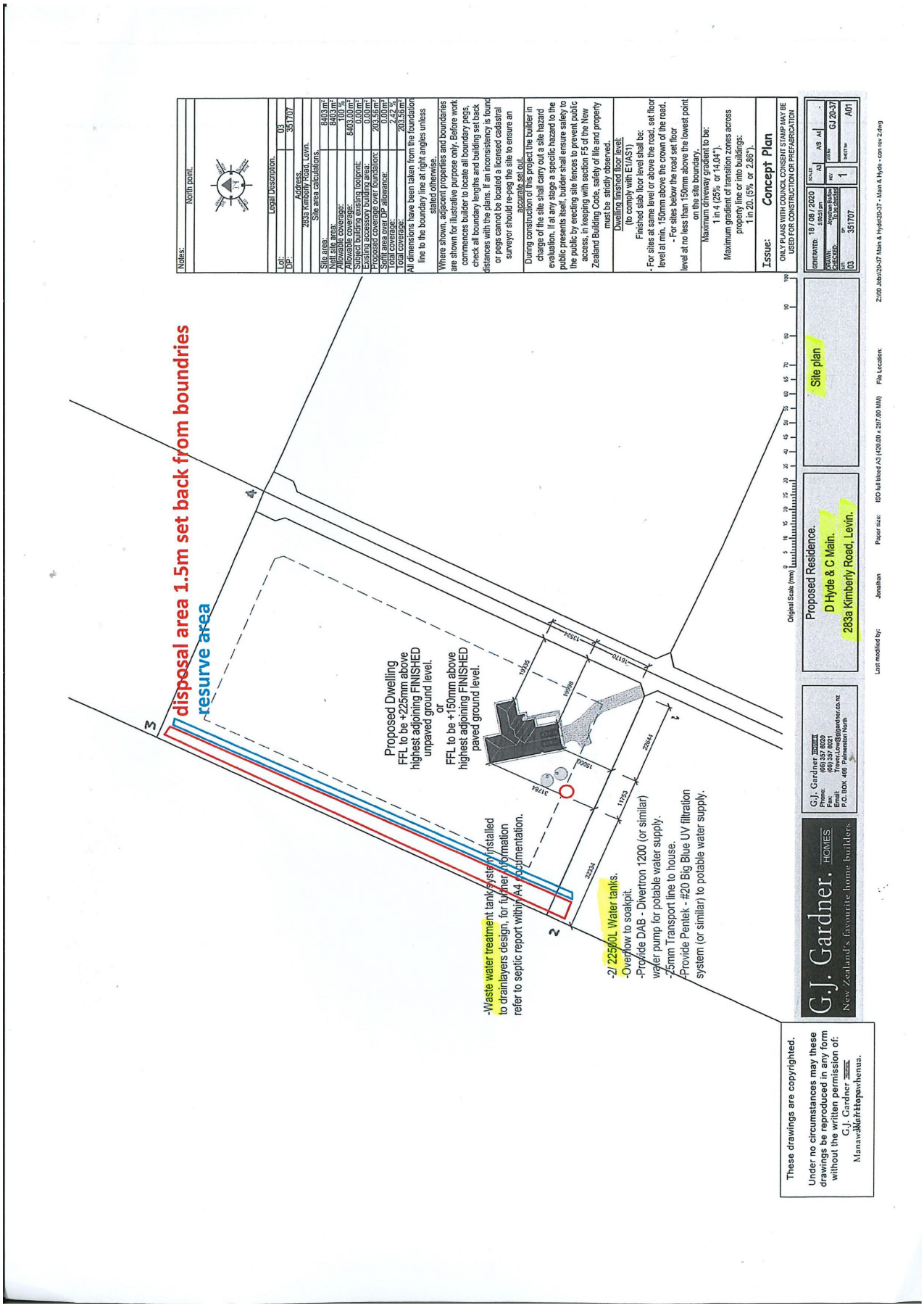
Shane O'Hagan (O'Hagan Contracting) has designed the onsite wastewater system for Dylan Hyde and Courtney Main's new three-bedroom G J Gardner dwelling on their 8403m^2 property at 283B Kimberley Road, Levin (Lot 3 DP 351707). An Oasis Clearwater 2000 AWTS will provide up to 990 litres of secondary treated effluent per day that will be dosed into 330m^2 of LAA at a rate of 3mm/day. The design complies with HRC's Rules and the Onsite Wastewater Design Manual. The wastewater system and LAA are required to be installed to Industry Standards by registered drain-layers (HDC Building Officers to ensure, please) in accordance with O'Hagan's Design Report and the G J Gardner the Site Plan. The treatment and LAA to be maintained thereafter under a Service Contract with O'Hagan Contracting to meet Horizons requirements. Shane O'Hagan's design is accepted.

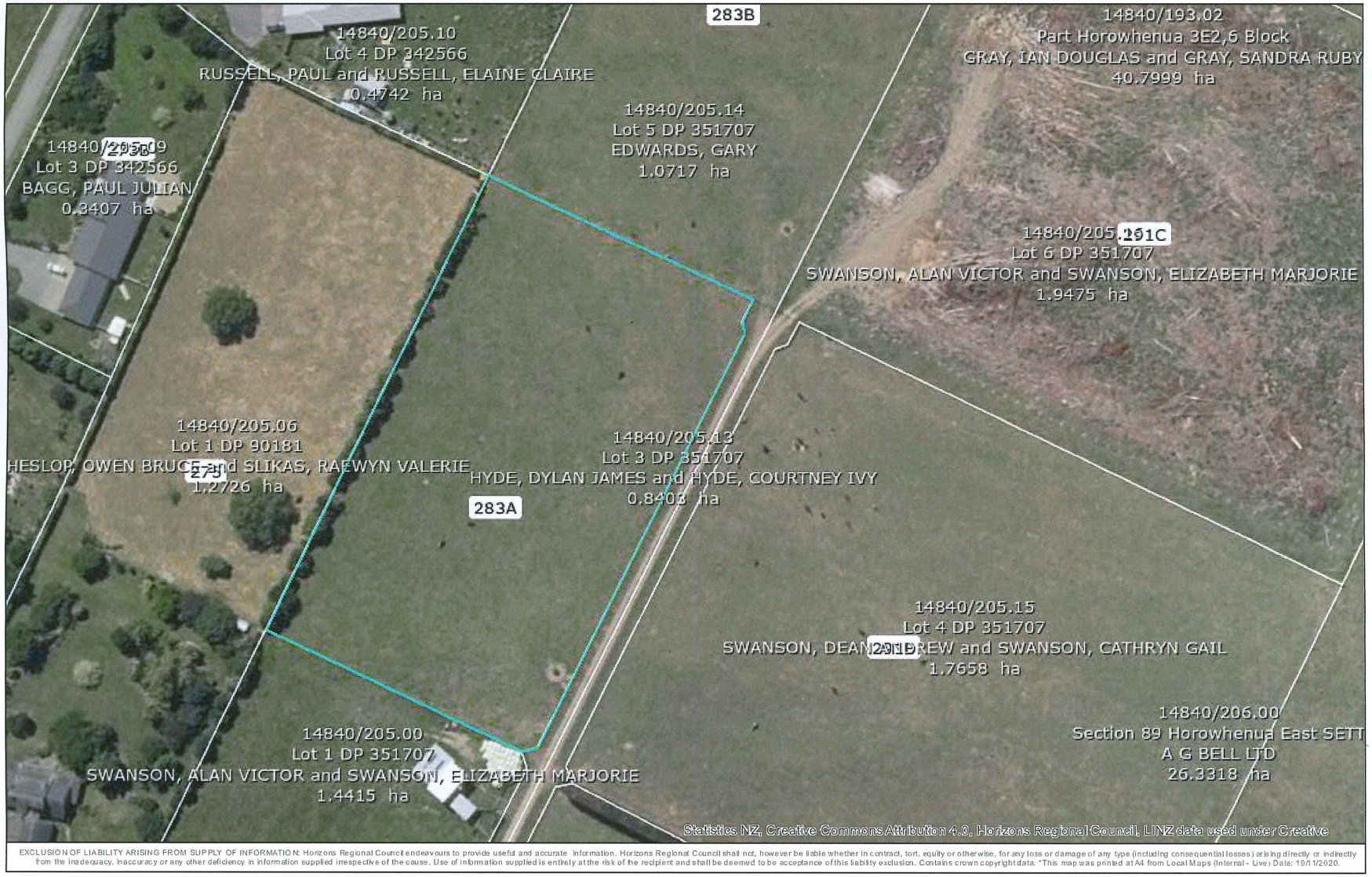
Ngā mihi



Harold Barnett
Environmental Scientist

G J Gardner Site Plan of Dylan Hyde and Courtney Main's 8403m^2 property at 283B Kimberley Road, Levin (Lot 3 DP 351707) with the locations of the proposed 3-bedroom G J Gardner dwelling, two 22,500L water tanks and the onsite wastewater system infrastructure – the Oasis Clearwater 2000 treatment plant, the 330m^2 LAA with subsurface PCDI line and the 50% Reserve Area.





HYDE & MAIN, 283A Kimberley Road Levin (Lot 3 DP 351707)

0 20 m N

An aerial photograph from Horizons Local Maps database (2016) showing Dylan Hyde and Courtney Main's 8403m^2 property at 283B Kimberley Road, Levin (Lot 3 DP 351707) and their immediate neighbours.

Horizons is the trading name of the Manawatu-Wanganui Regional Council