WHANGANUI
DISTRICT COUNCIL
Te Kaunihera a Rohe o Whanganui

IMPORTANT NOTE

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

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

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

WHANGANUI DISTRICT COUNCIL
Te Kaunihera a Rohe o Whanganui

INSPECTION RECORD

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

Project Location	***TO BOOK AN INSPECTION PLEASE PHONE WDC BUILDING CONTROL ON 349 0001 AND QUOTE THE FOLLOWING APPLICATION NUMBER:***	***BCon19/0733***
236A State Highway 3 South WHANGANUI		
Description of Work	**Construct a new detached 121m² dwelling.**	

Applicant	Mr DJ Coker 144 Westmere Station Road, RD 1, Whanganui 4571

SUMMARY OF CONDITIONS

Building Consent Number BCon19/0733

PIM Conditions

Code	***Condition***
	All work on the project must comply with the requirements of the NZ Building Code.
	A PIM only document is not an approval to build. A Building Consent is required before building work commences.
	W.D.C will follow up on building work not completed within two years of building consent issue.
	A Building Consent lapses and is of no effect if the building work has not been started within 12 months of the date of issue.
	If the building is public premises it may not be occupied until either a code compliance certificate or certificate for public use has been issued.
	Please note [Electrical, and Gasfitting subtrades do not form part of the building consent inspection process. However, Council is required to receive 'Energy Certificates' from both of these trades before issue of a Code Compliance Certificate].

Building Consent Information

Code	***Information***

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

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

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

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

Inspections Record For Building Consent Number BCon19/0733

Inspection	*When to Request*	*Date*	*Inspector*	*Complies with Code*	*Reinspect*	*Notes*		
CONCRETE SLAB INSPECTION	Prior to placing Concrete							
FRAMING INSPECTION	When all framing is complete.							
BRICK MASONRY INSPECTION	When bricks have been laid to sill height.					to check brick cavity when bricks are at sill height		
BUILDING PRELINE INSPECTION	Before Internal linings are fixed.							
POST LINE INSPECTION	To inspect fixings. Prior to covering up.					To inspect brace screw fixings prior to cover up		
PLUMBING SUBFLOOR INSPECTION	Before covering up					wastes in slab to be inspected prior to cover up		
PLUMBING PRELINE INSPECTION	Before Internal linings are fixed.							

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SANITARY DRAINS INSPECTION	Before backfilling drains					Drains to be inspected prior to cover up		
STORMWATER DISPOSAL INSPECTION	Before backfilling drains							
FINAL BUILDING AND PLUMBING COMBINED INSPECTION	On Completion					Includes the wood burner with a wet back installed		
CONSTRUCTION REVIEWS (NO INSPECTION)	On Completion					For final inspection on completion please supply: • The completed CCC application form. • All LBP memos for RBW. • All energy certs. • As Built Drainage and Stormwater if variation from plans.		

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WHANGANUI DISTRICT COUNCIL
Te Kaunihera a Rohe o Whanganui

BUILDING CONSENT NUMBER BCon19/0733

Section 51, Building Act 2004

The building:

Street address of building:	***Legal description of land where building is located:***
236A State Highway 3 South WHANGANUI	LOT 2 DP 399485 1.0000 ha
Building name:	***Location of building within site/block number:***
Level/unit number:	

The owner:

Name of Owner:	
Mr A Hooper, Miss MATAR Turia	
Mailing address:	***Street Address/registered Office:***
236 State Highway 3 South RD 2 Whanganui 4572	236 State Highway 3 South RD 2 Whanganui 4572

Phone numbers:

Landline:		***Mobile:***	0274416061
Daytime:		***After hours:***	
Facsimile number:			
Email address:		***Website:***	

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

Contact Person:	
Mr DJ Coker	
Mailing address:	***Street Address/registered Office:***
144 Westmere Station Road, RD 1, Whanganui 4571	144 Westmere Station Road, RD 1, Whanganui 4571

Phone number:

Landline:		***Mobile:***	
Daytime:	063454757	***After hours:***	
Facsimile number:			
Email address:		***Website:***	

Building Work

The following building work is authorised by this consent

Project
Construct a new detached 121m² dwelling.

101 Guyton Street
P O Box 637, Whanganui
Phone: (06) 349 0001
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WHANGANUI DISTRICT COUNCIL
Te Kaunihera a Rohe o Whanganui

Intended Use	***Intended Life***
Single Detached Residential	50+ Years
Estimated Value ($)	
$242000.00	

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty of responsibility under any other Act relating to or affecting the building (or proposed building). This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition or removal would be in breach of any other Act.

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WHANGANUI DISTRICT COUNCIL
Te Kaunihera a Rohe o Whanganui

CONDITIONS OF BUILDING CONSENT NUMBER BCon19/0733

Section 51, Building Act 2004

This Building Consent is issued Subject to the following conditions:

Building Act 2004, Section 90:

Inspections by Building Consent Authorities

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

(a) land on which building work is being or is proposed to be carried out; and

(b) building work that has been or is being carried out on or off the building site; and

(c) any building.

Compliance Schedule:

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

‡Attachments

‡Copies of the following documents are attached to this building consent:
‡Project information memorandum number BCon19/0733
‡Inspection record
‡Informative notes

Signed for and on behalf of the Whanganui District Council

GJ Hoobin
Building Control Manager

Date: 21 January, 2020

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

WHANGANUI DISTRICT COUNCIL
Te Kaunihera a Rohe o Whanganui

BUILDING CONSENT NUMBER BCon19/0733

Informative notes:

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

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WHANGANUI DISTRICT COUNCIL
Te Kaunihera a Rohe o Whanganui

PROJECT INFORMATION MEMORANDUM NUMBER BCon19/0733

Section 31, Building Act 1991

Mr DJ Coker
144 Westmere Station Road
RD 1
Whanganui 4571

Project Location	***Assessment Number/Legal Description***
236A State Highway 3 South WHANGANUI	LOT 2 DP 399485 1.0000 ha
Category	***Description of Work***
New Residential Dwellings - $200001 & over	Construct a new detached 121m² dwelling.
Intended Life	***Estimated Value ($)***
50+ Years	242000.00

This Project Information Memorandum is confirmation that the proposed work may be undertaken, subject to the provisions of the Building Act 2004 and any requirements of the Building Consent (number BCon19/0733), which has been granted.

This Project Information Memorandum is subject to the following conditions:

- **All work on the project must comply with the requirements of the NZ Building Code.**

Signed for and on behalf of the Whanganui District Council

GJ Hoobin
Building Control Manager

Date: 21 January 2020

144 Westmere Station Road
R.D1
Wanganui
Ph(06) 3480422
M 0279362169
Email coker.d.l.e@xtra.co.nz

01/08/2020

2nd **Request for further information on Application.**

Project Number: **BCon 19/0733**
Project Location: **236a State Highway 3 Wanganui**
Construct new detached 121m²

Att : (Alan Hoskin Cadet BCO)

2 **Internal non load bearing walls Table 8.4 refers to external load bearing wall refer to table 8.3 No 2 framing is a lower grade than SG 8 so 90 x45 SG8 @ 600mm ctr will comply**
3 **L17 added please see sheet 14**

Regards
David Coker

BP114150

144 Westmere Station Road
R.D1
Wanganui
Ph(06) 3480422
M 0279362169
Email coker.d.l.e@xtra.co.nz

01/08/2020

1st Request for further information on Application.

Project Number: **BCon 19/0733**
Project Location: **236a State Highway 3 Wanganui**
Construct new detached 121m²

Att : (Alan Hoskin Cadet BCO)

1 **Consent Notice please see attached**
2 **Internal non load bearing walls Table 8.4 refers to external load bearing wall refer to table 8.3 No 2 framing is a lower grade than SG 8 so 90 x45 SG8 @ 600mm ctr will comply**
3 **L17 added please see sheet 14**
4 **A3 bracing amended please see bracing calcs**
5 **Purlin fixings amended**
6 **Sealant to head flashing added please see sheet 23**
7 **Range hood added please see sheet 32**

Att: (Kelsey Lough Graduate Planner)

8 **Fire Fighting please see sheet 34,35,36**
9 **Consent Notice please see attached**
10 **Preformance std 17.5.2 (b) please see sheet 2 & 12**

Regards
David Coker

BP114150

CHANANEL CONSTRUCTION LTD, 236 STATE HIGHWAY No 3, WANGANUI:
LT 399485
CERTIFICATE PURSUANT TO SECTION 221 OF THE
RESOURCE MANAGEMENT ACT 1991

The Wanganui District Council has granted a Resource Consent under Section 104A of the Resource Management Act 1991 to Chananel Construction Ltd being a subdivision of Certificates of Title WN6B/936 and WN5D/393.

The subdivision is subject to the following condition:

1. The owners of Lots 2, 3 and 4 prior to the occupation of any dwelling on the Lots shall install an on-site secondary septic tank system approved by Council and designed and certified by a suitably qualified professional person engaged by the owners.

   The system shall comply with the requirements of Horizon Regional Council rules for discharge of domestic waste to land.

   The disposal field shall be located at least 3 metres from any dwelling and at least 1.5 metres from any other building or property boundary. The disposal field shall be separated at least 20 metres from any other effluent field or watercourse and at least 10 metres from any down slope.

   There shall be 900mm separation between the high winter water table and the level of drip irrigation line.

   The design discharge to the treatment system shall be not more than 2000 litres per day and the sub-surface application rate shall be no more than 3mm per square metre per day via a pressure compensating drip line.

   The disposal field shall be planted with the appropriate plants as recommended by Horizons Regional Council on approval of any system. Any system installed shall have a current maintenance contract, involving annual inspections of the plant and disposal field, with supplier or agent for the life of the system.

This consent notice shall be registered as appropriate against the Certificates of Title in terms of the Land Transfer Act 1952.

Dated at Wanganui this 22nd day of February 2008

D F Wan
Subdivisions Officer
(Acting pursuant to a delegated authority from the
Principal Administrative Officer)

FIRE EMERGENCY NEW ZEALAND

Drawing as reviewed meets the requirements of SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice

REVIEWED
By John Hotter at 3:41 pm, Dec 02, 2019

DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3
WANGANUI

Drawing Title: **FIRE FIGHTING**

Sheet # 34

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

D C Design
144 Westmere Station Road
RD1 Wanganui
P: 06 348 0422
M: 027 936 2169
E: coker.d.l.e@xtra.co.nz

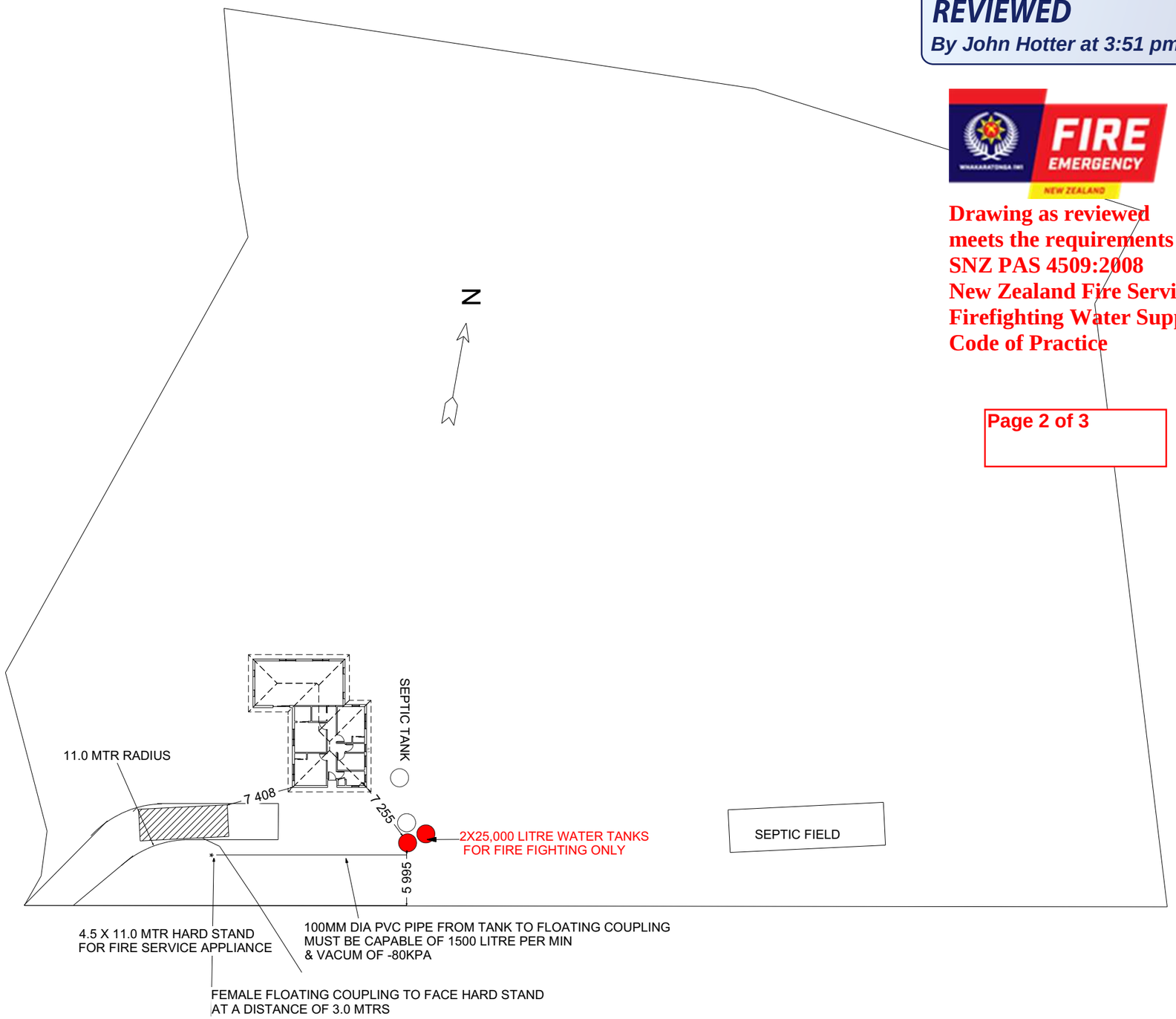
LICENSED BUILDING PRACTITIONER www.dbh.govt.nz BUILDING CONFIDENCE

BP114150

REVIEWED
By John Hotter at 3:51 pm, Dec 02, 2019

FIRE EMERGENCY NEW ZEALAND

Drawing as reviewed meets the requirements of SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice



DRAWINGS PROVIDED BY: sentinel HOMES / dc DESIGN ARCHITECTURAL DESIGN

Client Details : PROPOSED NEW RESIDENTIAL DWELLING

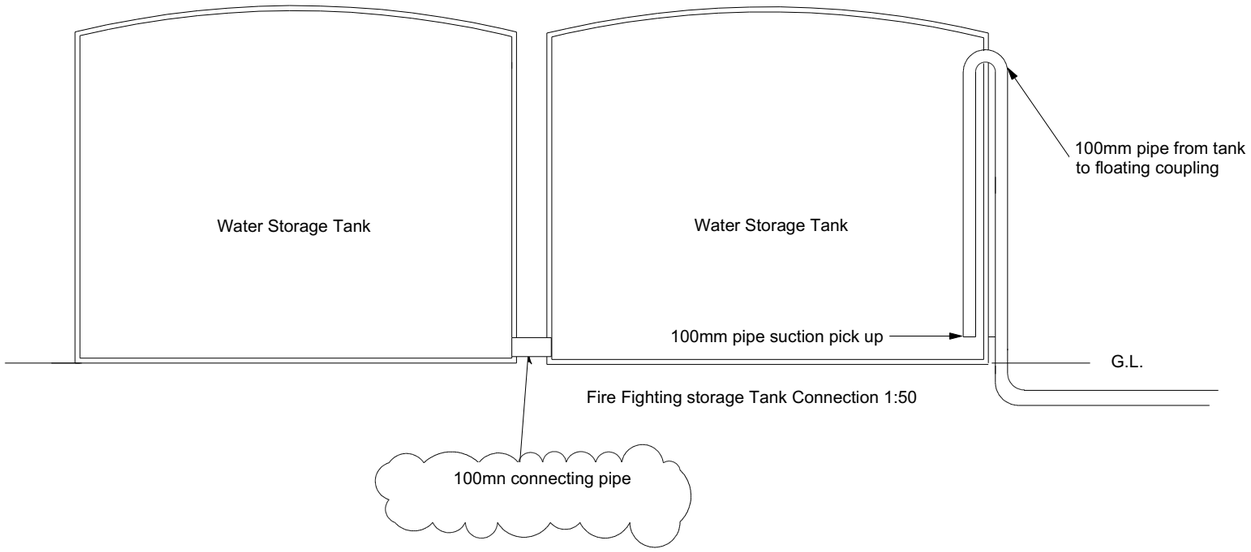
Address: 236A STATE HIGHWAY 3 WANGANUI

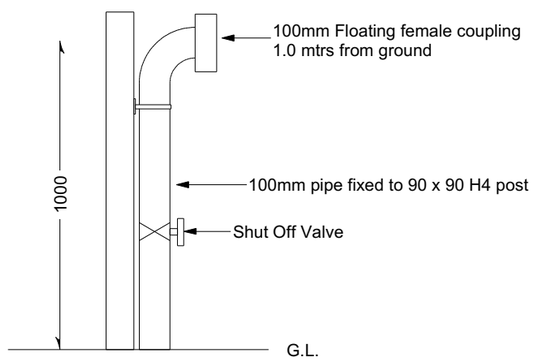
Drawing Title:	FIRE FIGHTING					Sheet #	35
Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: 1:500
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

D C Design
144 Westmere Station Road
RD1 Wanganui
P: 06 348 0422
M: 027 936 2169
E: coker.d.l.e@xtra.co.nz

LICENSED BUILDING PRACTITIONERS www.dbh.govt.nz BUILDING CONFIDENCE

BP114150





100mm Floating Female Coupling 1:20

Driveway gradient to be no more than 16%.

Driveway width 4 mtrs & Capable of supporting a gross axle laden weight of 20 tonnes.

Driveway surface suitable to be trafficable at all times by fire service appliance.

Turning radius > 11m to allow fire appliance to clear driveway edges.

Hatched area represents hardstand for fire appliance.

Connection point to be within 6mtrs of hardstand.

Water tanks set on top of ground

REVIEWED
By John Hotter at 3:51 pm, Dec 02, 2019

FIRE EMERGENCY NEW ZEALAND

Drawing as reviewed meets the requirements of SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice

Page3 of 3

DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **FIRE FIGHTING**

Sheet # 36

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

D C Design
144 Westmere Station Road
RD1 Wanganui
P: 06 348 0422
M: 027 936 2169
E: coker.d.l.e@xtra.co.nz

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BP114150

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**398052**
Land Registration District	**Wellington**
Date Issued	09 June 2008

Prior References
WN5D/393 WN6B/936

Estate	Fee Simple
Area	1.0000 hectares more or less
Legal Description	Lot 2 Deposited Plan 399485

Registered Owners
Apirana Hooper and Maharanui Andrea Te Aroha Rauhina-Turia

Interests

Subject to Section 59 Land Act 1948 (affects part formerly Section 511 Blk V Ikitara Survey District)

792312 Gazette Notice declaring portion of State Highway No. 3 to be a limited access road - 23.7.1969 at 9.15 am

7839981.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 9.6.2008 at 9:00 am

Subject to a right (in gross) to convey electricity over part marked A, G on DP 399485 in favour of Powerco Limited created by Easement Instrument 7839981.7 - 9.6.2008 at 9:00 am

The easements created by Easement Instrument 7839981.7 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right of way over part marked A and B on DP 399485 created by Easement Instrument 7839981.8 - 9.6.2008 at 9:00 am

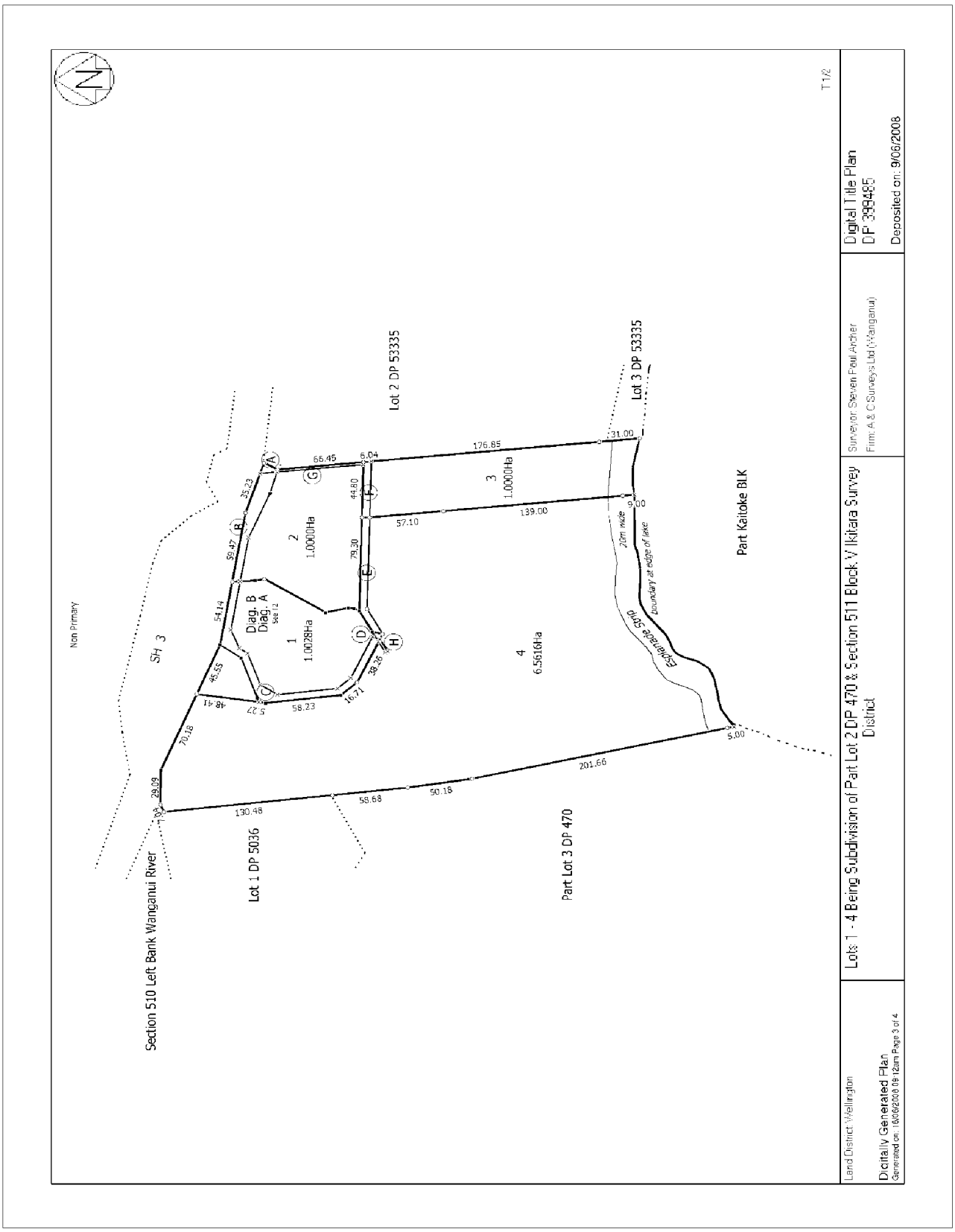
Appurtenant hereto are rights of way and rights to telecommunications created by Easement Instrument 7839981.8 - 9.6.2008 at 9:00 am

The easements created by Easement Instrument 7839981.8 are subject to Section 243 (a) Resource Management Act 1991

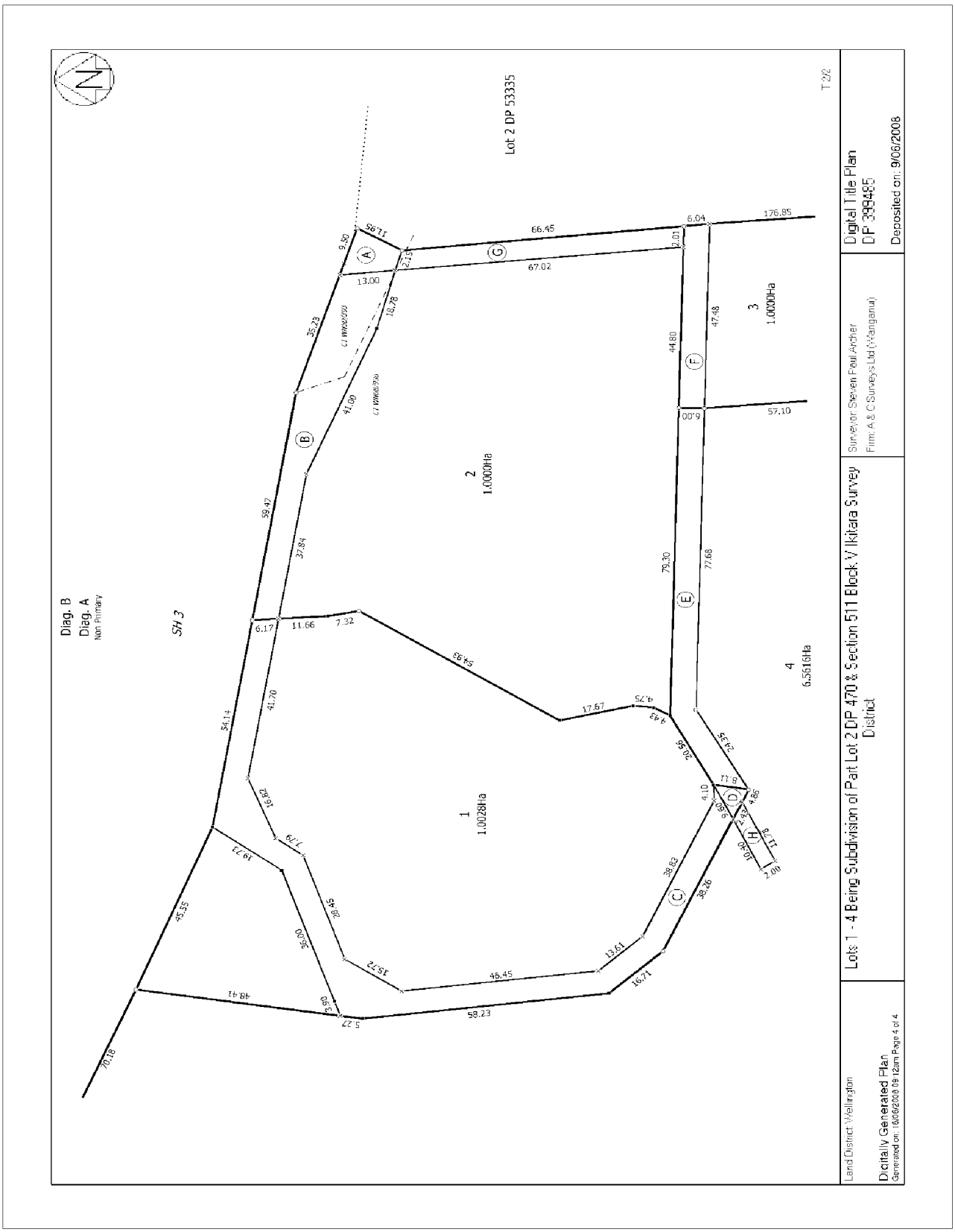
Land Covenant in Easement Instrument 7839981.9 - 9.6.2008 at 9:00 am

11598701.2 Mortgage to Bank of New Zealand - 15.11.2019 at 4:13 pm

Identifier **398052**



Identifier **398052**



Fwd: Letter Please

Bcon19/0733 - WDC Approved Plans - 21/01/2020

Derek McInnes <derek.mcinnes@sentinelhomes.co.nz> 14/11/2019 12:55
To coker.d.l.e@xtra.co.nz

Here you go

Derek McInnes
Operations Manager
Manawatu - Whanganui
027 701 5533

155 London Street, Whanganui
PO Box 183, Whanganui 4541
Website: www.sentinelhomes.co.nz
Have you seen our new Design Hub?
Youtube: How our sales process works

---------- Forwarded message ---------
From: **Maharanui Rauhina-Turia** <rauhina-turiam@windowslive.com>
Date: Thu, 14 Nov 2019 at 12:55
Subject: Re: Letter Please
To: Derek McInnes < derek.mcinnes@sentinelhomes.co.nz>

Good afternoon,

I am writing to give permission for Dave Coker to lodge the building consent on my behalf.

Thank you,

Maharanui Rauhina-Turia

> On 14/11/2019, at 12:39 PM, Derek McInnes < derek.mcinnes@sentinelhomes.co.nz> wrote:

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

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

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

THE BUILDING

Street address 236a State Highway 3	
Suburb: Marybank	
Town/City Wanganui	Postcode:

THE OWNER

Name(s):	
Mailing address:	
Suburb:	PO Box/Private Bag:
Town/City: Wanganui	Postcode:
Phone number:	Email address:

BASIS FOR PROVIDING THIS MEMORANDUM

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

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

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

PRIMARY STRUCTURE: B1

Design work that is restricted building work	**Description**	**Carried out/ supervised**	**Reference to plans and specifications**
Tick(✓)if included *Cross (X) if excluded*	*[If appropriate, provide details of the restricted building work]*	*[Specify whether you carried out this design work or supervised someone else carrying out this design work]*	*[If appropriate, specify references]*
Primary structure			
All RBW Design work relating to B1 (✓)		(✓) Carried out ( ) Supervised	
Foundations and (✓)	*Concrete foundation*	() Carried out	Sheet 5,6,7 & 12

subfloor framing			(✓) Supervised	
Walls	(✓)	*Exterior walls 90x45 SG8 H1.2 framing @ 400mm ctrs , double top plate & 2 rows of dwangs* *Internal walls 90x45 SG8 H1.2 @ 600mm ctrs double top plate & 2 rows of dwangs*	(✓) Carried out () Supervised	Sheet 12
Roof	(✓)	*Trussed Roof*	() Carried out (✓) Supervised	Sheet 12 & Truss design cert
Columns and beams	()		() Carried out () Supervised	
Bracing	(✓)	*Gib Ezi Brace*	(✓) Carried out () Supervised	Sheet 17,18 & bracing calcs
Other	( )		( ) Carried out ( ) Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2	(✓)		() Carried out (✓) Supervised	
Damp proofing	(✓)	*Under concrete slab* *& DPC to bottom of bottom plates*	(✓) Carried out () Supervised	Sheet 12
Roof cladding or roof cladding system	(✓)	*Corrugated colour steel*	(✓) Carried out () Supervised	Sheet 12,27,27
Ventilation system (for example, subfloor or cavity)	(✓)	*70 Series Brick & Linea weatherboard on cavity*	(✓) Carried out () Supervised	Sheet 12,21,22,23,24,25, 26
Wall cladding or wall cladding system	(✓)	*70 Series Brick & Linea Weatherboard fixed to manufacturers instructions*	(✓) Carried out () Supervised	Sheet 12,21,22,23,24,25, 26,27,28
Waterproofing	()		() Carried out ( ) Supervised	
Other	()		( ) Carried out ( ) Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems,	(×)		( ) Carried out ( ) Supervised	

suppression or control systems, or other			

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

Note: continue on another page if necessary.

WAIVERS AND MODIFICATIONS

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

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

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

Note: continue on another page if necessary.

ISSUED BY

Name: David Coker	LBP or Registration number: BP114150
The practitioner is a: (✓) Design LBP ( ) Registered architect ( ) Chartered professional engineer	
Design Entity or Company (optional): D C Design	
Mailing address (if different from below):	
Street address / Registered office: 144 Westmere Station Road RD1	
Suburb: Brunswick	Town/City: Wanganui
PO Box/Private Bag:	Postcode: 4571
Phone number: 06 348 0422	Mobile: 027 936 2169
After Hours:	Fax: 06 348 0422
Email address:coker.d.l.e@xtea.co.nz	Website:

DECLARATION

I David Coker [*name of practitioner*] , LBP,

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

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

Signature: D J Coker

Date: 21/11/2019

Demand Calculation Sheet

Job Details

Name:	
Street and Number:	236 A State Highway 3
Lot and DP Number:	
City/Town/District:	Wanganui
Designer:	D Coker
Company:	D C Design
Date:	11 November 2019

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Heavy
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	15
Roof Height above Eaves (m)	1.4
Building Height to Apex (m)	4.0
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	13.37
Building Width (m)	12.25
Building Plan Area (m²)	121.5

Building Location

Wind Zone = Extra High

Earthquake Zone 2

Soil Type D & E (Deep to Very Soft)

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

Bracing Units required for Wind

	Along	Across
Single Level	**799**	**731**

Bracing Units required for Earthquake

	Along & Across
Single Level	**755**

Single Level Along Resistance Sheet

Job Name:

									Wind	EQ
									Demand	
									799	755
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1035 130%	937 124%
a	1	0.70		2.4	BL1-H	GIB®	73	71		
	2	0.60		2.4	GS1-N	GIB®	34	35		
	3	0.40		2.4	BL1-H	GIB®	36	40		
									142 OK	146 OK
b	1	1.40		2.4	GS1-N	GIB®	97	84		
	2	2.90		2.4	GS2-N	GIB®	284	249		
	3	2.40		2.4	GS1-N	GIB®	166	144		
									546 OK	477 OK
c	1	1.70		2.4	GS1-N	GIB®	117	102		
	2	1.00		2.4	GS1-N	GIB®	65	60		
	3	0.50		2.4	BL1-H	GIB®	47	50		
									229 OK	212 OK
d	1	1.70		2.4	GS1-N	GIB®	117	102		
									117 OK	102 OK

Single Level Across Resistance Sheet

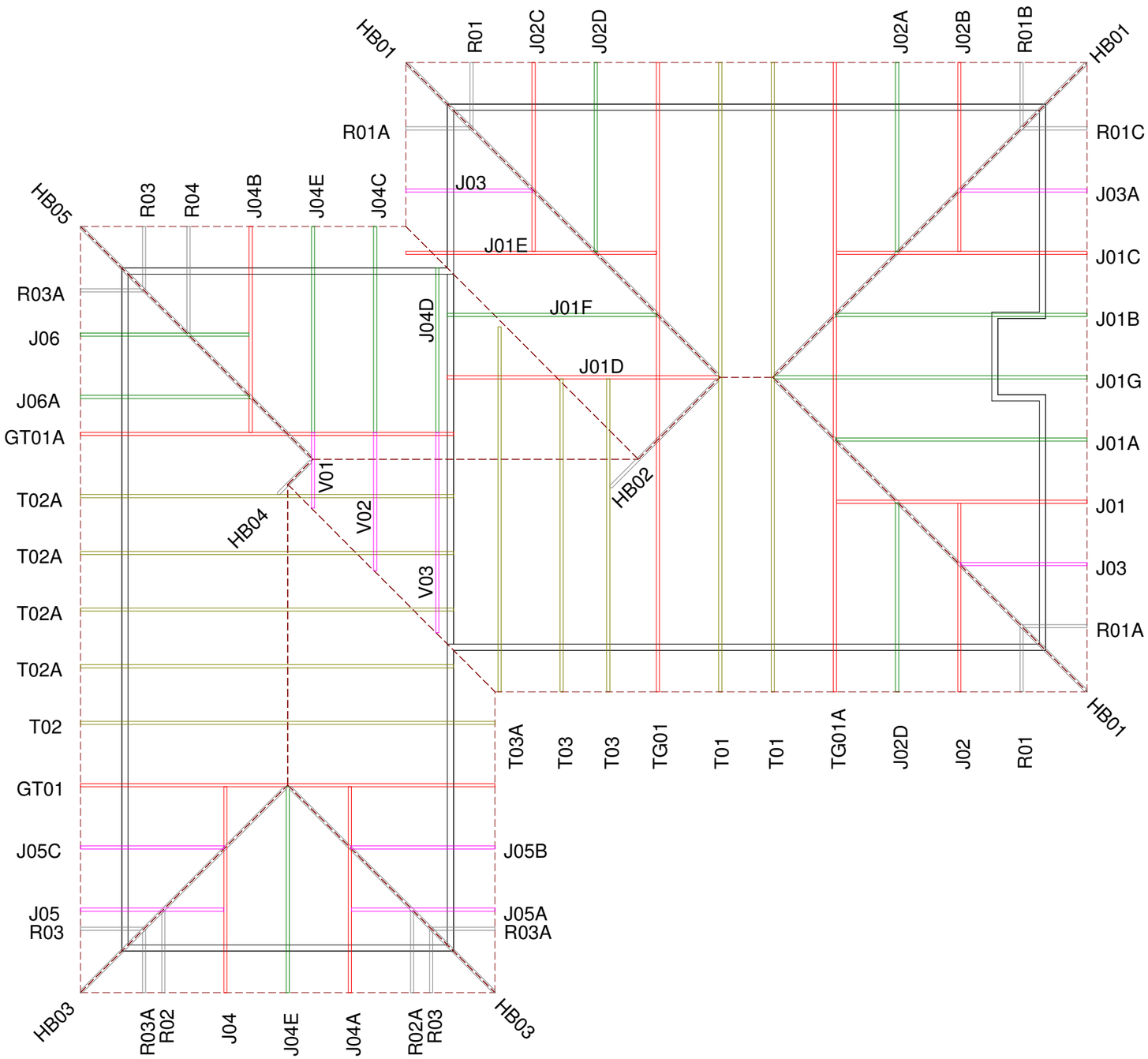
Job Name:

									Wind	EQ
									Demand	
									731	755
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1088 149%	968 128%
m	1	1.50		2.4	GS1-N	GIB®	104	90		
	2	1.00		2.4	GS1-N	GIB®	65	60		
									169 OK	150 OK
n	1	1.60		2.4	GS1-N	GIB®	110	96		
	2	2.00		2.4	GS1-N	GIB®	138	120		
									248 OK	216 OK
o	1	2.00		2.4	GS2-N	GIB®	196	172		
	2	3.50		2.4	GS2-N	GIB®	343	301		
									539 OK	473 OK
p	1	0.60		2.4	GS1-N	GIB®	34	35		
	2	0.80		2.4	GS1-N	GIB®	49	47		
	3	0.80		2.4	GS1-N	GIB®	49	47		
									132 OK	130 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m

Layout is null and void if trusses not supplied by PlaceMakers



PrimeCad v4.7.301

PlaceMakers® Know how. Can do.

Site Address :
Proposed Residence
144 Westmere Station Rd
RD1 Whanganui

Sheet Title :
For Building Consent
Buildable Truss Layout

Date : 20 Nov,2019 | Drawn : Mana Te Uira
Scale : 1: 70 | System : MiTek 20/20

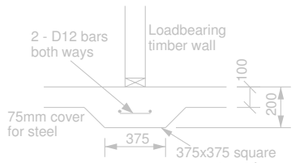
Job Details:

Roof Pitch	: 15.000 Deg		Truss Centres	: 900	mm
Roof Material	: Longrun Iron .5mm		Roof Live Load	: 0.250	kPa
Ceiling Material	: Standard		Floor Live Load	:	kPa
Wind Zone	: Extra High		Wind Speed	: 55.0	m/s
Roof Snow Load	: 0.000 kPa				

MiTek™

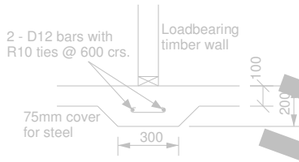
Job Title : 19-00176888
Sheet : 1
Revision Number :

Slab Thickening Details



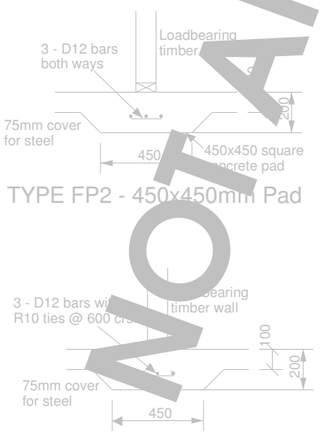
TYPE FP1 - 375x375mm Pad

Number of Understuds



TYPE FS1 - 300mm Strip Footing

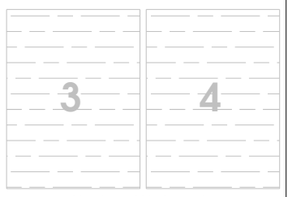
Number of Understuds



TYPE FP2 - 450x450mm Pad

Number of Understuds

TYPE FS2 - 450mm Strip footing



Number of Understuds

NOTES:

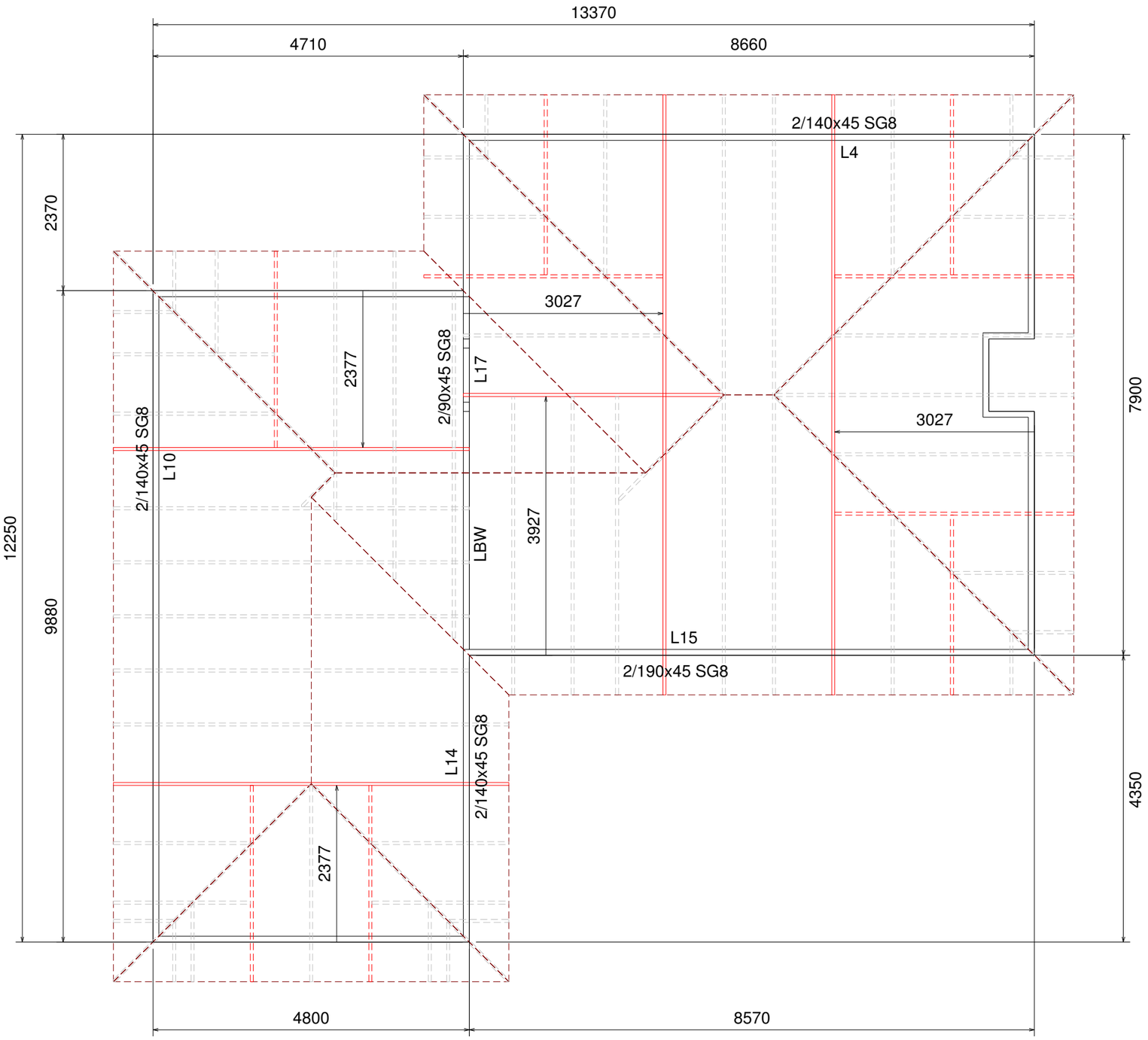
Lintels supporting girder trusses typically as per architectural plans

All point loads exceeding 8.0kN are indicated.

All walls shown to be considered load bearing.

Refer to Rib-raft floor design for slab thickening.

Layout is null and void if trusses not supplied by PlaceMakers



PrimeCad v4.7.301

PlaceMakers® Know how. Can do.

Site Address :
Proposed Residence
144 Westmere Station Rd
RD1 Whanganui

Sheet Title :
For Building Consent
Slab Thickening

Date : 20 Nov,2019 | Drawn : Mana Te Uira
Scale : 1: 70 | System : MiTek 20/20

Job Details:

Roof Pitch	: 15.000 Deg		Truss Centres	: 900	mm
Roof Material	: Longrun Iron .5mm		Roof Live Load	: 0.250	kPa
Ceiling Material	: Standard		Floor Live Load	:	kPa
Wind Zone	: Extra High		Wind Speed	: 55.0	m/s
Roof Snow Load	: 0.000 kPa				

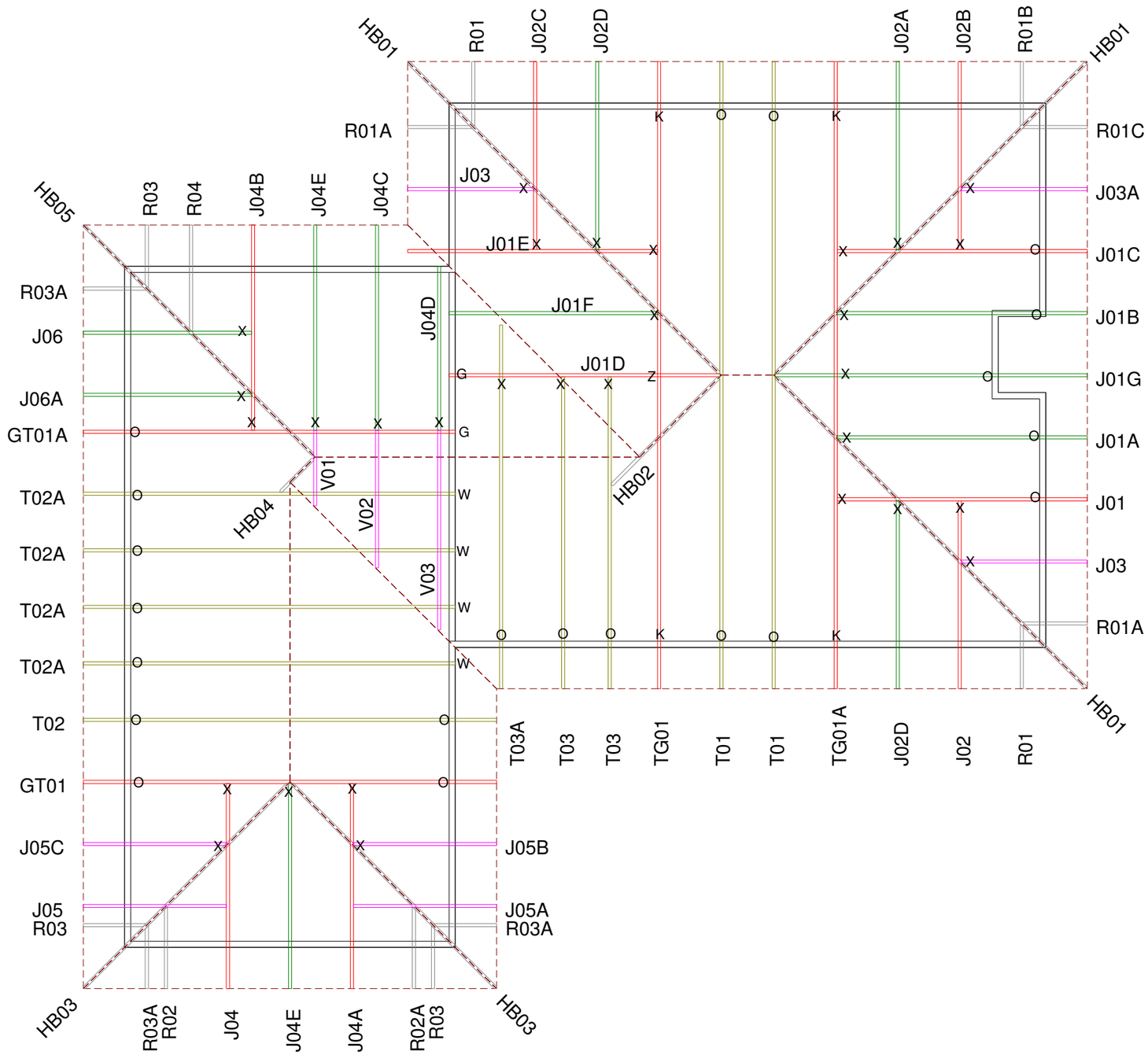
MiTek™

Job Title : 19-00176888
Sheet : 2
Revision Number :

Truss Fixings

- X - LUMBERLOK JH47x90 Joist Hanger
- Z - LUMBERLOK JH47x120 Joist Hanger
- P - LUMBERLOK JH47x190 Joist Hanger
- E - LUMBERLOK JH95x165 Joist Hanger
- O - Pair of LUMBERLOK CT200 Ceiling Ties
- H - LUMBERLOK CT400 Cyclone Tie
- B - LUMBERLOK CT600 Cyclone Tie
- M - Pair of LUMBERLOK Multi Grips
- NP - LUMBERLOK Nailon Plate
- N - LUMBERLOK N21 Diagonal 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

Layout is null and void if trusses not supplied by PlaceMakers



NOTES:

All other areas must have at the minimum
2/ 90x3.15mm skew nails + 2 wire dogs (4.7kN)
for truss to top plate connections.

Refer to:
LUMBERLOK Timber Connectors Characteristic
Loadings Data brochure 03/4

PrimeCad v4.7.301

PlaceMakers® Know how. Can do.

Site Address :
Proposed Residence
144 Westmere Station Rd
RD1 Whanganui

Sheet Title :
For Building Consent
Truss Fixings

Date : 20 Nov,2019 | Drawn : Mana Te Uira
Scale : 1: 70 | System : MiTek 20/20

Job Details:

Roof Pitch	: 15.000 Deg	Truss Centres	: 900	mm
Roof Material	: Longrun Iron .5mm	Roof Live Load	: 0.250	kPa
Ceiling Material	: Standard	Floor Live Load	:	kPa
Wind Zone	: Extra High	Wind Speed	: 55.0	m/s
Roof Snow Load	: 0.000 kPa			

MiTek™

Job Title : 19-00176888
Sheet : 3
Revision Number :

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

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

www.miteknz.co.nz

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

ISSUED BY: **MiTek New Zealand Limited**

TO: **Placemakers National Estimating Unit (NEU)**

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 **19-00176888** 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: Wednesday, 20 November 2019**

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

Bcon19/0733 - WDC Approved Plans - 21/01/2020

Job: 19-00176888
Client: Sentinel Homes
Phone:
Site: Proposed Residence
144 Westmere Station Rd
RD1 Whanganui
Description:
Building Consent No.:
Phone:

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **Placemakers National Estimating Unit (NEU)**, 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:	NEU-H1.2	Pitch:	15.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Longrun Iron .5mm	Material:	Standard	Area:	Extra High (55.0 m/s)
Dead Load:	0.210 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	400 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)
GT01	1	4800	15.000	900
GT01A	1	4800	15.000	900
J01	1	3027	15.000	900
J01C	1	3027	15.000	900
J01D	1	3027	15.000	900
J01E	1	3027	15.000	900
J01G	1	3027	15.000	900
T01	2	7900	15.000	900
T02	1	4800	15.000	900
T02A	4	4800	15.000	900
T03	2	3928	15.000	900
T03A	1	3928	15.000	900
TG01	1	7900	15.000	900
TG01A	1	7900	15.000	900
J01A	1	3027	15.000	900
J01B	1	3027	15.000	900
J01F	1	3027	15.000	900
J02	1	2127	15.000	900
J02A	1	2127	15.000	900
J02B	1	2127	15.000	900
J02C	1	2127	15.000	900
J02D	2	2127	15.000	900
J03	2	1227	15.000	900
J03A	1	1227	15.000	900
J04	1	2377	15.000	900
J04A	1	2377	15.000	900
J04B	1	2377	15.000	900
J04C	1	2377	15.000	900
J04D	1	2377	15.000	900
J04E	2	2377	15.000	900
J05	1	1477	15.000	900
J05A	1	1477	15.000	900
J05B	1	1477	15.000	900
J05C	1	1477	15.000	900
J06	1	1842	15.000	900
J06A	1	1842	15.000	900
V02	1	1996	15.000	900
V03	1	2896	15.000	900
*HB01	3	6403	10.729	900
*HB02	1	2227	10.728	900
*HB03	2	4211	10.729	900
*HB04	1	692	-10.729	900
*HB05	1	4727	10.729	900
*R01	2	940	15.000	900
*R01A	2	940	15.000	900
*R01B	1	940	15.000	900
*R01C	1	940	15.000	900
*R02	1	1190	15.000	900
*R02A	1	1190	15.000	900
*R03	3	913	15.000	900
*R03A	3	913	15.000	900
*R04	1	1555	15.000	900
*V01	1	1096	15.000	900

Total quantity : 70

The computer design input has been carried out by:

Signed: .... Date: ...Wednesday, 20 November 2019....

Name of Detailer: Mananui Te Uira.. Qualifications and Title:Estimator

On behalf of: Placemakers National Estimating Unit (NEU)

MiTek Beam v1.10 June 2011

Date: Wednesday, 20 November 2019
Job Number 19-00176888
Job Name Proposed Residence
Client
Calculated By

Roof Weight light + ceiling
Wind Zone extra high (55.0 m/s)
Snow Load 0 kPa

Beam Details

Beam Label	L4	L10	L14	L15	L17					
Beam Span (mm)	1210	1810	1810	1810	820					
Roof Span "S" (mm)	7900	4800	4800	7900	3030					
Overhang (mm)	600	600	600	600						
Wall Type										
Wall Height (mm)										
Floor Live load	NA	NA	NA	NA	NA					
Floor Span "F" (mm)										

MiTek Bearing Reactions

Not in use in this version

Point Load 1										
Girder Span (mm)	7900	4800	4800	7900	3030					
Setback (mm)	3030	2380	2380	3030	3930					
Location (mm)	915	740	290	660	410					
Point Load 2										
Girder Span (mm)										
Setback (mm)										
Location (mm)										
Point Load 3										
Girder Span (mm)										
Setback (mm)										
Location (mm)										
Beam Status	OKAY	OKAY	OKAY	OKAY	OKAY					
Beam Material	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8					
Beam Size	2/140x45	2/140x45	2/140x45	2/190x45	2/90x45					
Beam Deflection	1.81mm	4.93mm	3.81mm	3.4mm	1.06mm					
Beam Length	1210	1810	1810	1810	820					

Job No: 19-00176888
Job Name: Proposed Residence

Client:
Building Consent No:

Site: 144 Westmere Station Rd, RD1 WI

DESIGN STATEMENT
MiTek Beam Program v1.11 September 2017

Certification of MiTek Beam Program v1.11 September 2017

The MiTek Beam Program v1.11 September 2017 has been developed by MiTek New Zealand Ltd for the design of these beams: Timber, Glulam, GANGLAM and GANG-NAIL FLITCH BEAMS. The beam designs calculated by this program 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 to satisfy the requirements of Clause B1 of the Building Code. We believe on reasonable grounds that these beams for the proposed building, if constructed in accordance with the drawings, specifications and other documents provided will comply with the relevant provisions of the NZ Building Code. This is subject to all proprietary products meeting their performance specification requirements; the provision of adequate bracing and fixings; and the correct input of design data carried out by suitably trained personnel. This document may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

Summary of MiTek Beam Program v1.11 September 2017 Data and Output

Roof
Weight: light + ceiling
Dead Load: 0.45 kPa
Live Load: 0.25 kPa

Wind
Area/Speed: extra high (55.0 m/s)

Snow
Area: 0 kPa

Wall
Type: NA

Floor
Live Load: NA

Beam List

Opening Label	Beam Material	Beam Size	Beam Length	Design Status	Opening Label	Beam Material	Beam Size	Beam Length	Design Status
L4	MSG8/VSG8	2/140x45	1210	OKAY					
L10	MSG8/VSG8	2/140x45	1810	OKAY					
L14	MSG8/VSG8	2/140x45	1810	OKAY					
L15	MSG8/VSG8	2/190x45	1810	OKAY					
L17	MSG8/VSG8	2/90x45	820	OKAY					

GANGLAM plating details indicated with RD (regular duty plating), HD (heavy duty plating) and SHD (super heavy duty plating)

The design input has been carried out by:

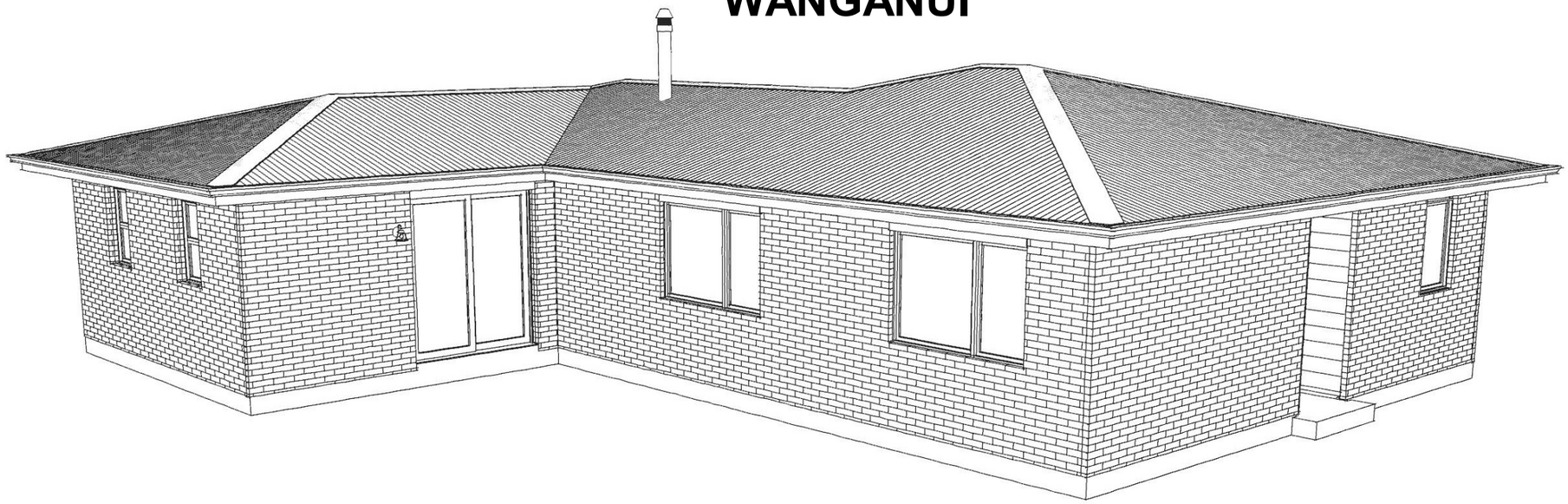
The computer design input has been carried out by:

Signed: .....

Name of Detailer: MANA TE UIRA

On behalf of: Placemakers National Estimating Unit (NEU)
25 Vickery St, Te Rapa, Hamilton,
Phone:

PROPOSED NEW RESIDENTIAL DWELLING
236A STATE HIGHWAY 3
WANGANUI



CAUTIONARY NOTES:
BUILDING CONTRACTOR TO ASSESS SITE TO ENSURE DAY-LIGHTING & BUILDING RESTRICTIONS ARE COMPLIED WITH.
NO LIABILITY FOR ENCROACHMENT SHALL BE HELD BY DESIGNER IF SITE IS NOT SURVEYED BY A REGISTERED SURVEYOR PRIOR TO COMMENCEMENT OF FOUNDATION.

CONSTRUCTION NOTES:
BEFORE BUILDING IS ERECTED ON SITE, ALL RUBBISH, NOXIOUS MATTER & ORGANIC MATTER SHALL BE REMOVED FROM THE AREA TO BE COVERED BY THE BUILDING.
ENSURE FINAL BUILDING PLATFORM & FINISHED GROUND HAVE AN EVEN FALL AWAY FROM BUILDING TO ENSURE WATER IS NOT ALLOWED TO ACCUMULATE AROUND FOUNDATION.
ANY FILL TO BE DRY & APPROVED & COMPACTED DOWN IN ACCORDANCE WITH NZS.3604.2011

CONTRACTOR TO
* CONFIRM GROUND HAS ADEQUATE BEARING TO COMPLY WITH NZS 3604:2011
* LOCATE ALL SERVICE CONNECTION POINTS ON SITE PRIOR TO COMMENCEMENT OF WORKS, CHECK INVERT LEVELS OR PIPES & MANHOLES.
*CONFIRM PLUMBING ROUTE & FIXTURES POSITIONS ON SITE PRIOR TO COMMENCEMENT OF WORK.
*LOCATE ALL ELECTRICAL & WATER SERVICES ON SITE.
*CONFIRM ON SITE ALL BOUNDARY BEARINGS, LENGTHS & PEG LOCATIONS ON SITE PRIOR TO COMMENCEMENT OF WORKS, TO ENSURE HOUSE POSITION IS CORRECT.

1.1 SITE FENCES & HOARDINGS

1.1.1 FENCES & HOARDINGS SHALL EXTEND AT LEAST 2.0M IN HEIGHT FROM GROUND LEVEL ON THE SIDE ACCESSIBLE TO THE PUBLIC.

1.1.2 AN ACCEPTABLE FENCE MAY BE CONSTRUCTED WITH GALVINISED CHAINLINK NETTING HAVING A MAXIMUM SIZE GRID OF 50MM X 50MM. POST SPACING SHALL BE A MAXIMUM OF 2.5M & THE GAP BETWEEN THE BOTTOM OF THE FENCE & GROUND NO GREATER THAN 100MM

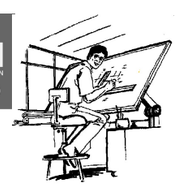
NZBC F5: CONSTRUCTION & DEMOLITION HAZARDS ACCEPTABLE SOLUTIONS F5/AS1
1.0 WORK-SITE BARRIERS
1.0.1 THE NECESSITY FOR BARRIERS WILL DEPEND MAINLY ON THE SITE LOCATION.THE NEED WILL BE GREATER IN AREAS WITH HIGH LEVELS OF
PEDESTRIAN TRAFFIC (I.E. IN CENTRAL BUSINESS DISTRICTS), THAN IN INDUSTRIAL OR RURAL AREAS.BARRIERS
ARE NOT NECESSARY FOR DOMESTIC DWELLINGS UP TO 2 STOREYS ABOVE GROUND LEVEL UNLESS SPECIFIC HAZARDS EXIST.

AT ALL WORK-SITES HAZARDS EVALUATION WILL TAKE ACCOUNT OF:
1. PEDESTRIAN COUNTS ADJACENT TO THE SITE.
2. CAR PARKING ADJACENT TO THE SITE.
3. LOCATION OF NEIGHBOURING BUILDINGS.
4. PRESENCE OF NEIGHBOURING WORK-SITES OR RECREATION AREAS.
5. PROXIMITY TO SCHOOLS OR EARLY CHILDHOOD CENTRES.
6. PROXIMITY TO HOUSING.
7.THE DEPTH OF WATER HAZARDS.
8. THE PERIOD OF TIME FOR WHICH PONDED WATER WILL BE PRESENT.
9. THE ACCESSIBILITY & 'VISIBILITY' OF THE SITE

1.0.2 IF A WORK-SITE IS NOT COMPLETELY ENCLOSED, & UNAUTHORISED ENTRY BY CHILDREN IS LIKELY, IT IS ACCEPTABLE FOR SPECIFIC HAZARDS TO BE FENCED ONLY WHEN WORKERS ARE ABSENT FROM THE IMMEDIATE VICINITY.

SHEET #

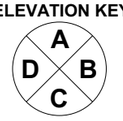
dcDESIGN ARCHITECTURAL DESIGN
p. 06 348 0422 m. 027 936 21 69
New Homes Alterations
Light Commercial
Project Management



sentinel HOMES

LICENSED BUILDING PRACTITIONER www.dbh.govt.nz BUILDING CONFIDENCE
BP114150

ELEVATION KEY

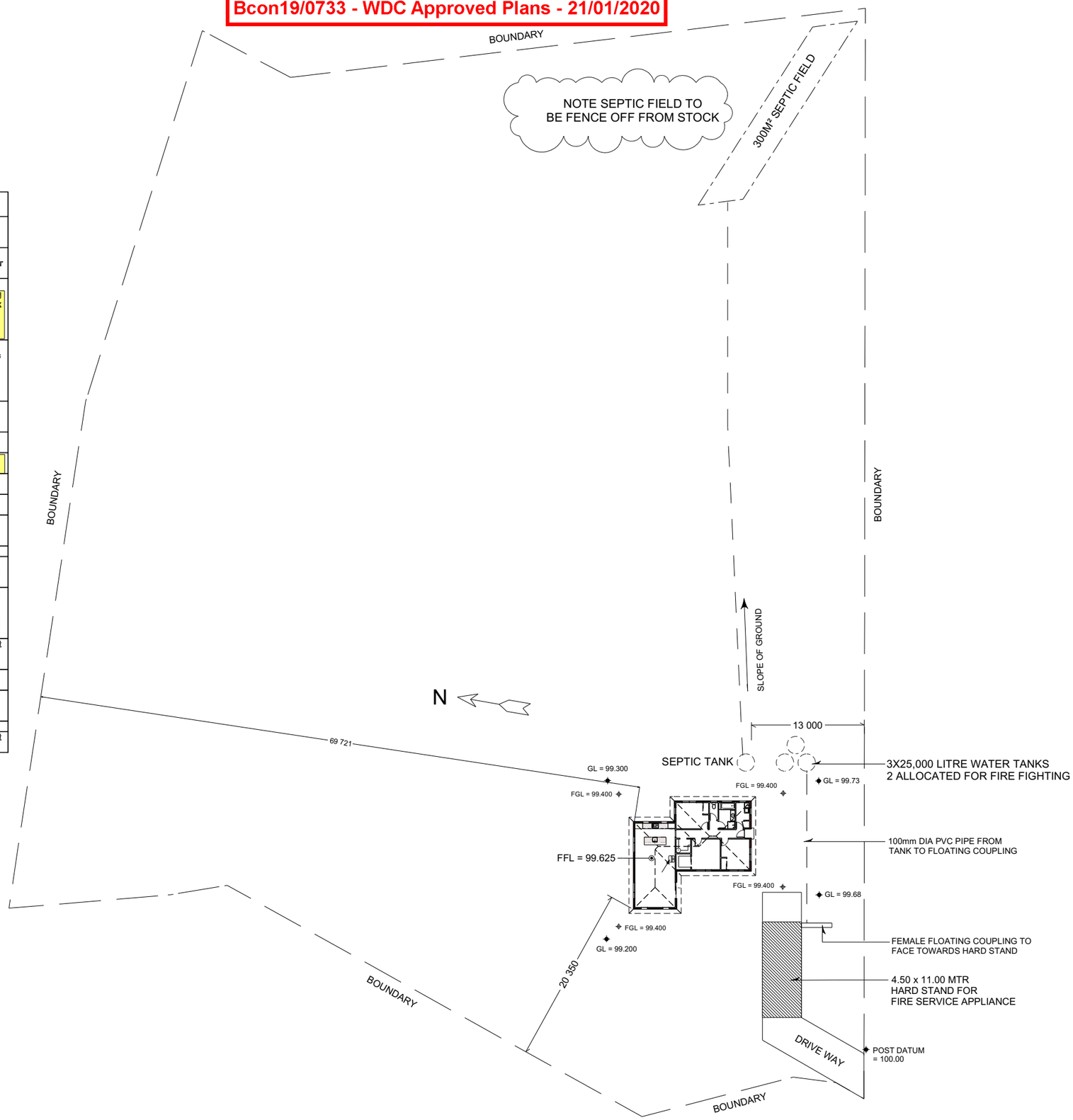


17.6 NOISE INSULATION TABLE

The schedule describes the minimum requirements necessary to achieve an external sound insulation level of $D_{2m,nT,w}$+ C_r > 30 dB

Building Element	Minimum Construction Requirement	
External Walls of Habitable Rooms	Stud Walls: ○ Exterior cladding:	20mm timber or 9mm compressed fibre cement sheet over timber frame (100mm x 50mm)
	○ Cavity infill:	Fibrous acoustic blanket (batts or similar of a minimum mass of 9kg/m³) required in cavity for all exterior walls. Minimum 90mm wall cavity
	○ Interior lining:	One layer of 12mm gypsum plasterboard. Where exterior walls have continuous cladding with a mass of greater than 25kg/m² (e.g. brick veneer or minimum 25mm stucco plaster), internal wall linings need to be no thicker than 10mm gypsum plasterboard.
	○ Combined superficial density:	Minimum not less than 25kg/m² being the combined mass of external and internal linings excluding structural elements (e.g. window frames or wall studs) with no less than 10kg/m² on each side of the structural elements.
	Mass Walls:	190mm concrete block, strapped and lined internally with 10mm gypsum plasterboard, or 150mm concrete wall.
Glazed Areas of Habitable Rooms	Glazed areas up to 10% of floor area	6mm glazing single float
	Glazed areas between 10% and 35% of floor area	6mm laminated glazing or the equivalent in double glazing
	Glazed areas greater than 35% of floor area	Require a specialist acoustic report to show conformance with the insulation rule.
	Frames to be aluminium window frames with compression seals.	
Skillion Roof	Cladding:	0.5mm profiled steel or 6mm corrugated fibre cement, or membrane over 15mm thick ply, or concrete or clay tiles.
	Sarking	17mm plywood (no gaps).
	Frame:	Minimum 100mm gap with fibrous acoustic blanket (batts or similar of a minimum mass of 9kg/m³).
	Ceiling:	Two layers of 10mm gypsum plasterboard (no through ceiling lighting pementrations unless correctly acoustically rated). Fibrous acoustic blanket (batts or similar of a minimum mass of 9kg/m³).
	Combined superficial density:	Combined mass with cladding and lining of not less than 25kg/m² with no less than 10kg/m² on each side of structural elements.
Pitched roof (all roofs other than skillion roofs)	Cladding:	0.5mm profiled steel or tiles, or membrane over 15mm thick ply.
	Frame:	Timber truss with 100mm fibrous acoustic blanket. (batts or similar of a minimum mass of 9kg/m³) required for all ceilings.
	Ceiling:	12mm gypsum plaster board.
	Combined superficial density:	Combined mass with cladding and lining of not less than 25kg/m².

SITE COVERAGE = 1.21 %
LAND AREA = 10,000.0 M²
HOUSE = 121M²



DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTUAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
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Drawing Title: **SITE PLAN**

Sheet # 2

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: 1:500

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

D C Design
144 Westmere Station Road
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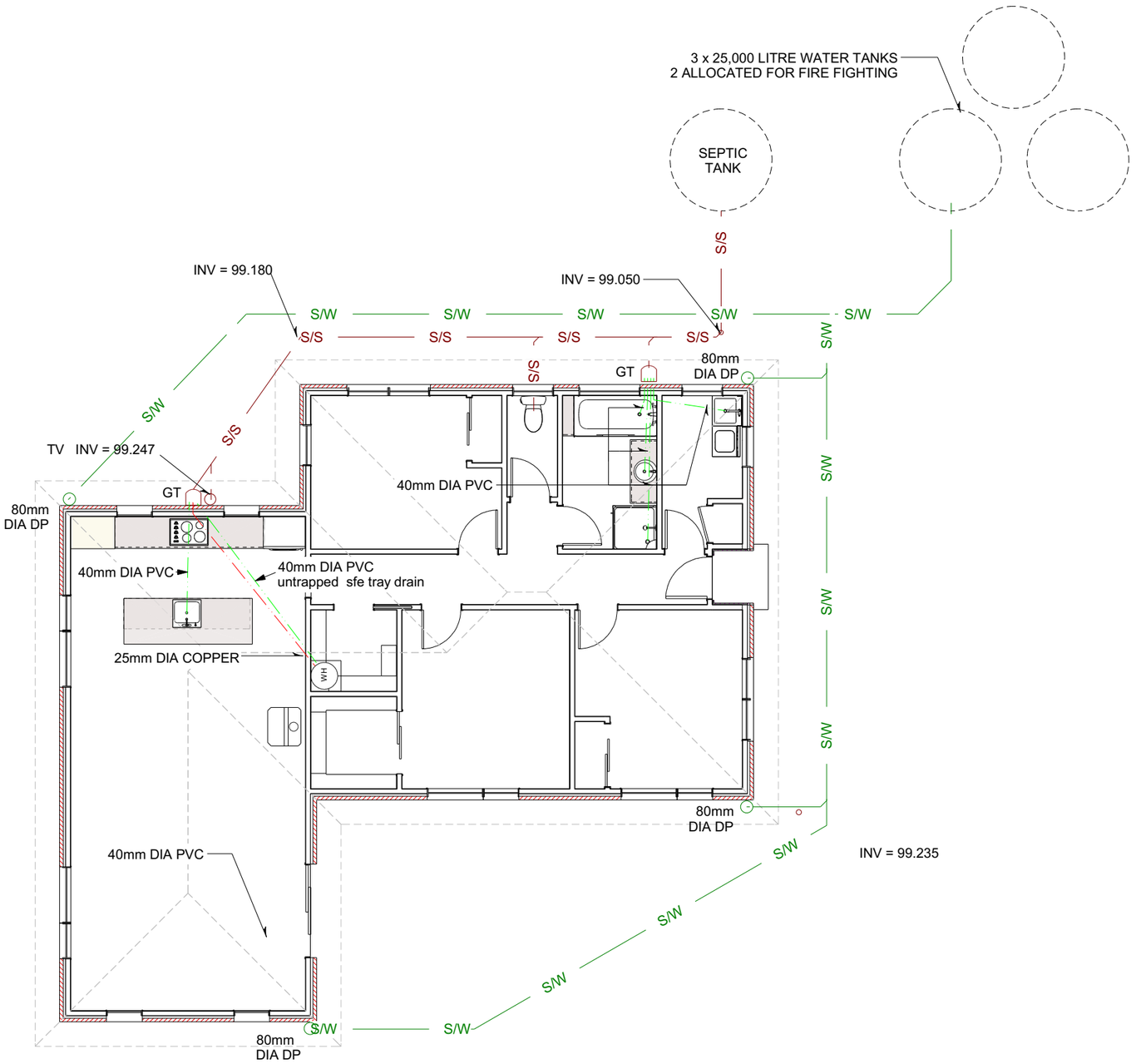

Denotes 40mm Waste Pipe Min Fall 1:40

Denotes 100mm uPVC Sanitary Sewer Line Min Fall 1:60

S/S

Denotes 90mm uPVC Storm Water Line Min Fall 1:90

S/W

Denotes 25mm Blueline Water Pipe

Denotes 65mm Waste Pipe Min Fall 1:40

Denotes Exterior Tap ▼

Denotes Terminal Vent
80mm T.V.

Denotes 80mm Down Pipe
80mm D.P.

Denotes Gully Trap
G.T.

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Drawing Title: **DRAINAGE PLAN**

Sheet # 3

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: 1:100

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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Figure 7: Bedding and backfilling
Paragraphs5.2.1, 5.3.1 and 5.4.1

3.9 Bedding & Backfilling
3.9.1 General
NZBC B1 requires all drains be constructed to withstand the combination & frequency of loads likely to be placed upon them without collapse, undue damage, undue deflection or undue vibration.
in addition adequate support needs to be provided to prevent gradients becoming less than those required as a result of:
a) Differential settlement, or
b) Deflection of an unsupported span

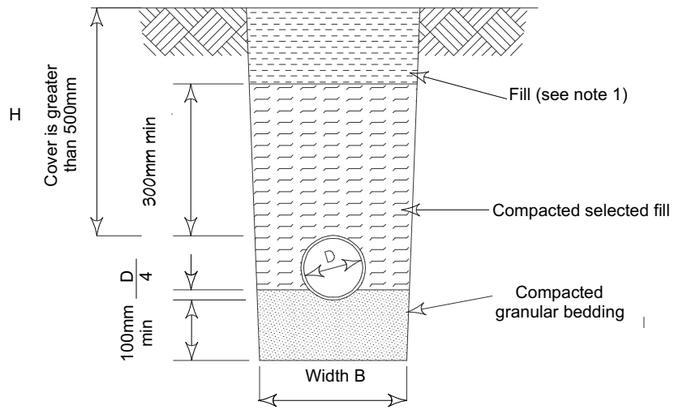
3.9.2 Bedding & Backfilling
Fig 13 gives acceptable solutions for the bedding & backfilling of the drainage pipes except where:
a) The trench is located within or above peat, or
b) Scouring of the trench is likely due to unstable soils, or
c) The horizontal separation between any building foundation & the underside of the pipe trench is less than that required by Paragraph 3.9.7, or
d) The cover H to the pipe is more than 2.5m.

3.9.3 Trench slope
Where the slope of the trench is 1 in 8 or greater, anti-scour blocks shall be provided.
These anti-scour blocks shall be:
a) Constructed from 150mm thick concrete (17 Mpa),
b) Keyed into the sides & floor of the trench by 150 mm,
c) Extend to 300 mm above the drain or to ground level where the drain cover is less than 300mm &
d) Spaced at:
i) 7.5m centres for trench slope between 1 in 8 & in 5, or
ii) 5.0 m centres for trench slopes greater than 1 in 5.

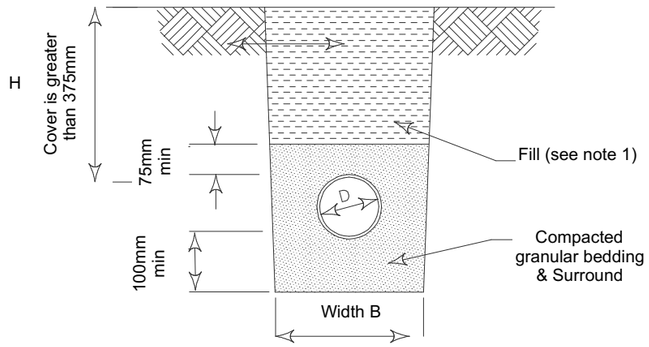
3.9.4 Trench width
The width B of the trench shall be less than pipe diameter D plus 200mm .
Trench width at the top of the pipe shall be no more than 600mm unless the pipe(s) in the trench are covered with concrete, as shown in fig 13 (c)

3.9.5 Acceptable materials
Acceptable fill material shown in figure 13 are;
a) Bedding material of clean granular non cohesive material with a maximum particle size of 20mm or
b) Selected compacted fill of any fine-grained soil or granular material which is free from topsoil & rubbish & has a maximum particle size of 20mm, or
c) Ordinary fill which may comprise any fill or excavated material.

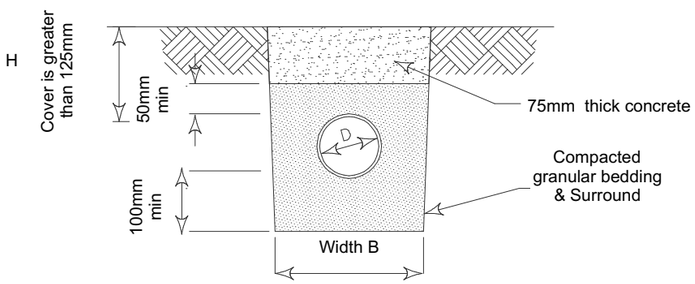
3.9.6 Placing & compacting
a) Granular bedding & selected fill shall be placed in layers of no greater than 100mm loose thickness & compacted.
b) Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area of 75+or- 25mm by 75+or- 25mm) over the entire surface of each layer to produce a compact layer without obvious voids.
c) More than 300mm above the pipe, compaction hall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg.



(A) BEDDING TYPE "B" OF NZS7643
Cover greater than 500mm



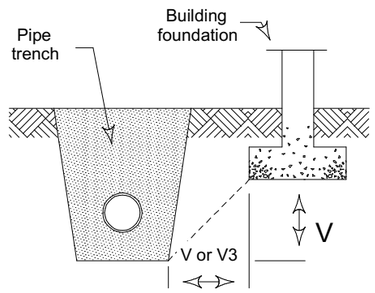
(B) BEDDING TYPE "D" OF NZS7643
Cover greater than 375mm



(C) COVER BETWEEN 125MM & 375MM

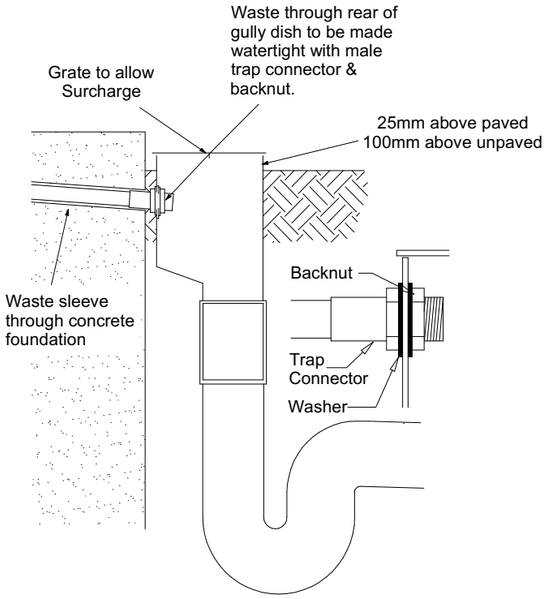
NOTE:
1. Fill Shall be:
- Ordinary fill where drains are located below gardens & open country
- Compacted selected fill where the drains are located below residential driveways & similar areas subject to light traffic

Figure 8: Relationship of pipe trench to building foundation
Paragraph5.6.1



Minimum horizontal separation shall be V or 3V dependant on length of time trench open, see Paragraph 5.6.1

PROXIMITY OF TRENCH TO BUILDING
5.6.1
For light timber framed & concrete masonary buildings founded on good ground & constructed in accordance with NZS 3604 or NZS 4229, pipe trenches which are open for no longer than 48 hours shall be located no closer than V to the underside of any building foundation, as shown in fig 8. Where the trench is to remain open for periods longer than 48 hours the minimum shall increase to 3V in ground except rock.



(A) WASTE DISCHARGE TO REAR OF GULLY DISH

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Address:
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Drawing Title: **BEDDING & BACKFILL - GULLY TRAP**
Sheet # 4
Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: N.T.S
Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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CONSTRUCTION NOTES:

The site requirements of this NZS 3604: 2011 are concerned with soil site conditions under or adjacent to the building.
If a site does not comply with the definition of good ground, the foundations shall be the subject of specific design (SED) & investigation as appropriate.
All foundations shall bear upon solid bottom in undisturbed good ground material or upon firm fill for which a certificate of suitability has been issued under NZS 4431.
Where good ground is at a depth greater than 0.6., the excavation between the good & foundation base may be filled with mass concrete having a minimum strength of 10Mpa at 28 bays.
Granular fill material complying with 7.5.3.2 shall be placed & compacted in layers of 150mm max thickness, over the area beneath the proposed ground slab, so that the total thickness of granular base is not less than 75mm nor more than 600mm.
compact each layer until the material is bound together & does not visibly deform under the weight of a pressed adult heel. SED is required if filling is in excess of 600mm.

7.5.3.2
Granular fill material shall be composed of round gravel, crushed rock, scoria or approved material.
a) Not more than 5% shall pass through a 2.2mm sieve with the exception of conditions in 4.5.3.3:
b) 100% shall pass either.
i) A 19mm sieve for any fill thickness; or
i) A 37.5mm sieve for a fill thickness exceeding 100mm.
Where it can be demonstrated that site conditions ensure that capillary water is unlikely to reach the underside of the slab, then the requirements of 7.5.3.2 (a) can be waived.

25mm Sand blindings to cover hardfill to ensure the vapour barrier is protected from granular protrusions. Conc, floor to comply with NZS 3109,surface tolerance, & NZS 3114, maximum deviations of 3mm.

Shrinkage control joints -3mm wide x 25mm deep saw cuts to form bays NZS3604:2011 - section 7 Floors 7.5.8.6.4
The bay dimensions formed by either construction or shrinkage control joints shall be limited to a maximum length ; width ratio of 2:1. Maximum bay dimensions in exposed concrete, vinyl or tiled areas to be 6mx6m.

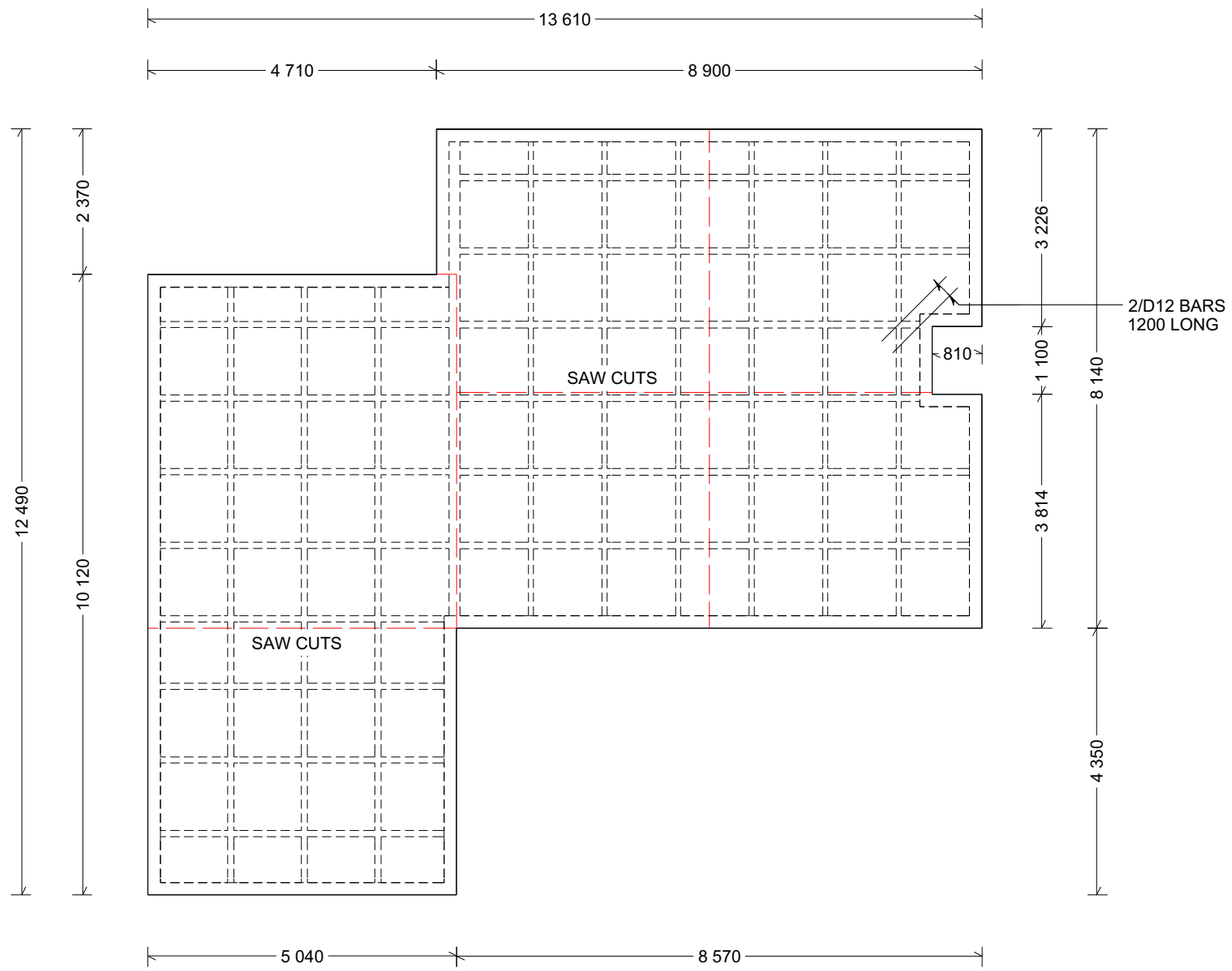
Steel reinforcing within concrete floors & walls of rooms that contain a Bath or Shower must be bonded to the earth system as per AS/NZS 3000:2007 Electrical installations. See clause 5.6.2.5

Confirm layout & fittings of kitchen & bathroom etc before foundation commences

FOUNDATION & SLAB
100mm thick concrete slab, SE62 500E reinforcing mesh, min 225 mm lap on 0.25 polythene
Concrete strength to be 20 Mpa after 28 days
25mm Sand blindings, to cover hardfill to ensure the vapour barrier is protected from any granular protrusions
Malthoid DPC underlay under all bottom plates, overlapping timber by min 6mm.

WIND RESISTANCE 5.2 TABLE 4
SINGLE STOREY LIGHT ROOF HEAVY CLADDING BU'S REQUIRED 1802 PER 100M²
121M² FLOOR AREA = 2180.42 BU'S
BRACING ALONG = 1070 BU'S
BRACING ACROSS = 1360 BU'S
TOTAL = 2430 BU'S
NO SHEAR KEYS REQUIRED

Denotes Construction Joints



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Address:
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Drawing Title: **FOUNDATION PLAN**

Sheet # 5

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: 1:100
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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Internal load bearing beam steel to be terminated with 300 mm 90 deg hook

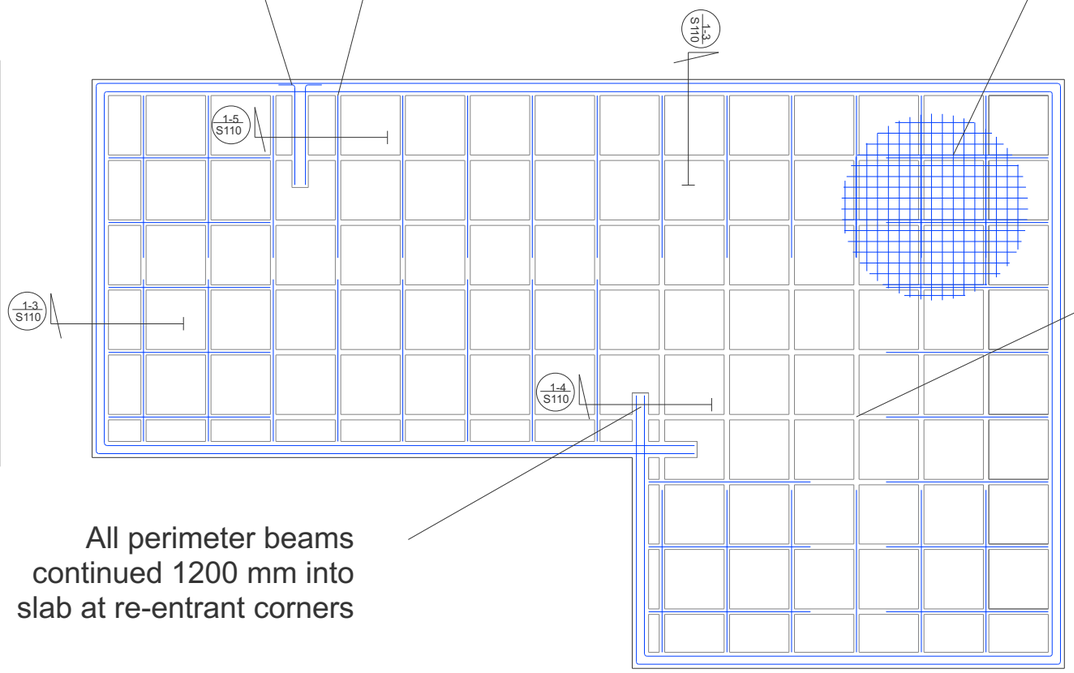
HD12-3000 mm long tied to under side of SE62 Mesh perpendicular to all exterior formed edges

SE62 Ductile Mesh at 30 min top cover

NOTE

CONCRETE TO BE FIRTH RP2019TC2
NO SUBSTITUTIONS
MIX CONTAINS STEEL FIBRES
NO SURFACE GRIND OR POLISHING
HIGH SLUMP MIX DESIGN (160 mm)
RIBS AND SLAB TO BE FULLY VIBRATED

DETAILS SHOWN ARE SPECIFIC TO RIBRAFT EQ
ALL OTHER DETAILS NOT SHOWN REFER:
'FIRTH RIBRAFT TECHNICAL MANUAL
JAN 2012' FOR BEARING REQUIREMENTS
AND TECHNICAL INFOMATION



Bottom layer HD12's omitted for clarity, refer sections on S110

All perimeter beams continued 1200 mm into slab at re-entrant corners

FIRTH RIBRAFT EQ
FLOORING SYSTEM

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Drawing Title: **FOUNDATION DETAILS**

Sheet # 6

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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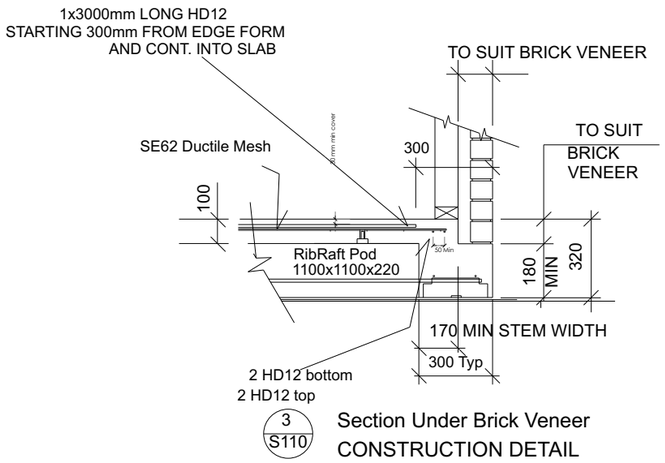


3 / S110 Section Under Brick Veneer
CONSTRUCTION DETAIL

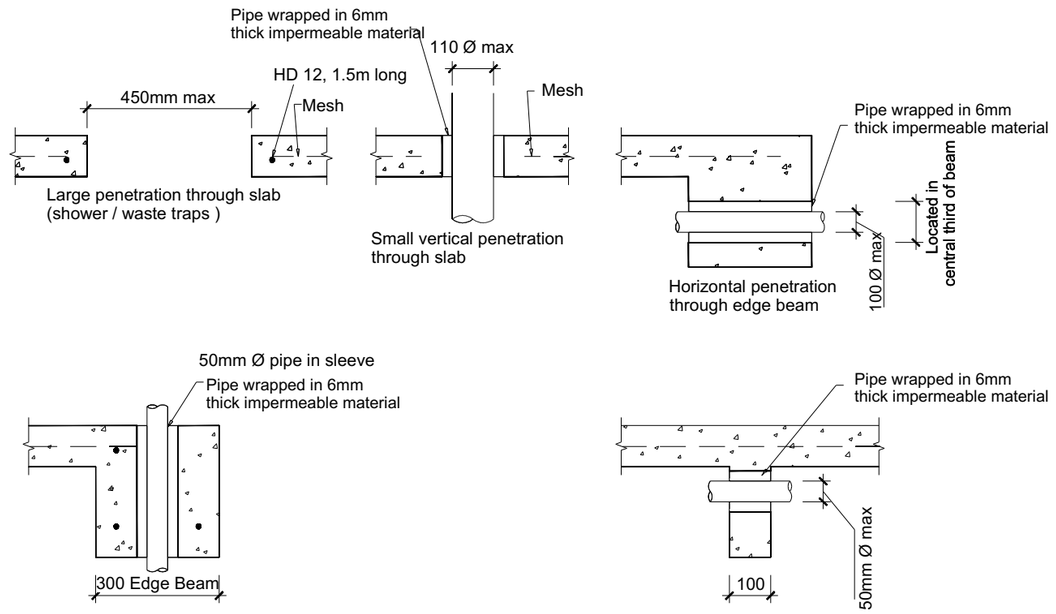
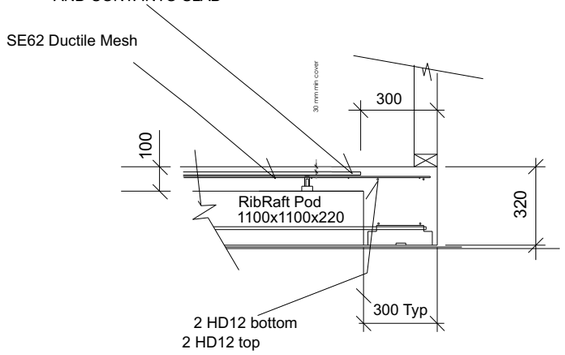


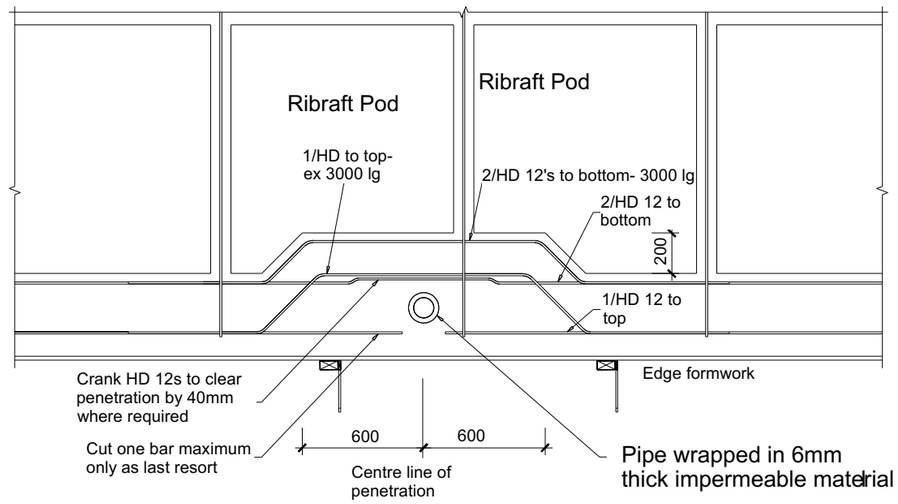
FIGURE 13 EXAMPLE OF DETAILING REQUIREMENTS FOR SERVICES

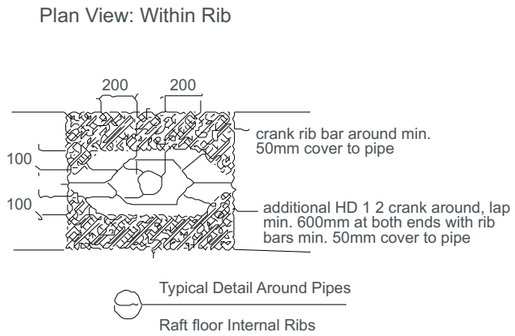
1x3000mm LONG HD12
STARTING 300mm FROM EDGE FORM
AND CONT. INTO SLAB



1 / S110 Clad Frame
CONSTRUCTION DETAIL

LOCALISED INCREASE IN WIDTH AT EDGE WHERE VERTICAL SERVICE UP TO 100MM DIAMETER REQUIRED





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Client Details :
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Drawing Title:	**FOUNDATION DETAILS**					Sheet #	7
Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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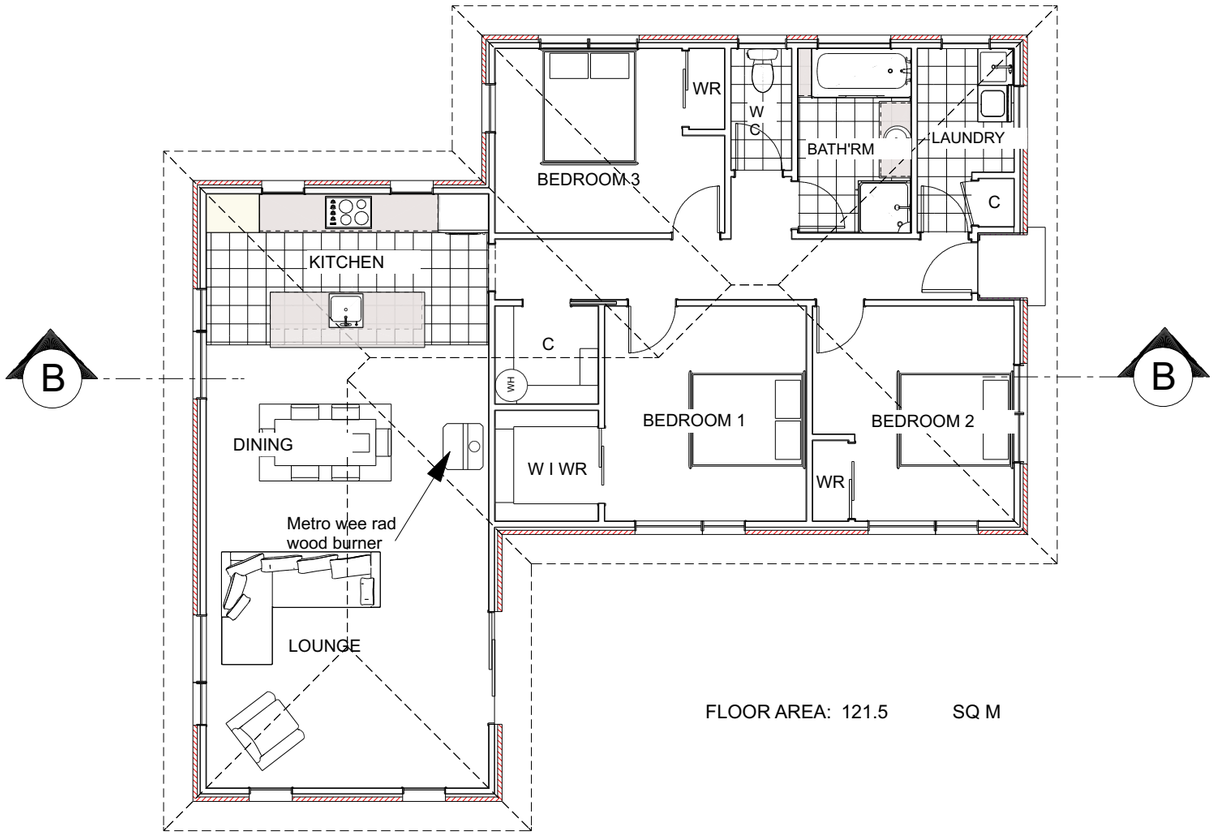
FLOOR FINISHES	
Bedrooms / Hall Living	Carpet
Kitchen Bath Room	Non-Slip Vinyl



FLOOR AREA: 121.5 SQ M

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Drawing Title: **LAYOUT PLAN & FLOOR COVERINGS**

Sheet # 8

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C

Scale: 1:100

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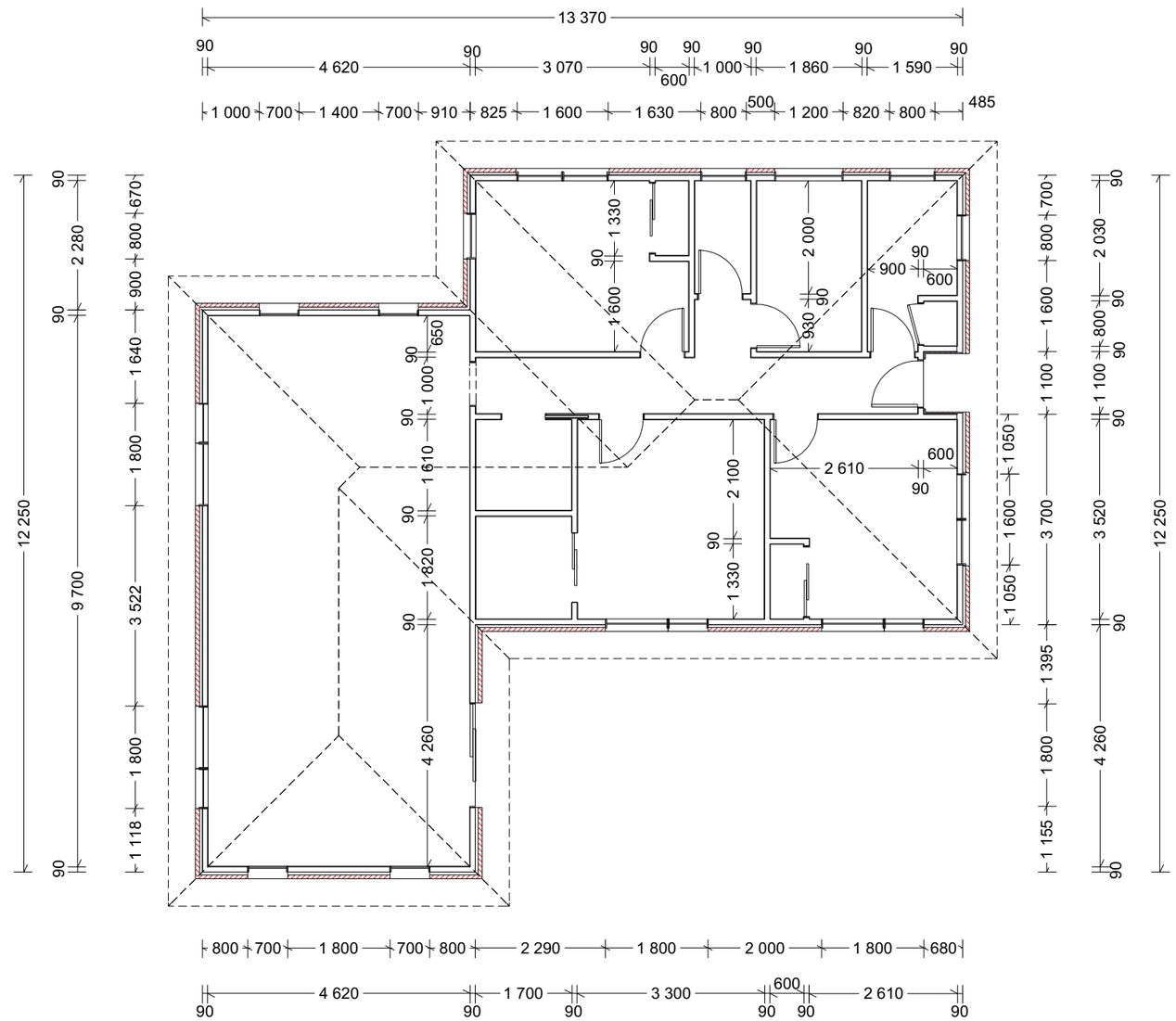
CONSTRUCTION NOTES:

Always cross reference the foundation plan with the floor plan prior
to setting out.

Exterior Joinery Head height to be 2.000 from FFL all sizes to be confirmed on site by manufactory (SITE MEASURE) liner to suit architrave finish

No liability shall be held by designer for incorrect supply of Joinery.

Interior doors shall be of std height 1980mm on 19mm thick jambs to suit architraves.



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Drawing Title: **DIMENSIONED FLOOR PLAN**

Sheet # 9

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: 1:100
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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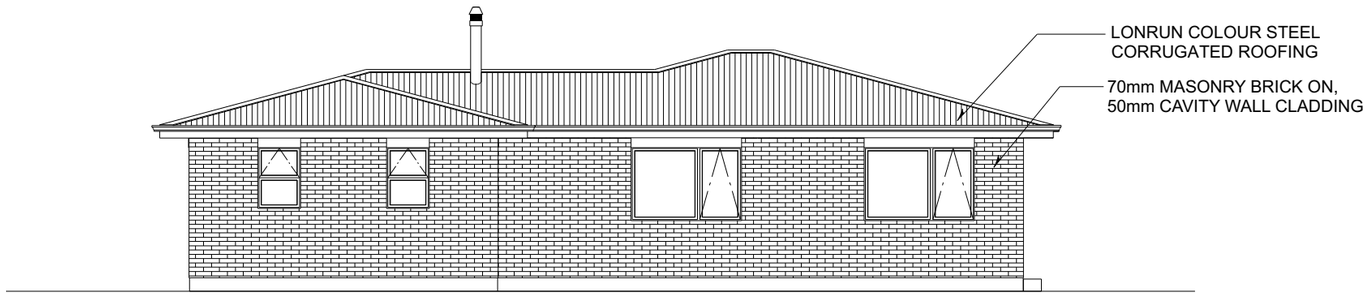
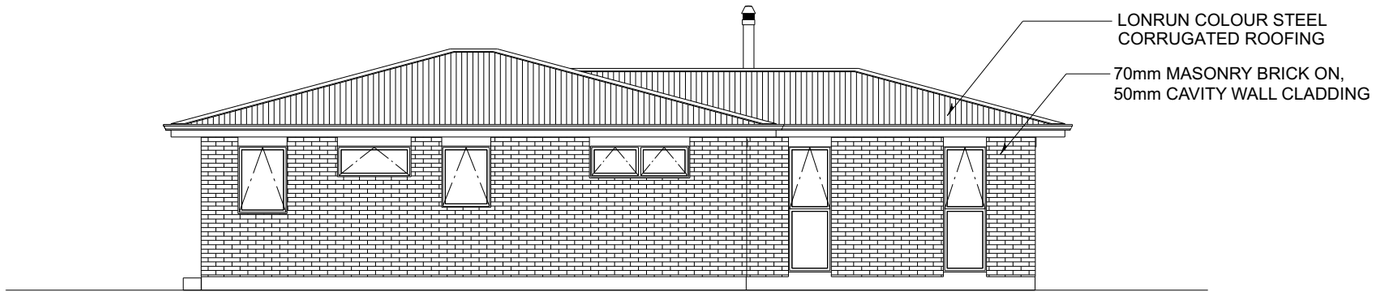
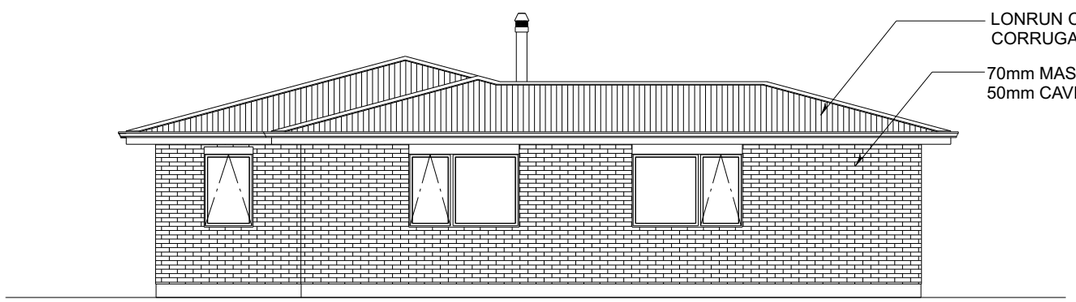


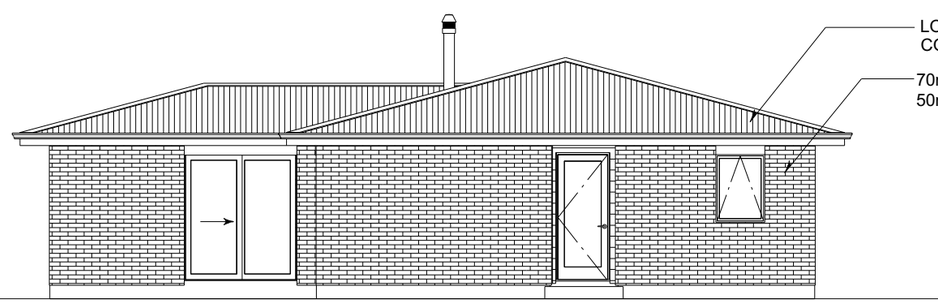
WEST ELEVATION



EAST ELEVATION



NORTH ELEVATION



SOUTH ELEVATION

BUILDING ENVELOPE RISK MATRIX

All Elevations		
Risk Factor	Risk Severity	Risk Score
Wind zone (per NZS 3604)	V HIGH	2
Number of storeys	LOW	0
Roof/wall intersection	LOW	0
Eaves width	MEDIUM	1
Envelope complexity	MEDIUM	1
Deck & balconies	LOW	0
TOTAL Risk Score:		4

CONSTRUCTION NOTES

Glazing in accordance with NZS 4223 .3 2016 plus amendments
All glazing clear float except for obscure glass to bathrooms
WC & garage. Double glazing to all windows & doors.

Aluminium joinery head heights to be 2.050m Refer to floor plan
for exterior door & window sizes. Joinery schedule & sizes to
be confirmed by pre-cut manufacturer & joinery fabricator
prior to manufacture via e-mail phone or other.

SAFETY RESTRICTOR STAYS:
Windows restrictors are required to outward opening windows
that may protrude into walk paths.

NZBC D1/AS1 Access Routes:
Concrete or H5 timber steps to all access points 150mm below FFL
Acceptable Slip Resistance for Walking Surfaces:
* Portland cement concrete
- Broomed (Class5 or 6) or wood float finish (Class U2)
Concrete surface finishes comply with NZS 3144.
- Coated & sand/grit impregnated
The sand/grit which is sprinkled over the complete surface of the final
paint coating should be hard angular material such as silica sand or
calcined bauxite. The particle size should not be less than 0.2mm so that
it is not submerged by the coating & not greater than about 2-3mm so
that it remains tightly bound to the surface.
- Exposed aggregate finish
crushed aggregate
* Asphaltic concrete
* Concrete pavers
- Dry press concrete
- Interlocking concrete block pavers to NZS 3116
* Anti-slip tapes
- Will normally require regular replacement to remain effective. To ensure
foot contact, tapes should be placed at right angels to the line of travel
& be spaced at no more than 150mm cen3res.

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Client Details :
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Drawing Title: **ELEVATION & RISK MATRIX**

Sheet # 10

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: 1:100
Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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144 Westmere Station Road
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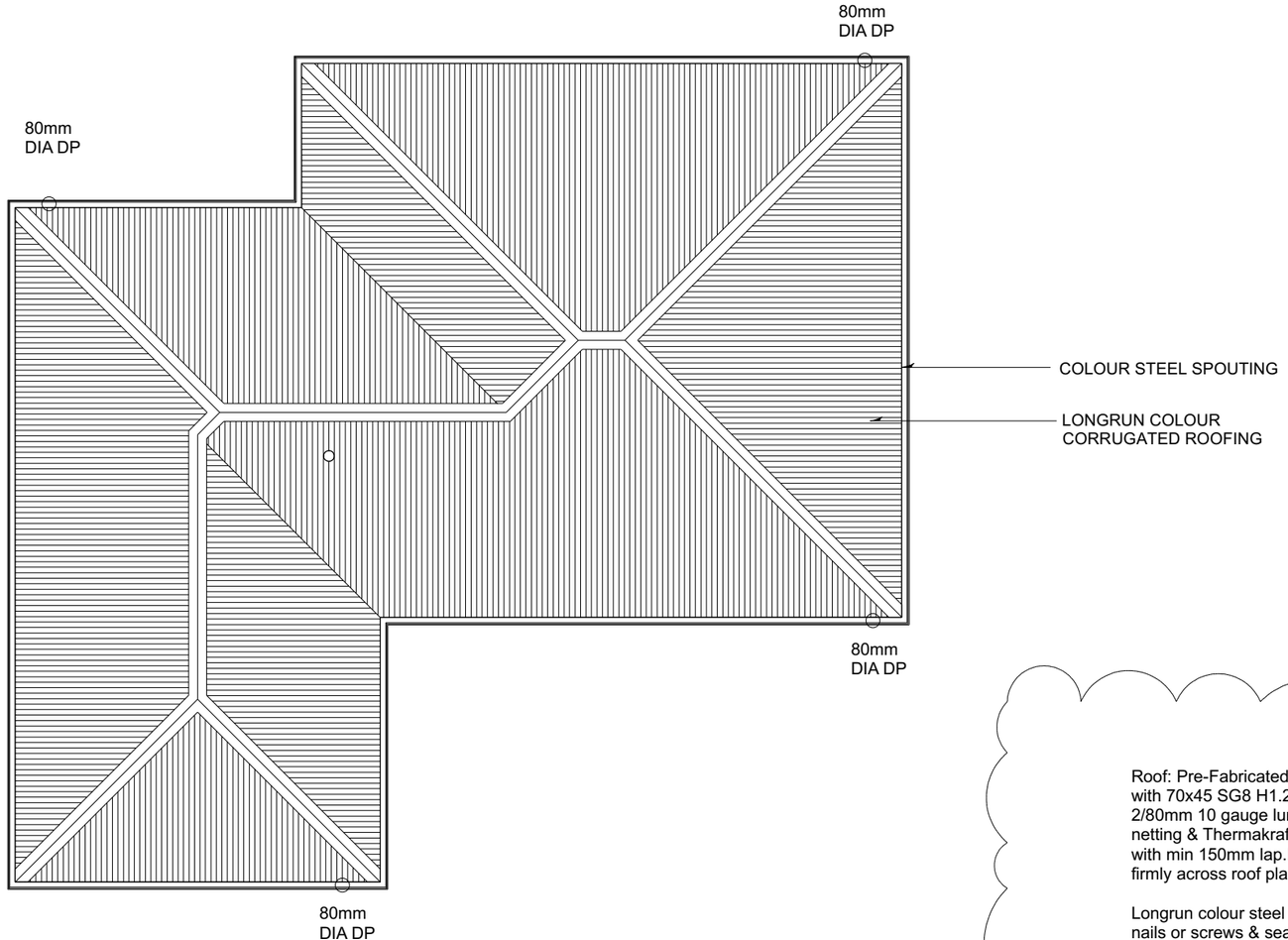
BP114150

Roof Pitch	15°
Roof Plans Area =	150 SQ M
Max Roof area for 80mm Ø Down Pipe = 85m2	



Roof: Pre-Fabricated trusses @ 15 degree pitch H1.2 @ 900mm ctrs with 70x45 SG8 H1.2 Purlins @ 900mm ctrs fixed to trusses with 2/80mm 10 gauge lumberlok blue Purlin screws, With roofing netting & Thermakraft 215 self supporting underlay laid horizontally with min 150mm lap.Lumberlok strip brace with tensioners tightened firmly across roof plane.

Longrun colour steel corrugated roofing fixed with compatible roofing nails or screws & sealed washers, by qualified persons with flashings as required to all junctions- flashings fixed with compatible roofing screws & sealing washers.
E2/AS1 8.4.8 Fixing Corrugated
Fixing shall be as shown in table 11& 12, & shall be a minimum 12-gauge screw, as shown in fig 39, which compiles with Class 4 of AS 3566: Part 2.
8.4.8.1 Fixing requirements
Fixing shall :
a) Be fixed through crests
b) Penetrate Purlins by a min of 40mm for nail fixing & 30mm for screw fixings
c) Include sealing washers of:
i) Neoprene)having a carbon black content of 15% or less by weight)
ii) Profiled washer & EPDM washer where required to allow for expansion of the profiled metal roof cladding.

DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3
WANGANUI

Drawing Title: **ROOF ELEVATION**

Sheet # 11

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C

Scale: 1:100

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External walls (SG8 H1.2)
90x45 H1.2 SG8 frame @ 400mm ctrs & 2 rows of dwangs +140x35 H1.2 top plate packer to frames that have trusses set on top,
Dwang at no more than 800mm ctrs.

MARSHALL WATERPROOFING: Tekton building wrap to all exterior frames, including gable ends.
Standard 10mm gib to all walls except wet areas gib aqua line. Fixed to comply with the latest Winstone Gib Manual - level 4 finish.

BOTTOM PLATE FIXING: External walls to comply with NZS 3604; 2011 M12x 135mm Galv Thru Bolts @ no more than 900mm ctrs & no more than 150mm from any opening,

EXTERNAL CLADDING: 70 Series Bick in stalled to manufacturers instructions & James Hardie Linea weatherboards installed to manufactures instructions & in accordance with NZBC: E2/AS1 External Moisture. & fixings as required by cladding system.

EXTERNAL JOINERY: Aluminium joinery to comply with NZBC: E2/AS1: 20mm primed jambs suitable for architraves. Approved window seal tape to all openings. Glazing to comply with NZS:4223.3: 2016 & amendments.

INTERNAL WALL: (SG8 H1.2) 90x45 H1.2 frames with 140x35 top plate packer studs @ 600mm ctrs 2 rows of dwangs. Standard 10mm gib throughout except for wet areas to be Aqua line gib. Bottom plate fixing: Ramset HD875 driven pin + washer **(or equivalent)** @ 600mm ctrs.

Wet Areas: Floor finish Bathroom, Kitchen Ensuite.
Non-Slip Vinyl over sealed floor. Min slip resistance Co-efficient for level surface between 0.25-0.50 acceptable with NZBC: D1/1 AS1 Access.
Waterproof seal Tiles to edge of painted skirting, contractor to comply with NZBC: E3/AS1.

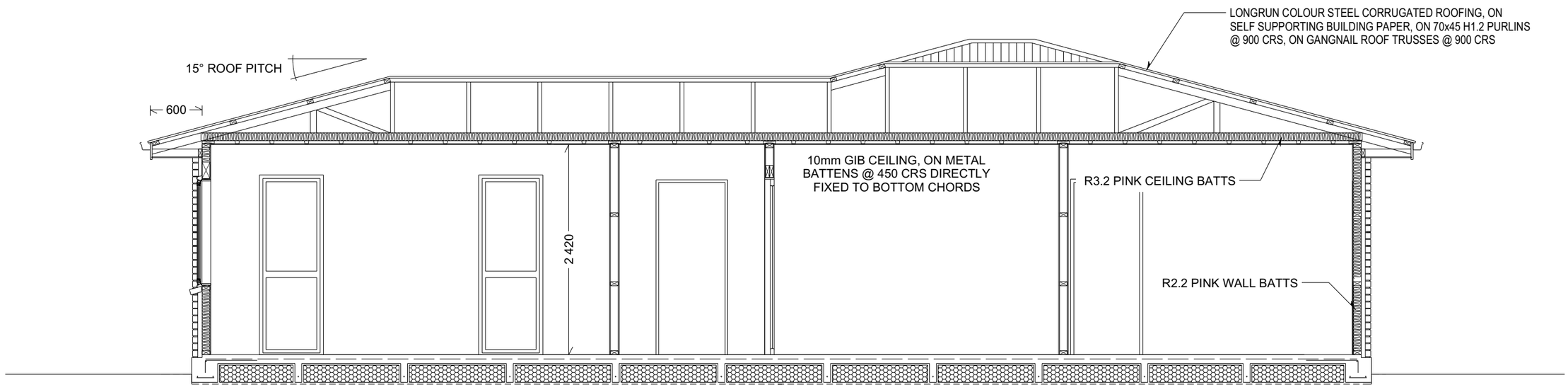
Ceiling: Rondo ceiling battens nailed to trusses @ 450mm ctrs. Ensure battens are straight prior to lining. Fix 10mm std Gib linings & 100mm Aqua-Line Gib to wet areas with 32mmx6g gib grabber screws @ 600mm ctrs. Glue daubs to be min of 200mm from centre screw. Do not screw where you glue. 32mm x6g Gib grabber screws @ 200mm ctrs around the perimeter. Gib stopping level 4 paint finish. 1/850mm sq ceiling access to roof space.

Insulation: R3.2 BIB Blanket insulation = mass of 10.88 kg m³ to all ceilings Maintain 25mm air gap clearance between the insulation & roof underlay.
R2.2 insulation to all exterior wall cavities friction fitted.

Soffits: 4.5mm Hardiflex soffit lining fixed to underside of truss top cord & rafter extensions. Refer roof plan for eaves widths, 25x19pp soffit mould. continuous colour steel Fascia with continuous colour steel spouting & PVC down pipes 80mm

Roof: Pre-Fabricated trusses @ 15 degree pitch H1.2 @ 900mm ctrs with 70x45 SG8 H1.2 Purlins @ 900mm ctrs fixed to trusses with 1/80mm 10 gauge lumberlok blue Purlin screws, With Thermakraft 215 self supporting underlay laid horizontally with min 150mm lap.

Longrun colour steel corrugated roofing fixed with compatible roofing nails or screws & sealed washers, by qualified persons with flashings as required to all junctions- flashings fixed with compatible roofing screws & sealing washers.
E2/AS1 8.4.8 Fixing Corrugated
Fixing shall be as shown in table 11& 12, & shall be a minimum 12-gauge screw, as shown in fig 39, which compiles with Class 4 of AS 3566: Part 2.
8.4.8.1 Fixing requirements
Fixing shall :
a) Be fixed through crests
b) Penetrate Purlins by a min of 40mm for nail fixing & 30mm for screw fixings
c) Include sealing washers of:
i) Neoprene)having a carbon black content of 15% or less by weight)
ii) Profiled washer & EPDM washer where required to allow for expansion of the profiled metal roof cladding.



100mm OF 20MPa FLOOR SLAB WITH SE62 500-E SEISMIC MESH TO SLAB ON Rib Raft Pods on DPM VAPOUR BARRIER, OVER 100mm OF 20mmsand blindings

SECTION - B

DRAWINGS PROVIDED BY: sentinel HOMES / dc DESIGN ARCHITECTUAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **CROSS SECTION** Sheet # 12

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: 1:50
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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BP114150

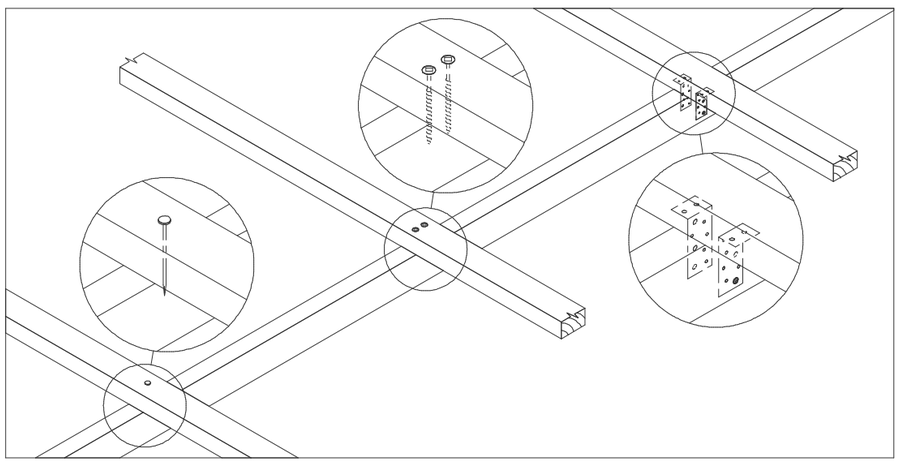
PURLIN & BATTEN FIXING CHART

ALTERNATIVE SOLUTION TO

NZS 3604:2011 TABLES 10.10 & 10.12

NOTE:

All purlin and batten sizes are as per NZS 3604:2011.
All fixings assume that the purlin and battens are installed on their flat over the top of the rafter or truss.
The minimum fixing requirements apply to all purlin locations within the roof area.
The LUMBERLOK BLUE SCREW where specified requires a minimum of 30mm penetration into rafter or truss i.e. it is suitable for rough sawn timber up to 50mm thick at 18% moisture content.



SELECTION CHART FIXING OPTIONS

(minimum fixing requirements)

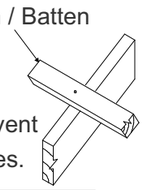
ROOF WEIGHT	MAX. PURLIN SPAN (mm)	MAX. PURLIN CRS. (mm)	WIND ZONE				
			L	M	H	VH	EH
HEAVY ROOF Tile Battens	900	370	A	A	A	A	A
LIGHT ROOF Tile Battens	900	370	A	A	B	C	C
	1200	370	A	B	C	C	C
LIGHT ROOF Purlins	900	900	C	C	C	C	
	1200	900	C D	C	C	D	D
	1200	1200	C	C	D	E	E

Wind Zone: As per NZS 3604:2011

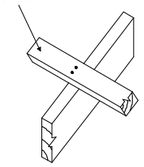
L = Low Wind
M = Medium Wind
H = High Wind
VH = Very High Wind
EH = Extra High Wind

STANDARD FIXING OPTIONS

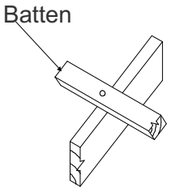
FIXING TYPE A
0.55kN
1 NAIL
Note: Two nails maybe preferred to prevent batten rolling over with high roof pitches.



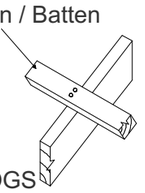
FIXING TYPE B
0.8kN
2 NAILS



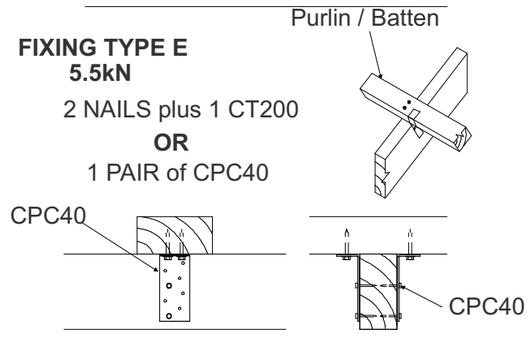
FIXING TYPE C
2.4kN
1 BLUE SCREW



FIXING TYPE D
3.45kN
2 BLUE SCREWS
OR
2 SKEW NAILS plus 2 WIRE DOGS
(for purlin on edge)



FIXING TYPE E
5.5kN
2 NAILS plus 1 CT200
OR
1 PAIR of CPC40



FIXING DEFINITIONS

NAIL = Either 90mm x 3.15 dia. power-driven nail or 100mm x 3.75 dia. hand-driven nail

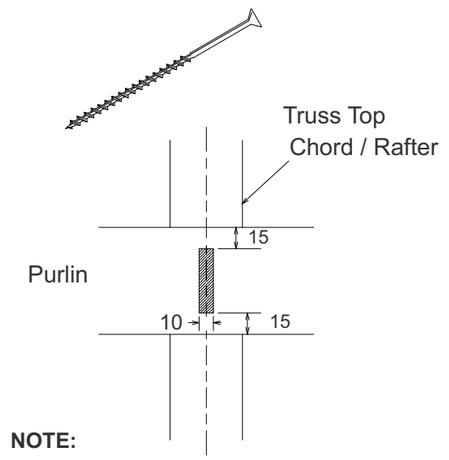
BLUE SCREW = 80mm x 10 gauge LUMBERLOK BLUE SCREW

WIRE DOG = LUMBERLOK WIRE DOG either LH or RH

CT200 = LUMBERLOK Ceiling Tie CT200 bend over purlin, 4 x LUMBERLOK Product Nails 30mm x 3.15 dia. each end

CPC40 2 x Type 17- 14g x 35mm Hex Head Screws per flange

FIXING TOLERANCES
LUMBERLOK BLUE SCREW

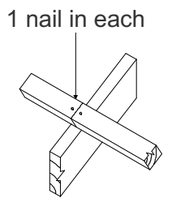


NOTE:
Locate fixings within the shaded area. Care to be taken to avoid over tightening of screws.

PURLIN / BATTEN SPLICE FIXING OPTIONS

FIXING TYPE A & B OVER PURLIN SPLICE

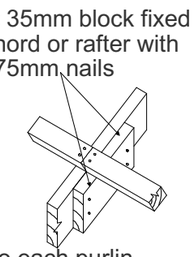
NOTE:
Skew nail when fixing to 35mm rafter or truss



FIXING TYPE C, D or E OVER PURLIN SPLICE

TYPE C
1 SCREW
to each purlin

TYPE D & E
1 NAIl plus 1 SCREW to each purlin



DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3
WANGANUI

Drawing Title: PURLIN FIXING DETAIL
Sheet # 13
Drawn: David Coker | Date: 18 NOV 2019
Checked: David Coker | Variation #
Wind Region A | Wind Zone E/High
Earthquake Zone 2 | Exposure Zone C
Scale: N.T.S

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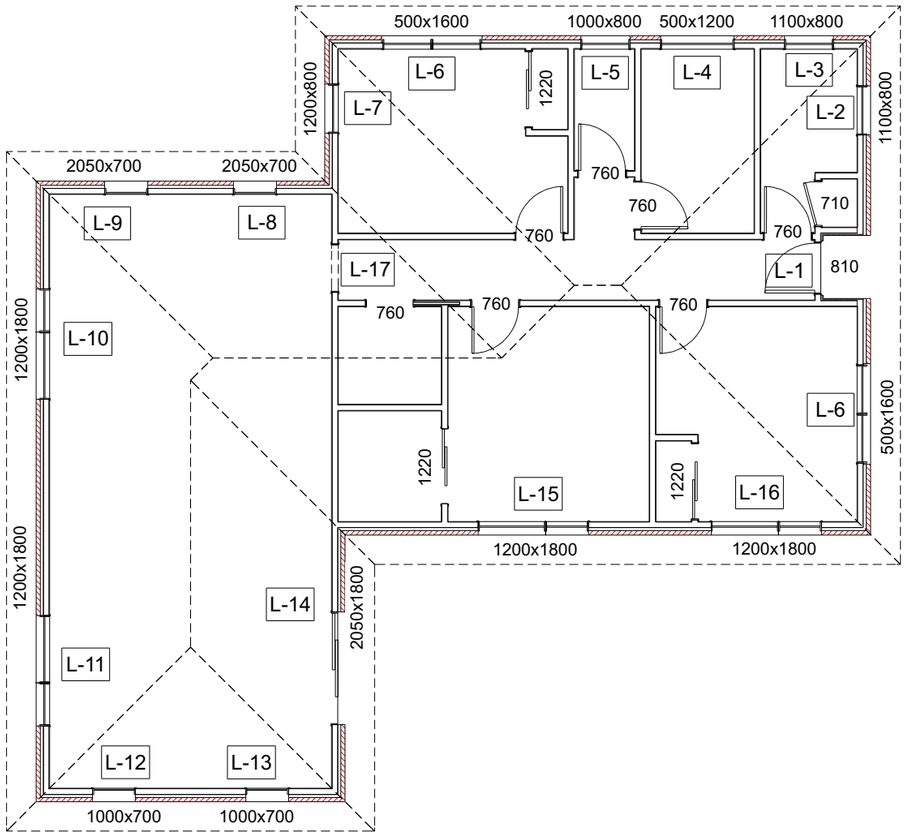
NOTE
1) TRUSS DESIGN TAKES PRECEDENCE OF LINTEL SIZES SHOWN IF DIFFERENT
2) WINDOW MANUFACTURER IS TO SITE MEASURE BEFORE MANUFACTURE

Lintel	Size
L1	90 x 90 SG8
L2	90 x 90 SG8
L3	90 x 90 SG8
L4	140 x 90 SG8
L5	90 x 90 SG8
L6	140 x 90 SG8
L7	90 x 90 SG8
L8	90 x 90 SG8
L9	90 x 90 SG8
L10	140 x 90 SG8
L11	140 x 90 SG8
L12	90 x 90 SG8
L13	90 x 90 SG8
L14	140 x 90 SG8
L15	190 x 90 SG8
L16	140 x 90 SG8
L17	2/90x45 SG8



DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3
WANGANUI

Drawing Title: **DOOR SIZES, WINDOW & LINTEL SIZES**

Sheet # 14

Drawn: David Coker | Date: 18 NOV 2019

Checked: David Coker | Variation #

Wind Region: A | Wind Zone: E/High

Earthquake Zone: 2 | Exposure Zone: C

Scale: 1:100

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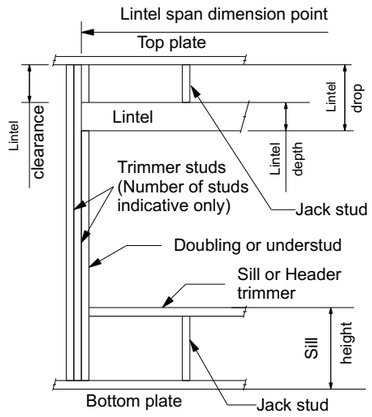
LINTEL FIXING SCHEDULE
ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12
NZS 3604:2011

NOTE:

All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 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	-	-

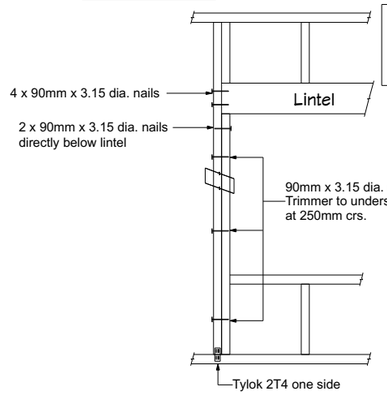
Notes:
1) Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by lintel)
2) Assumed girder truss is at mid-span or middle third span of lintel
3) Use similar fixings for both ends of lintel
4) All other cases require specific engineering design

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	-	-

LINTEL FIXING OPTIONS

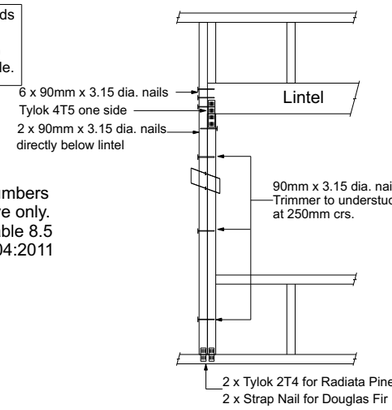
TYPE E
1.4 kN



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

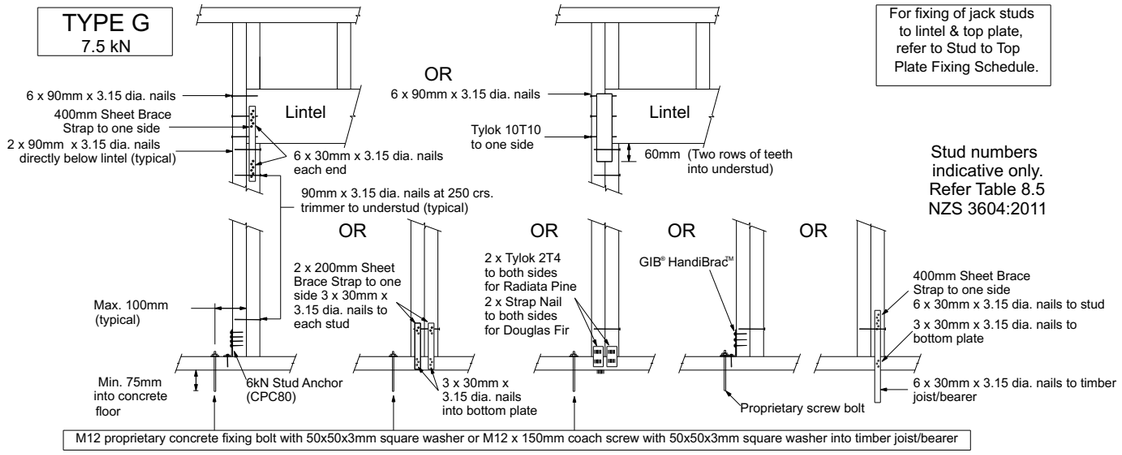
TYPE F
4.0 kN



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

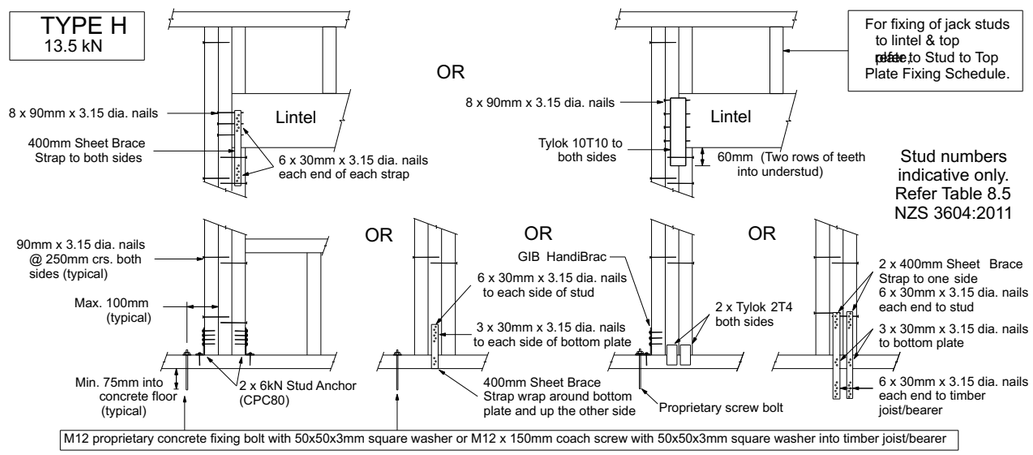
TYPE G
7.5 kN



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



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

DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3
WANGANUI

Drawing Title: **LINTEL FIXING DETAILS**

Sheet # 15

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: N.T.S

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

D C Design
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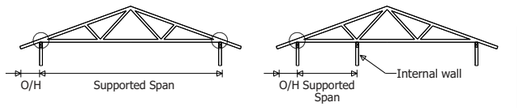
BP114150

STUD TO TOP PLATE FIXING SCHEDULE
ALTERNATIVE TO TABLE 8.18 NZS 3604:2011

NOTE:

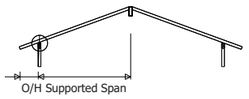
- ☆ All fixings are designed to resist vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ☆ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
- ☆ These fixings assume the correct choice of rafter/truss to top plate connections 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

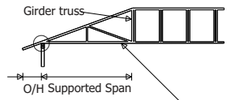


External wall
Standard truss

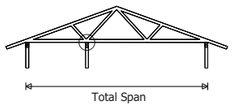
External wall
Internally supported truss



External wall
Rafter roof



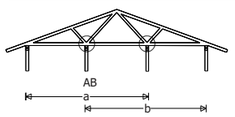
Jack truss



EXTERNAL WALL
LOADED DIMENSION =
SUPPORTED SPAN / 2 + O/H

Internal wall
Internally supported truss
overhang dimension does not apply)

INTERNAL WALL
LOADED DIMENSION =
TOTAL SPAN / 2



MULTIPLE INTERNAL WALL
LOADED DIMENSION FOR
WALL A = a/2
WALL B = b/2

Multiple internal walls
overhang dimension does not apply)

FIXING SELECTION CHART

Suitable for walls supporting roof members at 600, 900 or 1200mm crs.)

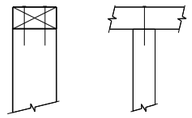
Wind Zones L, M, H, VH, EH, as per NZS 3604:2011

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	
4.0	3.0	2.0	A	A	B	B	B	A	A	B	B	
5.0	3.8	2.5	A	B	B	B	B	A	A	B	B	
6.0	4.5	3.0	A	B	B	B	B	A	A	B	B	
7.0	5.3	3.5	A	B	B	B	B	A	A	B	B	
8.0	6.0	4.0	A	B	B	B	B	A	A	B	B	
9.0	6.8	4.5	B	B	B	B	B	A	A	B	B	
10.0	7.5	5.0	B	B	B	B	B	A	A	B	B	
11.0	8.3	5.5	B	B	B	B	B	A	A	B	B	
12.0	9.0	6.0	B	B	B	B	B	A	A	B	B	

FIXING OPTIONS

FIXING TYPE A 0.7 kN

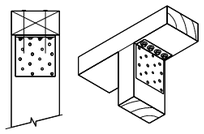
wire nails driven vertically into stud.
2 x 90mm x 3.15 dia. plain steel



FIXING TYPE B 4.7 kN

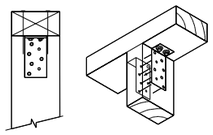
CHOOSE ANY OF THE 3 OPTIONS BELOW

2 x 90mm x 3.15 dia. plain steel
wire nails driven vertically into stud.



Plus
LUMBERLOK
6kN Stud Anchor
CPC80)

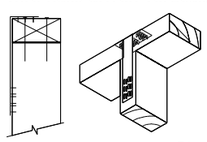
2 x 90mm x 3.15 dia. plain steel
wire nails driven vertically into stud.



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.

8. WALLS

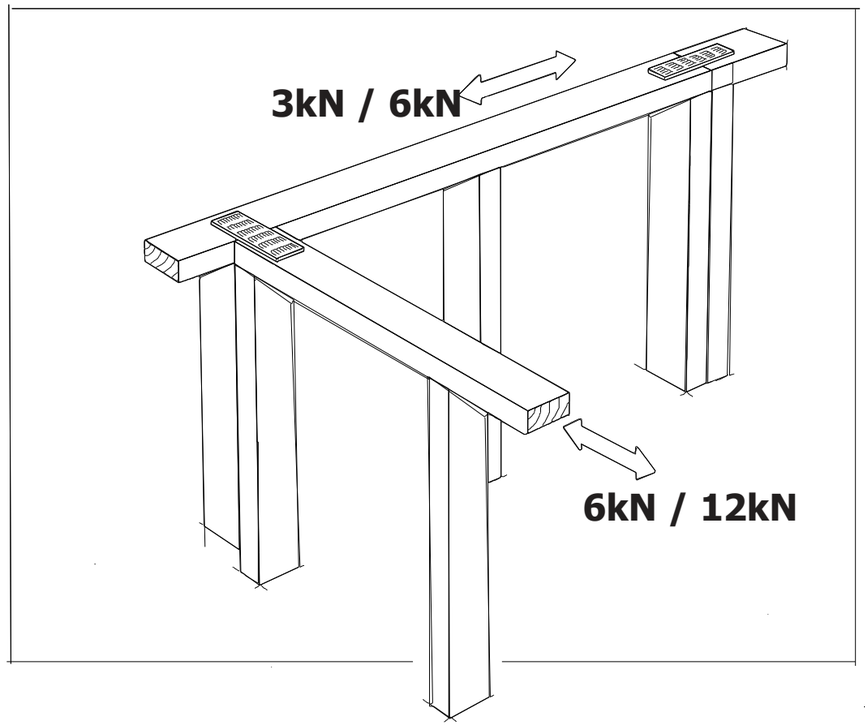
TOP PLATE JOINTING
AS PER CLAUSE 8.7.3 NZS 3604:2011

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 (4 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



DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTUAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3
WANGANUI

Drawing Title:	TOP PLATE JOINTING & STUD TO TOP PLATE FIXING DETAILS					Sheet #	16
Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale:	N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C		

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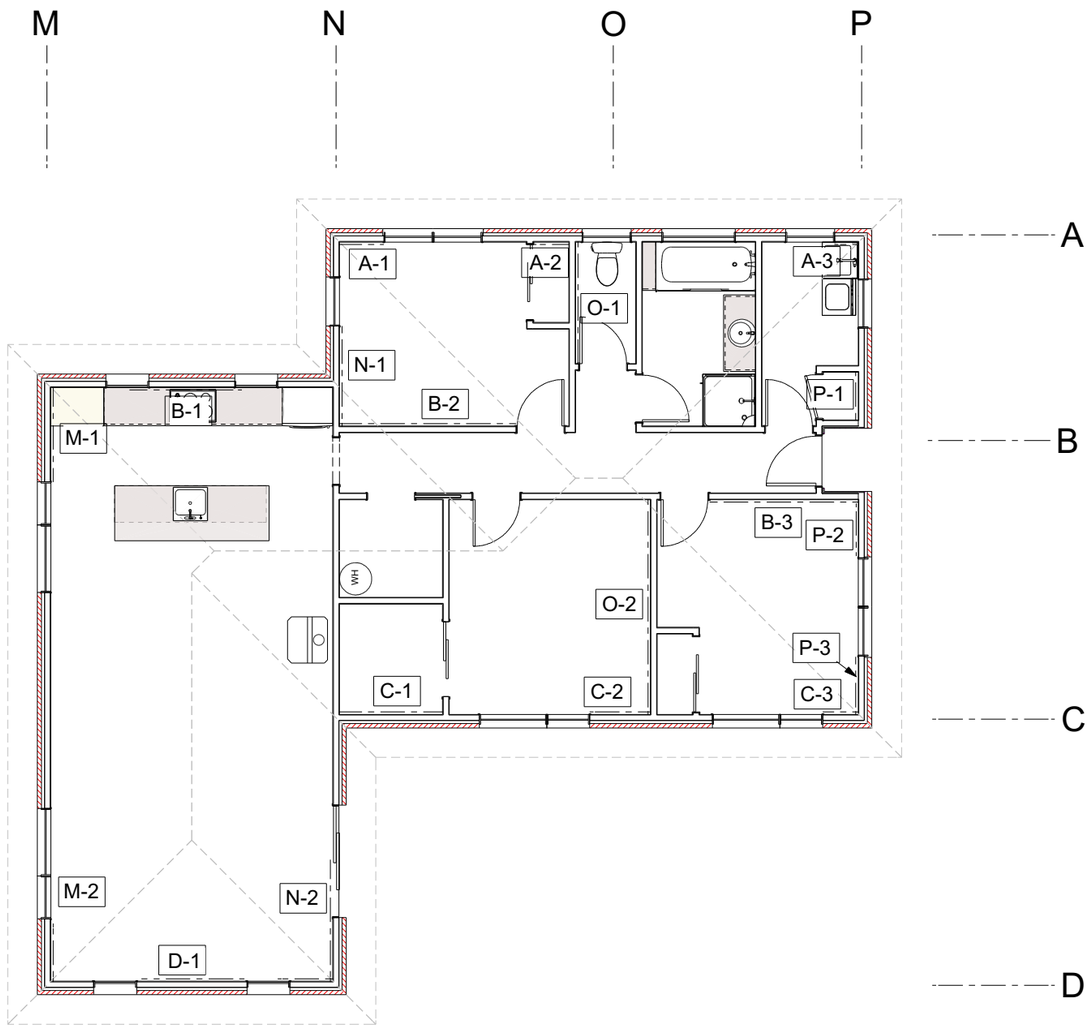
Bracing Element	Stud Height (mm)	Length (mm)	Type
Along			
	2400		
A1		700	BL1-H
A2		600	GS1-N
A3		400	BL1-H
B1		1400	GS1-N
B2		2900	GS2-N
B3		2400	GS1-N
C1		1700	GS1-N
C2		1000	GS1-N
C3		500	BL1-H
D1		1700	GS1-N
Bracing Element	Stud Height (mm)	Length (mm)	Type
Across			
	2400		
M1		1500	GS1-N
M2		1000	GS1-N
N1		1600	GS1-N
N2		2000	GS1-N
O1		2000	GS2-N
O2		3500	GS2-N
P1		600	GS1-N
P2		800	GS1-N
P3		800	GS1-N



DRAWINGS PROVIDED BY: sentinel HOMES

dc DESIGN ARCHITECTUAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **BRACING PLAN**

Sheet # 17

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: 1:100
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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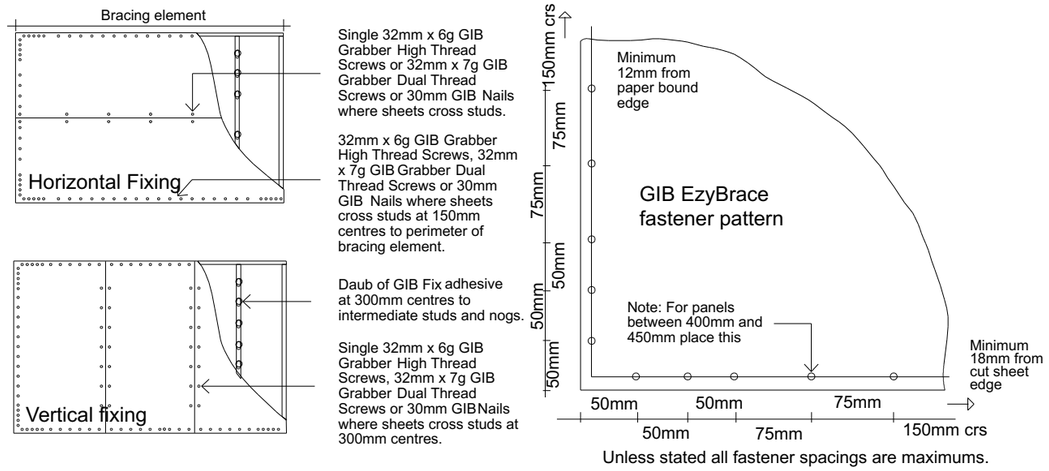
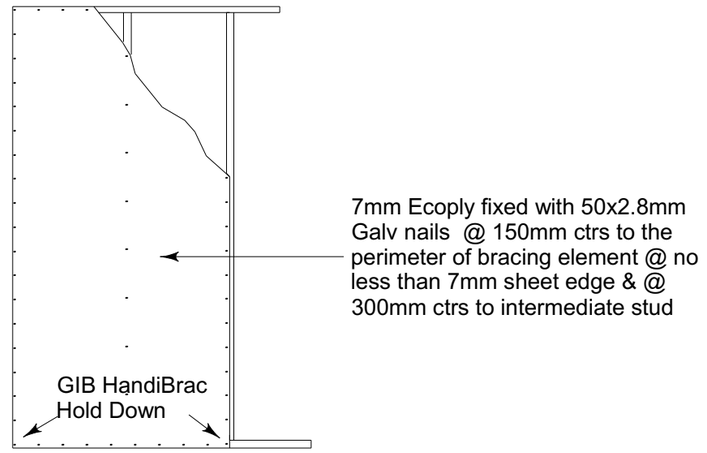
GIB EzyBraceSystems specification GS1-N

Specification code	Minimum length (mm)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB Standard plasterboard to one side only

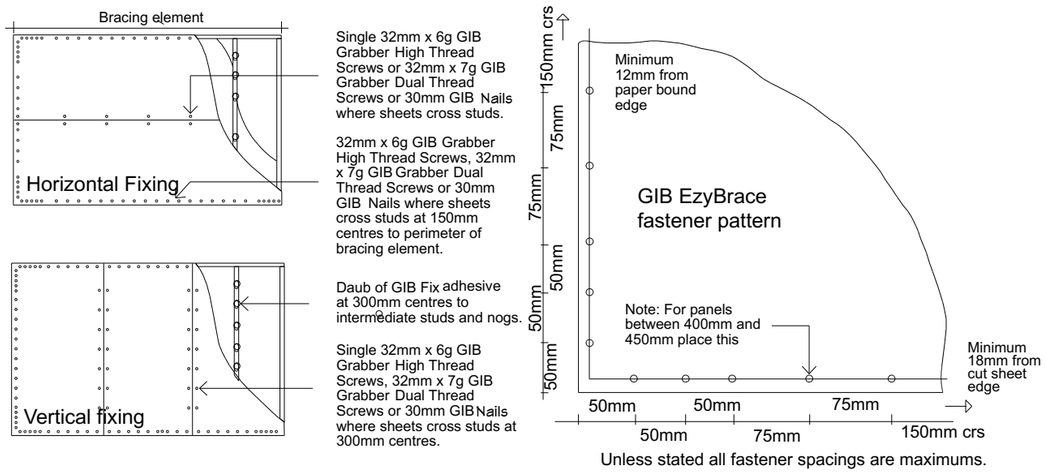


Specification No	Min Wall Length	Lining Requirements	BUs/m wind	BUs/m Earthqake
EP1	0.4 M	7MM ECOPLY ONE SIDE	80	95



GIB EzyBraceSystems specification GS2-N

Specification code	Minimum length (mm)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB Standard plasterboard to each side of wall framing



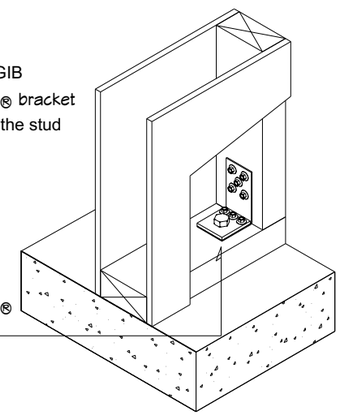
Panel Hold-down Details

Concrete Floor - Internal Wall

The bottom plate at both ends of the bracing element is fixed using a fastener with a proprietary fixing with a minimum characteristic uplift strength of 15 kN. If included in pack see overleaf instruction to install BOWMAC screw bolt.

Locate the GIB HandiBrac ® bracket centrally on the stud

GIB HandiBrac ® bracket

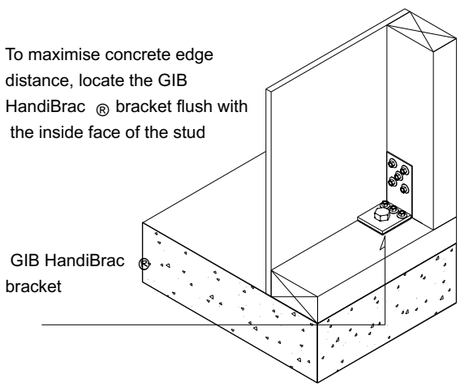


Concrete Floor - External Wall

The bottom plate at both ends of the bracing element is fixed using a fastener with a proprietary fixing with a minimum characteristic uplift strength of 15 kN. If included in pack see overleaf instruction to install BOWMAC screw bolt.

To maximise concrete edge distance, locate the GIB HandiBrac ® bracket flush with the inside face of the stud

GIB HandiBrac ® bracket



DRAWINGS PROVIDED BY: sentinel HOMES / dc DESIGN ARCHITECTURAL DESIGN

Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **BRACING DETAILS**

Sheet # 18

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: N.T.S

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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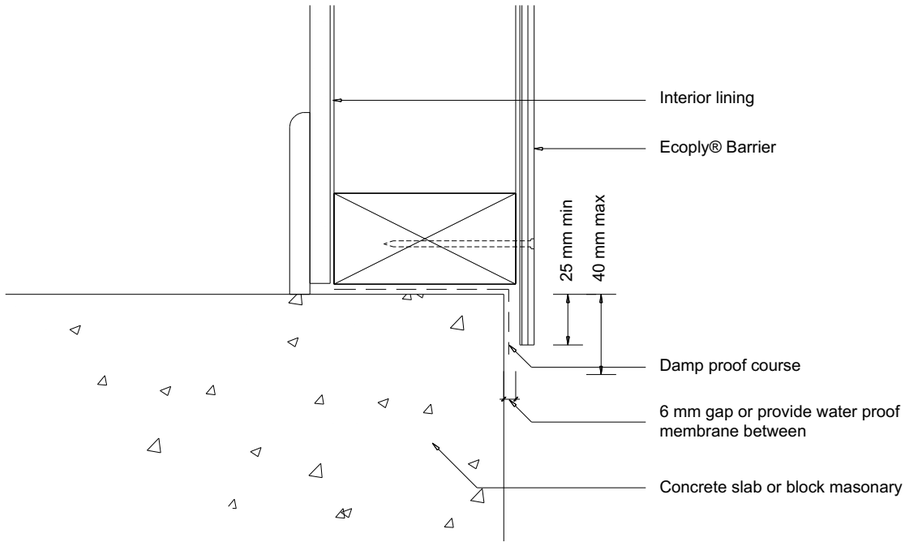
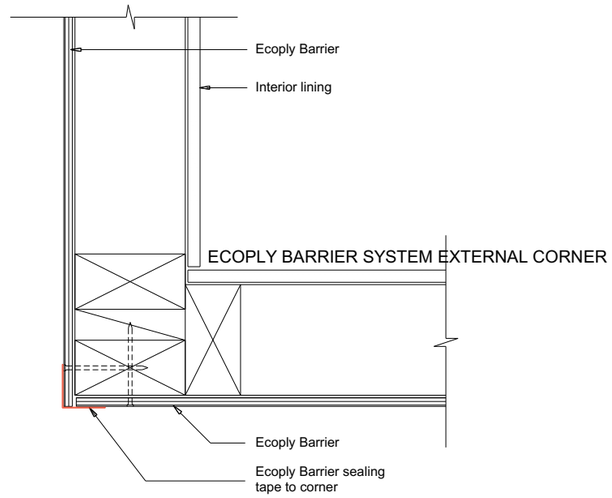
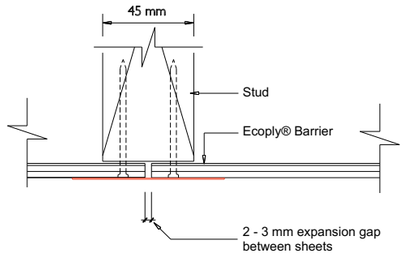


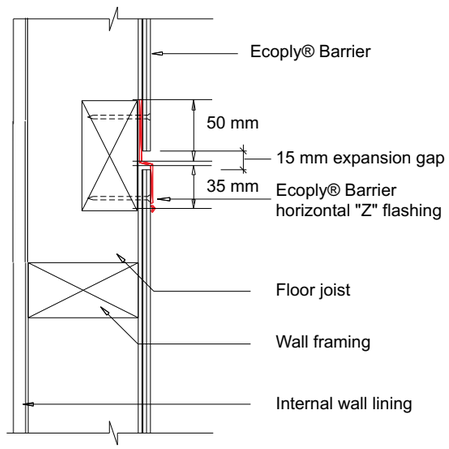
ECOPLY BARRIER SYSTEM OVERHANG & JOINT CLEARANCE



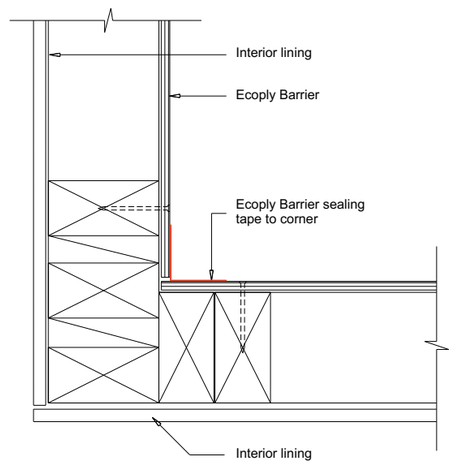
ECOPLY BARRIER SYSTEM EXTERNAL CORNER



ECOPLY BARRIER SYSTEM VERTICAL JOINTS



Vertical section



ECOPLY BARRIER SYSTEM INTERNAL CORNER

DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTURAL DESIGN

Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **ECO PLY BARRIER**

Sheet # 19

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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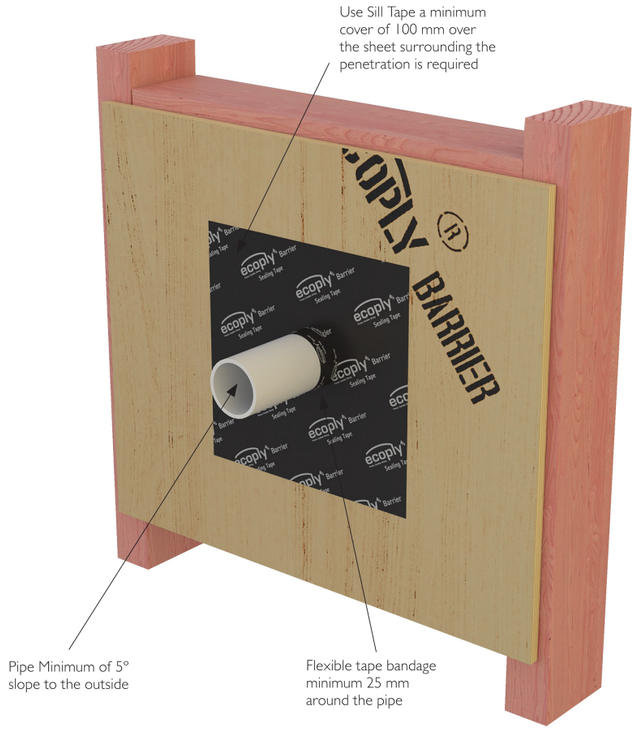
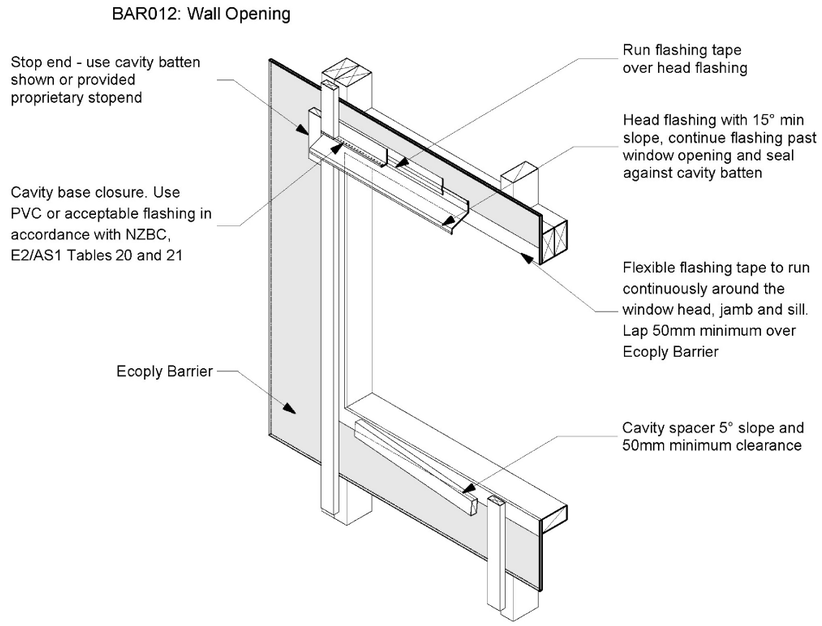
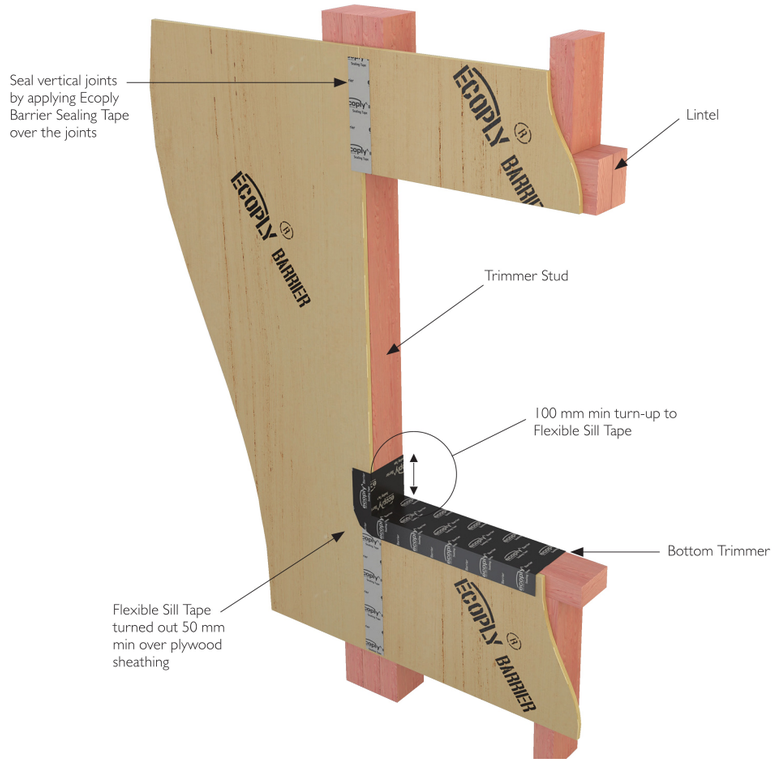


ECOPLY BARRIER PENETRATION



ECOPLY BARRIER WALL OPENING



ECOPLY BARRIER PENETRATION FRAME SEALING TAPE INSULATION WITH HEAD FLASHING

DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTUAL DESIGN

Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: ECO PLY BARRIER

Sheet # 20

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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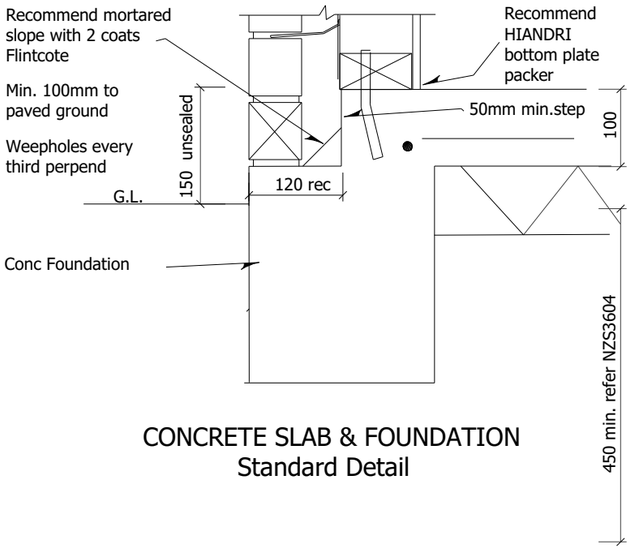
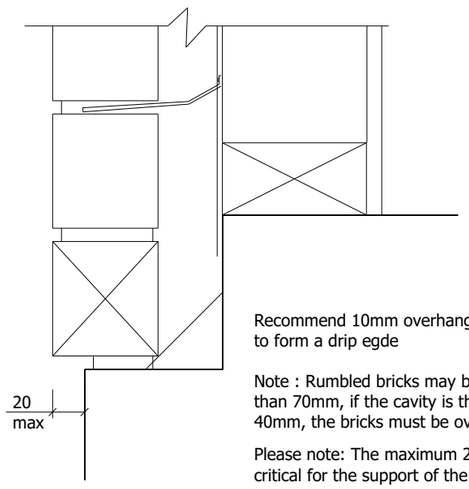


CONCRETE SLAB & FOUNDATION
Standard Detail

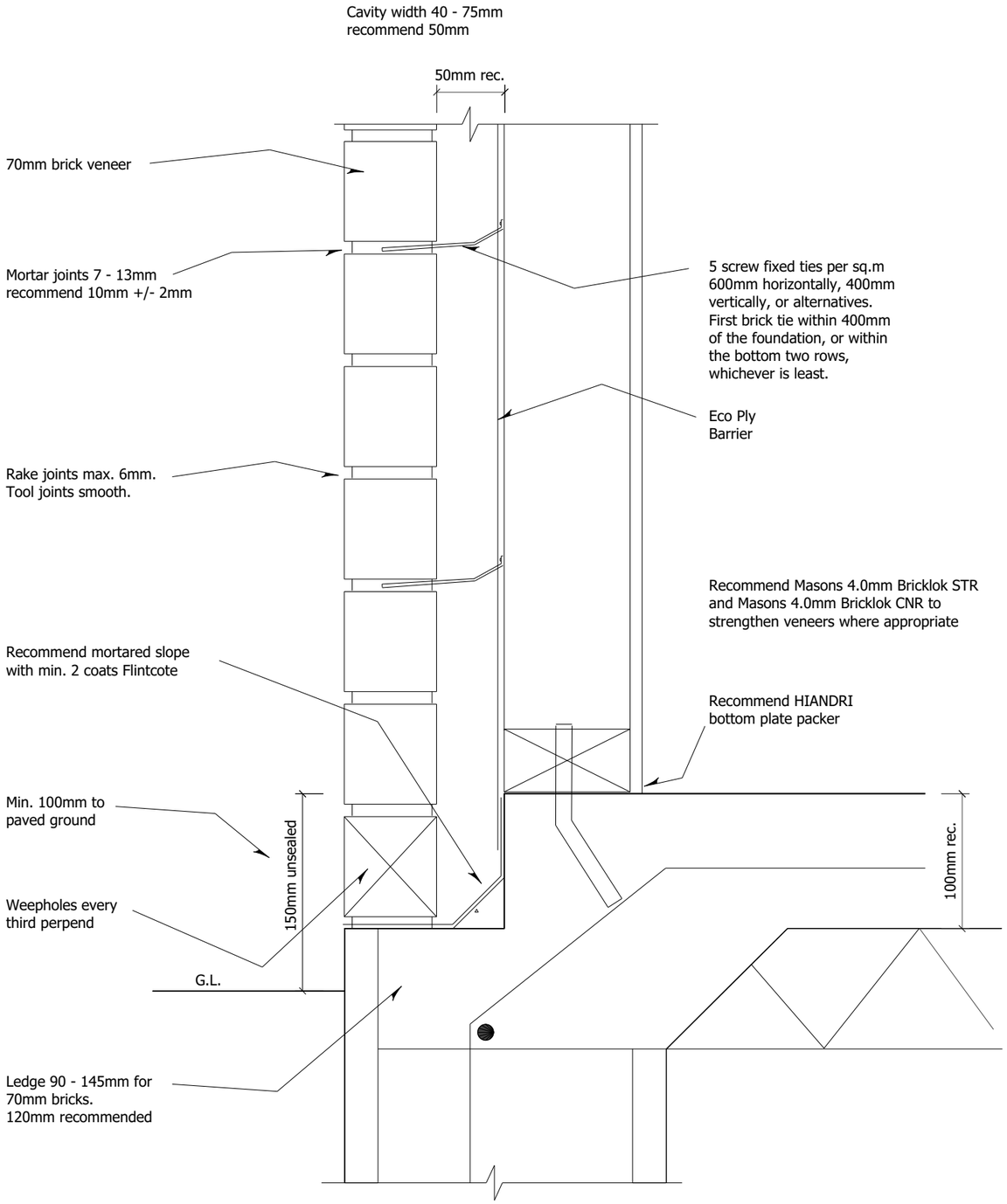


Recommend 10mm overhang to form a drip egde

Note : Rumbled bricks may be wider than 70mm, if the cavity is the minimum 40mm, the bricks must be overhung.

Please note: The maximum 20mm is not critical for the support of the veneer.

OVERHANGING BRICK VENEER



STANDARD BRICK VENEER

DRAWINGS PROVIDED BY: sentinel HOMES / dcDESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **BRICK DETAILS**

Sheet # 21

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

D C Design
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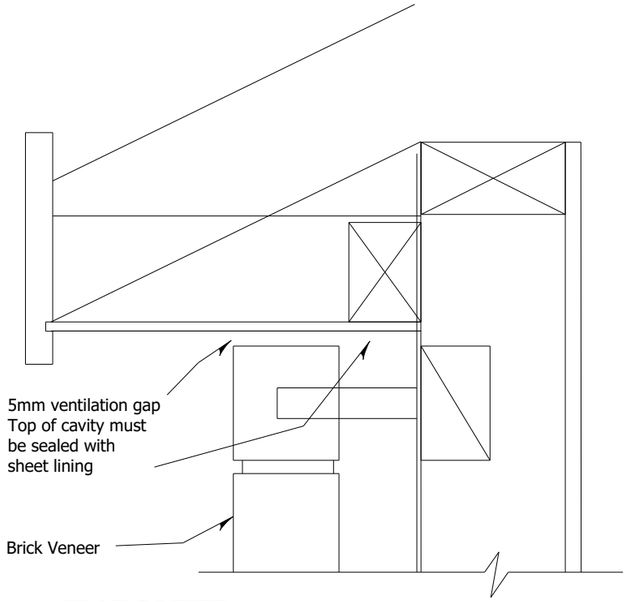
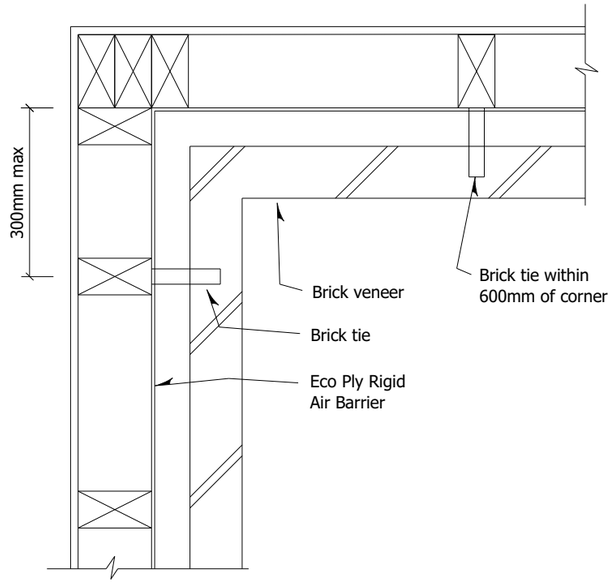
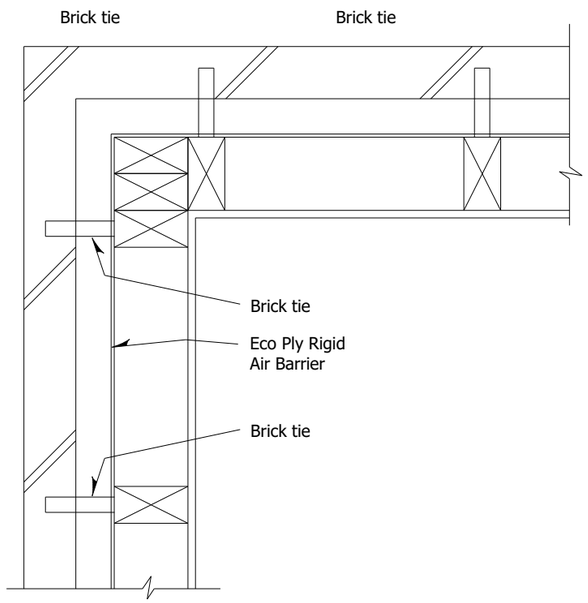


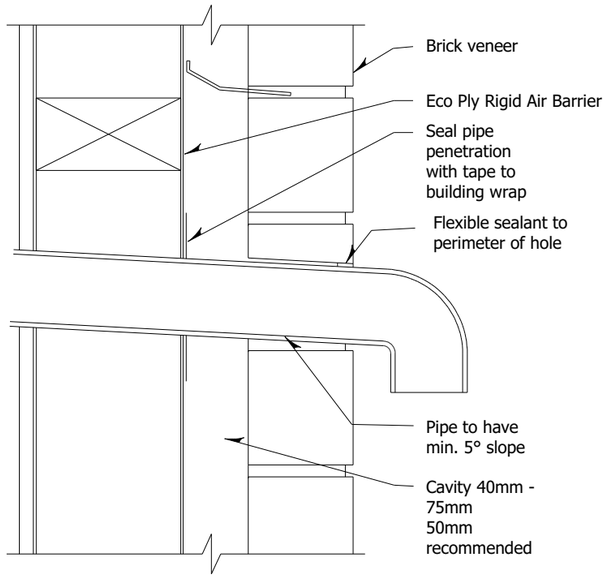
FLAT SOFFIT



STANDARD INTERNAL CORNER



STANDARD EXTERNAL CORNER



TYPICAL PIPE PENETRATION

DRAWINGS PROVIDED BY: sentinel HOMES / dc DESIGN ARCHITECTUAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3
WANGANUI

Drawing Title: **BRICK DETAILS**

Sheet # 22

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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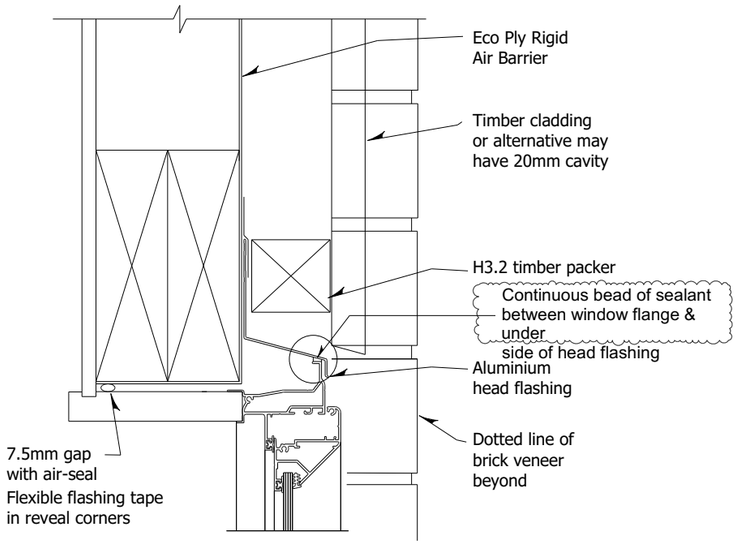
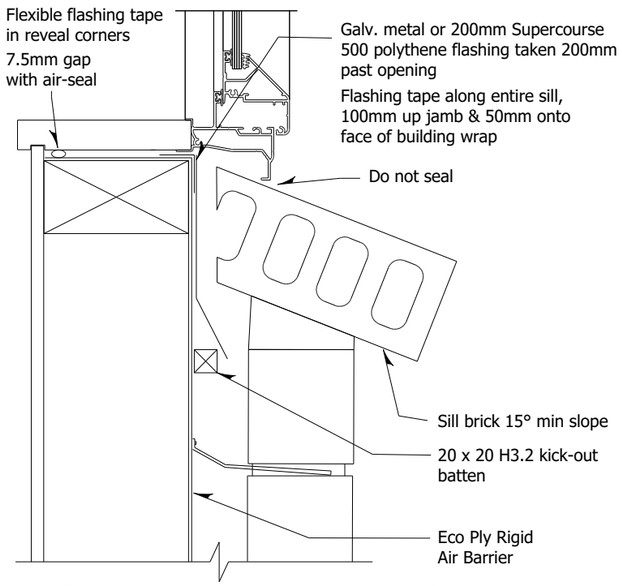
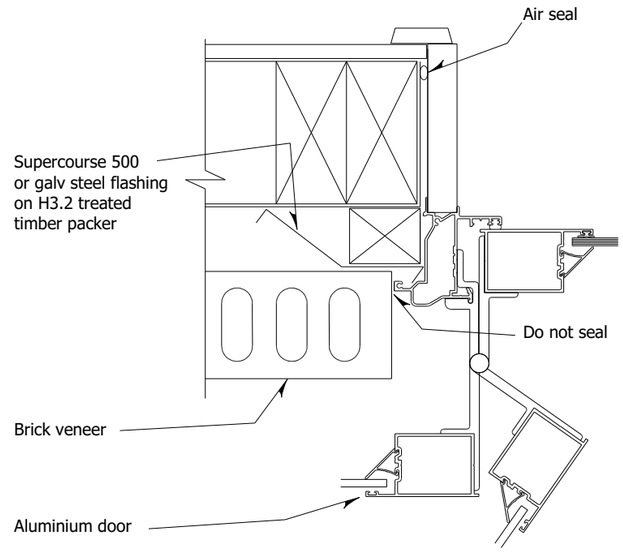


WINDOW HEAD - ALUMINIUM
Alternative cladding above

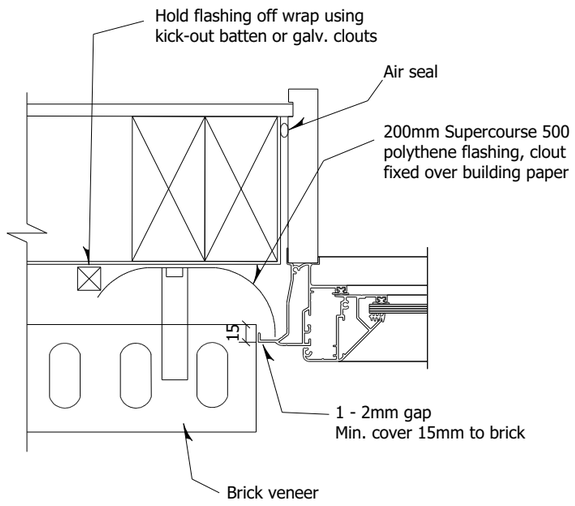


WANZ 55mm aluminium support bar omitted for clarity. Refer www.wanz.co.nz

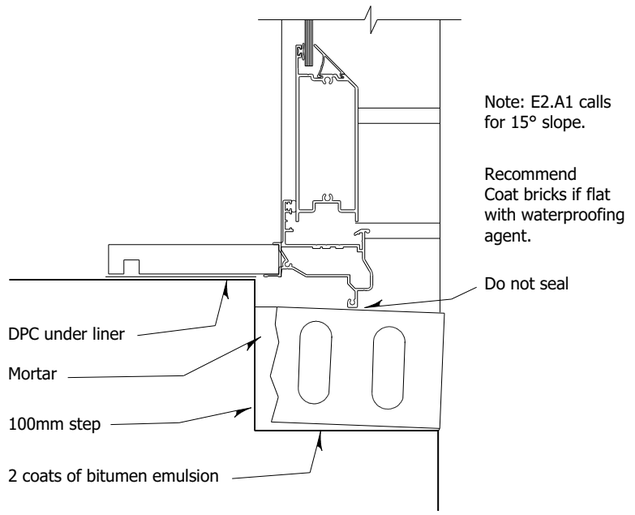
WINDOW SILL - Aluminium



DOOR JAMB - Aluminium



WINDOW JAMB - Aluminium



Note: If brick is to be sloped further either increase the depth of the step or reduce the thickness of brick.

WANZ 55mm aluminium support bar omitted for clarity. Refer www.wanz.co.nz

BRICK DOOR SILL

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Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **BRICK DETAILS**

Sheet # 23

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C

Scale: N.T.S

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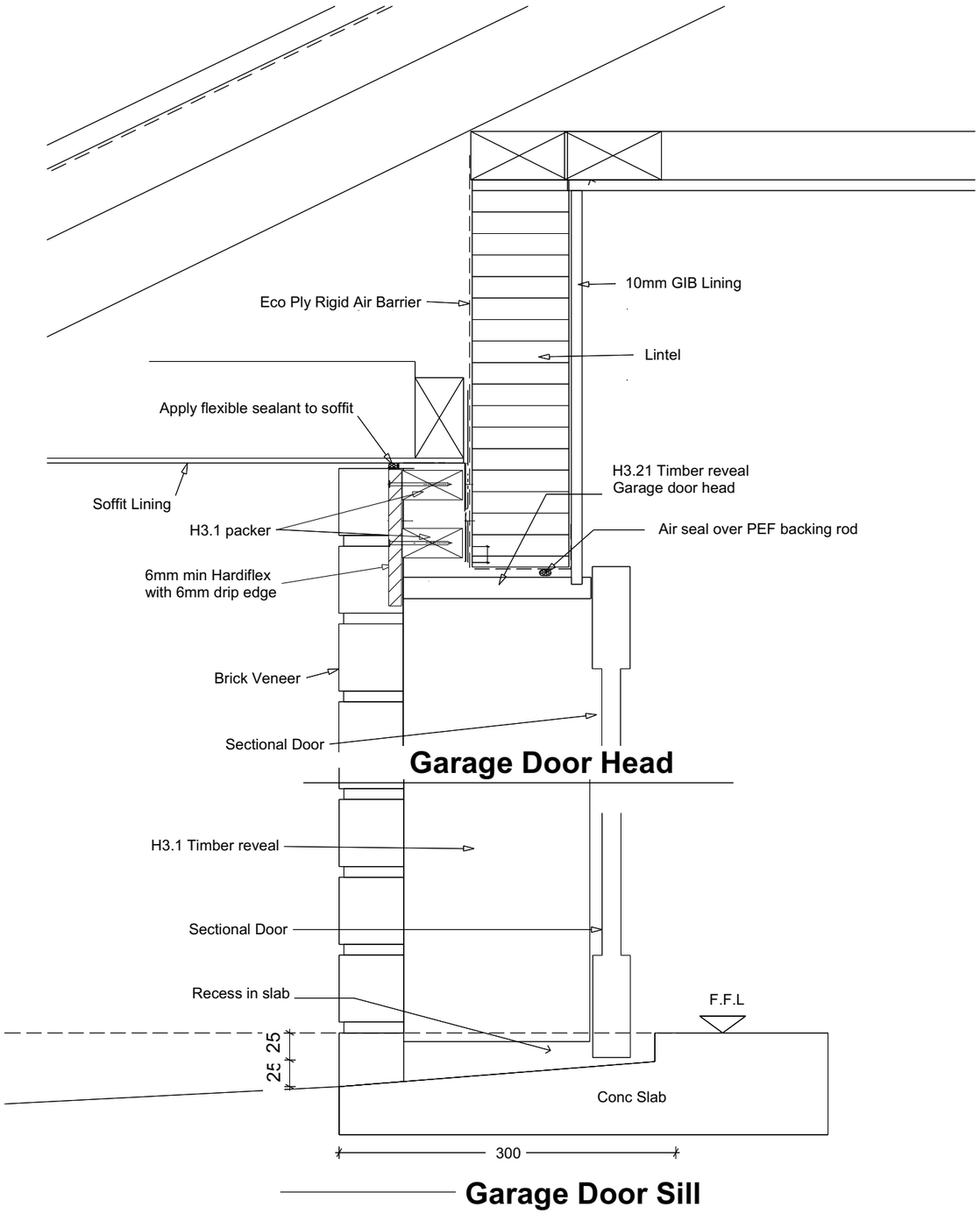
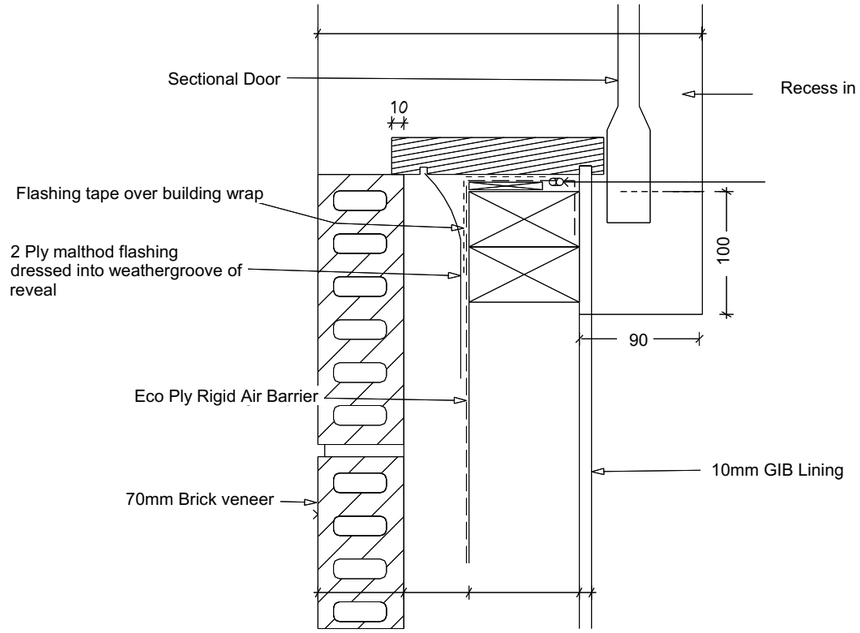


Garage Door Head

Garage Door Sill



Garage Door Jamb Detail

DRAWINGS PROVIDED BY: sentinel HOMES

dcDESIGN ARCHITECTURAL DESIGN

Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **BRICK GARAGE DOOR DETAILS**

Sheet # 24

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C

Scale: N.T.S

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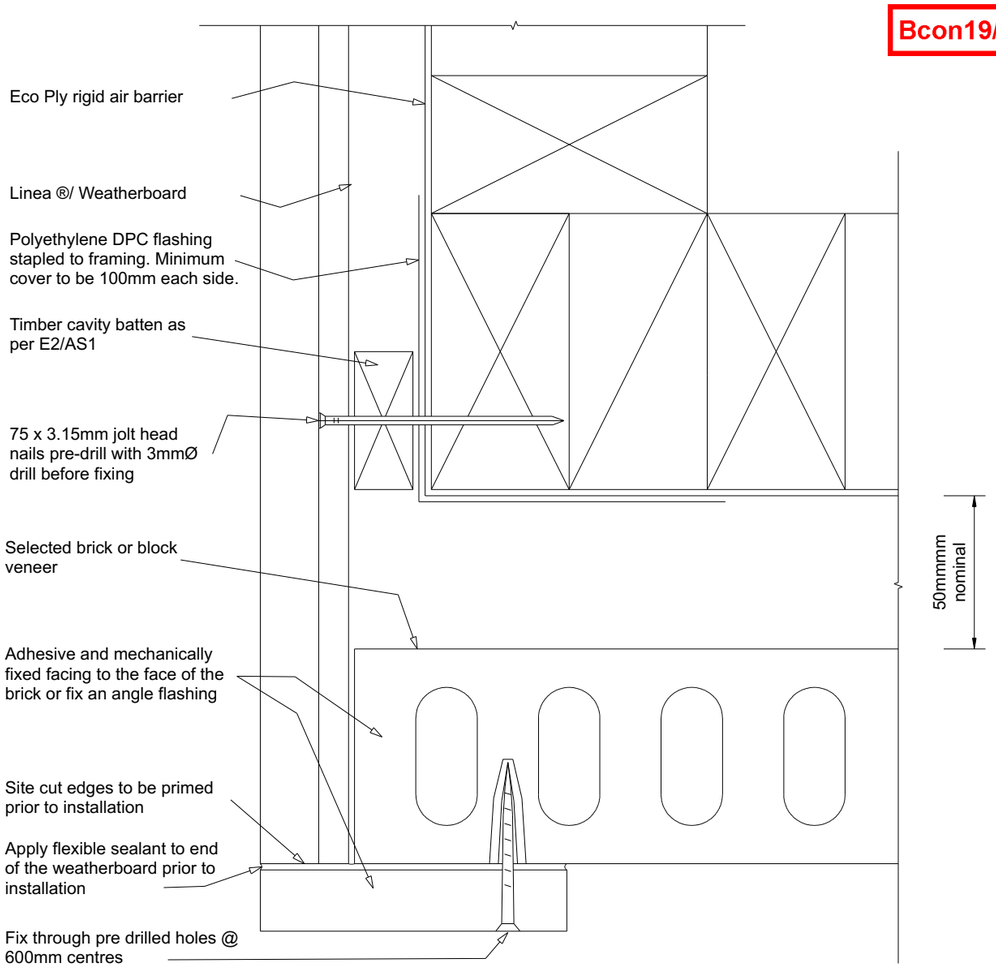
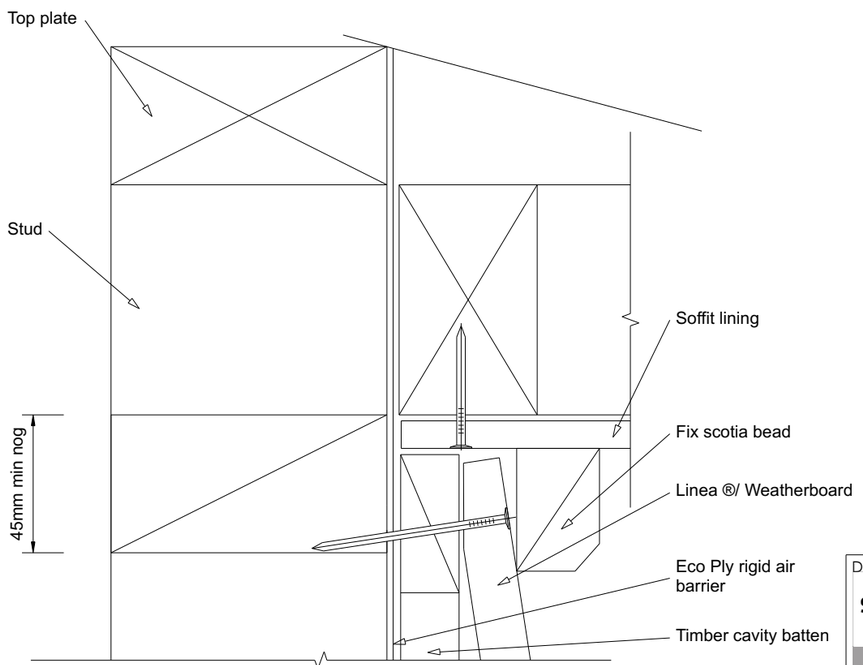
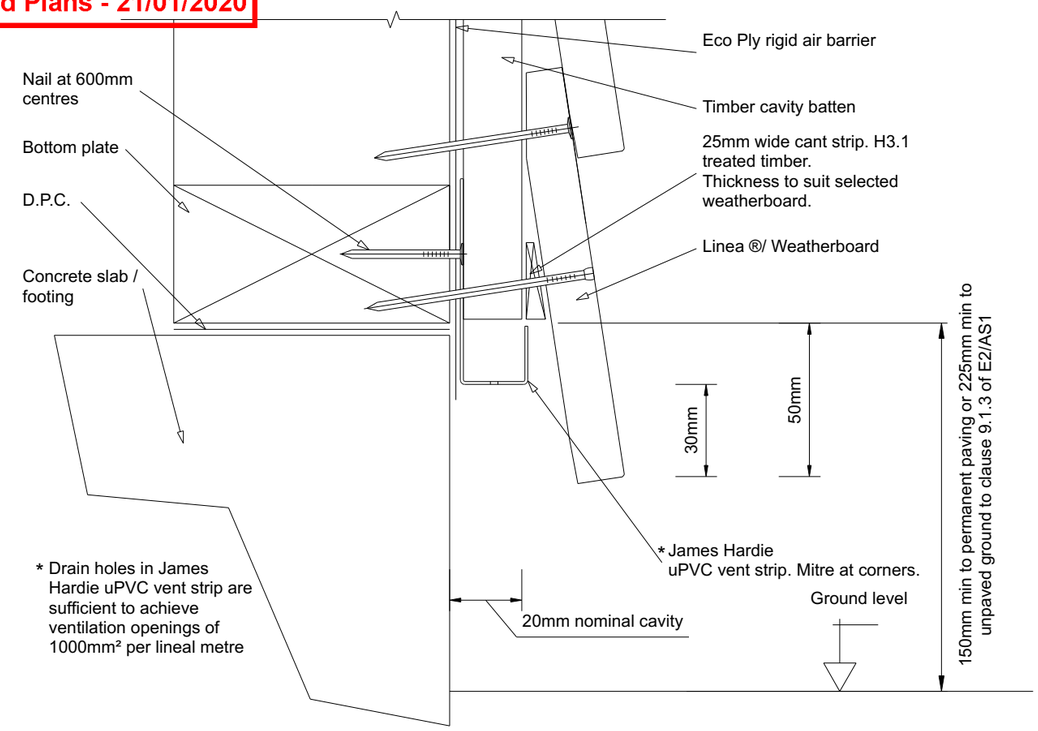


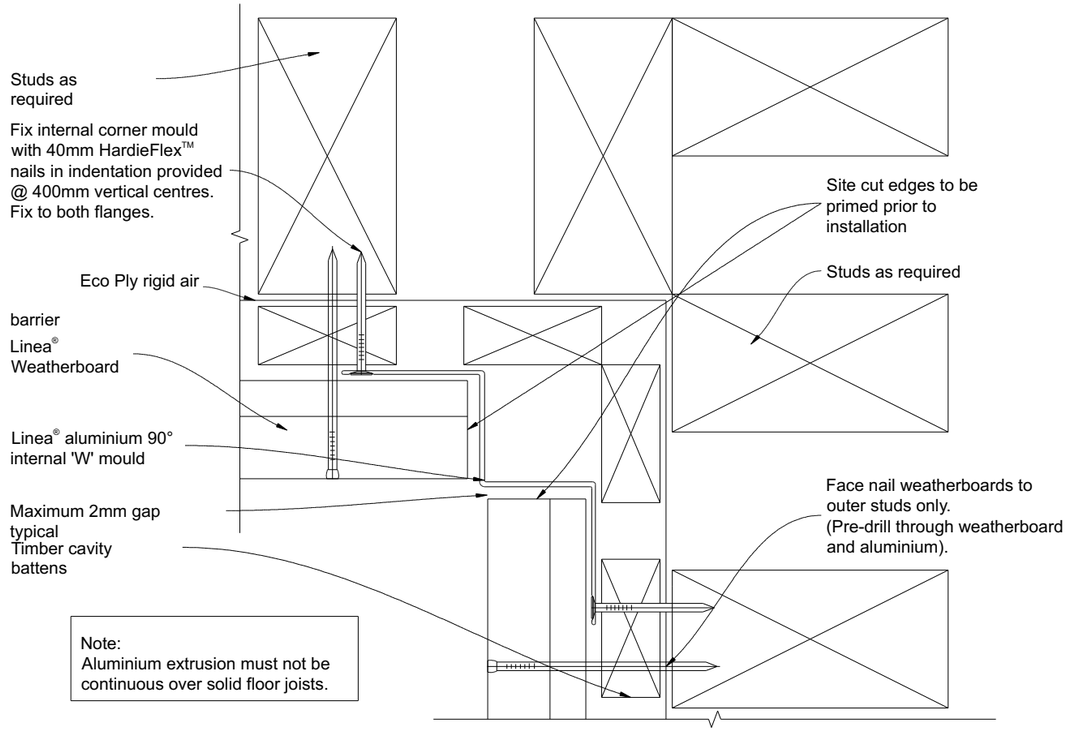
EXTERNAL CORNER JUNCTION BETWEEN LINEA ®/ WEATHERBOARD ON CAVITY AND BRICK VENEER



TIMBER CAVITY SOFFIT JUNCTION



TIMBER CAVITY FOUNDATION



TIMBER CAVITY INTERNAL 90° ALUMINIUM 'W' MOULD CORNER

DRAWINGS PROVIDED BY: sentinel HOMES

Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

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Drawing Title:	VEHICLE CROSSING					Sheet #	25
Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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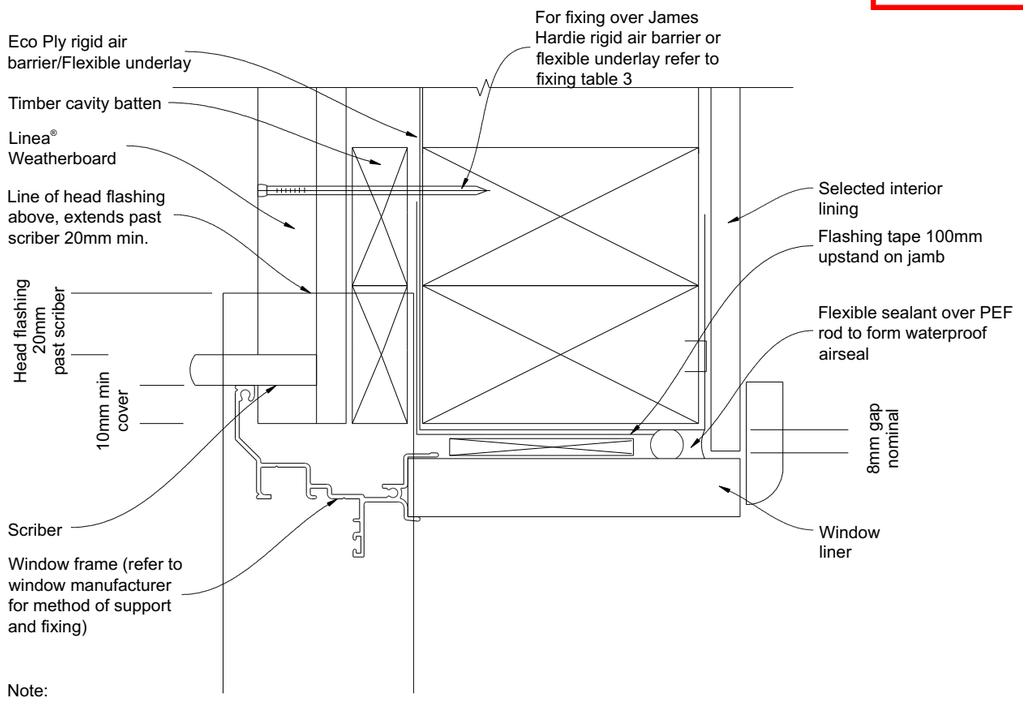
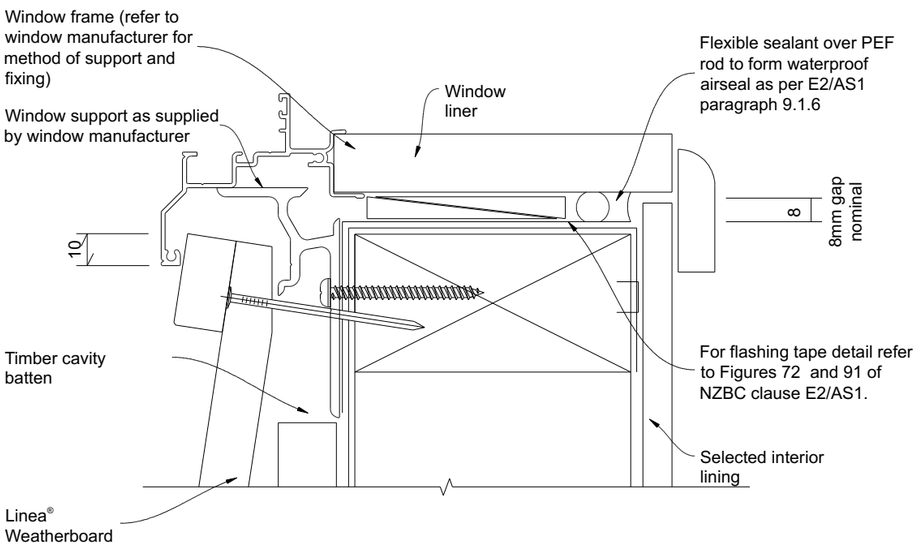


Note:
When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening.

TIMBER CAVITY WINDOW AND DOOR JAMB WITHOUT FACINGS

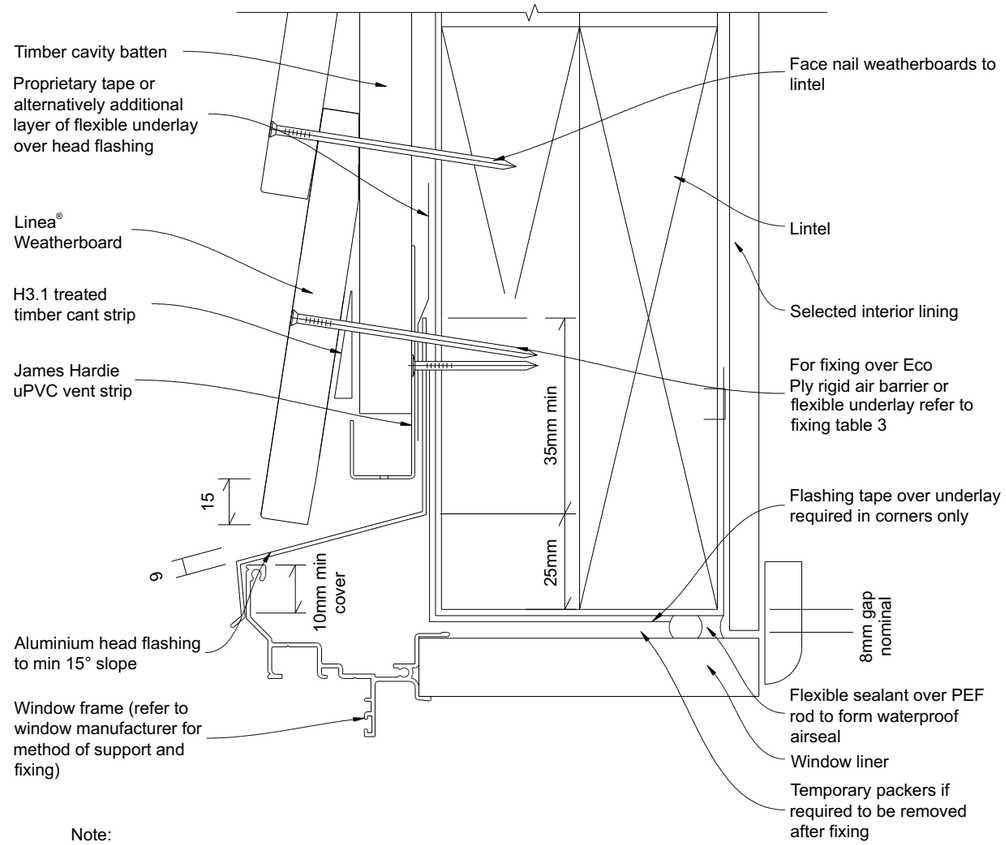


General notes for materials selection

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.

TIMBER CAVITY WINDOW AND DOOR SILL WITHOUT FACINGS



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

TIMBER CAVITY WINDOW AND DOOR HEAD WITHOUT FACINGS

DRAWINGS PROVIDED BY: sentinel HOMES

dc DESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3 WANGANUI

Drawing Title:

Drawn: David Coker | Date: 18 NOV 2019
Checked: David Coker | Variation #

Wind Region: A | Wind Zone: E/High
Earthquake Zone: 2 | Exposure Zone: C

Sheet # 26
Scale:

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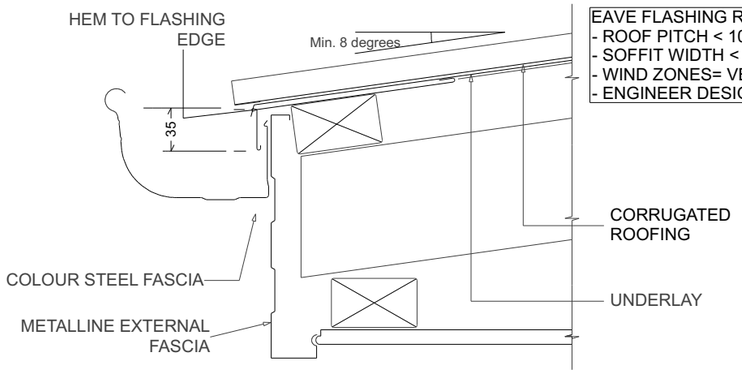
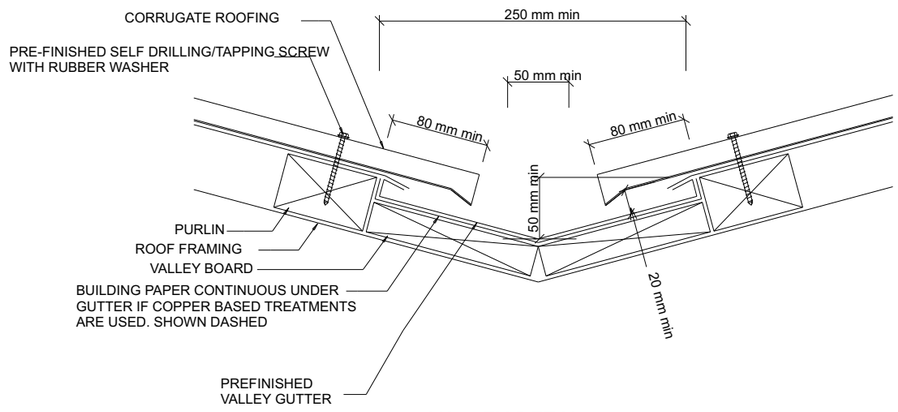
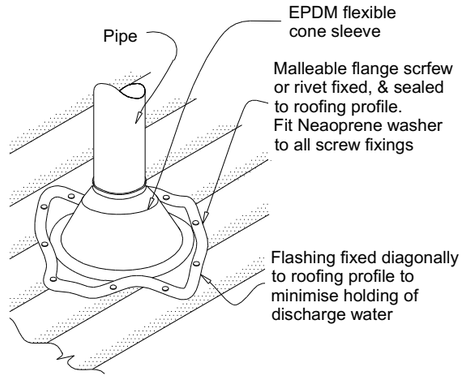


GUTTER- FASCIA DETAIL

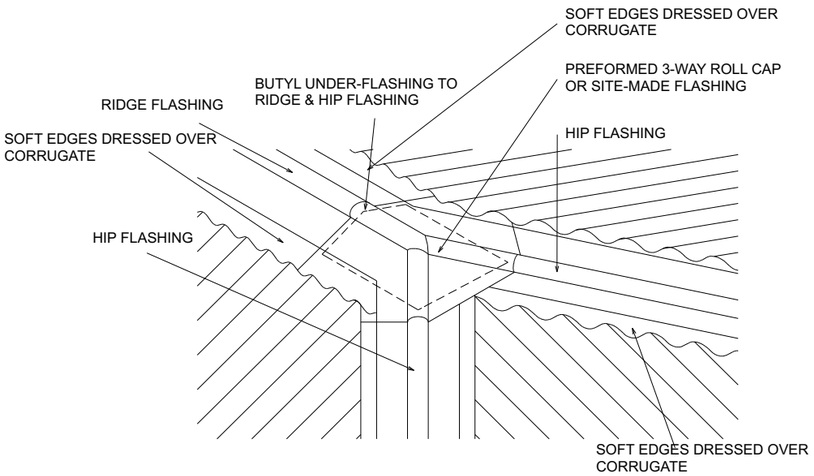


VALLEY DETAIL

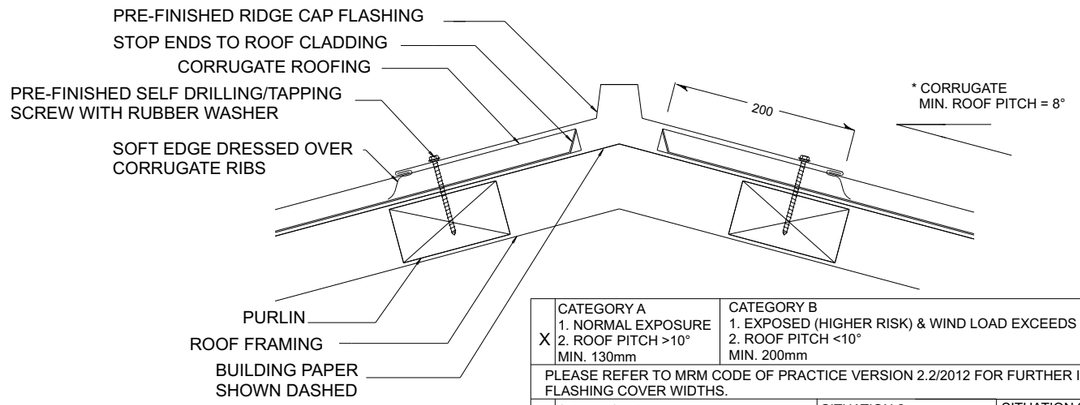


NOTE:
(1) Max roof pitch for this flashing 45°. minimum pitch 10° if base of flange covers one or more complete troughs
(2) For pipes up to 85mØ

PENETRATION UP TO 85MM



5.1.36A METAL RIDGE/HIP FLASHING JUNCTION



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

X	SITUATION 1 1. LOW, MEDIUM, HIGH WIND ZONES 2. ROOF PITCH ≥ 10° MIN. 130mm	SITUATION 2 1. VERY HIGH WIND ZONE 2. ALL ROOF PITCHES MIN. 200mm	SITUATION 3 1. EXTRA HIGH WIND ZONE 2. ALL ROOF PITCHES MIN. 200mm
PLEASE REFER TO E2 FOR FURTHER INFORMATION ON FLASHING COVER WIDTHS.			

RIDGE DETAIL

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Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **ROOF FLASHING DETAILS** Sheet # 27

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: N.T.S

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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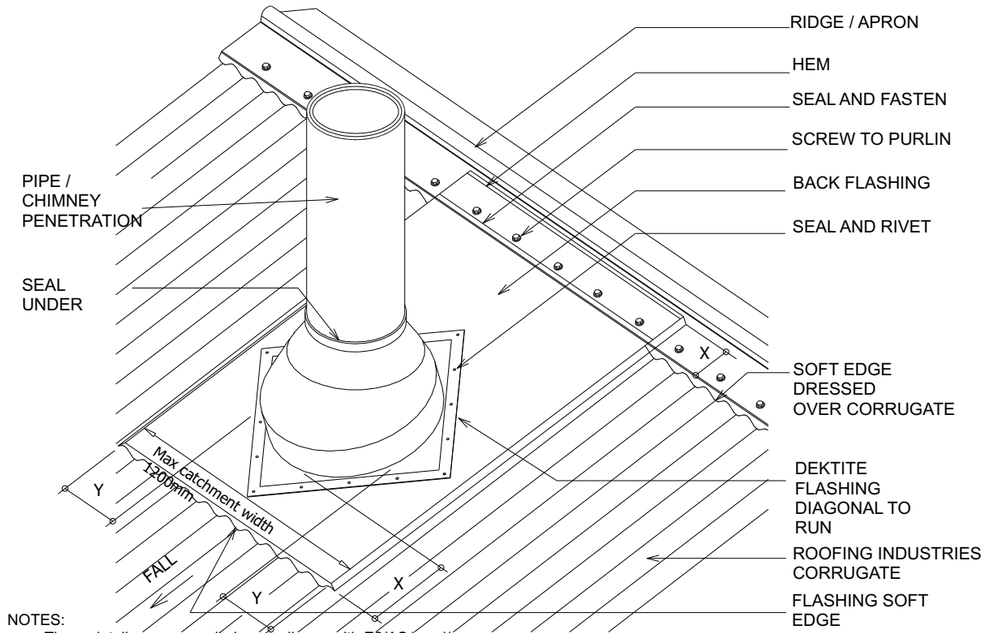
RESIDENTIAL CORRUGATE
UNDER RIDGE / APRON SOAKER FLASHING FOR PIPE / CHIMNEY PENETRATION UP TO 500mm DIA.



NOTES:
(1) SITUATION 1: IN LOW, MEDIUM OR HIGH WIND ZONES, WHERE ROOF PITCH IS 10° OR GREATER.
(2) SITUATION 2: FOR ALL ROOF PITCHES IN VERY HIGH & EXTRA HIGH WIND ZONES, FOR ALL LESSOR WIND ZONES WHERE ROOF PITCH LESS THAN 10°.
(3) SUITABLE FOR PIPES UP TO 500mm DIAMETER.
(4) MAX ROOF PITCH FOR THIS FLASHING 45°, MIN PITCH 8°
(5) ADDITIONAL SUPPORT FRAMING REQUIRED WHEN PENETRATION EXCEEDS 200mm THROUGH ROOF.
(6) ALSO REFER TO NZ METAL ROOF & CLADDING CODE OF PRACTICE.

CATCHMENT WIDTH	MAX ROOF LENGTH ABOVE PENETRATION
0-400	12 METRES
400-600	8 METRES
600-800	6 METRES
800-1200	4 METRES

SITE WIND ZONE (As per NZS3604)	MIN mm (cover)	
	X	Y
SITUATION 1 (1)	150	2 CRESTS
SITUATION 2 (2)	200	2 CRESTS

NOTES:
· These details are generally in compliance with E2/AS1 and/or the NZ Metal Roof & Wall Cladding Code of Practice and in some cases specific details by 'Roofing Industries'.
· The building designer is ultimately responsible to ensure that details used meet the requirements of the NZ Building Code for the specific project.
· Details of the supporting structure including cavity battens are indicative only and are the responsibility of the building designer. For steel framed buildings thermal break cavity battens may be required.
· Underlay selection and building wrap types are the responsibility of the designer, Netting or other support is generally required at roof pitches less than 8 degrees combined with a self supporting paper. At roof pitches of 8° and above where non self supporting paper is used or purlin spacing is in excess of self supporting criteria, netting or other support should be used. Alternative support to netting should be used in severe coastal environments including when aluminium is used.
· These details are for Roofing Industries profile/s as nominated and may not be applicable to other profiles.
· This drawing is the copyright of 'Roofing Industries' and can only be copied or reproduced with their permission.
· Further information can be obtained from the NZ Metal Roof & Wall Cladding Code of Practice www.metalroofer.org.nz or E2/AS1

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Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **ROOF FLASHING DETAILS**

Sheet # 28

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: N.T.S

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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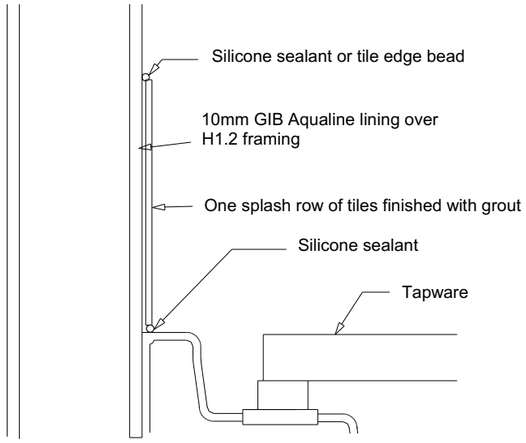
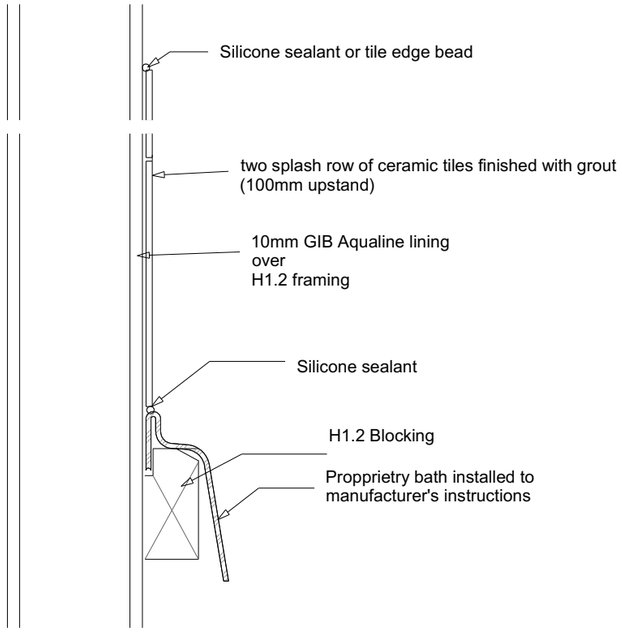
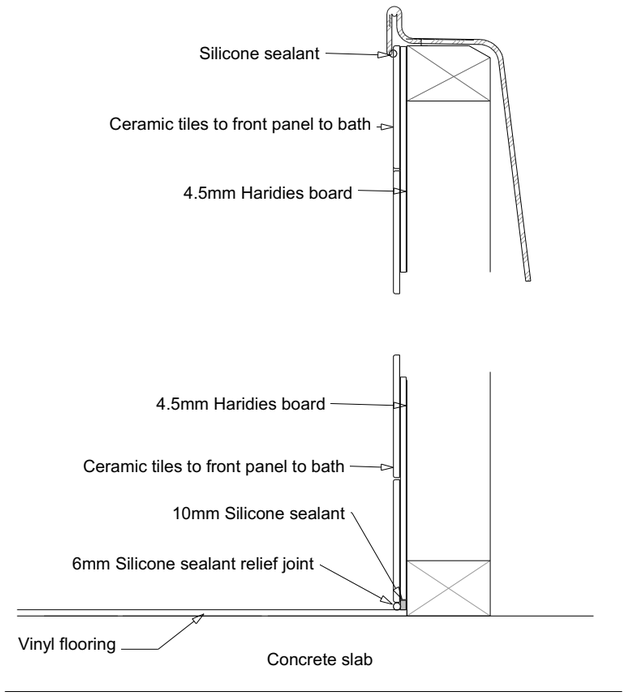


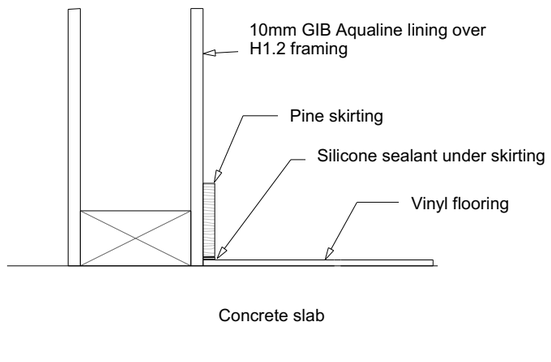
Basin Water Splash Back



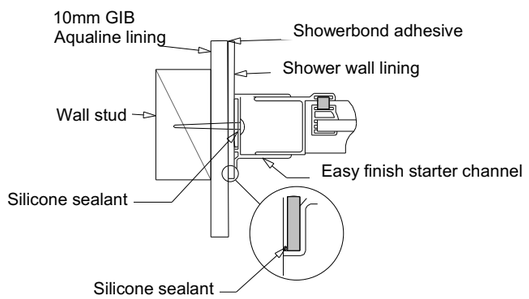
Bath Water Splash Back

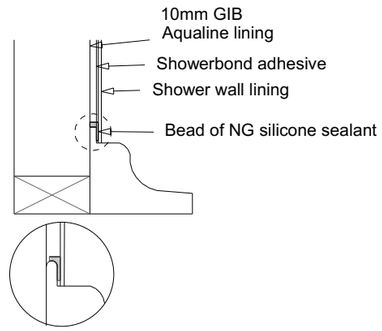


Bath & Plinth



Vinyl Floor Over Timber flooring





Actylic Shower Detail

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Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **WET AREA DETAILS**

Sheet # 29

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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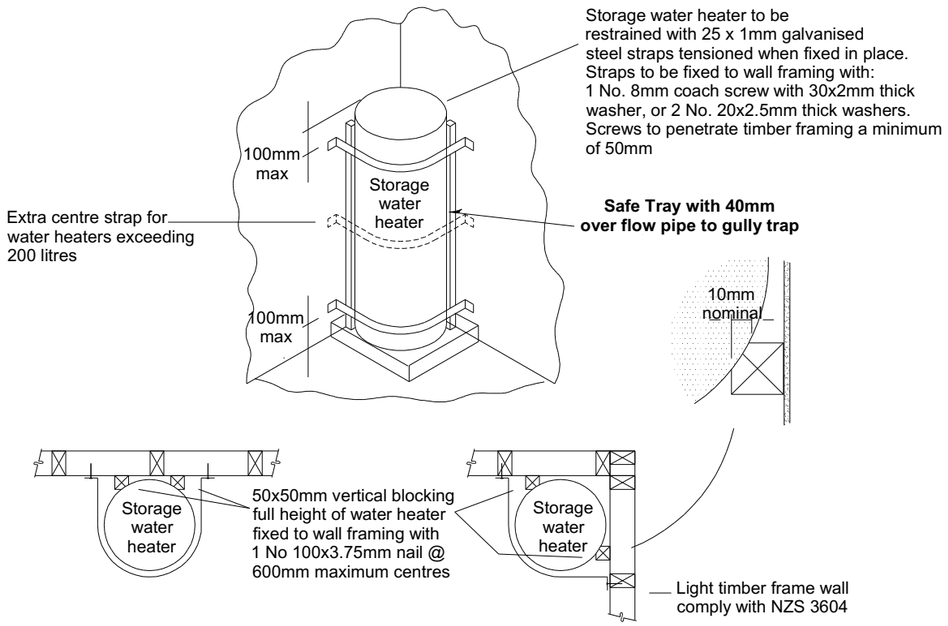
Figure 14: Seismic Restraint of Storage Water Heaters 90 - 360 litres
Paragraph 6.11.4



6.11.4 Structural Support

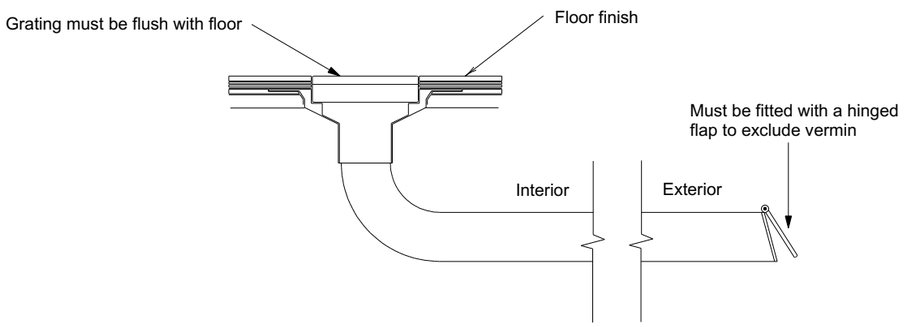
NZBC B1.3.2 requires building elements (including storage water heaters) to be adequately supported including support against earthquake forces. The method illustrated in Figure 14 is acceptable for water *heaters up to 360 litre capacity. Where fittings* and pipework are attached to the water heater through the supporting platform or floor a 50 mm minimum clearance shall be provided between the fitting and the support structure.

Safe water temperature

a) The delivered hot water temperature at any sanitary fixture used for Personal hygiene shall not exceed 55 degrees. An acceptable method of limiting hot water temperature delivered from storage water heater is to in stall a mixing device between the outlet of the water heater & the sanitary fixtures.
b) Tempering valves shall comply with NZS 4617 or AS 1357.2

NOTE:
Safe Tray to have a 40mm overflow pipe that discharges to gully trap. the overflow pipe shall not permit the entry of vermin

Note: All outlets must be recessed into the substrate, to allow water to flow freely into the outlet and to avoid water ponding around outlet.
Untrapped wastes should discharge 50mm min above grating if discharged to gully trap.



Untrapped Floor Waste Detail 1:5

FIGURE 13 Acceptable Solution G12/AS1

TEMPERING VALVE INSTALLATION

6.14 Safe water temperatures

6.14.1Maximum temperatures

The delivered hot water temperature at any sanitary fixture used for personal hygiene shall not exceed:

a) 45260C for early childhood centres, schools, old people's homes, institutions for people with psychiatric or physical disabilities, hospitals, and

b) 55260C for all other buildings.

COMMENT:
1. At greatest risk from scalding are children, the elderly, and people with physical or intellectual disabilities, particularly those in institutional care.
2. Sanitary fixtures used for personal hygiene includes showers, baths, hand basins and bidets.

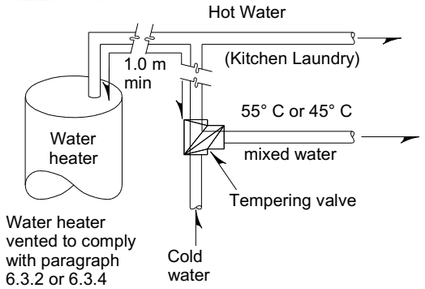
6.14.2Hot water delivered from storage water heaters

a) An acceptable method of limiting hot water temperature delivered from storage water heaters is to install a mixing device between the outlet of the water heater and the sanitary fixture (see Figure 16)

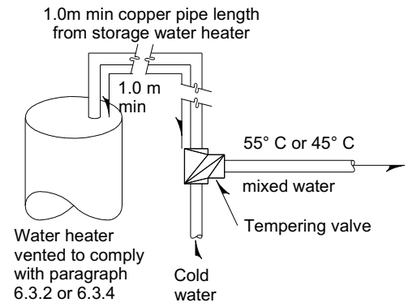
b) Tempering valves shall comply with NZS 4617 or AS 1357.2.

6.14.3Legionella bacteria

Irrespective of whether a mixing device is installed, the storage water heater control thermostat shall be set at a temperature of not less than 60260C to prevent the growth of Legionella bacteria.



(a) With untempered water to laundry and kitchen fixtures and appliances



(b) Where all hot water is tempered
Note:
1. For optimum ststem efficiency the tempering valve, for other than a mains pressure system, may be located as low as practicable to achieve the manufacturer's recommended head at the tempering valve.

2. 1.0m minimum copper pipe lenght from storage water heater

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Client Details : PROPOSED NEW RESIDENTIAL DWELLING

Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **ELECTRIC HOT-WATER CYLINDER DETAILS** | Sheet # 30

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: N.T.S

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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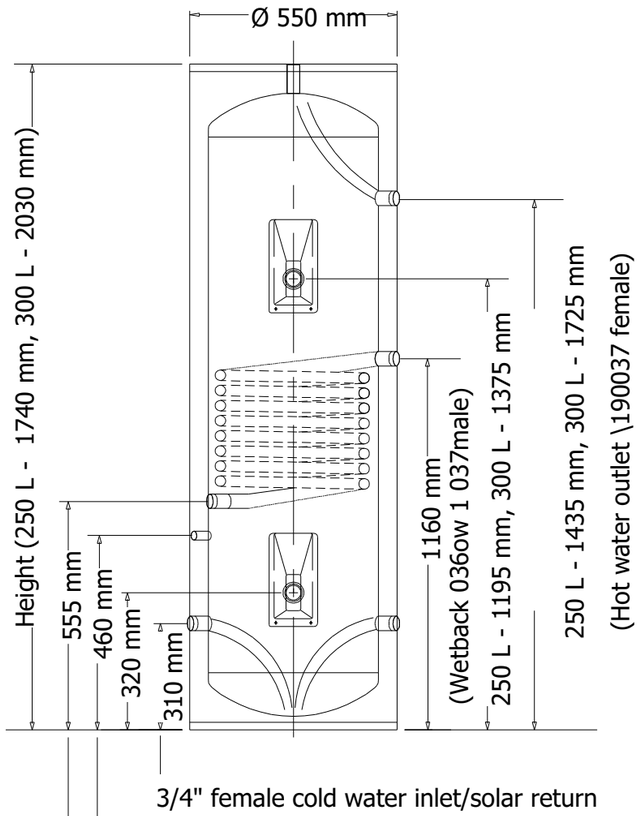
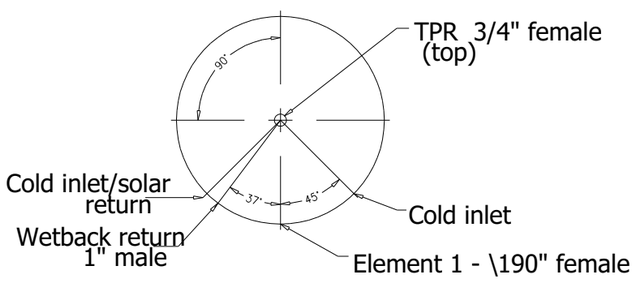
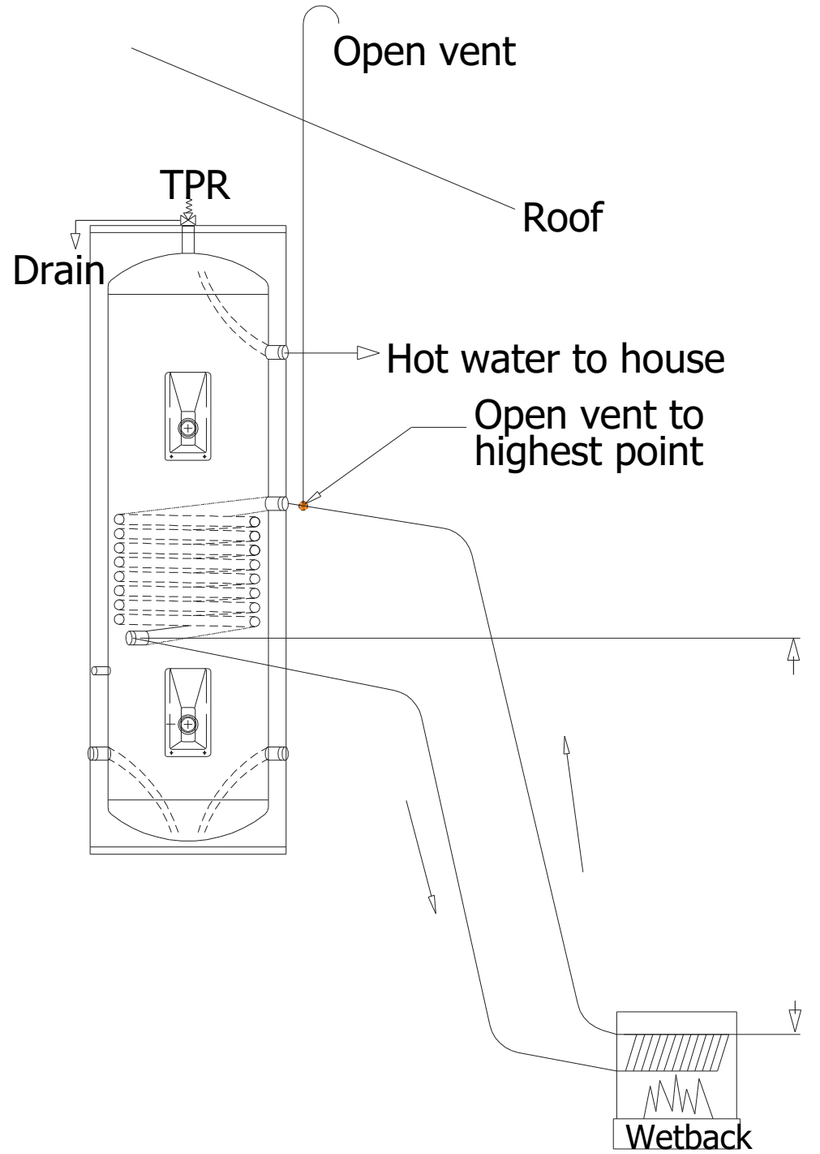
Dimensions
250/300 L thermosiphon coil for wetback







Common set up for thermo-siphon coil connection to a wet back

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		Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale:
		Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	
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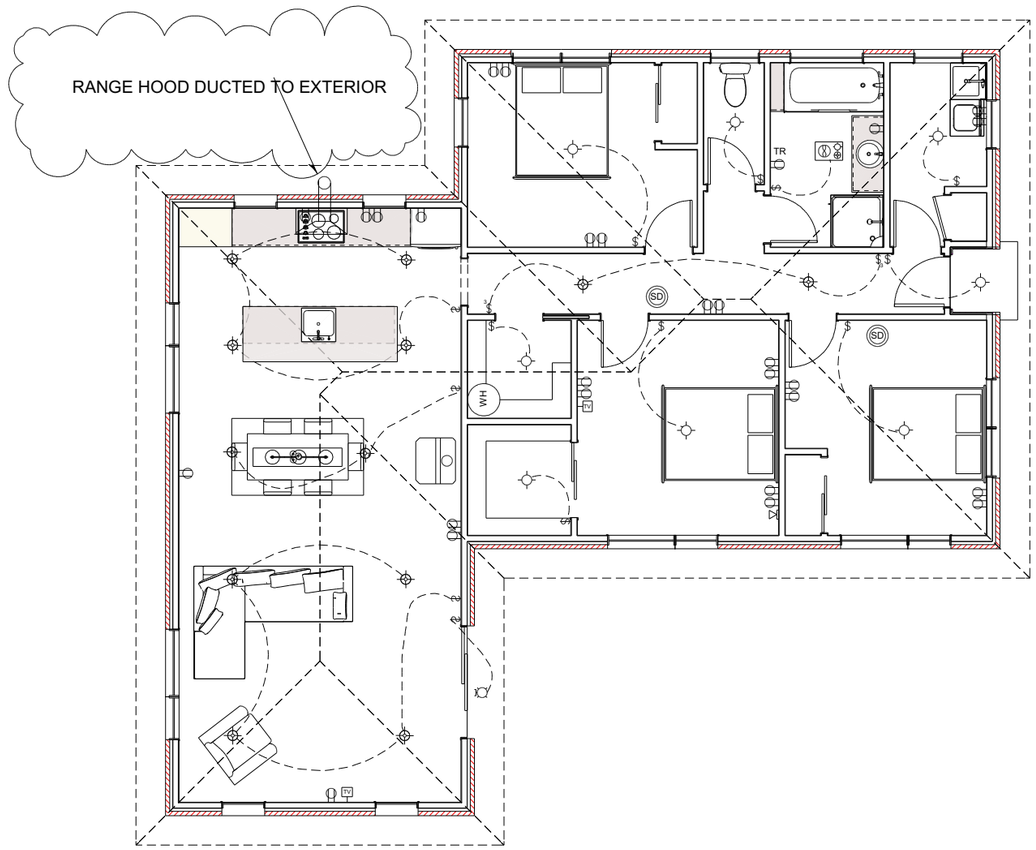
EXTRACTOR FAN TO BE DUCTED TO OUTSIDE

NOTE
CONFIRM THE LAYOUT OF THE FIXTURES WITH CLIENT AFTER FRAMING IS COMPLETED WHERE
POSSIBLE FIT RCD OUTLET TO FIRST OUTLET ON CIRCUIT SO ALL DOWN STREAM ARE PROTECTED
ALLOW FOR DOUBLE POWER OUTLETS WHERE POSSIBLE.

SMOKE ALARMS TO BE SITUATED IN EACH SLEEPING SPACE OR WITH IN 3 MTRS OF A SLEEPING SPACE SMOKE ALARM MUST BE AUDIBLE TO SLEEPING OCCUPANTS ON THE OTHER SIDE OF THE CLOSED DOOR



ELECTRICAL LEGEND:

	BATTENS HOLDER
	DOWN LIGHTS
	TELEPHONE
TV	TELEVISION
	POWER POINT
SD	SMOKE DETECTOR
$	LIGHT SWITCH
	ELECTRICAL CONNECTION
	HEAT LIGHT FAN
TR	HEATED TOWEL RAIL
	WALL LIGHT

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Address: 236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **SMOKE DETECTORS & EXTRACTOR FANS** | Sheet # 32

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: 1:100

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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DURABILITY - PRODUCT SELECTION

ALTERNATIVE SOLUTION FOR TABLE 4.1 NZS 3604:2011

Zones	Fixings	Environment	Product Option
All Zones	Nail plates and timber connectors	Closed	GANG-NAIL and LUMBERLOK Standard Zinc Coated Product (1)
	All other structural fixings		BOWMAC Hot Dip Galvanised (3)
Zone D	Structural fixings	Sheltered and Exposed	LUMBERLOK Stainless Steel 304 (2) BOWMAC Stainless Steel 304 (2)
Zones B and C	Timber pile fixings MORE than 600mm from ground	Sheltered Subfloors vented 7000 mm^2 /m^2 or less	LUMBERLOK Hot Dip Galvanised (4) BOWMAC Hot Dip Galvanised (3)
		Exposed Subfloors vented 7000 mm^2 /m^2 or more	LUMBERLOK Stainless Steel 304 (2) BOWMAC Hot Dip Galvanised (3)
	Timber pile fixings LESS than 600mm from ground	Sheltered and Exposed	LUMBERLOK Stainless Steel 304 (2)
	All other structural fixings	Sheltered	LUMBERLOK Hot Dip Galvanised (4) BOWMAC Hot Dip Galvanised (3)
		Exposed	LUMBERLOK Stainless Steel 304 (2) BOWMAC Hot Dip Galvanised (3)

1. All GANG-NAIL, LUMBERLOK and BOWMAC product complies with Table 4.2 NZS 3604:2011.
2. LUMBERLOK and BOWMAC Stainless Steel product is 304 grade. Regular washing and maintenance will positively affect long term appearance of these items.
3. BOWMAC Hot Dip Galvanised product is to AS/NZS 4680 to 600g/m 2
4. LUMBERLOK Hot Dip Galvanised product is to AS/NZS 4680 to 390g/m 2

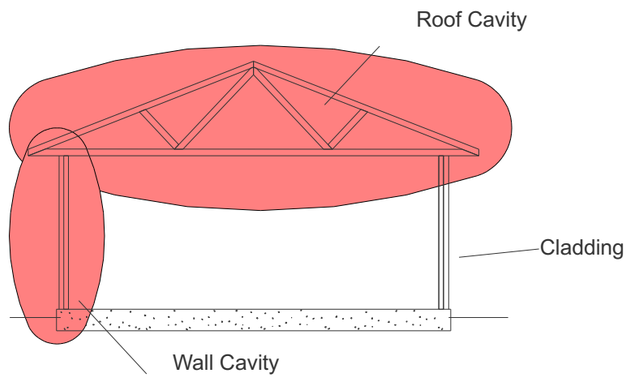
NOTES

Items above refer to GANG-NAIL, LUMBERLOK and BOWMAC product marketed for specific applications with a requirement to last 50 years as an alternative solution to Table 4.1 NZS 3604:2011.

The MiTek New Zealand Limited Durability Flow Chart for product selection is derived from this alternative solution to Table 4.1 NZS 3604:2011. Definitions of zones and environments are derived from NZS 3604:2011.

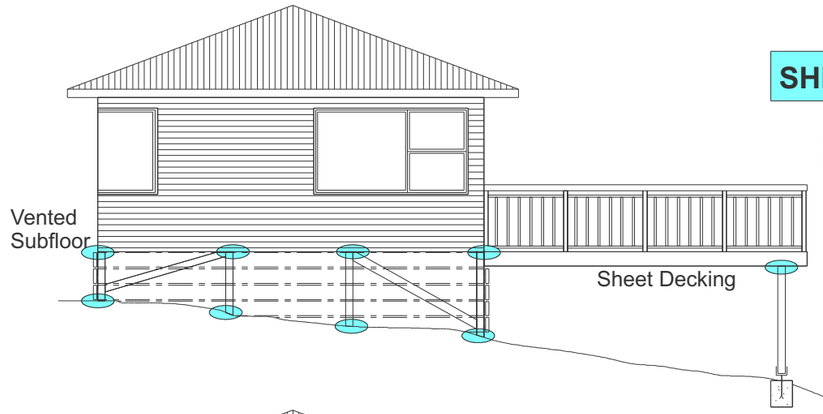
Supporting documents available for this alternative solution:-
Les Boulton and Associates. Materials and Corrosion Consultants Report 00330: Evaluation of Bracket Durability; NZS 3604:2011 and Report 01372: Corrosion of BOWMAC Fixings in Treated Timber.
Optimech Services Metallurgical Consultancy Test Certificate Reports No: 00-134 BOWMAC and No: 01-023 LUMBERLOK Determination of Galvanising Coating thickness.
Product statements January 2012 for LUMBERLOK and BOWMAC products.

DURABILITY FLOW CHART



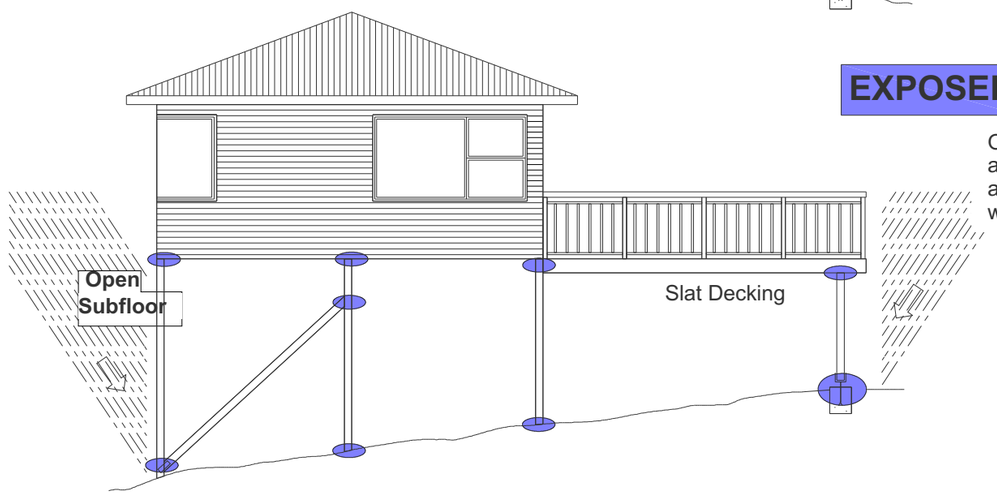
CLOSED

Dry, internal location, not subject to airborne salts or rain wetting.



SHELTERED

Open to airborne salts, but not rain washed.



EXPOSED

Open to airborne salts and rain washed.

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Drawing Title: **DURABILITY**

Sheet # 33

Drawn: David Coker | Date: 18 NOV 2019 | Wind Region A | Wind Zone E/High | Scale: N.T.S

Checked: David Coker | Variation # | Earthquake Zone 2 | Exposure Zone C

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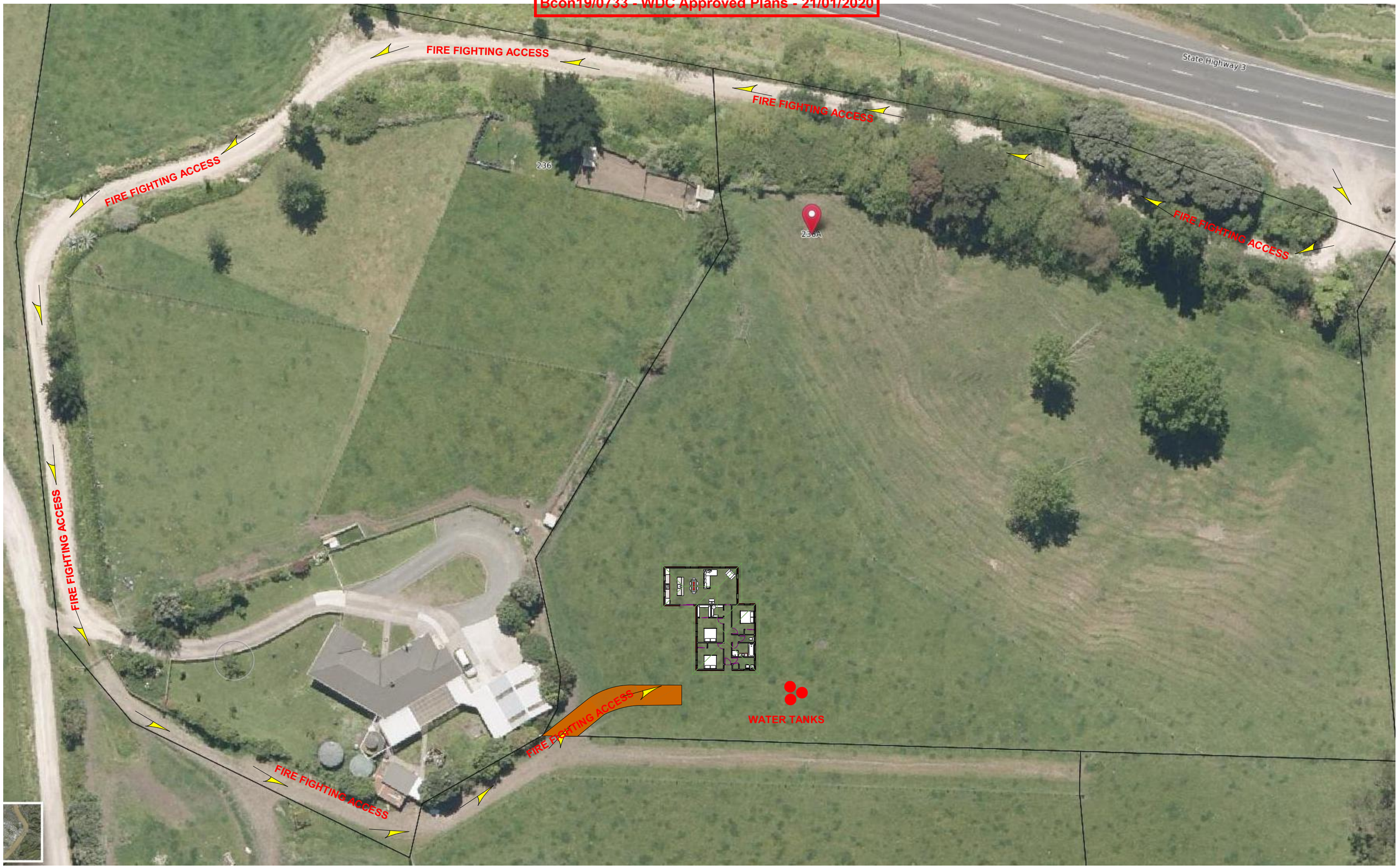

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Drawing Title:	FIRE FIGHTING					Sheet #	34
Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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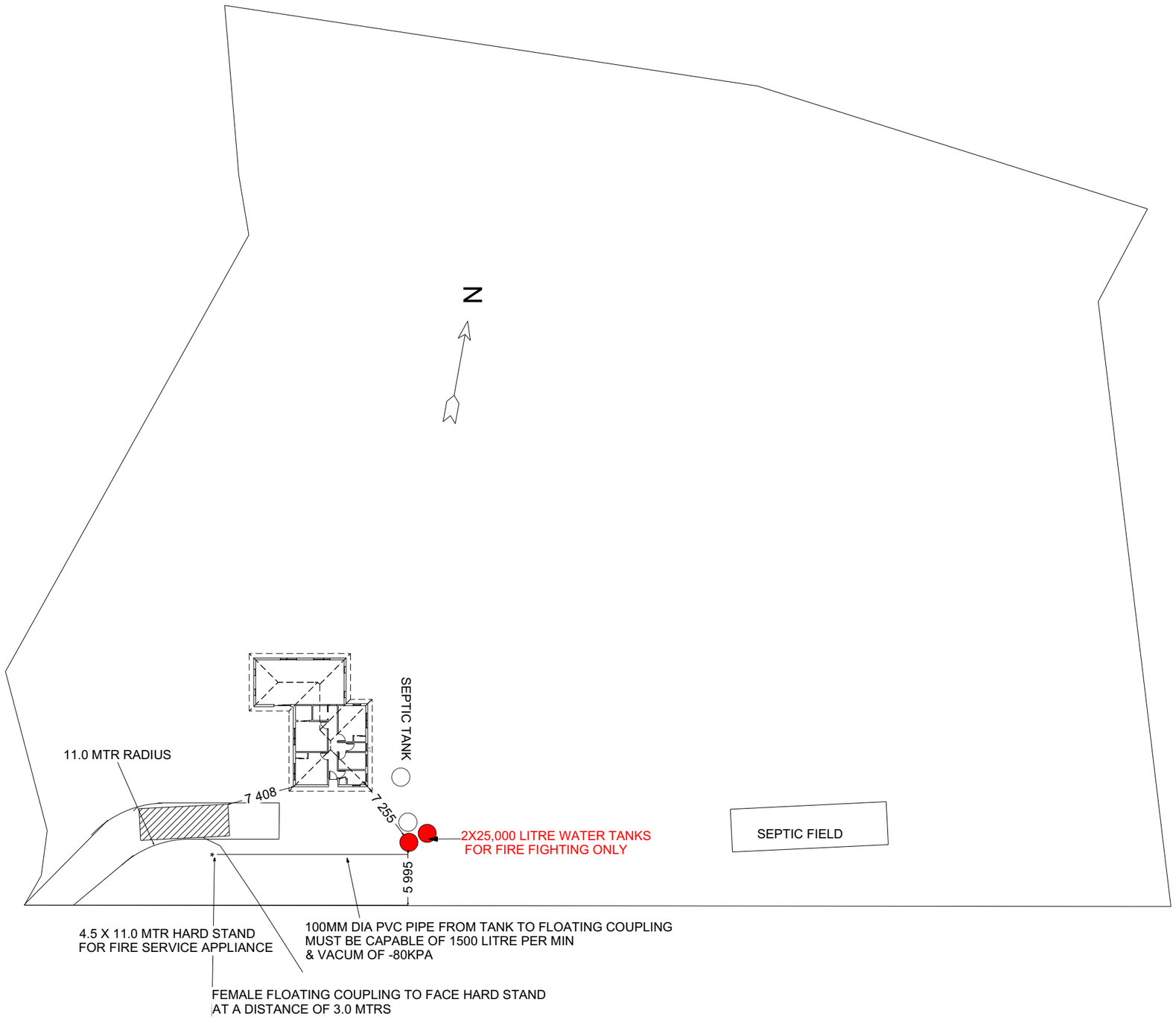

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Client Details :
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Address:
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Drawing Title:	**FIRE FIGHTING**					Sheet #	35
Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: 1:500
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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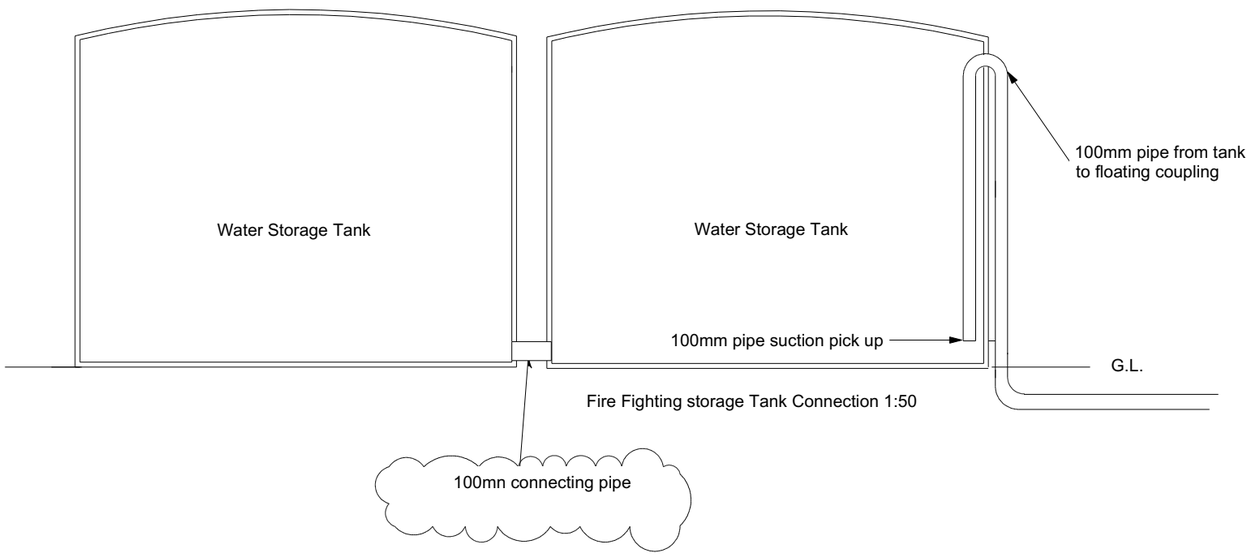
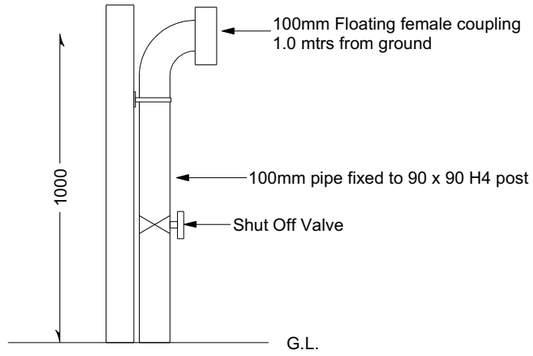


Fire Fighting storage Tank Connection 1:50



100mm Floating Female Coupling 1:20

Driveway gradient to be no more than 16%.

Driveway width 4 mtrs & Capable of supporting a gross axle laden weight of 20 tonnes.

Driveway surface suitable to be trafficable at all times by fire service appliance.

Turning radius > 11m to allow fire appliance to clear driveway edges.

Hatched area represents hardstand for fire appliance.

Connection point to be within 6mtrs of hardstand.

Water tanks set on top of ground

DRAWINGS PROVIDED BY: sentinel HOMES

dcDESIGN ARCHITECTURAL DESIGN

Client Details :
PROPOSED NEW RESIDENTIAL DWELLING

Address:
236A STATE HIGHWAY 3 WANGANUI

Drawing Title: **FIRE FIGHTING**

Sheet # 36

Drawn: David Coker	Date:	18 NOV 2019	Wind Region	A	Wind Zone	E/High	Scale: N.T.S
Checked: David Coker	Variation #		Earthquake Zone	2	Exposure Zone	C	

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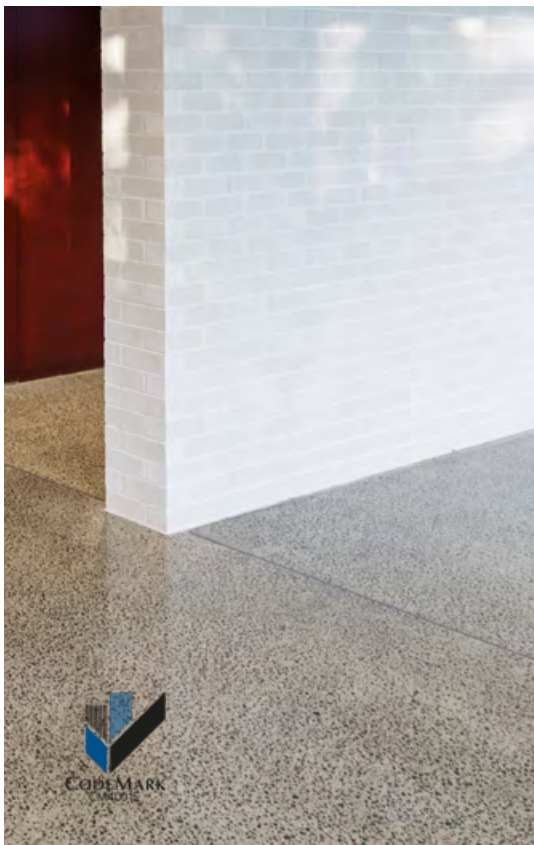
OCTOBER 2018 REV A

+RibRaft®

TECHNICAL MANUAL



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

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

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

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

THIS MANUAL CONSISTS OF 3 SECTIONS:

SECTION 1 DESIGN INFORMATION

Contains information principally useful for the specifier or building designer

SECTION 2 INSTALLATION INFORMATION

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

SECTION 3 VERIFICATION

Describes the required verification checks

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).

CodeMark CM40015

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).

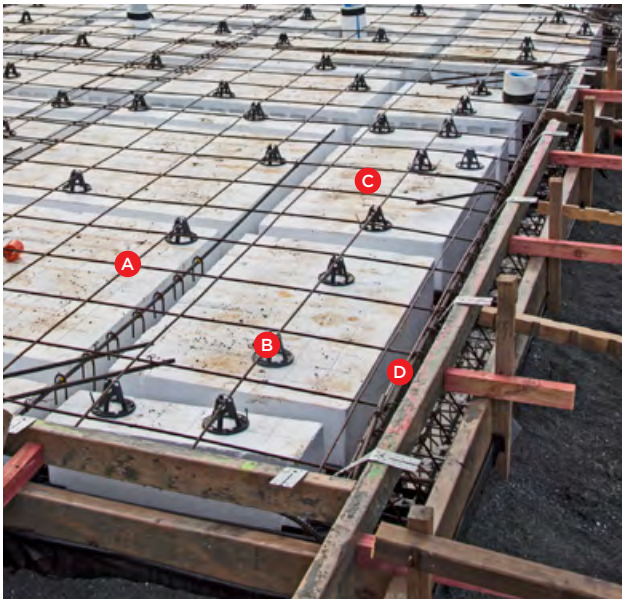
3.3 Snow Loading

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 300mm spacer

C Firth RibRaft® polystyrene pods **D** Steel reinforcing

3.5 Foundation Requirement for Different Building Types

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

Table 1 Foundation Type Identifier

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

3.6 Foundation Soils

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

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

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

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

Table 2 Scala Penetrometer Blows Required and Ultimate Bearing Capacity

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

3.7 Flow Diagrams

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

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

Figure 1 Building Check Flow Diagram

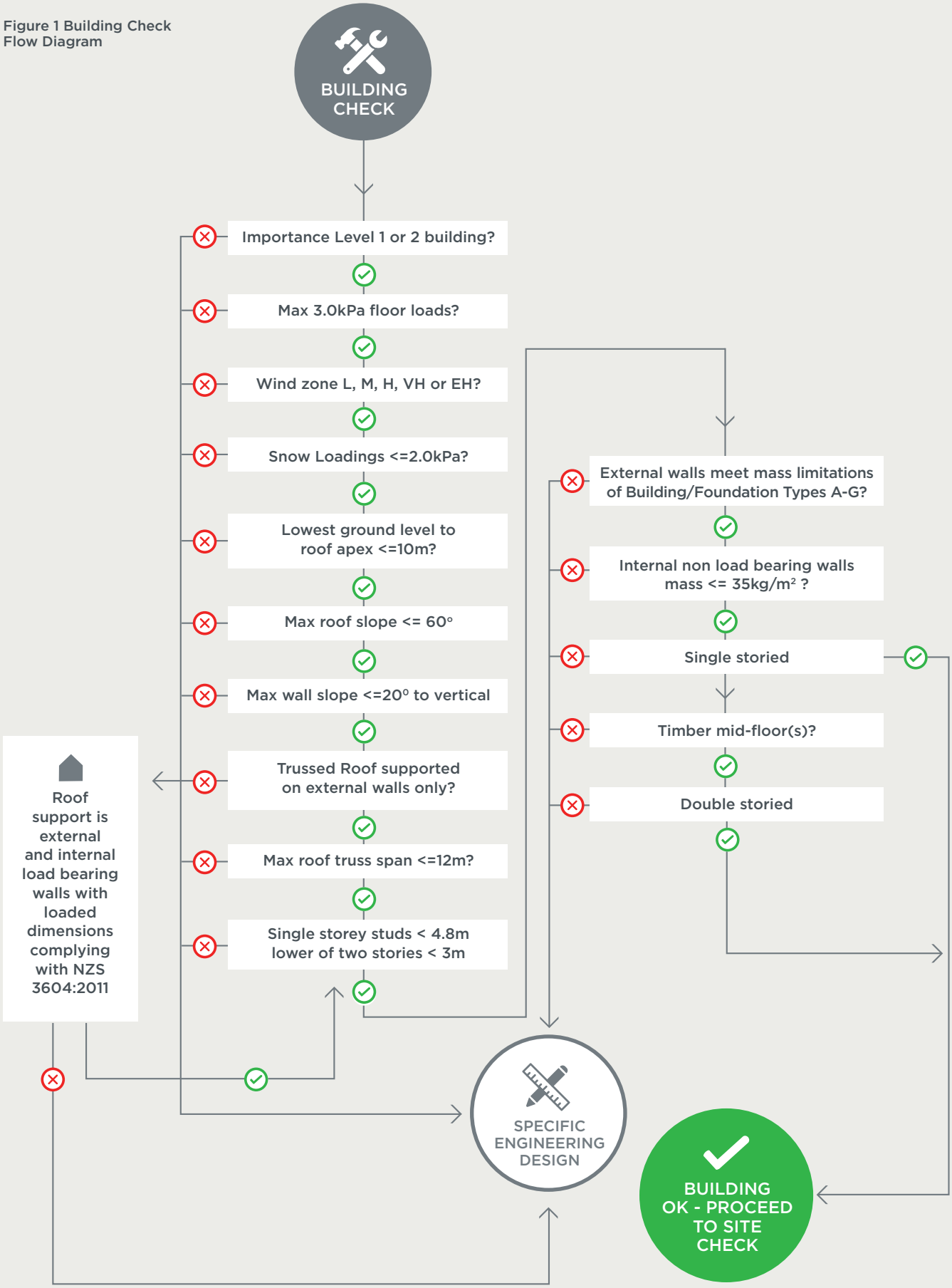
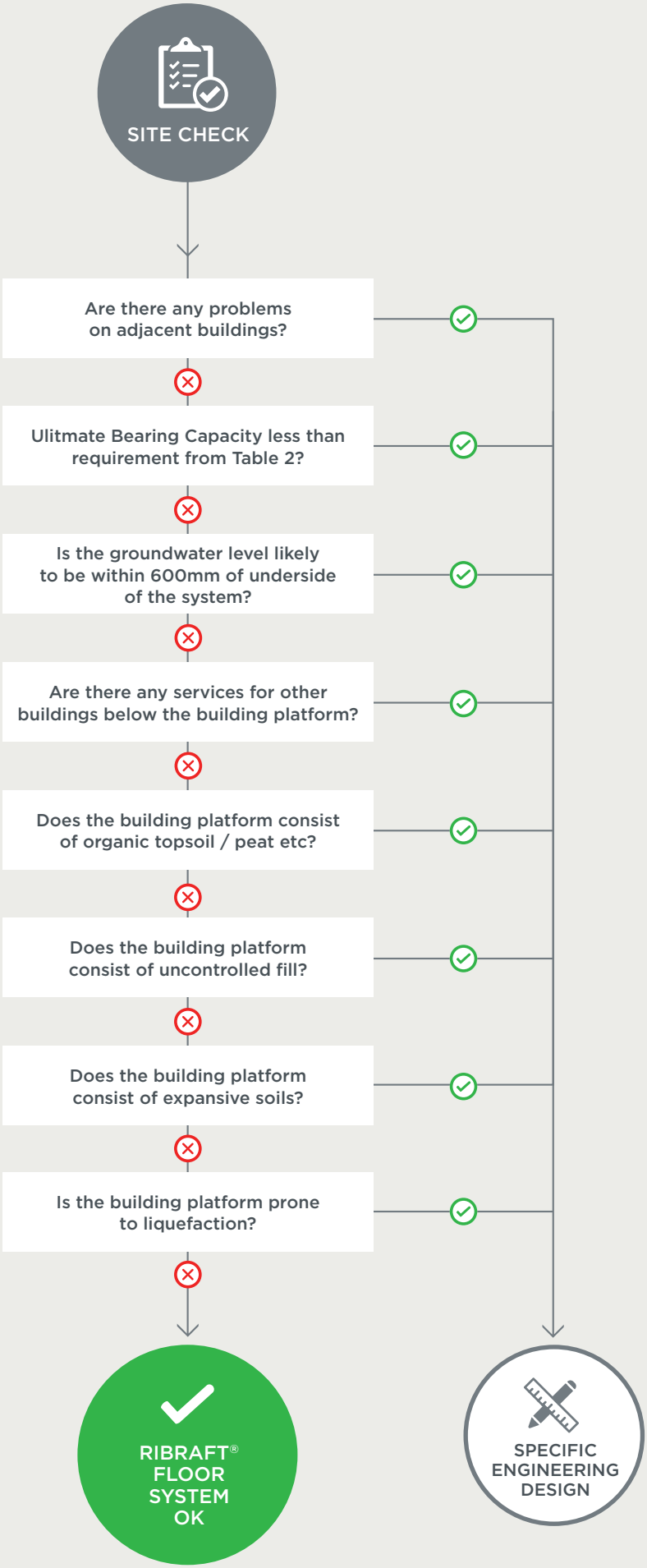


Figure 2 Building Check Flow Diagram



4.0 CONSTRUCTION DETAILS

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

4.1 Pod Layout

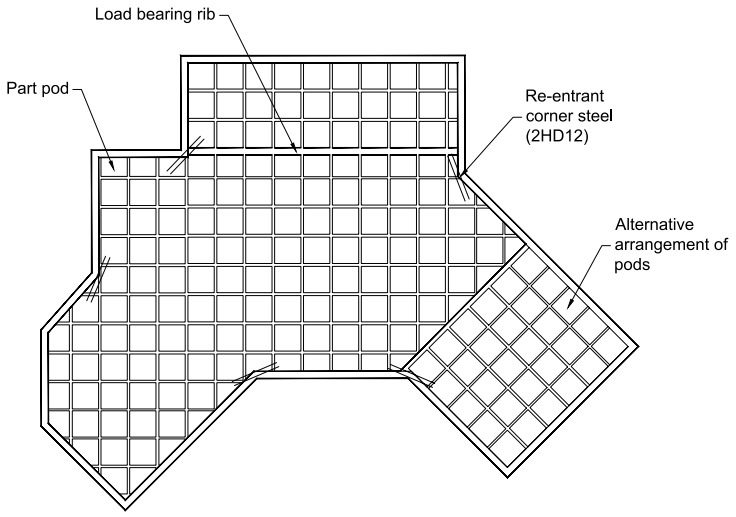
RibRaft® polystyrene pods supplied by Firth (1100 x 1100 x 220mm thick) shall be placed on levelled ground and arranged in a waffle pattern. The pods are used as void formers while the concrete is curing. These pods are an integral component of the system and shall not be substituted.

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

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

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

Figure 3 Typical RibRaft® Plan



4.2 Edge Beam Width and Reinforcement

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

4.3 Internal Ribs (non load bearing) Width and Reinforcement

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

4.4 Internal Ribs (load bearing) Width and Reinforcement

For 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.

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

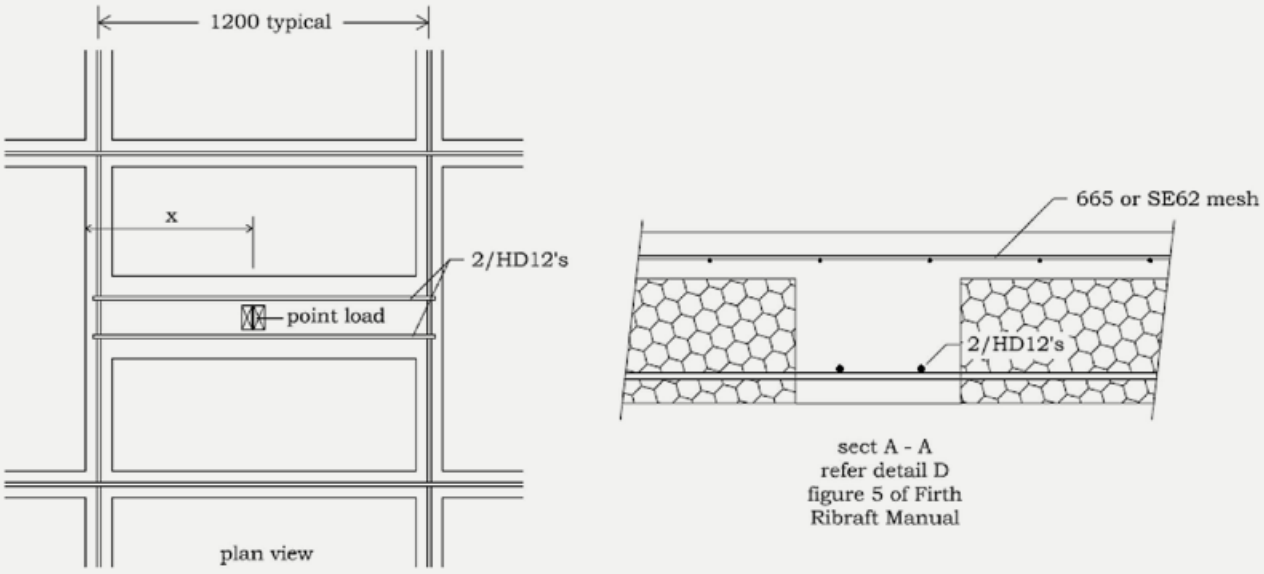
	FOUNDATION OPTIONS BELOW POINT LOAD:	
ULTIMATE LIMIT POINT LOAD REACTION	PAD OPTION, GOOD GROUND	BEAM OPTION, BEARING CAPACITY GREATER THAN 140KPA [3]
Up to 10kN	No thickening required	No thickening required
Up to 20 kN	375x375 pad[1]	300mm wide load under point load as detailed in Figure 5
Up to 30kN	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



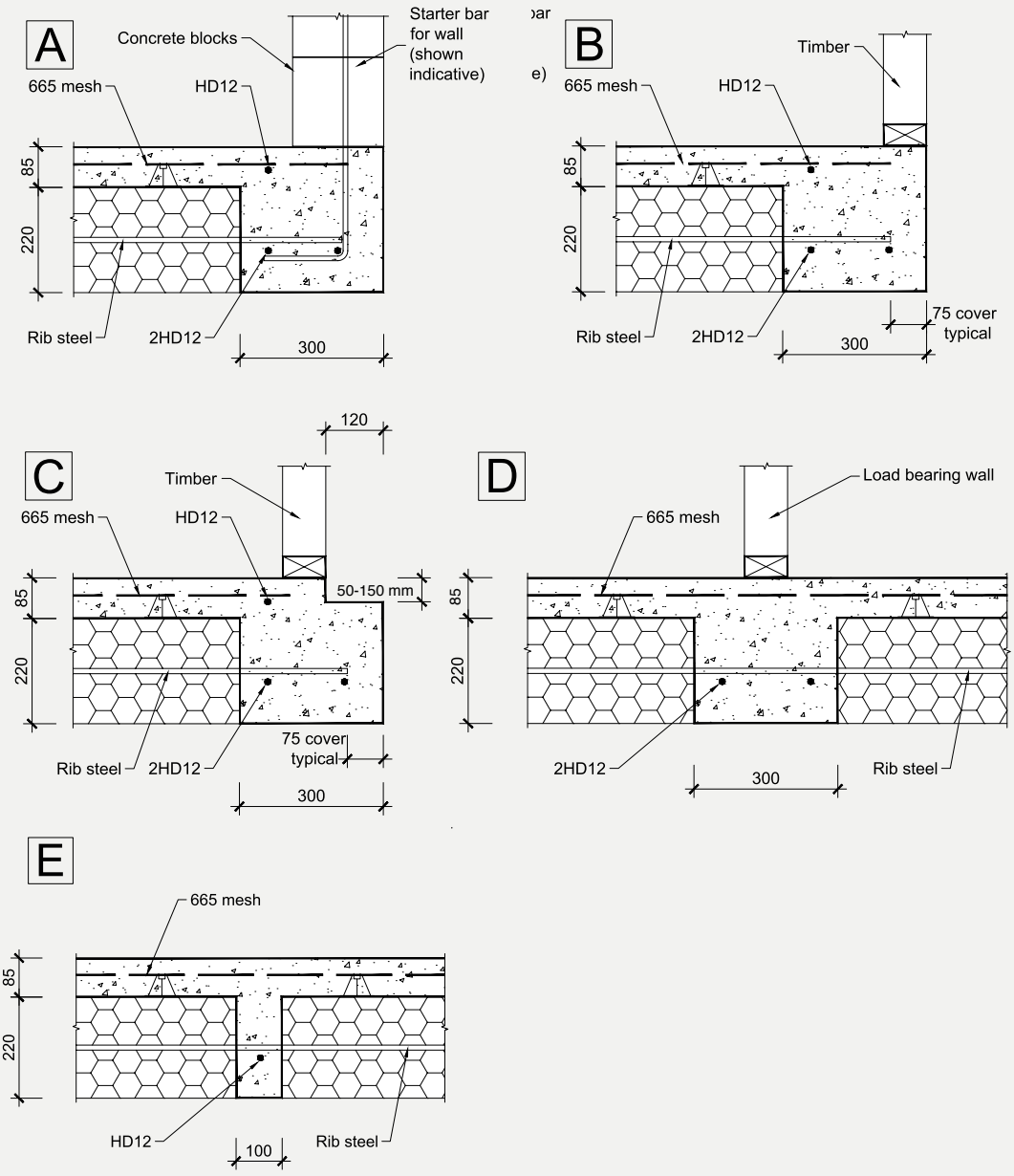
4.6 Mesh Reinforcement

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



5.0 LATERAL RESISTANCE

5.1 Earthquake Resistance

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

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

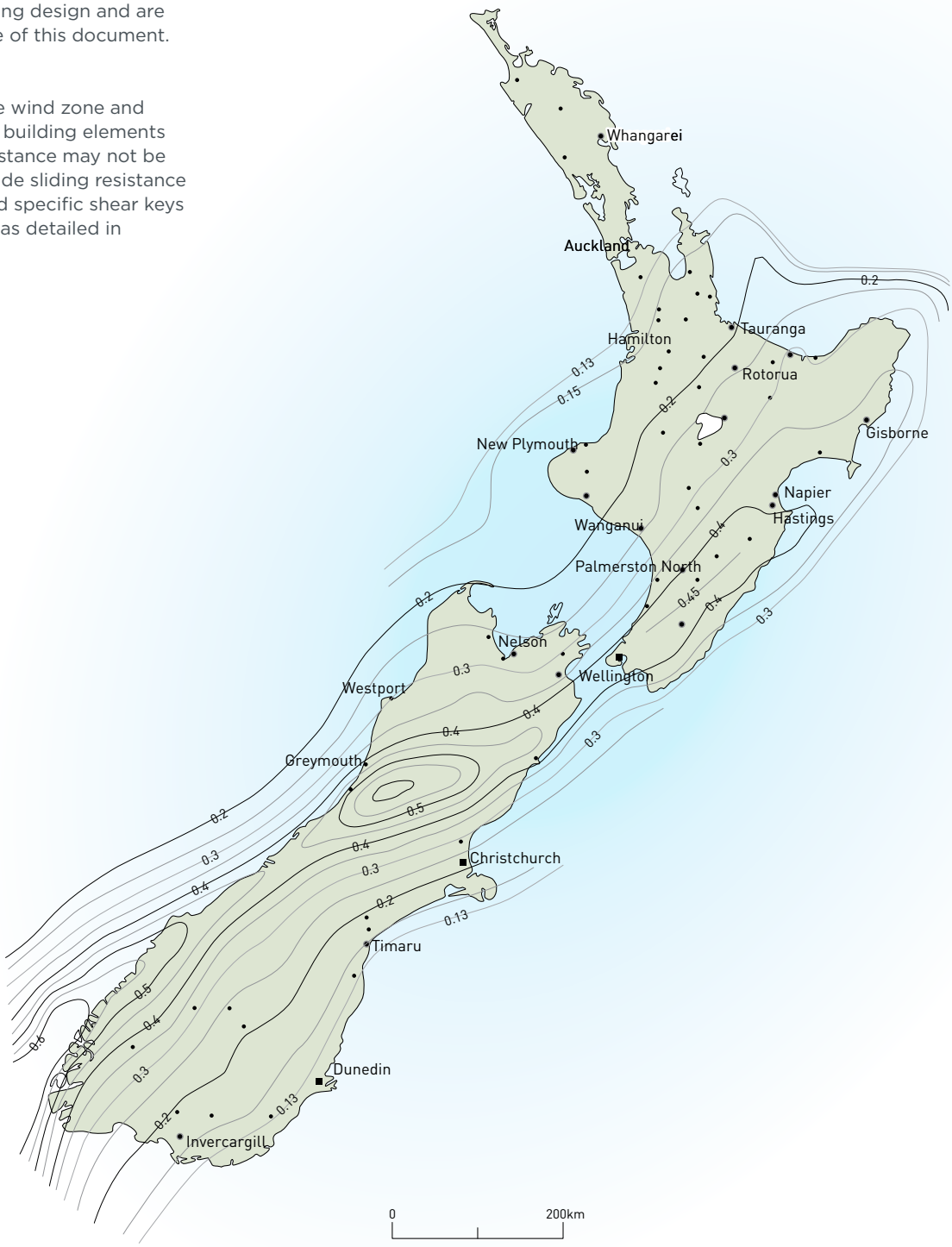


Figure 6
Seismic Hazard Factor Z to NZS 1170.5

5.2 Wind Resistance

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

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

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

BUILDING TYPE	ROOF TYPE	GROUND FLOOR EXTERNAL WALLS	SECOND STOREY EXTERNAL WALLS	BU's PROVIDED PER 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

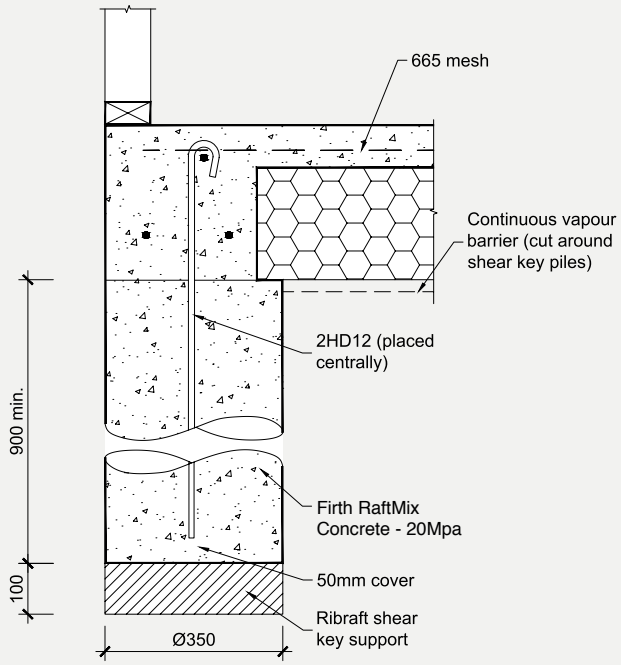
Table 4 Bracing Capacity Provided By Frictional Resistance Per 100m² Of Ground Floor Area

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



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.

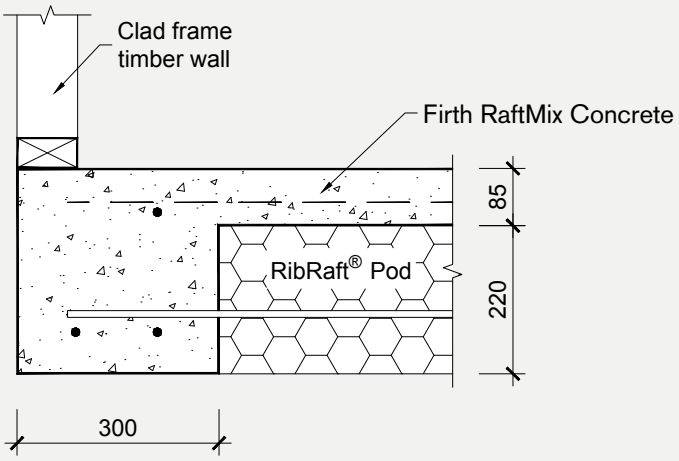


Figure 8
RibRaft® R Values For 90mm Thick Walls On The Floor Edge

	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

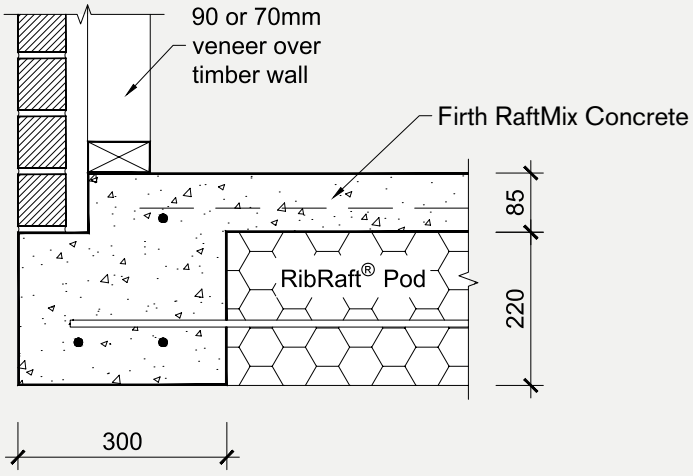


Figure 9
RibRaft® R Values For 70-90mm Thick Veneer, Cavity, and 90mm Walls.

	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

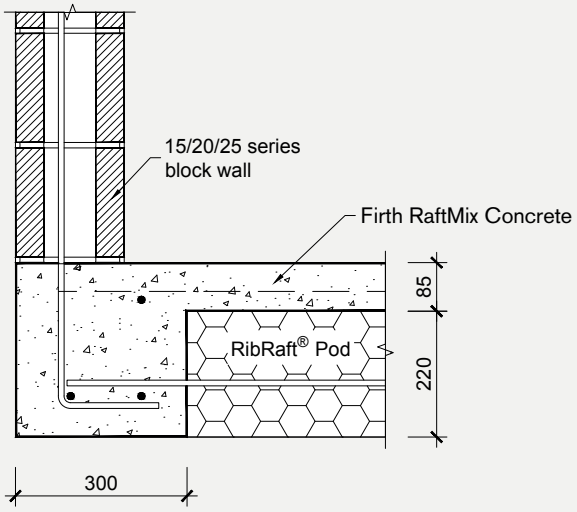


Figure 10
RibRaft® R Values For Various Thicknesses Of Masonry Walls

	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

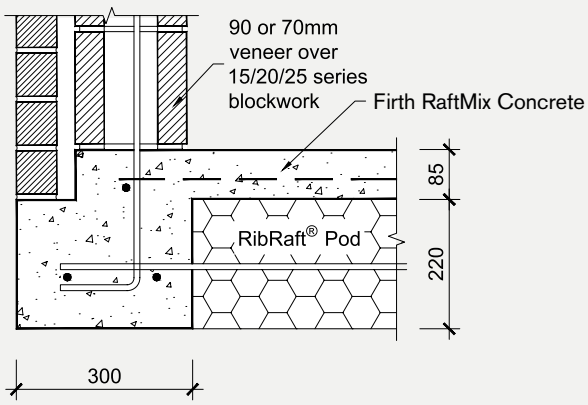


Figure 11
RibRaft® R-Values For 70-90mm Thick Veneer, Cavity, And Various Thickness Masonry Walls

	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

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.

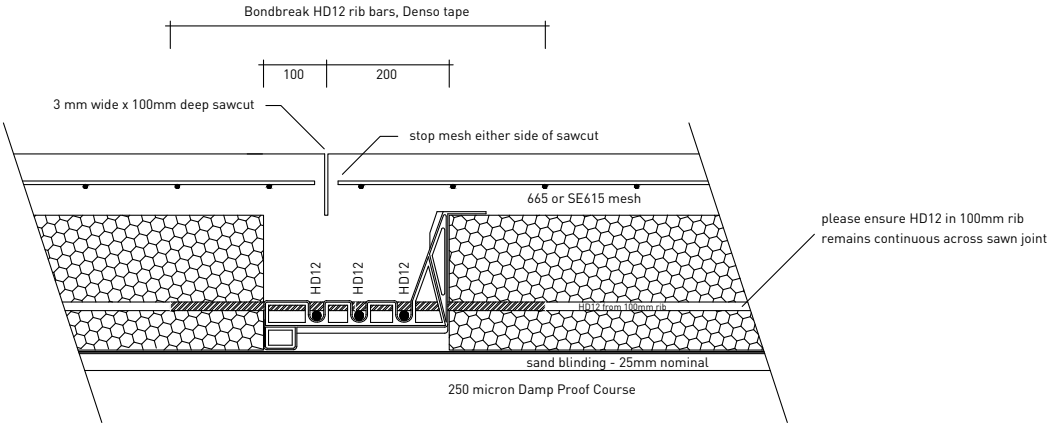
In order to limit the width of cracks at re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner – refer Figure 3.

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

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.

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

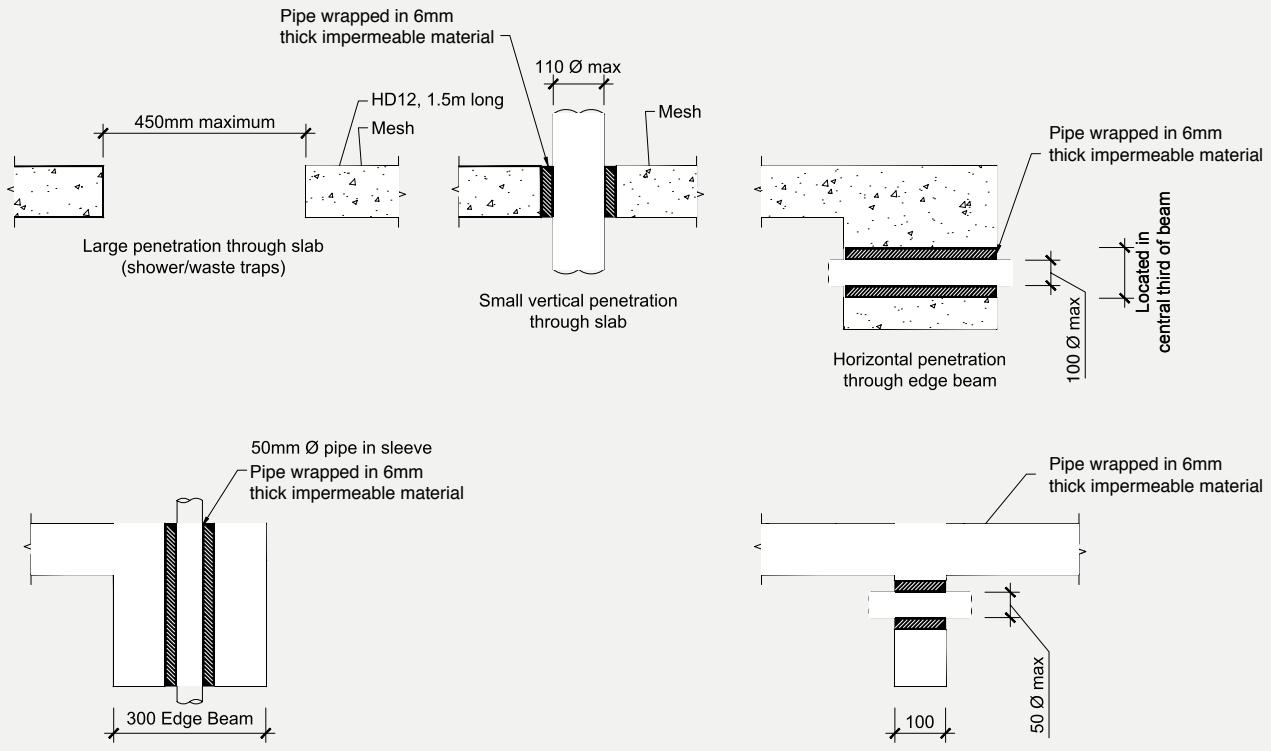
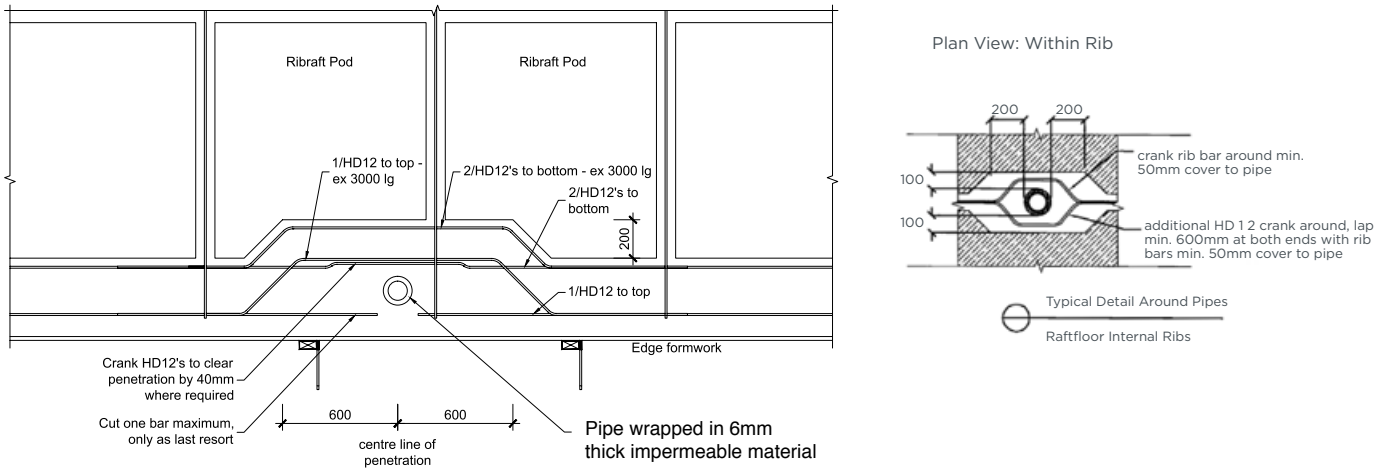


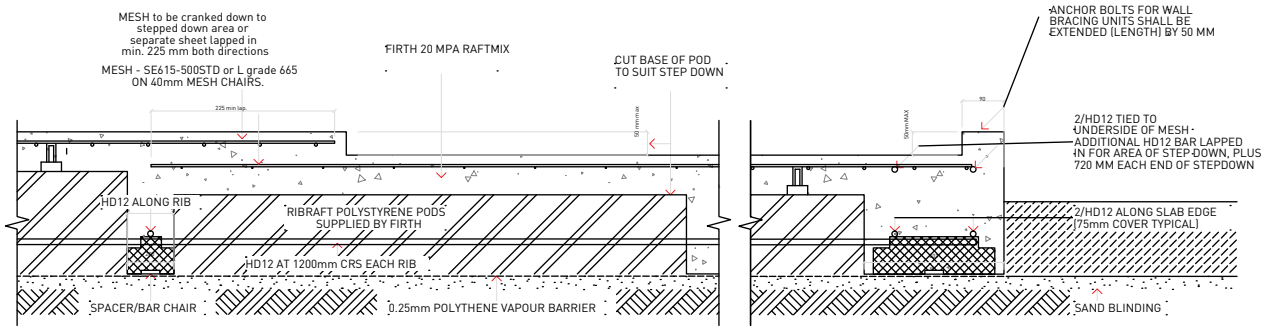
Figure 14
Localised Increase In Width At Edge Beam Where Vertical Service Up To 100mm Diameter Are Required



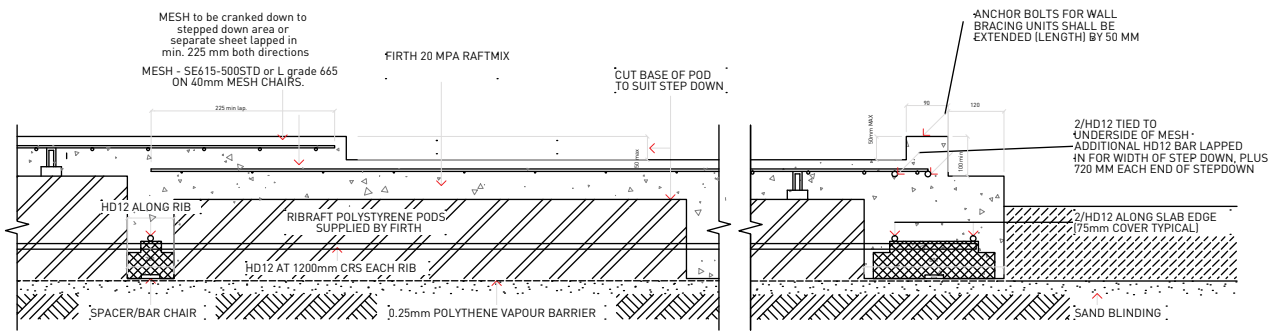
6.3.3 Recesses for Showers

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

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

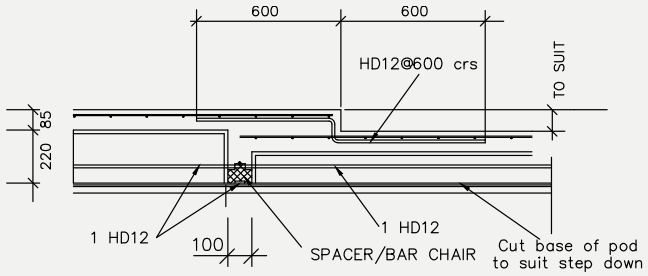


RIB RAFT FLOOR - SET-DOWN DETAIL FOR MAX. 50mm REBATED SHOWER

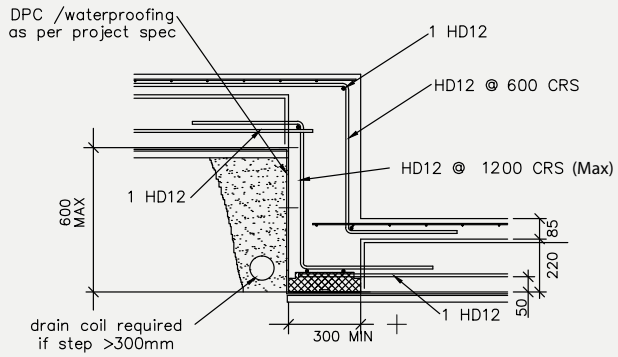


RIB RAFT FLOOR - SET-DOWN DETAIL FOR MAX. 50mm REBATED SHOWER

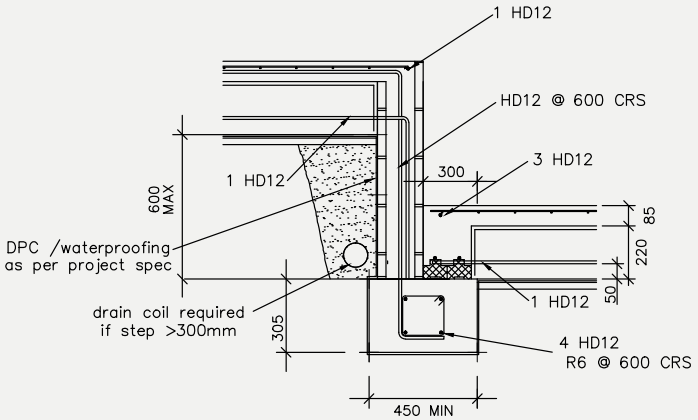
Figure 16 Details where step downs are required in the floor



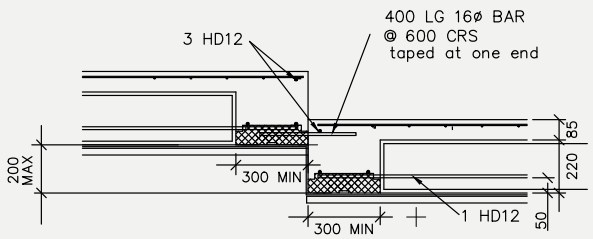
7/S2 SET–DOWN DETAIL FOR STEP UP TO 100mm
1:20



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



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



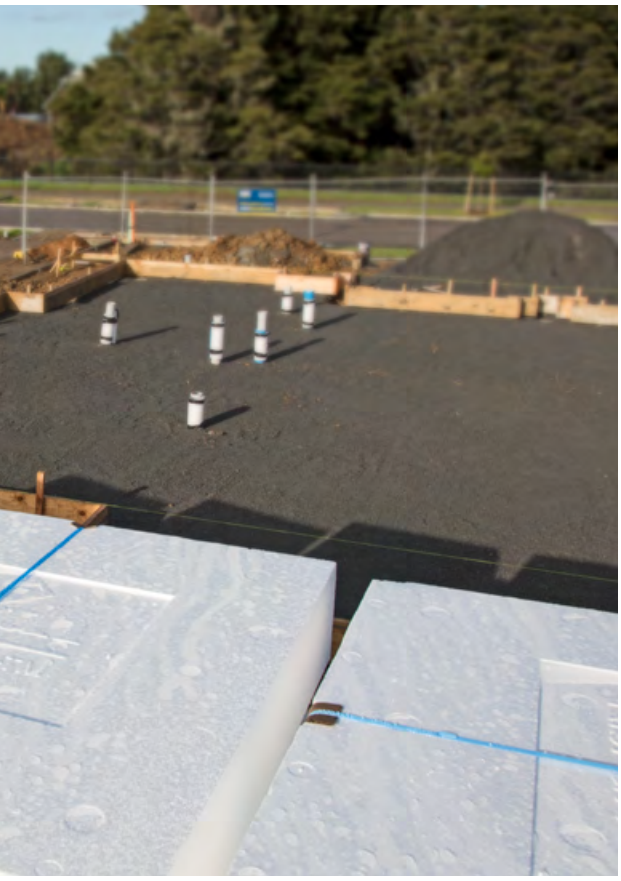
10/S2 SET–DOWN DETAIL FOR STEP 100 TO 200mm FOR SEPARATELY POURED SLABS
1:20

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

Where the site topography requires a step down in the slab, steps of 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.

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.

Figure 1
Relationship
Of RibRaft®
To Sloping
Ground Surface

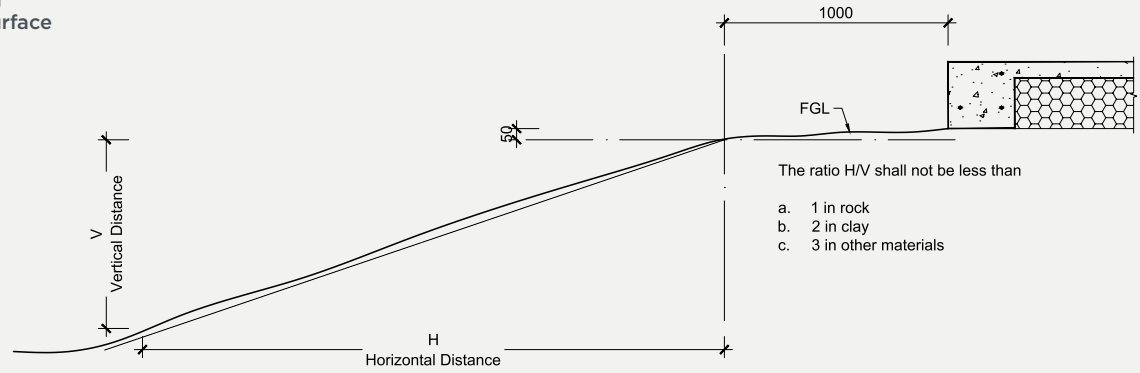


Figure 2
Temporary
Excavation
Limited

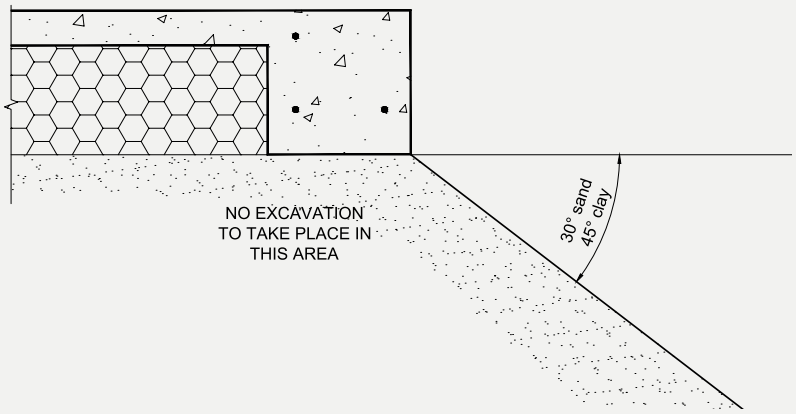
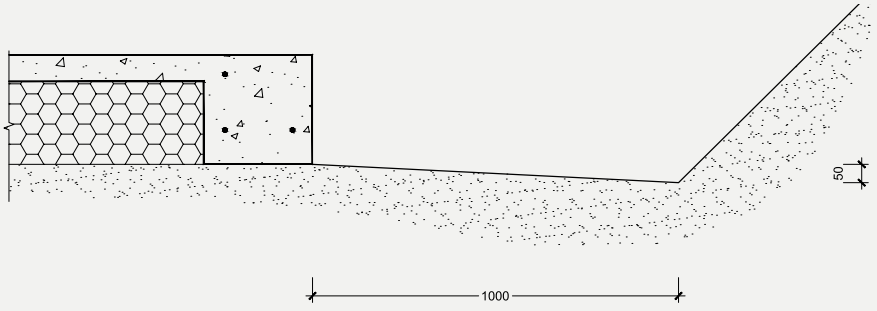


Figure 3
Site Grading



3.0 INSTALLATION PROCEDURE

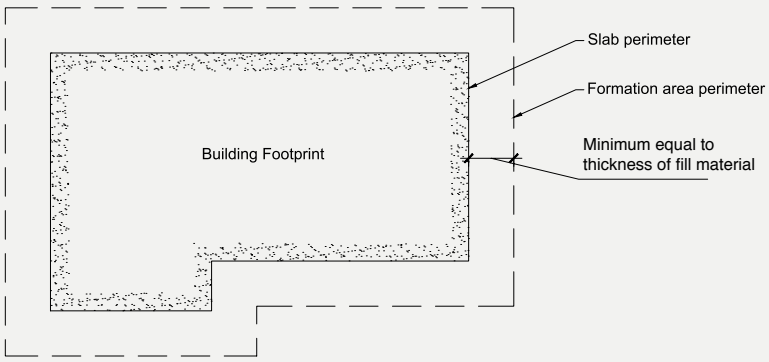
3.1 Site Preparation

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

3.2 Earthworks

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

Figure 4 Plan of Formation Area



3.3 Shear Keys

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

3.4 Plumbing and Services

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

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

Where the services pass through the top of the pods, the opening shall be sealed to prevent materials entering the subfloor cavities. (This can be achieved with Denso tape and a type of easily compressible foam.)

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

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

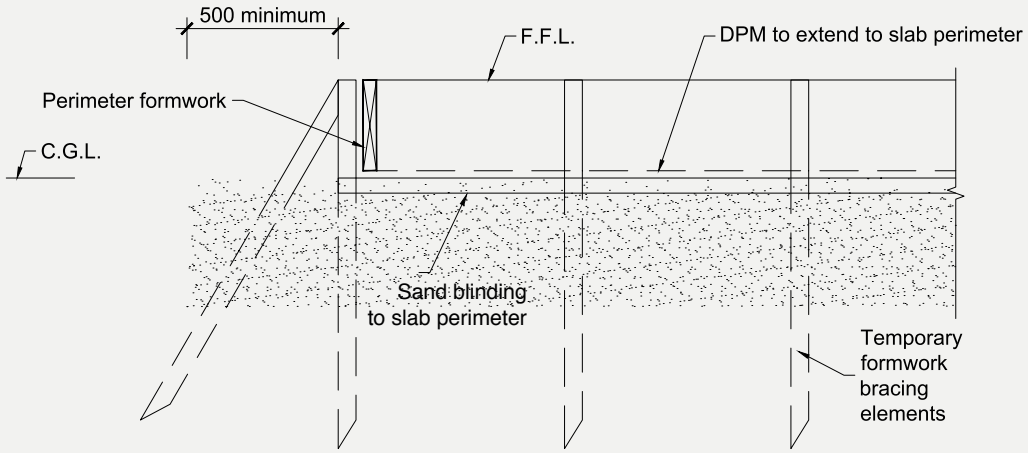
3.5 Sand Blinding

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

3.6 Damp Proof Membrane

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

Figure 5 Sand blinding / DPM / Formwork Details



3.7 Edge Formwork

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

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

3.8 Laying the Pods and Spacers

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

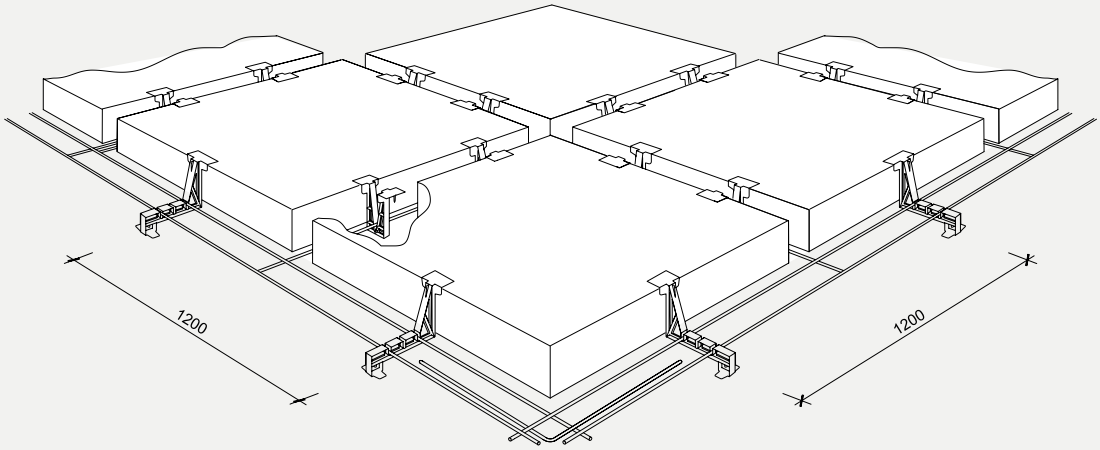
Except where a 300mm wide rib is required, each pod or part pod shall always be separated by 100mm using a minimum of one Firth approved 100mm spacer along each edge of each pod or part pod. The ribs in both directions shall form a waffle pattern throughout the slab. It is essential that the ribs and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

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

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

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

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



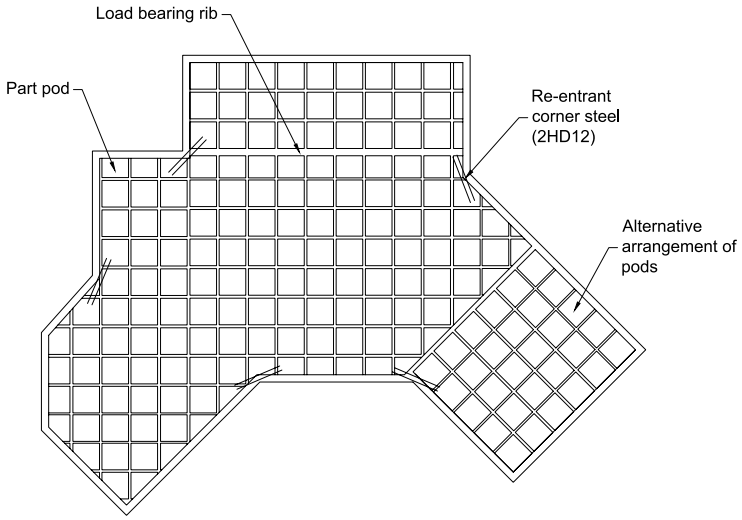


Figure 7 Typical Pod And Rib Layout

3.9 Reinforcing Steel

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

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

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

3.9.1 Edge Beam Steel

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

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

3.9.2 Rib Steel

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

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

3.9.3 Mesh Reinforcing

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

3.9.4 Re-entrant Corner Steel

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

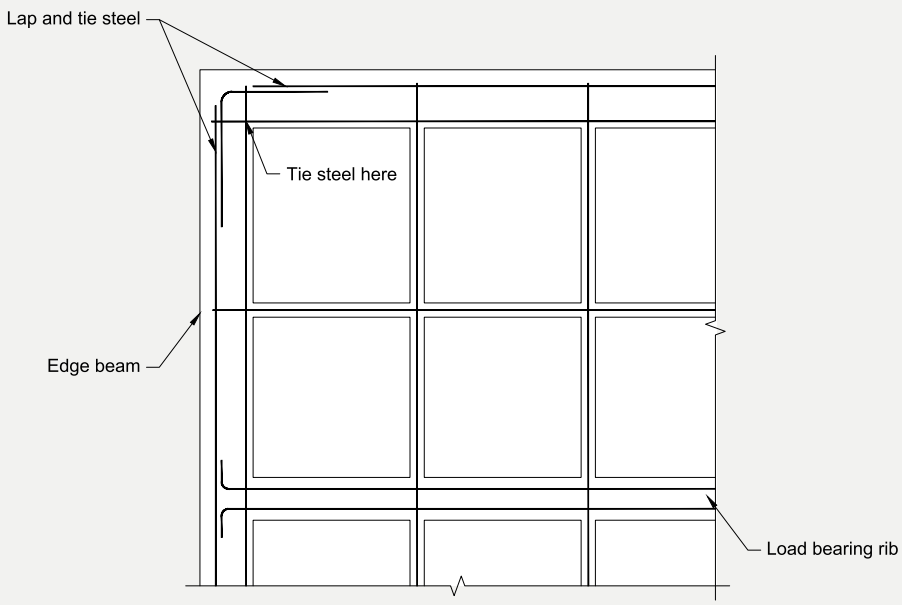


Figure 8 Corner steel layout

3.10 Concrete Installation

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

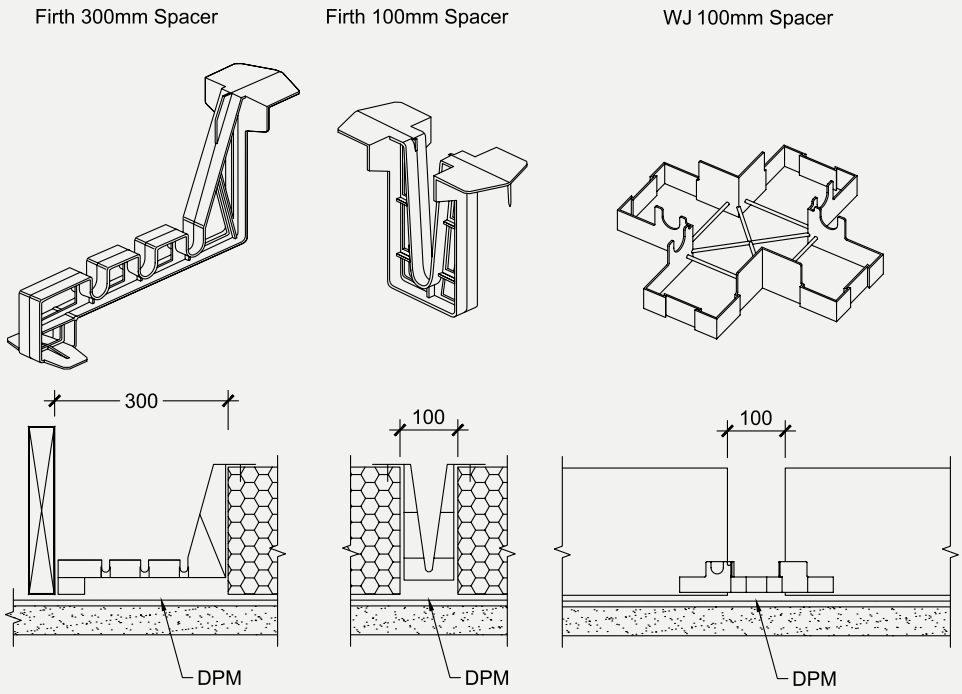
3.10.1 Placing

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

> Raftmix – a 20MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix

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

Figure 9
Spacer
Details



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

3.10.2 Finishing

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

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

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

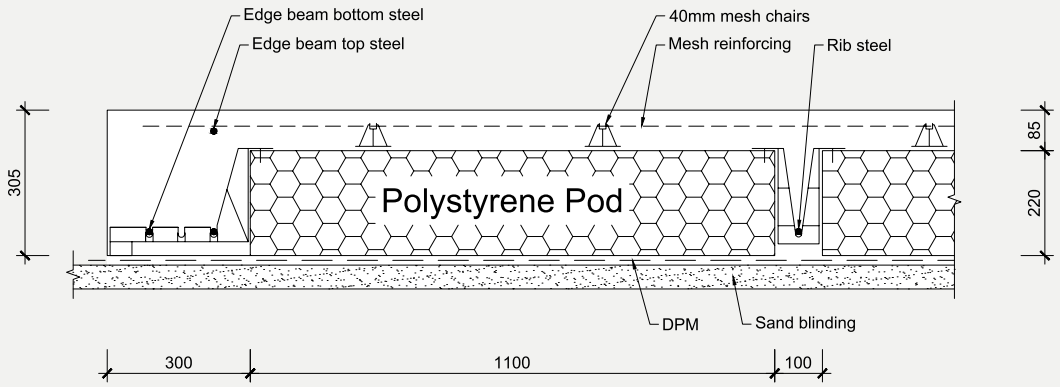
In order to limit the width of cracks at re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner – refer Figure 7.

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

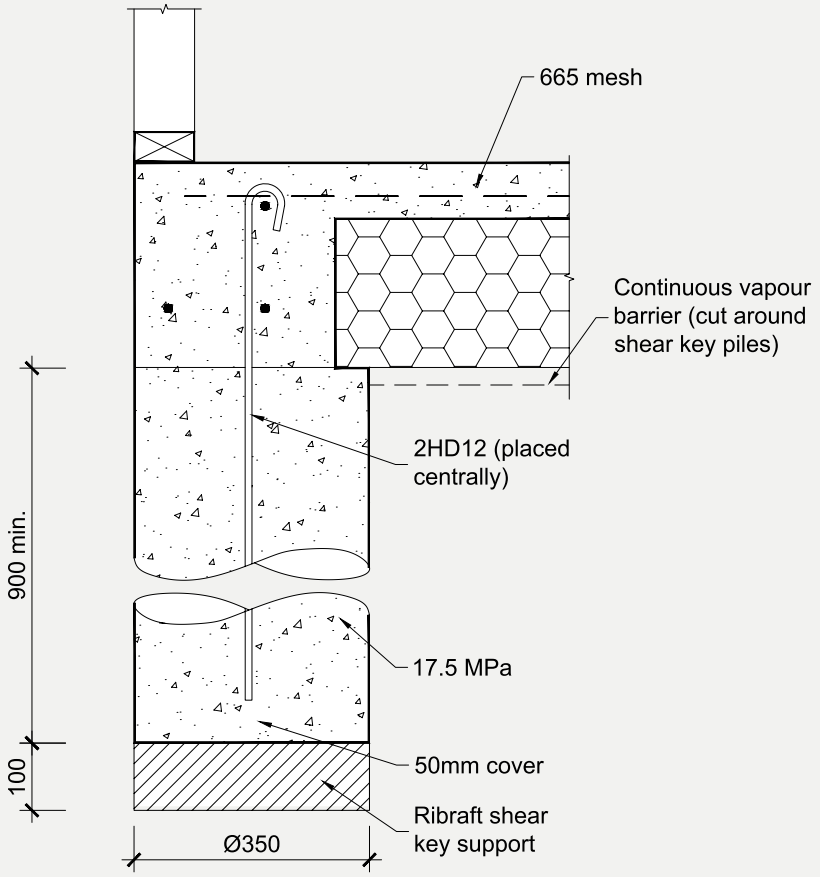
The building owner shall ensure that the ground surrounding the system be maintained so that the integrity of the system is not jeopardised. In other words, at no time shall the ground immediately adjacent to the system be allowed to settle away to expose the underside of the slab.

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



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

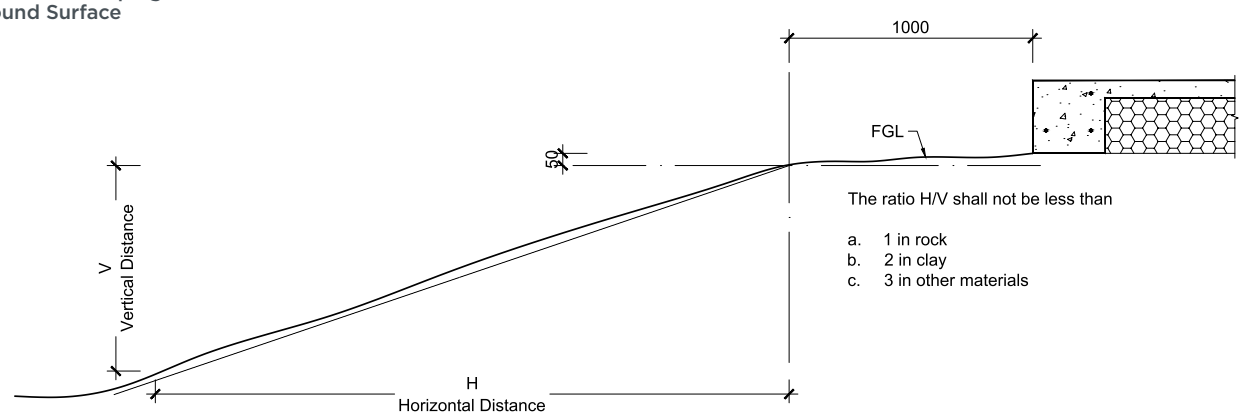
The RibRaft® foundation system has been designed to accommodate structures complying with the non specific design standards NZS3604 or NZS4229. With these types of structures the Building Control Authority specifies the inspections required and often conducts these. A similar construction verification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



CODEMARK CM40015

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

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

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

CONCRETE & MASONRY PRODUCTS: A SUSTAINABLE BUILDING OPTION & SOLUTION

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

0800 FIRTH 1 (347841)
FIRTH.CO.NZ

WRIGHT ENVIRONMENTAL

On Site Wastewater Disposal Site Investigation, Assessment and Evaluation Report.

Site evaluation must be read in conjunction with site plan

Applicant Details

Applicant(s)

Surname: Hooper First name: Apirana

Surname: Turia First name: Maharanui

Company name: C/o Sentinel Homes

Postal address:

Phone: Mobile: 027 701 5533

Email: Derek.mcinnes@sentinelhomes.co.nz Fax:

Consultant Details:

Consulting Company:	Wright Tanks Limited	Evaluator:	Andrew Wright
Registration Number:	23958	Mobile:	021 505 198
Postal address:	PO Box 4777 Palmerston North	Phone:	0800 253 273
Email:	admin@wrighttanks.co.nz	Fax:	06 3533020

Site Information

Address: 236a State Highway 3, Whanganui

Legal description: Lot 2 DP 399485

District: Whanganui District Council Regional: Horizons Regional Council

Land area: 1.0 hectares Grid reference:

WRIGHT ENVIRONMENTAL

Dwelling one type: Bedrooms: 3 ☑ New ☐ Existing

Dwelling two type: Bedrooms: ☐ New ☐ Existing

Dwelling three type: Bedrooms: ☐ New ☐ Existing

Description:

Number of persons: 5 Total wastewater produced: 900 L per day. (L/day)

Potable water supply: ☑ Rain water (Tanks) ☐ Bore water ☐ Reticulated ☐ Well Well number:

Site Description

Date of site evaluation: 2nd December 2019

Land Application Area Topography

Slope: ☑ <10° ☐ 11 - 15° ☐ >15° Direction: South East To North West

Field elevation from surrounding area: n/a Metres/Feet Description: n/a

History of flooding: ☐ Yes ☑ No ☐ Report Attached Description: n/a

Cut off drain(s): ☐ Yes ☑ No Description: n/a

Waterways: >20

Sub Soil Descriptions

☑ Test hole dug ☐ Excavated ☐ Other Depth: 0.9 M Photos attached: ☑ Yes ☐ No

Topsoil: Loams Thickness: 0-300 mm

Sub soil: Light Clays Thickness 300-900 mm

Category: ☐ 1 ☐ 2 ☑ 3 ☐ 4 ☐ 5 AS/NZS 1547:2012 table E1

Description: Moderately Drained

Ground water: ☐ Yes ☑ No Depth: M Mottling: ☑ No ☐ Yes Depth: M

Percolation test: ☐ Yes ☑ No ☐ Attached Reporter:

t:0800 253 273 fax:06 353 3020
e: admin@wrighttanks.co.nz web: www.wrighttanks.co.nz
PO Box 4777 Palmerston North

WRIGHT ENVIRONMENTAL

System Design:

System Type

System is: ☑ New ☐ Existing Manufacturer: Wright Tanks Ltd

Treatment plant: ☑ Pumped twin chamber: ☐ Siphon: ☐ Gravity: ☐ Other: ☐

Model: Protec 5 Total capacity: 6000 L Working capacity: 4700 L

Direction from dwelling: East Distance from dwelling: 6 M

Land Application Area (LAA) Design

High Pressure Drip lines

✓Buried 150mm

Number of Rows: 10 Length: 40 m Distance apart: 1 m

Application rate DIR/DLR: 2.25 mm/Day Total Land Application Area: 400 m²

Description:

Direction from dwelling: East Distance from dwelling 54 M

Closest boundary: East & South Distance from closet boundary: 1.5 M

LAA distance from: Waterway: >20 M Neighbouring LAA: >20 M

Well: n/a M Well number: n/a

t:0800 253 273 fax:06 353 3020
e: admin@wrighttanks.co.nz web: www.wrighttanks.co.nz
PO Box 4777 Palmerston North

Comments:

Part 7: Installation Information

We strongly advise clients to plant small trees and shrubs over the land application area in order to increase the volume of discharged treated effluent that is transpirated, as this greatly assists the treatment of released effluent. Planting is advised with a soil category over 3 or in an environmentally sensitive area. This area has been designated as an effluent land application area and no stock or vehicle access is allowed on the land application area itself.

This effluent site plan and the proposed system is installed in general accordance with AS/NZS1547.2012. Wright Tanks Limited also constructs in general accordance to AS/NZS 1546.1:2008, 3106.2009 and TP58 standards (Where applicable.) Wright Tanks Limited is a member of the New Zealand Concrete Tank Manufacturers Association.

The installation of the system includes a 2-year service contract and thereafter the owner enters into a maintenance contract with Wright Tanks Limited that allows for bi-annual services. These services are to be conducted only by Wright Tanks Limited employees or approved installers. This sewage system will be installed by Wright Tanks Limited or their nominated installers. Wright Tanks Limited will not 'sign off' work conducted by any other drain layer, plumber or person who carries out any aspect of the above for mentioned work.

The following practices are strongly recommended to assist in the continual smooth operation of the system:

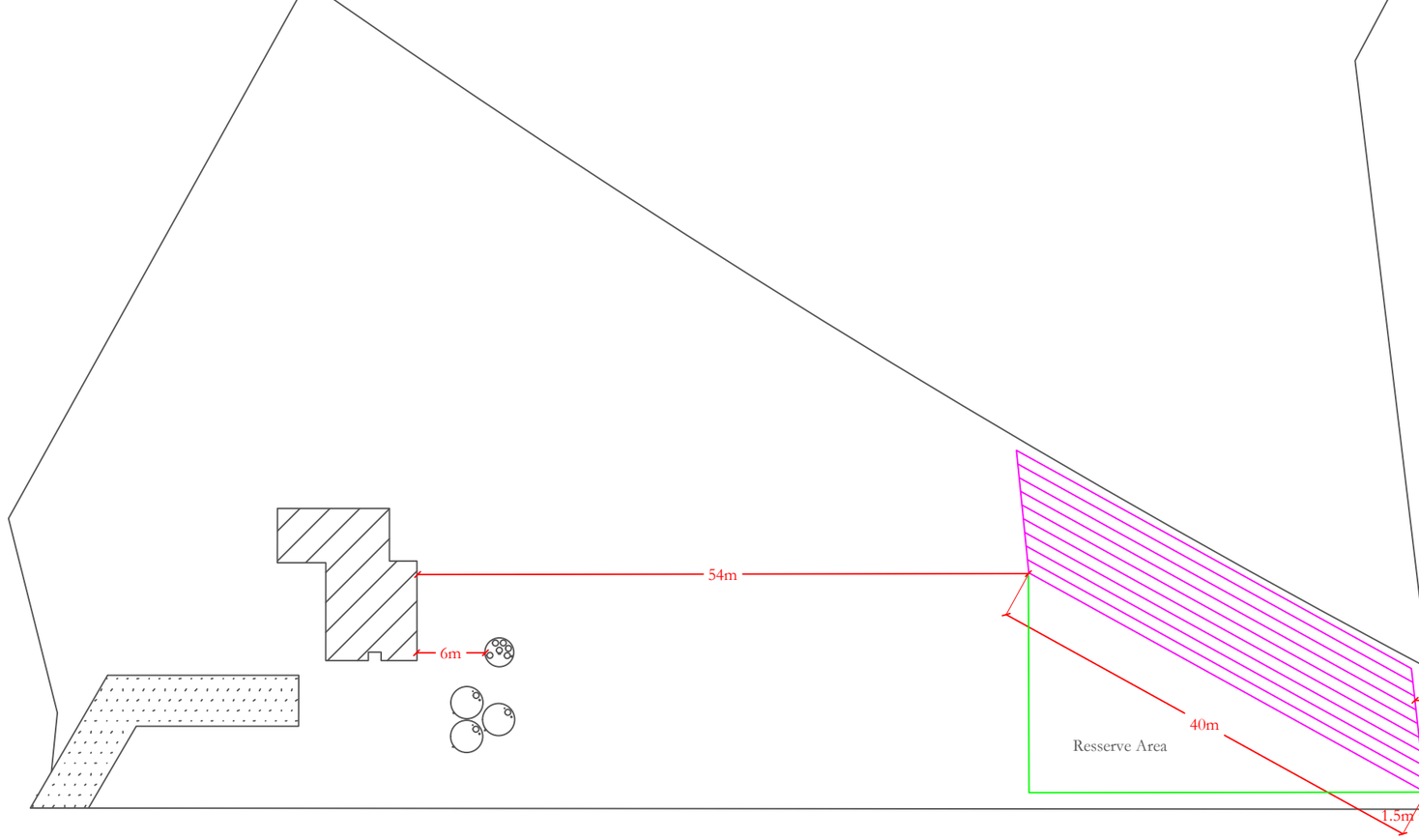
1: Minimal sanitary products and no nappies should be introduced into the tank
2: Water should be conserved
3: No strong chemicals or cleaners should be introduced into the tank, and we recommend the use of environmentally friendly products
4: The tank should be pumped out regularly; the average period between emptying is three to five years however this may vary depending on the use of the particular system.

All fixtures, vent pipes and fittings required by the building code are to be supplied and fitted by the owners' drain layer. The concrete plant is guaranteed for a period of ten years, pumps for two years, electrical fittings and all plastic pipes and fittings are guaranteed for one year.

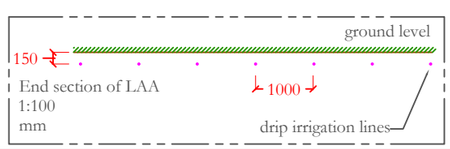
Regards

Andrew Wright
Director
Registration Number: 23958

Date: 3rd December 2019



Building location and design approximate only. Please see architectural plans for exact details



KEY

Wright ProTec 5000 Wastewater Treatment Plant

water tank

test hole

WRIGHT TANKS LTD

The 3 bedroom dwelling will produce 900L of wastewater/day.

Disposed over 400m² = 2.25L/m²/day.

There will be 10 rows of drip irrigation lines 40m long and 1m apart, buried 150mm deep.

Netafim Bioline™ AS.
2.3 l/h
OD 16.6mm
ID14.2mm

The installation of the wastewater treatment plant and land application area will be done in accordance with;

NZ building Code Clause G13/VM4.
AS/NZS 1547:2012

The construction of the wastewater treatment plant is in accordance with;

AS/NZS 1546.1:2008
AS/NZS 3106:2009
TP58

As Built plans are drawn off the supplied drawing from the sub contractor. Wright Tanks Ltd do not survey the site and therefore take no responsibility for the accuracy of such plots.

Plans are drawn off a supplied drawing. Wright Tanks Ltd do not survey the site for boundary dimensions or building and driveway location. These are approximate and may vary to exact locations. See architectural site plan for exact measurements and locations. Wright Tanks Ltd therefore take no responsibility for the accuracy of such dimensions.

Site Plan to be read in conjunction with the enclosed site inspection report.

Name:	A Hooper & M Turia
Address:	236a SH3, Whanganui
Drawn By:	S.K
Scale:	Do not scale
Date:	3/12/2019
Ref #:	Lot 2 DP 399485
Signed:	

fp: 0800 253 273
t: 06 353 6157 f: 06 353 3020
PO Box 4777 Palmerston North 4442
email: admin@wrighttanks.co.nz
www.wrighttanks.co.nz

WRIGHT TANKS LTD

3rd December 2019

Wanganui District Council
PO Box 637
Wanganui
Attention: Chris Gould

Dear Chris

Re: PS1
Apirana Hooper and Maharanui Turia
236a SH3
Wanganui
Lot 2 DP 399485

I write to confirm that the enclosed plans for the above-named property and reports and all specifications to do with the sewage disposal system for the proposed installation is in accordance with NZ Building Code Clause G13/AS2. The system is installed and constructed in accordance with AS/NZS1547:2012, AS/NZS1546.1:2008, NZS3106:2009 and TP58 standards. Wright Tanks Limited is also member of the New Zealand Concrete Tank Manufacturers Association.

All plans and drawings have been drawn up and assessed by a suitably qualified professional and as an independent suitably qualified professional to complete this work (and covered by a current policy of professional indemnity insurance to a minimum value of $250,000) I hereby declare that all of the work to be completed by Wright Tanks Limited specifications will be signed off by the writer.

A Producer Statement will also be issued after the installation of the above work has been completed.

Regards

Andrew Wright
Director
Registration Number: 23958

t:0800 253 273 fax:06 353 3020
e: admin@wrighttanks.co.nz web: www.wrighttanks.co.nz
PO Box 4777 Palmerston North

Hamish Wells
Engineer Ltd
Civil Engineer
CMEngNZ # 186323

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236a State Highway 3
Wanganui

DATE: 11/10/2019

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PREPARED FOR :
Sentinal Homes

SITE REPORT

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Site suitability Retest report

in terms of NZS 3604:2011 Timber framed buildings - Section 3 "Site requirements"

Date: 11/10/2019

Site Data

Address: 236a State Highway 3
Town: Wanganui
Post code NA

Client Data

Client: Sentinal Homes
Email: derek.mcinnes@sentinalhomes.co.nz
Address: NA
Mobile: 021 242 4555
Landline: NA

Legal

Lot: 2 **DP:** 399485
TA: WDC
RA: Horizons

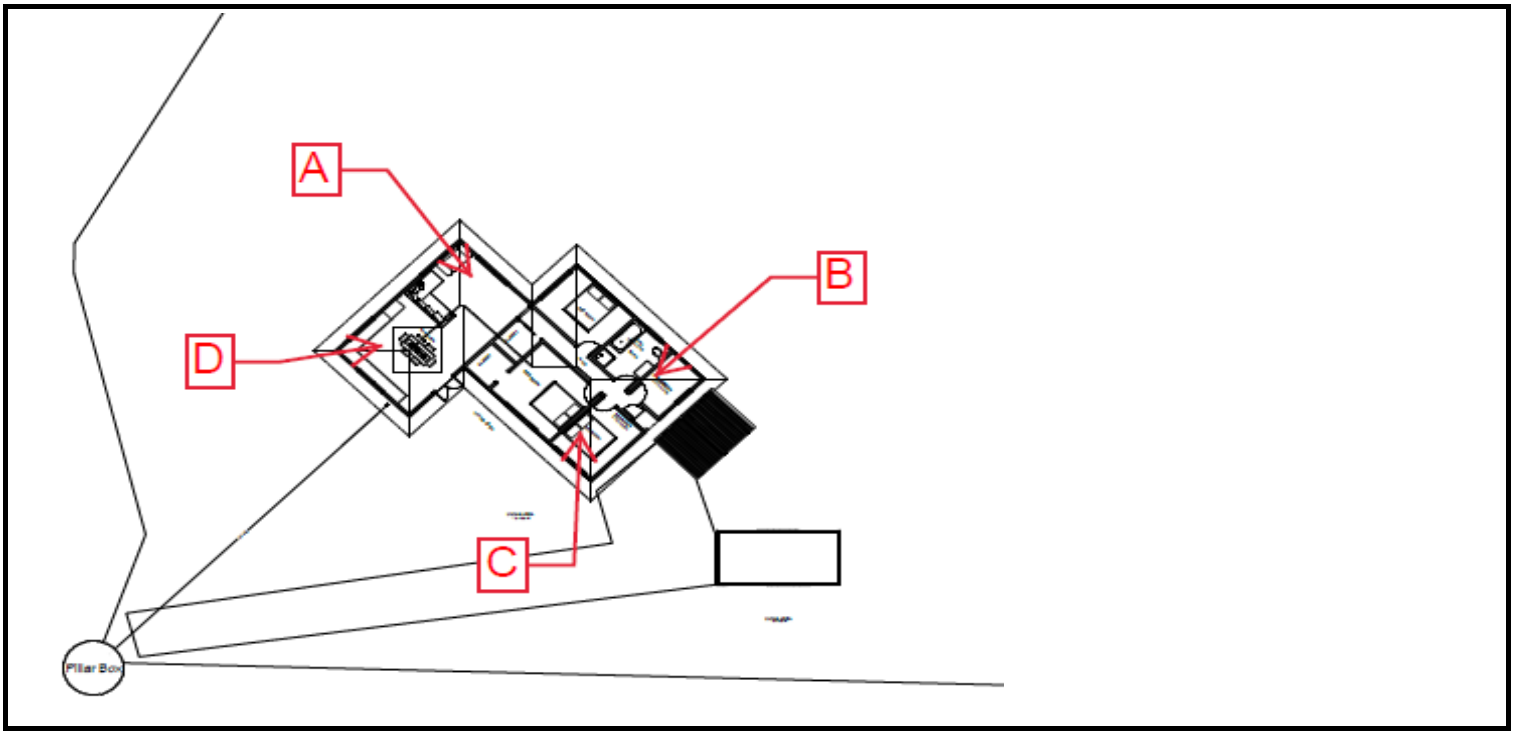
Wind Zone	XH
Corrosion zone	C
Earthquake zone	3
Site subsoil class	D & E

Topography Hilly Rural Section

Basic soil type Silty Clay

NZGS data Q2a
Tested by JDW

Site Plan showing test locations



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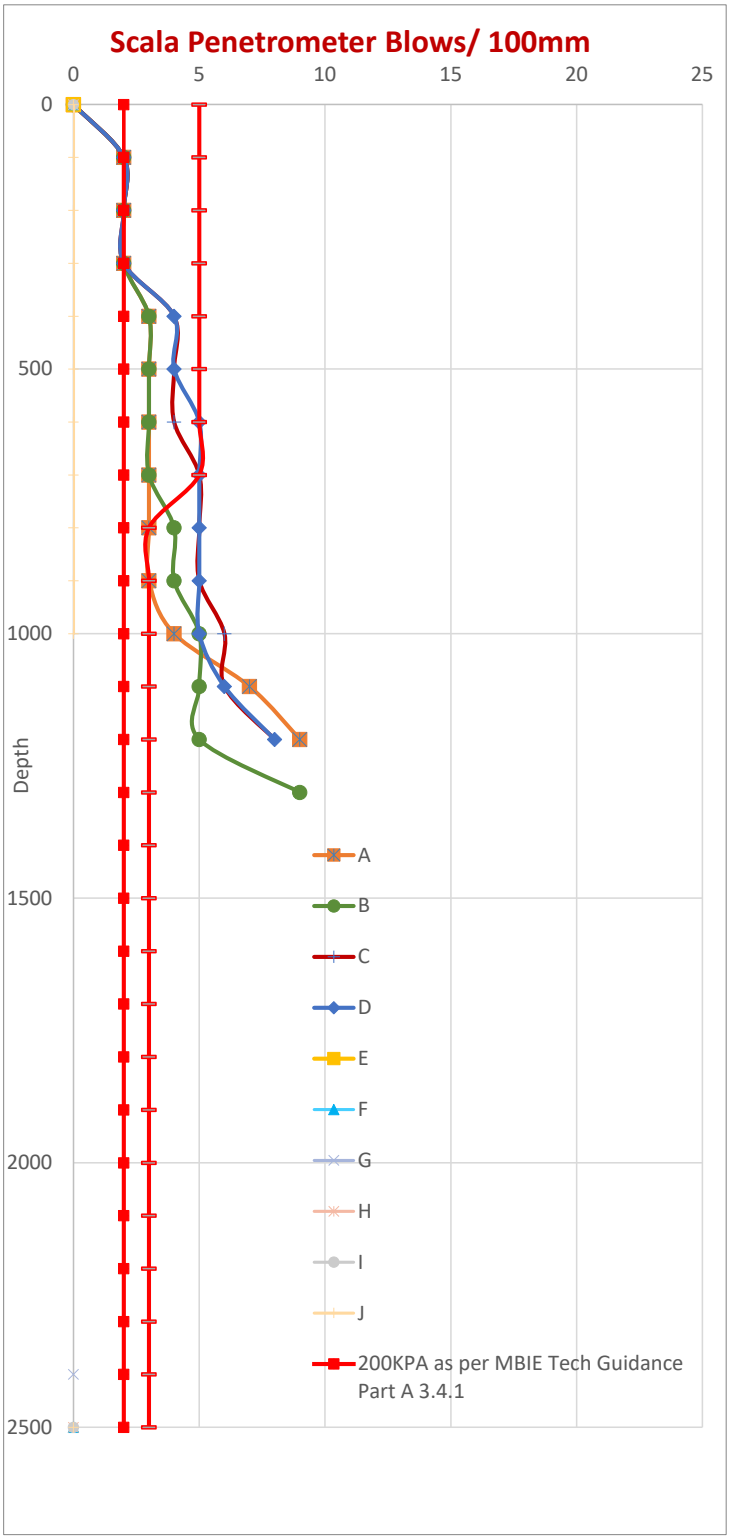
SCALA PENETROMETER FIELD SHEET - SUMMARY

Property: 236a State Highway 3 **BY** JDW
Client: Sentinal Homes

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							5
200	2	2	2	2							5
300	2	2	2	2							5
400	3	3	4	4							5
500	3	3	4	4							5
600	3	3	4	5							5
700	3	3	5	5							5
800	3	4	5	5							3
900	3	4	5	5							3
1000	4	5	6	5							3
1100	7	5	6	6							3
1200	9	5	8	8							3
1300		9									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



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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	-700		-700	-700	-300
b) Required digout area - footprint +	1.0		1.0	1.0	1.0
c) Can the work be carried out with the soil still in situ (roll / compact with suitable heavy machinery)	N		N	N	N

Notes:

This site is moisture sensitive and is suitable for a 300mm gravels rib raft system.

5 Piling options					
a) Driven timber piles					
b) Cast in situ concrete timber piles					
6 Slab options					
a) SED required for slab and foundations					
b) SED required for slab and foundations if the site is mechanically stabilised					

7 Summation

Site has unsuitable materials and does not comply with NZS 3604:2011 Sec 3 Good ground requirements. Specifically designed foundations are required for a NZS 3604:2011 type slab, but is suitable for a non sed 300mm gravel rib raft systems.

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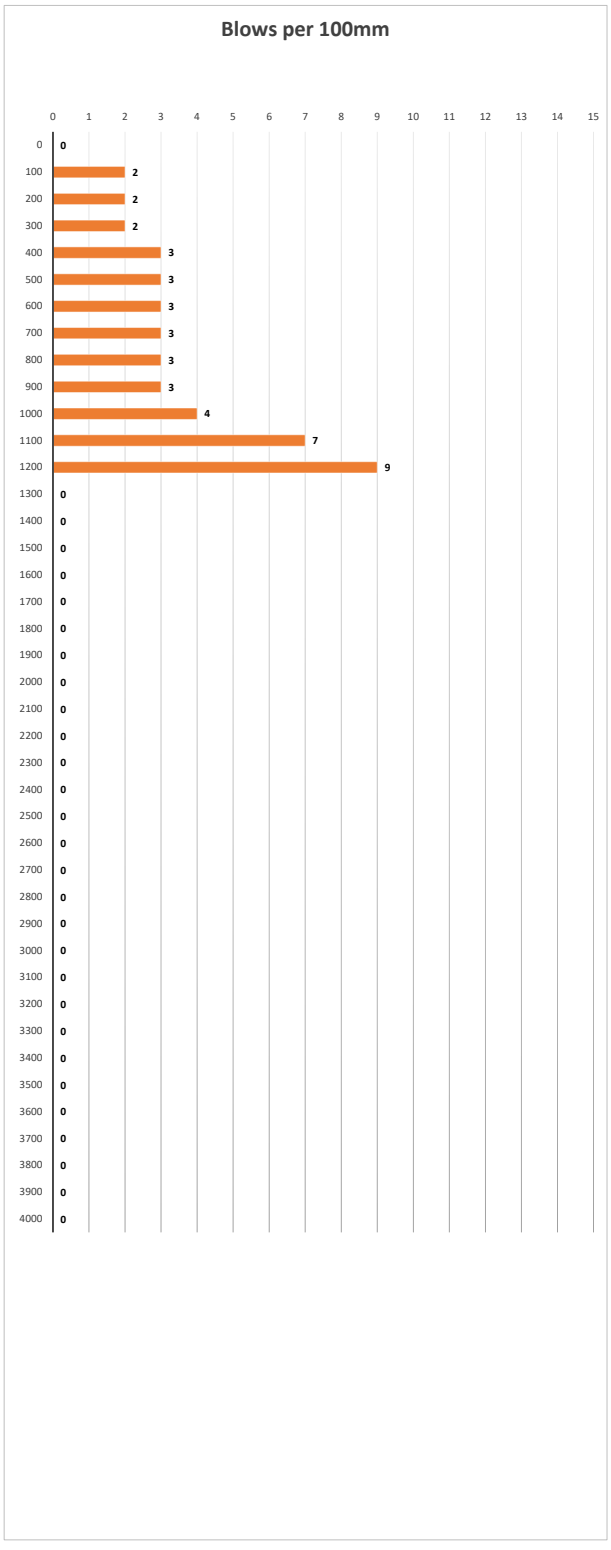
SCALA A PENETROMETER FIELD SHEET - SUMMARY

Site 236a State Highway 3

Logged by:	**JDW**
Date Tested:	11/10/2019

Client: Sentinal Homes

Water Table not encountered		
Soil Description	**Depth (m)**	**Blows**
	0	0
	100	2
	200	2
	300	2
	400	3
	500	3
	600	3
	700	3
	800	3
	900	3
	1000	4
	1100	7
	1200	9
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	2100	0
	2200	0
	2300	0
	2400	0
	2500	0
	2600	0
	2700	0
	2800	0
	2900	0
	3000	0
	3100	0
	3200	0
	3300	0
	3400	0
	3500	0
	3600	0
	3700	0
	3800	0
	3900	0
	4000	0
Additional Notes:		



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SCALA B PENETROMETER FIELD SHEET - SUMMARY

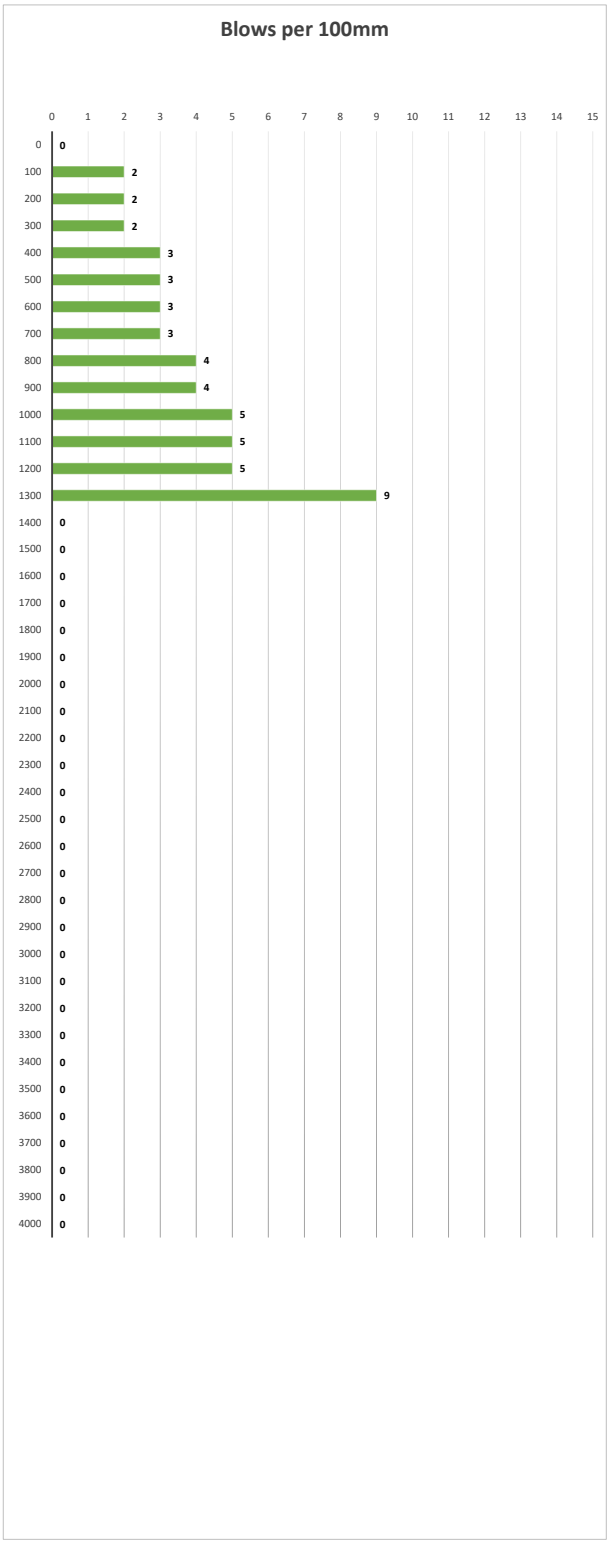
Site 236a State Highway 3

Client: Sentinal Homes

Logged by:	**JDW**
Date Tested:	11/10/2019

Water Table not encountered		
Soil Description	**Depth (m)**	**Blows**
	0	0
	100	2
	200	2
	300	2
	400	3
	500	3
	600	3
	700	3
	800	4
	900	4
	1000	5
	1100	5
	1200	5
	1300	9
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	2100	0
	2200	0
	2300	0
	2400	0
	2500	0
	2600	0
	2700	0
	2800	0
	2900	0
	3000	0
	3100	0
	3200	0
	3300	0
	3400	0
	3500	0
	3600	0
	3700	0
	3800	0
	3900	0
	4000	0

Additional Notes:



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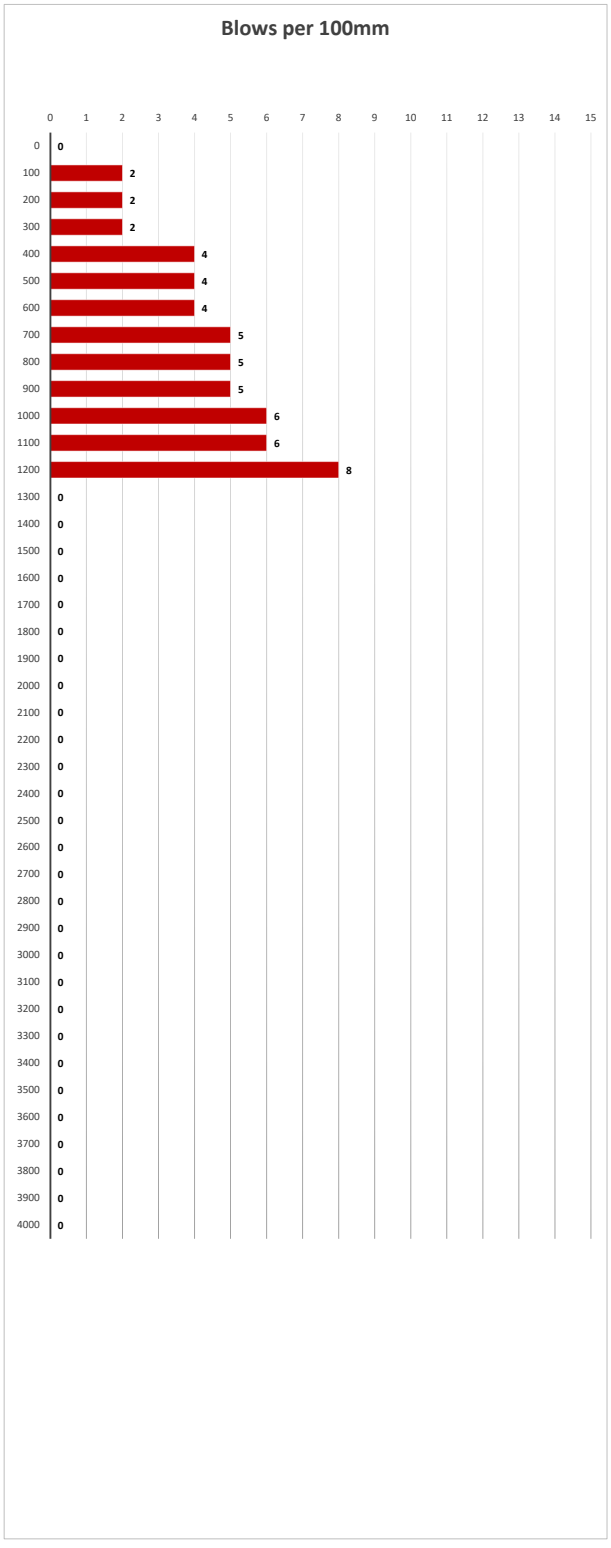
SCALA C PENETROMETER FIELD SHEET - SUMMARY

Site 236a State Highway 3

Logged by:	JDW
Date Tested:	11/10/2019

Client: Sentinal Homes

Water Table not encountered		
Soil Description	Depth (m)	Blows
	0	0
	100	2
	200	2
	300	2
	400	4
	500	4
	600	4
	700	5
	800	5
	900	5
	1000	6
	1100	6
	1200	8
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	2100	0
	2200	0
	2300	0
	2400	0
	2500	0
	2600	0
	2700	0
	2800	0
	2900	0
	3000	0
	3100	0
	3200	0
	3300	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

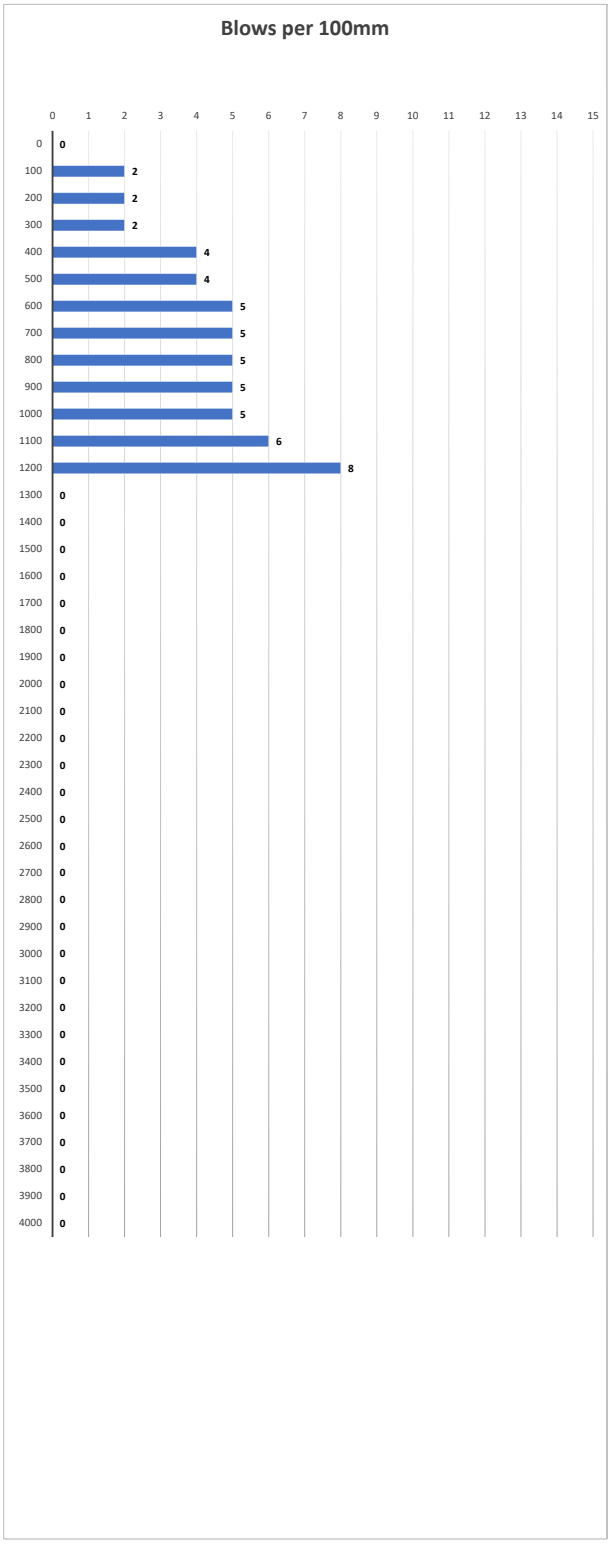
Site 236a State Highway 3

Logged by: JDW

Date Tested: 11/10/2019

Client: Sentinal Homes

Water Table not encountered		
Soil Description	**Depth (m)**	**Blows**
	0	0
	100	2
	200	2
	300	2
	400	4
	500	4
	600	5
	700	5
	800	5
	900	5
	1000	5
	1100	6
	1200	8
	1300	0
	1400	0
	1500	0
	1600	0
	1700	0
	1800	0
	1900	0
	2000	0
	2100	0
	2200	0
	2300	0
	2400	0
	2500	0
	2600	0
	2700	0
	2800	0
	2900	0
	3000	0
	3100	0
	3200	0
	3300	0
	3400	0
	3500	0
	3600	0
	3700	0
	3800	0
	3900	0
	4000	0
Additional Notes:		



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MIPENZ CPEng 186323

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

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

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.

sentinel HOMES

DESIGN. BUILD. enjoy!

Proposed New Residential Dwelling
236a State Highway 3
Wanganui

dc DESIGN
ARCHITECTUAL DESIGN

Dave Coker Design
144 Westmere Station Road
RD1
Wanganui
ph 06 348 0422
m 027 936 2169
Email coker.d.l.e@xtra.c.nz
BP114150

MATERIAL & CONSTRUCTION SUMMARY

ELEMENT	DESCRIPTION
Floor	Concrete strength 20 Mpa after 28 days. 85mm thick concrete slab, SE62 500E reinforcing mesh, min 225 mm lap on 0.25 polythene. On 20mm sand blindings to cover hardfill to ensure the vapour barrier is protected from any granular protrusions.
Walls	**EXTERNAL WALLS** Timber framed External walls to be 90x45 H1.2 SG8 @ 400mm ctrs with double top plate that have trusses set on top & 2 rows of dwangs. **DPC underlay under all bottom plates. Overlapping timber by min 6mm** **INTERNAL WALL:** (SG8 H1.2) 90x45 H1.2 frames with 140x35 top plate packer studs @ 600mm ctrs 2 rows of dwangs. 10mm Gib wall linings throughout except for wet areas to be 10mm Aqua Line Gib. Bottom plate fixing: Ramset HD875 driven pin + washer **(or equivalent)** @ 600mm ctrs.
Roof Framing	Trusses Manufactured by approved manufacturer @ 900mm ctrs
Roof Cladding	Corrugated long run colour steel (colour owner choice)
Ext Wall Cladding	70 Series bricks installed to manufacturers instructions James Hardie linea weatherboard cavity fixed to manufacturers instructions
Ext Joinery	Powder coated aluminum double glazed, size & location indicated on plans.(colour owners choice)
Insulation	R3.2 insulation to ceilings, R 2.2 insulation to walls.
Wall Int linings	10mm gib to walls wet areas to be 10mm aqua lins gib
Ceiling Linings	10mm std Gib to ceilings 10mm Aqua line ceiling to wet areas
Internal Doors	Owner Choice
Door Hardware	Owner choice.
Finishing lines	55mm Gib cove 60x12 MDF single bevel skirting & 60x10 F/J single bevel skirting to wet areas. 40x12 single bevel MDF architraves & 40x10 F/J single bevel architraves to wet areas
Floor Finishes	(Non slip Vinyl Kitchen, WC, Laundry, & Bathrooms owner to select size & colour Carpet to balance of house (owner to select colour and type)
Spouting	Continuous colour steel spouting owner to select style & colour on colour steel fascia
Water Heating	180 Litre electric hot water cylinder
Fashion Plumbing	Owner to select tape ware & sanitary fittings

PRELIMINARY AND GENERAL

* **Scope:** This specification conforming to the attached Agreement conditions of contract describes The work to be done and the materials to be used in the construction of the house shown on the Attached drawings

* **Building consent/s:** The owner or Owners agent shall apply to the Territorial Authority (TA) for BUILDING CONSENT, for inspections by the TA during the construction and pay all Bonds and fees Incurred.
* **Acceptable solutions:** All work shall be EQUAL (OR BETTER THAN) 'Acceptable Solutions' given in NZBC Approved Document; complying with the Building Act 1991 and Building Regulations. All as COMPLETED and SHOWN in TABLE 1.

* **Health & safety:** As directed by the Owner, the Contractor shall be responsible in complying with the Health and safety in Employment Act 1992 effectively operating a safety Management Programme for The duration of the contract.

* **Insurance:** The Contractor shall take out Builders All Risk Policy.

* **Interpretation:** Work or material shown on the drawings but not specified (or specified & not shown Shall be supplied as though both shown & specified. Materials shown but not specified must be of the Kinds commonly employed for the services they are intended to perform. All figured dimensions shall Be taken in preference to scale. The contractor shall be held responsible for setting out of work & he Shall make good at his own expense any errors that occur though his lack of checking or faulty Workmanship. Unless written as provide only or fix only, the words `provide` &`fix 'Shall mean Provide fix. `
  This document is a general specification & is to be read in conjunction with the plans & the Building Contract. Where there is any contradiction between the Building contracts the plans & specification The Building Contract shall take first precedence, the plans second precedence, the Specification Schedule third precedence & General Specification Forth precedence

* **Stability of construction:** The contractor shall carefully brace & support all of his work against Damage by wind and protect work from the elements as necessary during construction.

* **Protection of property:** The Contractor shall protect adjoining properties during the contract and Shall make good all damage at his own expense.

* **Damage:** The Contractor shall make good at his own expense & to the satisfaction of the controlling Authorities, any damage done to footpaths. Kerbs, drainage, etc. or other property under control of Such authorities. Each trade shall take care to prevent damage or disfigurement of the work of other Trades & will be responsible for cost of restoring same.

* **Materials:** Any materials specified that are not procurable when required, thus slowing progress of The Contract, may be substituted with other similar materials, providing that the substitute material Conform to the NZBC & permission is given by the Owner. The Contractor is first to notify the Owner Of any change proposed & at the completion of the Contract adjust any difference in cost.

* **Workmanship:** All work shall be carried out in accordance with the best trade practice, in strict Conformity with the drawings & specification to the satisfaction of the Owner. All defective or damaged Work shall be removed & made good to the satisfaction of the Owner.

* **Cleaning:** The Contractor, at the conclusion of the Contract, shall have all ceiling, wall & woodwork Carefully dusted & wiped down, windows washed & glass free from scratches, floor brushed & wiped Down & the entire building left in a perfect clean condition.

SET OUT

* **Setting out:** Set out the work as shown or implied on the drawings. Check accuracy in terms of Position, levels and Square.

EXCAVATION

* **General:** Accord with Preliminary and General Clauses applying to this section AND:-
  * Means of compliance to the relevant NZBC requirements.
  * Excavation code of Practice, Occupational Health & Safety Department.
  * Regional/Territorial Authority requirements for silt control from excavations

* **Setting out:** Set out the work as shown or implied on the drawings. Check accuracy in terms of Position, levels and Square.

* **Hard fill:** Use only approved fill well compacted under concrete ground floors & as otherwise specified.

* **Drainage trenches:** Take out seepage land drainage trenches where indicated to adequate depth & fall to prevent dampness under the building. Provide Nova Drain or similar bedding on scoria.

CONCRETE & REINFORCING

* **General:** Accord with Preliminary & General clauses apply to this section & means on compliance to NZBC requirements.

* **Extent of work:** Comprises the setting out, boxing & placing of concrete in foundations, floor slabs, Walls, beams & bands & any other concrete work shown in drawings.

* **Materials:** Ordinary grade concrete shall comply with NZS3104 & NZBC 3109. Concrete from an approved Batching plant only shall be used. Minimum concrete strength at 28 days shall be:
  A) 10MPa for un-reinforced concrete used in mass foundation.
  B) 17.5 Mpa for un-reinforced concrete application for reinforced concrete either not exposed to Weather or exposed to the Weather in zone B as shown in figure 4.12 NZS 3604:2011.
  C) 20MPa for reinforced concrete exposed to the weather at least 500m from mean high tide mark in Zone C as shown in Figure 4.2 NZS 3604:2011.
  D) 25 MPa for reinforced concrete exposed to weather in zone D as shown in figure 4.2 NZS 3604:2011

* **Formwork:** Formwork shall be so constructed that the concrete thickness & shapes required are obtained as detailed without removal causing damage. Methods of construction & pouring & curing of Concrete & times of removal of formwork shall be as set down in NZS: 3109.

* **Concrete foundation walls:** Foundation footings & reinforcing shall be the sizes shown on drawings in Accordance with relevant clauses of NZS: 3604:2011, supporting single story, 2 or 3 story as Appropriate. Such walls shall finish not less than 225mm above finished ground level but not more than 2m above the bottom of the footings.

* **Completion:** Make good any defective work. Leave all clean & stain free.

CARPENTRY

* **General** Accord with Preliminary & General clauses applying to this section & means of compliance to Relevant NZBC requirements.

* **Extent of Work**: The work of this section shall include all labour, materials, equipment necessary to Carry out & complete the carpentry as shown, or as further required by this specification. Any work That is intended or implied but not specifically shown but necessary for the proper completion of the Building shall be included.

* **Attendance & Protection**; Arrange & attend upon all works by other trades in a Logical sequence e.g. As in this section to allow early closing-in. provide all blocking, fixing, trims. Nogging as necessary for The full completion or their respective works & make good after all trades. Provide for temporary Protection from adverse weather & damage & ensure closing in of the building as soon as possible.

* **Materials & Workmanship:** All timber & wood based products shall conform to NZS: 3604:2011 Requirements, "Code of practice for specifying timber & wood-based products for use in building" Timber shown in the schedule of timbers to be treated with an approved preservation process in Plants licensed by the Timber Preservation Council. Any materials which in the opinion of the Owner,Loan Body or Territorial Authority is not up to standard, to be removed immediately from the site. All work shall be carried out in accordance with best trade practice.

* **Compliance with this Specification;**
  A) Do any works under specific design in accord with details provided. The Contractor & Carpenter Shall do all other work in accord with NZS: 3604 2011. In particular complying with the whole of SECTION 2- GENERAL of NZS: 3604. The requirement here shall be to meet NZBC Approved Documents B 1 - Structure & B 2 - Durability. The treatment requirements are:
  * Roof framing rafters and ceiling joists: H1.2 treated kiln dried radiata pine SG8
  * All wall framing: H1.2 SG8
  * Enclosed framing with flat roofs: H1.2 SG8
  * Exposed timber to the weather: H3.2
  * Close to contact with ground: H4
  * Timber subject to ground contact: H5

  B) All fixings of materials to be in accordance with NZS; 3604:2011, Section 4.

* **General Framing:** All framing to be 90x45 SG8 H1.2 @ 400mm ctrs for external walls & 90x45 SG8 H1.2 @ 600mm ctrs, for internal walls studs with 45mm wide studs to all openings not exceeding 3m span where supporting only one story. Top and bottom plates to be same size as Studs in long lengths, halved or nail plated at wall junctions & jointed over studs, all studs to comply with section 8 table 8.2 NZS 3604:2011. Provide dwangs @ no more than 900mm ctrs to full height each wall unless otherwise stated on drawings. Alternative kiln-dried (dry-frame).

* **Wall Bracing**: Provide all wall bracing as shown on drawings & wall bracing calculation sheets as is Intended to satisfy the Territorial Building Authority. Keep strictly to the "Type", Lengths & locations Shown on plan & elevations.

* **Damp Proofing**: All timber to be protected from dampness with 3-ply bituminous felt or other Approved damp proofing material when in contact with concrete or brickwork, or as in clause 2.1of NZS: 3604:2011

* **Roof Construction:** (See Drawings & Schedule of Timber for types.) TRUSSED: Drawings Showing clearly the type, pitch, span, spacing & overhangs of trusses & details of roof cladding, Shall be provided to Truss Manufacturer to allow them to comply with clause 10.22 NZS: 3604:2011. Thereafter, the Contractor shall match construction with the drawings & details provided by the

manufacturer throughout all stages of fixing & bracing. The contractor shall especially accord with the manufacturer's instructions for tying down where overhangs exceed 750mm. In all cases anchorage of all trusses to plates shall be with not less than 2/100mm skew nail plus 2/4.9 mm wire dogs

* **Purlins. Eaves, Gables:** size framing, spacing, overhangs & sheathing type as shown on plan.

* **Fascia Boards ECT:** fix fascia, barge frieze etc. to suit roofing selected.

* **Thermal Insulation:** All roofs, wall & floors are to be insulated in accordance with NZS: 4214 & NZS: 4218P. No insulation material shell is used that does not comply with NZS: 4222. All insulation Materials are to be installed in accordance with manufactures recommendations.
  * Wall to be insulated with R 2.2
  * Ceilings to be insulated with R 3.2

* **Moisture Control:** Where a vapor barrier is required in the form of foil or polythene film this Barrier shall be fixed according to manufacturer's instructions. Foil or polythene film shall not be used As a substitute for building paper. Building paper shall be properly fixed to bottom plates, especially in Veneer construction, to prevent entry of sub-floor air into stud cavities. Linings shall not be fixed Until moisture content of framing has been tested and approved.

* **External Cladding 70 Series brick installed to manufacturers instructions**
  James Hardie Lineia weatherboard cavity fixed installed to manufacturers instructions

* **Ceilings:** Ceiling linings "10mm std Gib"10 mm Aqua line to wet areas Gib Board Fix to manufacturer's instructions. "Fixer & Stopper to be approved". All nails, screws, fixing & joints to be a true smooth surface. In particular fix all ceiling servicing as structural ceiling diaphragms under terms of NZS: 3604:2011. (See Winstone Wallboard Ltd Taped joint system). Check that each wall under or connected to has adequate bracing for diaphragm.

* **Internal Wall Linings:** 10mm gib board & 10mm aqua line gib to wet areas after Placement of thermal insulation when framing has moisture of no more than 16%.

* **Skirting's, Architraves & Scotia:** 55mm Gib cove 60x12 MDF single bevel skirting & 60x10 F/J single bevel skirting to wet areas. 40x12 single bevel MDF architraves & 40x10 F/J single bevel architraves to wet areas

JOINERY

* **Joinery:** Joinery & Glazing shall comply with the following standards;
  * NZS 4211 (Specification for performance of windows)
  * NZS 3504 (Specification for Aluminum windows)
  * NZS 4203 (General structural design)
  * NZS 4223 .1 (Selection & installation) . 3 (Human impact safety) & . 4 (loadings)
  * AS/NZS 4666 (Insulation glass units)
  * AS/NZS 4667 (Quality requirements & tolerances)
  * AS/NZS 2208 (Safety glazing materials)
* Obtain joinery from reputable aluminum joinery manufacturer. Supply complete with glazing, friction restraints, & catches. Fix plumb both ways & in correct alignment & flash all in accord with manufacturer's instructions.

ROOFING

* **Temporary** bracing as might be necessary, & shall be provided in walls below to sustain such loading until Roof cladding is complete & wall lining subsequently fixed.

* **Underlay** shall be breather type building paper to NZS: 2295 run horizontally with upper sheets lapped 150mm over lower sheets & with bottom edges turned over fascia into gutters. Such underlay shall be Provided under all metal roofs & be adequately supported by 100mm wire mash unless self-supporting.

* Provide all gutters, valleys & under flashings, compatible with roof material, before cladding Commences. Valleys shall be 0.6mm to match colour of roof at least 400mm wide with folded edges & With lower end finishing well into spouting.

* **For** profiled metal roofing set out purlins as shown on plans 900mm ctrs & to suite ridge fixing.

* **Ensure** all edges of roof cladding are adequately supported around projections such as pipes, ducting & Roof lights.

* Roof cladding shall be **Corrugated Long Run Colour Steel (owner to select colour).**

* Adequately & neatly secure all ridges, caps & over flashings wherever needed to make & keep roof Watertight.

* Do not leave swarf, broken rivets, screws, nails or waste metal on roof

PLUMBING

* Wherever possible use flashing that are readily available but purpose-made for a given situation. Otherwise provide flashings as required & adequately secure. Flash wherever needed to make & keep The building envelope watertight. Ensure compatibility with other materials. Flashings to each window Head & door shall be provided in one piece.

* **Spouting** shall be Continuous colour steel (owner to select colour). Connect outlets to 80mm diameter downpipes. Provide sufficient
Number of downpipes to service roof areas. Discharge storm water though 90mm uPVC pipes to Lateral as shown on site plan.

* **Provide** 12mm POLYBUTLENE pipe to all fittings. All branched to be as short, straight & at even gradient as possible. Use only approved connections throughout. All pipes are to be adequately supported, well secured & concealed.

* **Water** heater to be **180 Litre electric Hot Water Cylinder** location indicated on plans

* **SANITARY Fittings to** be chosen by owner.

* Consult with owner on choice of brands & fixing of all **taps, faucets & mixing valves.** Provide & fix all other water supply fittings as necessary.

* Provide all necessary waste pipes, soil stacks, back vents, terminal vents, & necessary overflow pipes. Proved cleaning eyes to all pipes at junctions.

* Under no circumstances should holes or notches etc. be cut except in accordance with the Restrictions imposed by NZS 3604. The plumber is to make good at his own expense, any failings In this regard.

DRAINAGE

* No connection to sanitary drains or mains shall be made except by a registered plumber. Plumber shall Arrange all permits, connection and testing fees.

* All materials shall be the best of their respective kinds. Typically pipes shall be uPVC in sizes stated On the plans.

* All drains are to be laid to straight lines & even grades with sockets against fall in all cases. Minimum Cover of 375mm is to be maintained. The whole of the soil and storm water drains are to be laid to a Regular & even fall.

* The plan shows the layout of the system. Additional fittings that may be required but not Specifically shown must be allowed for by the drain layer to comply with normal practice to comply With G13 of the NZBC.

* **The** pipes are to be jointed in a proper manner according to materials used.

* **Supply** all gully traps & securely bed & build up with 5:1 concrete surround, 150mm above finished Ground level.

GIB STOPPER

* Use only materials approved by winstone wall boards for the jointing of sheets & follow closely Jointing instructions supplied by them.

* Tape all joints. All external corners shall be reinforced with Gib slim angle.

* Finish being level 4 throughout.

* Sweep site & remove all rubbish to leave interior ready for painting.

ELECTRICAL

* Pay all fees & charges & obtain all necessary permits for this trade.

* Carry out the whole of the electrical installation in accordance with the latest Electrical Wiring Regulations & meter wiring diagrams.

* All work shall be carried out by Registered Electrician in accordance with regulation& best trade Practice & in a manner which will cause minimum inconvenience to other workmen& the work as a whole.

* Allow for power points, switches, Light fitting etc. in accordance with the electrical plan final position Shall be determined by the owner on the job.

* Generally install plugs 300mm above floor 225mm above bench top. Point to washer, dryer & Refrigerators (where required) & light switches shall be 1200mm from floor. Style & make of points Shall be the owner choice.

* Lights not otherwise specified shall be standard white plastic batten holder type.

* Leave work complete, pay all charges & arrange for all inspections & tests & for connection of power to Works. Supply owner with electrical certificate on completion.

* Under no circumstances should holes or notches ECT, be cut except in accordance with restrictions Imposed by NZS: 3604. The Electrician is to make good at his own expense, any failings in this regard.

PAINTING

* Generally all materials shall be of approved brands & premium quality (i.e. Dulux Resene ECT). Respective coats shall be of the same brand.

* Surface shall be clean & properly prepared before applying coats & all work shall be in accordance With Code of Practice NZS: 7703 “Painting of Buildings“.

* Owner is to select colour scheme. Allow for a 2 way colour scheme to allow ceilings, finishing items & Features to be picked out in different colours.

* Stop all holes in finishing timber as required.

* Inspect finish of Gypsum wall boards & ceilings after successive coats in glancing light, &arrange for Rectification work by the Gib stopper to be carried out as required (at his expense).

* Bare surfaces are to be primed & sealed in accordance with topcoat manufacturer’s instructions.

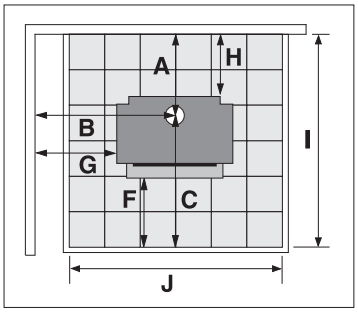
* Apply at least 2 top coats to all surfaces. Additional coats may be required to achieve a totally opaque Finish.

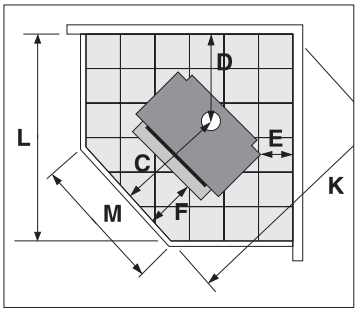
* PVC Downpipes shall be lightly sanded & primed with a suitable etch primer prior to finishing with at Least 2 coats of selected paint finish.

CLEANING & COMPLETION

* The Contractor. At the conclusion of the contract, shall have all ceilings, walls & woodwork carefully Dusted & wiped down, windows washed down, & glass free from scratches, floors brushed & wiped down & the entire building left in a perfectly clean condition. All subcontractors shall remove all their Rubbish & leave the site tidy for other trades.

Wood Fire Installation & Owner's Operation Manual





metrofires

Freestanding Wood Fires

NZHHA New Zealand Home Heating Association Inc.

NEW ZEALAND MADE

PIONEER MANUFACTURING LIMITED

19 Oropuriri Road // New Plymouth 4312
info@metrofires.co.nz // www.metrofires.co.nz

⚠ WARNING! Important Information

- **WE HIGHLY RECOMMEND YOU READ THIS ENTIRE MANUAL AS INCORRECT OPERATION, MISUSE AND/OR LACK OF MAINTENANCE WILL VOID THE WARRANTY**
- The appliance and flue-system shall be installed in accordance with AS/NZS2918 and the appropriate requirements of the relevant building code or codes
- Any modification of the appliance that has not been approved in writing by the testing authority is considered to be in breach of the approval granted for compliance with AS/NZS4013 and will void the warranty
- The appliance must be installed correctly. We recommend a competent and suitably qualified NZHHA installer

⚠ CAUTION! Important Information

- Mixing of appliance or flue-system components from different sources or modifying the dimensional specification or components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted in the first instance
- Do not install a Metro fire if there is any sign of visible damage to the product
- This appliance must be regularly maintained.
- Use authorised Metro replacement parts only. The use of unauthorised parts may void the warranty
- This manual MUST be left with the home owner

All Metro wood fires comply with AS/NZS2918:2001 when installed in accordance with this manual. Please ensure you are fully conversant with the relevant standard and the contents of this manual. Correct installation is critical to the safe operation and performance of this wood fire.

Please take particular note of the following:

- It is recommended that Metro fires be installed with a Metro ECO flue system which has been developed to enhance the performance of Metro wood fires. Any alternative flue system must have a minimum flue pipe length of 4.2 metres of 150mm diameter flue pipe & have been tested to AS/NZS2918:2001
- The 150mm active flue pipe must be fully encased from the ceiling to the underside of the flashing cone at the top of the flue system, (i.e. there must not be any 150mm flue pipe exposed)
- All flue pipe joints must be sealed and riveted. The bottom of the flue pipe in particular MUST be fully sealed into the flue outlet of the Metro fire
- In New Zealand, the Metro fire must be bolted through the floor protector into the floor to comply with the seismic restraint provisions of AS/NZS2918:2001
- All Metro's are extremely heavy, varying in weight from 75kgs up to 185kgs. During the installation process do not lift the appliance by yourself, and take care not to damage the panel coating
- Please take care when lifting the Metro fire into place onto the hearth or floor protector as point loading may break tiles and/or scratch surfaces.

Assembling your Metro wood fire

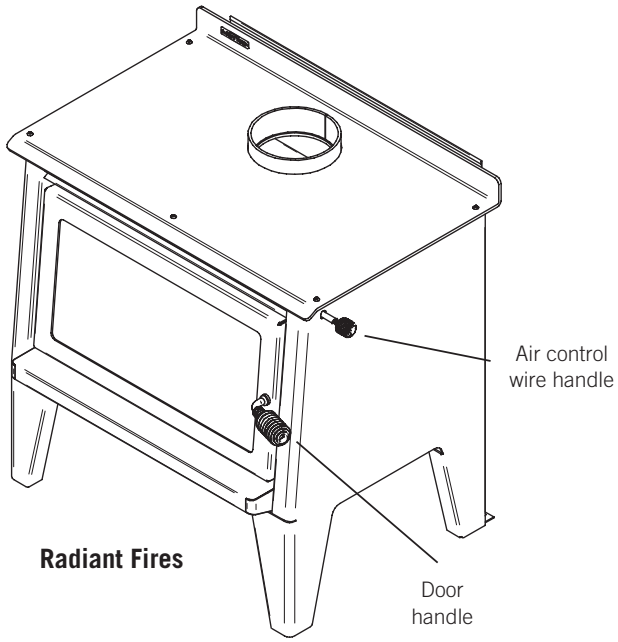
Please note: You should only assemble this wood fire if you are suitably experienced in wood fire assembly and installation. The Metro carton shows the model Metro you are about to install, enabling you to select the appropriate model's assembly instructions.

All Metro wood fires are packed in a single heavy-duty carton, and tek screwed to a wooden pallet. Having removed the packaging and located this manual, familiarise yourself with the illustrations on pages 2 & 3, and proceed as follows.

Metro radiant fires

These Metro's are supplied virtually fully assembled. Packed inside the firebox you will find bricks in a cardboard wrapper, a wire door handle and the air control wire handle.

- Remove the two tek screws located at the base of each rear leg which secure the Metro to the wooden pallet, and carefully 'walk' the Metro off the pallet
- Open the door fully and fit the side bricks to each side of the firebox. Location lugs are fitted to the base and rear wall of the firebox to retain the side bricks in position. Refer to Diagram 2
- Attach the door handle to the door latch assembly by screwing it on clockwise
- Attach the air control wire handle by screwing it on clockwise.



Radiant Fires

Assembling your Metro wood fire

Please note: You should only assemble this wood fire if you are suitably experienced in wood fire assembly and installation.

Metro pedestal and base model fires

To eliminate freight damage, the pedestal base has been packaged inside the firebox. To safely assemble your Metro, please proceed as follows:

- Lift off the top grill (convection models only) and place somewhere safe. Be careful not to chip the enamel coating or damage paint
- Open the door 45 degrees and lift the door off the hinge and place somewhere safe. Be careful not to damage the finish
- Remove the pedestal packed in a cardboard wrap
- Remove, rotate and re-fix the mount plate to the pedestal.

  Note: The pedestal mount plate is fixed to the back of the pedestal base with 4x screws. This mounting plate must be removed, rotated and re-fixed to the pedestal as detailed on page 4 in diagrams 3 and 3A. The return fold must face back the opposite way to create the mount plate and fixing points for seismic restraint of the wood fire.
- Remove the pedestal heat shield

  Note: For some models the pedestal heat shield may be taped to the rear heat shield. The ECO Tiny Ped's pedestal heat shield is pre-fitted.
- Remove the side bricks, door handle and the bolt bag
- Remove the 2 tek screws at the base of the inside of the firebox that fix the wood fire to the pallet.

It is recommended that 2 people work together with the next step:

- Grab the underneath top of the firebox door opening with one hand, holding the flue spigot with the other, slowly lift the front of the wood fire all the way back and rest the wood fire on its rear heat shield on the floor. Remove the packaging pallet.
- Fit the pedestal heat shield over the 4 bolts as shown in Diagram 1, with the open edge facing the front of the Metro (up)
- Position the pedestal with its front facing over the 4 bolts and fit the washers and nuts supplied, check to ensure the pedestal is correctly aligned and securely tighten the nuts.

It is recommended that 2 people work together with the next step:

- Grab the flue spigot with one hand and the other hand underneath the top of the firebox door opening, lift upwards standing the wood fire onto its pedestal
- Fit the side bricks to each side of the fire box. Location lugs are fitted to the base and rear wall of the firebox to retain the side bricks in position. Refer to Diagram 2. (Classic Rad also features two side rear bricks).
- Re-fit the door and top grill (Convection models only)

All Metro models

Check to ensure the top baffle is in its correct position in the top chamber of the firebox. It should be resting on four support lugs (two on each side of the firebox). The baffle must be hard back against the rear of the firebox with the "promet extension" (white board) or return front steel edge of the baffle facing forward as illustrated in Diagram 2.

Note: Some models feature a two-piece top baffle.

Diagram 1

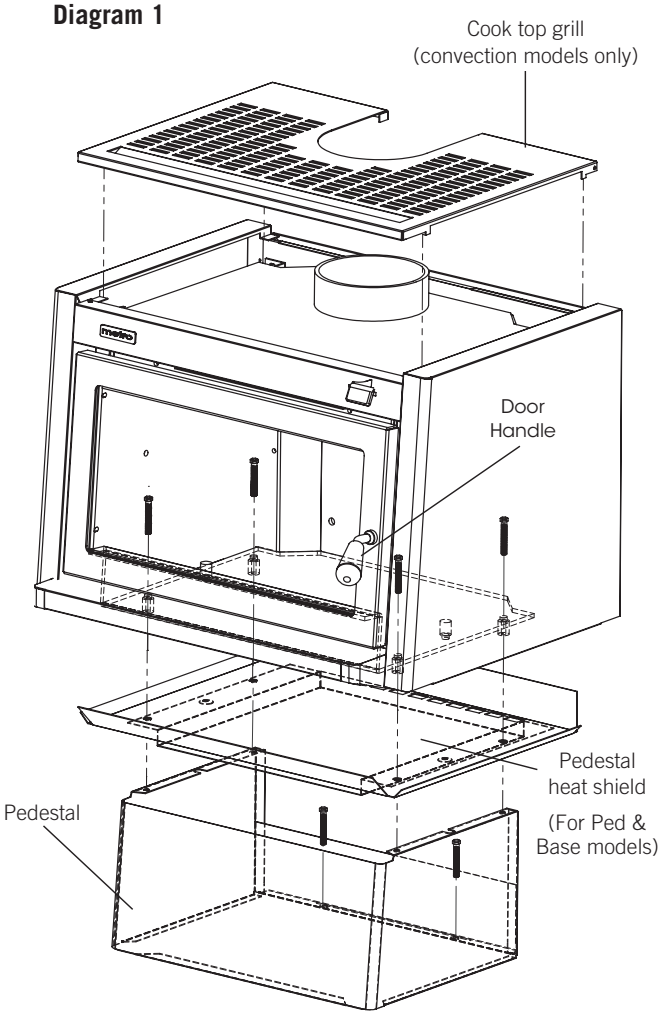
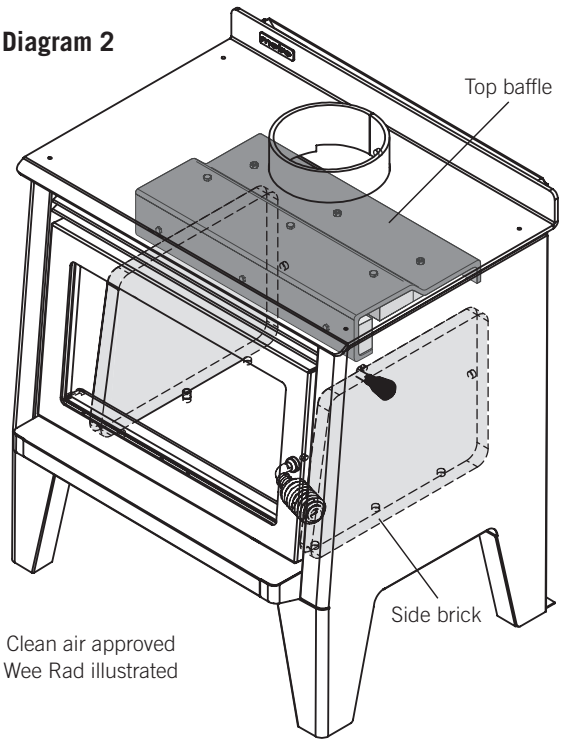


Diagram 2



Floor protector size, construction and fitting

Pioneer manufacture an extensive range of Pioneer 'Ash Floor Protectors' which comply with the minimum floor protector requirements of AS/NZS2918:2001, and can be installed with any freestanding Metro wood fire. Metro freestanding wood fires do not require an insulated floor protector as they comply with the minimum floor protector requirements of AS/NZS2918:2001. These minimum floor protector requirements are;

- They must be of adequate size to give appropriate wall, rear and front clearances/projections as detailed below and in the chart illustrated on page 7. Note;
- The floor protector must extend 200mm horizontally to the rear and each side directly below the door opening, and 300mm forward of the door opening
- The upper surface of the floor protector must be made of non-combustible material.

A suitable floor protector for a Metro freestanding wood fire is therefore any non-combustible material which could include;

- Ceramic tiles with grouted joints fixed directly to a hard base over timber flooring
- A sheet of toughened glass, panel steel etc. laid directly onto a wooden or other combustible floor.

Metro radiant fires

Lift the Metro fire onto the floor protector and using a suitable measuring device, ensure that the minimum wall clearances and front floor protector projections as detailed in the chart on page 7 are met or exceeded. Once the Metro's location on the floor protector is established and if the installation is within New Zealand, seismic restraint is required.

Using masonry anchors if the floor protector is on a concrete floor or coach bolts if a wooden floor, secure through the holes provided at the base, behind both rear legs.

Note: The anchors must pass through the floor protector and securely anchor the Metro to the floor.

Metro pedestal and base model fires

Prior to lifting the Metro fire onto the floor protector, ensure you have removed, rotated and re-assembled the mount plate from the back of the pedestal base as detailed in diagrams 3 & 3A above. This rear panel must be rotated with the return fold facing back the opposite way to create the mount plate and fixing points for seismic restraint of the wood fire.

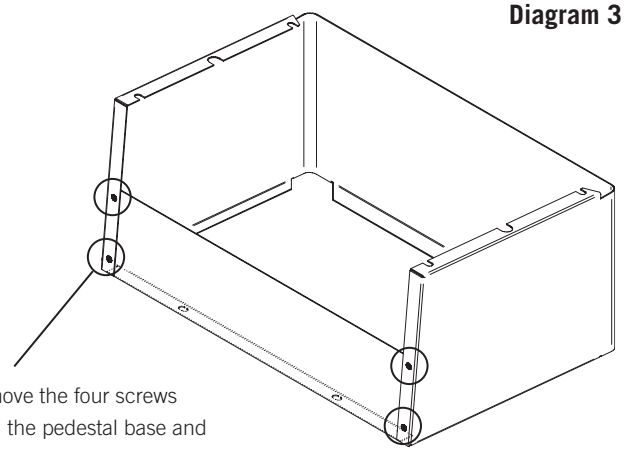
Lift the Metro fire onto the floor protector and using a suitable measuring device, ensure that the minimum wall clearances and front floor protector projections as detailed in the chart on page 7 are met or exceeded.

Once the location of the fire is established, you can then secure the Metro through the floor protector into the floor using the two seismic restraint holes in the rear edge of the mount plate. Use masonry anchors if the floor protector is on a concrete floor or coach bolts if a wooden floor

Note: The anchors must pass through the floor protector and securely anchor the Metro to the floor.

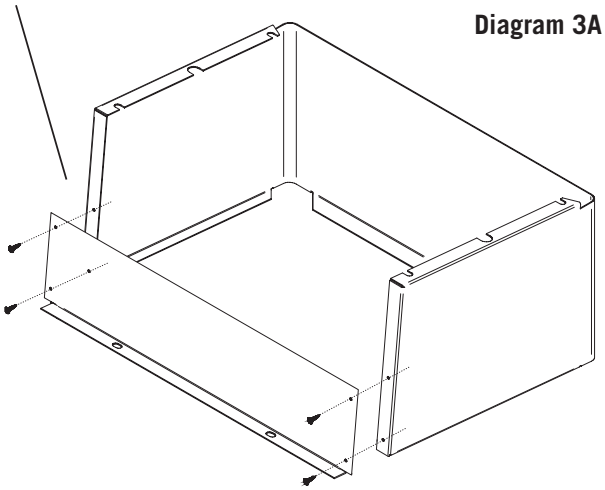
Preparing the mount plate

Diagram 3

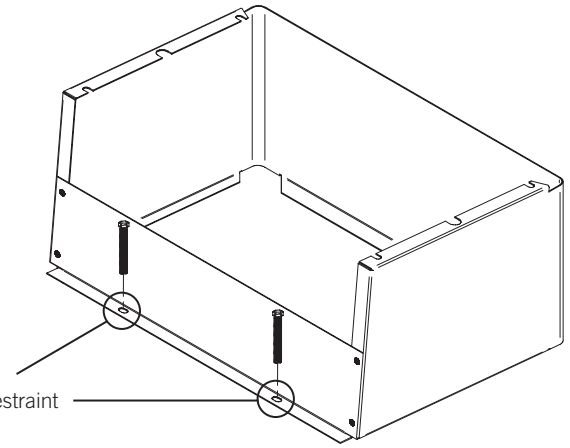


Remove the four screws from the pedestal base and rotate the mount plate so the return fold faces back the other way. Refix in place.

Diagram 3A



Correct mount plate position



Flue installation

It is recommended that all Metro freestanding wood fires be installed with the energy efficient ECO Flue System which comes complete with a detailed installation manual. This installation manual must be presented with your application to gain consent with your local council.

A copy of the ECO Flue System installation manual can be downloaded from metrofires.co.nz, or a copy can be obtained from your Metro retailer. Any alternative flue system must comply with and be installed as detailed in AS/NZS2918:2001, and a copy of the installation manual must also be presented with your application to gain consent with your local council.

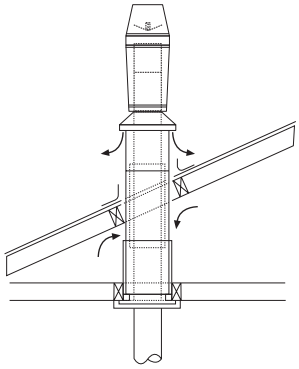
All Metro fires require a 150mm diameter flue. Please note:

- Metro ECO flue systems must be installed to allow unrestricted air supply from either the ceiling cavity for an ECO Flue Kit, or above the roof line if the ECO Flue Kit and ECO Option Kits are both installed
- The ECO Flue system must be installed into a 'vented' flat ceiling cavity, or have an ECO Option Kit added to the flue system to provide an external air supply
- ECO Flue systems shall be installed in accordance with AS/NZS2918:2001 and the appropriate requirements of the relevant building codes
- Any modification to this flue system that has not been approved in writing by the testing authority is considered to be in breach of all approvals granted
- The flue systems 150mm diameter flue pipe must terminate a minimum of 4.6 metres above the top surface of the floor protector
- All joints in the flue pipe must be sealed with Pioneer fire cement (or similar) and riveted. The base of the flue pipe must also be sealed into the Metro fires flue outlet. This is critical for optimum operation.

All Metro fires have been tested with a Pioneer double flue shield. For the Metro fire to be installed with minimal clearances as the clearance table on page 7 states, only the Pioneer double flue shield can be used. All other flue shields will invalidate the installation.

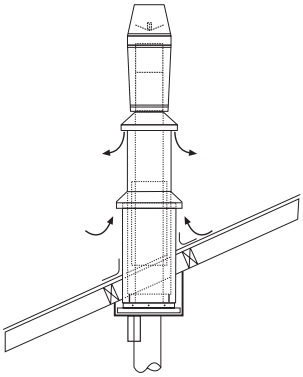
Detailed below are the more common installation methods for installing Metro ECO Flue Systems. To ensure a safe and efficient installation, this flue system must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

Single Storey Installations



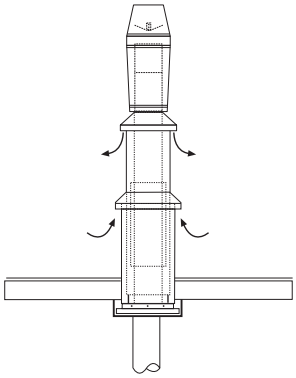
Flat Cavity Ceiling

ECO Flue Kit only required as air is drawn into the flue system direct from the ceiling cavity.



Sloping Ceiling

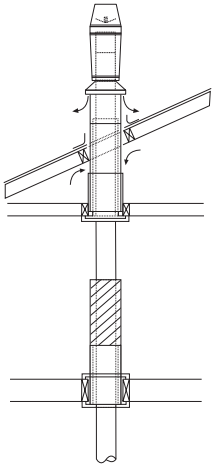
Both the ECO Flue Kit and ECO Option Kit are required to enable air to be drawn from outside the home.



Flat Ceiling/Roof

Requires both ECO Flue Kit and ECO Option Kit as per sloping ceiling unless a vented ceiling cavity exists.

Two Storey Installations



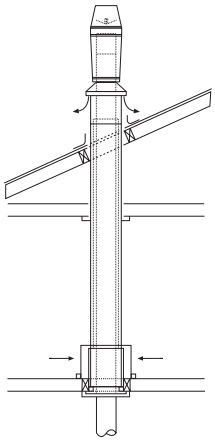
2nd Floor - Exposed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- A floor penetration kit
- 1x 1200mm long mesh/screen

*In accordance with AS/NZS2918:2001



2nd Floor - Enclosed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- 200mm & 250mm inner/outer combination liners.
- 2nd floor vent cover and an additional ceiling plate with a 250mm diameter hole

*In accordance with AS/NZS2918:2001

Wetback installation

⚠ WARNING! Important Information

- DO NOT connect to an unvented hot water system
- Install in accordance with AS 3500.4.1 or NZS 4603 and the appropriate requirements of the relevant building code or codes.

⚠ CAUTION! Important Information

- Wetbacks must be connected with water before operating the fire and available to the wetback while the fire is in operation
- Wetback systems are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail
- Rainwater collection tanks installed lower than the wetback that use a water pump to supply the home, can cause problems if the pump is not operational. In these situations either the type of wetback or a roof header tank should be considered

Wetback	Suitable for models:
2kW Wetback 	• ECO Tiny Rad • ECO Tiny Ped
Side Wetback 	• Tiny Rad Woody • Wee Rad Leg & Wee Rad Base • Wee Rad Woody • Wee Ped • Classic Rad
3kW Wetback 	• Xtreme Rad Leg & Xtreme Rad Base • Xtreme Rad Woody • Xtreme Ped • Mega Rad • All LTD rural models
4kW Wetback 	• All LTD rural models

The Wee Rad V2 Base model cannot be fitted with a wetback.

Water heating is another key feature of your Metro wood fire; nearly all Metro models can be fitted with a wetback, which are designed to give maximum output with minimal effect on the operation of the fire. Only the Pioneer cast jacket wetback system should be fitted to your Metro; alternative wetbacks will void the Metro's emission approvals and may seriously affect the performance of the appliance and void its warranty.

Wetback connections are as follows, taken facing the Metro/wall; the return pipe connection is directly above the inlet connection. Heights for all models are illustrated and detailed opposite on page 7.

- ECO Tiny Ped and ECO Tiny Rad models are 92mm left of the flue centre
- The Tiny Rad Woody model is 184mm left of the flue centre
- Wee Series models are 226mm left of the flue centre
- The Classic Rad model is 184mm left of the flue centre
- All other models are 140mm left of the flue centre

All wetbacks are fitted to the inside rear wall of the firebox, with the exception of the Tiny Rad Woody, clean air Wee Series models and the Classic Rad model. Side wetback position for these models is to the outside left hand firebox wall. Please see the specific installation instructions in the 'Side Wetback' box for installation of a wetback into these appliances.

It is recommended the return pipe has a minimum rise of 1 in 12; performance will reduce as the distance to the storage cylinder increases.

To fit the wetback proceed as follows

1. Remove the rear panel of the Metro by removing the four pozi drive screws. Remove the two pre-punched knockouts from this panel.
2. Two further knockouts will be visible on the inner rear heatshield, remove these also. Once these are removed 6mm nuts will be visible through the knockout holes.
3. Open the Metro's door and locate two bolts securing the pressed washers which are visible on the left hand side of the firebox for both inlet and outlet connection points.
4. A further three bolt heads will also be visible on the inside rear wall of the firebox; these are threaded into the 6mm thick firebox. Remove all three.
5. Using the tube of sealant supplied with the wetback, apply a liberal bead of sealant around both the two connection pipes and also the outer circumference of the wetback which will face and press against the inside rear wall of the firebox. This will completely seal the wetback to the inside rear wall of the fire on installation.

Ensure there is no gap between pipe and rear wall access holes. This cement must fully cure before appliance use.

6. Fit the wetback into the firebox and carefully pass the connection pipes through the holes in the rear of the firebox. Securely attach the wetback using the three bolts previously removed from the rear face of the firebox, fitting them through the slots provided in the wetback's jacket.
7. The wetback is now ready for connection to the storage cylinder by a registered plumber.

Metro clearances and specifications (Minimum clearances shown are in mm, with a Pioneer double flue shield fitted)

Minimum clearances

All Metro wood fires comply with AS/NZS2918:2001. Minimum clearances shown below are detailed in millimetres, with a Pioneer double flue shield fitted to the appliance. Measurements are taken from the following reference points as illustrated:

- From the nearest combustible wall or surface (A, B, D, E, G, H)
- From the Metro's flue centre (A, B, C, D)
- From the Metro's cabinet/heatshield outermost point (E, F, G, H)
- To the edge of the ash floor protectors non-combustible surface (C, F, I, J, K, L, M)

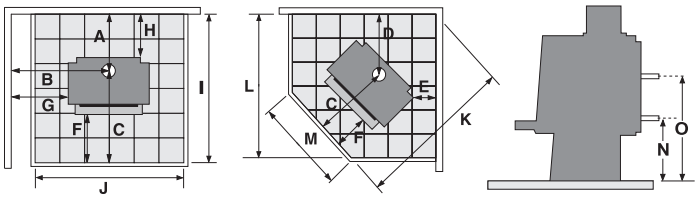
AS/NZS2918:2001 allows for a reduction in minimum clearances as detailed in Section 3, tables 3.1 and 3.2 of the standard.

Some Metro models have undergone additional testing which allows for reduced clearances. Please see the footnotes below the clearance table for the applicable models.

Wetback connections (taken facing the Metro/wall)

- ECO Tiny Ped and ECO Tiny Rad models are 92mm left of the flue centre
- The Tiny Rad Woody model is 184mm left of the flue centre
- Wee Series models are 226mm left of the flue centre
- The Classic Rad model is 184mm left of the flue centre
- All other models are 140mm left of the flue centre

Specifications were correct at the time of printing, but may alter and those detailed within should be used only as a guide. If in doubt, please consult your Metro retailer or metrofires.co.nz.



	Minimum installation clearances with a Pioneer double flueshield fitted (mm)													Wetback		Dimensions		
Clean air models	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**Width**	**Depth**	**Height**
ECO Tiny Ped	211	433	580	290	25	235	185	60	791	650	990	780	250	280	470	496	492	659
ECO Tiny Rad	230	553	585	419	150	232	300	75	815	650	1180	910	250	280	470	505	508	667
Tiny Rad Woody	251	568	580	382	110	232	310	100	831	650	1120	870	250	365	555	515	498	758
Wee Rad - Leg [1]	251	568	580	456	150	232	260	100	831	825	1225	1016	425	295	485	615	501	688
Wee Rad - Base	271	678	580	486	180	232	370	120	851	825	1270	1048	425	295	485	615	501	691
Wee Rad - Woody	271	708	580	506	200	232	400	120	851	825	1295	1066	425	365	555	615	501	758
Wee Rad V2 - Base	318	768	580	586	250	232	460	150	898	825	1410	1147	425	N/A	N/A	615	518	691
Wee Ped [2]	263	651	580	473	170	230	350	110	843	825	1250	1034	425	295	485	602	503	665
Classic Rad [3]	257	695	780	500	220	229	430	100	1037	728	1490	1170	328	393	583	530	708	680
Xtreme Ped	251	624	630	442	110	226	280	100	881	907	1260	1070	507	312	502	688	554	707
Xtreme Rad - Leg	251	650	630	458	100	227	280	100	881	907	1280	1084	507	312	502	740	554	743
Xtreme Rad - Base	251	650	630	458	100	227	280	100	881	907	1280	1084	507	312	502	740	554	743
Xtreme Rad - Woody	251	680	630	478	120	227	310	100	881	907	1306	1103	507	382	572	740	554	813
Mega Rad	285	720	728	497	100	224	300	130	1013	1006	1435	1229	606	300	490	840	659	744
LTD rural models	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**Width**	**Depth**	**Height**
LTD Wee Rad - Leg	251	548	580	426	120	232	240	100	831	825	1185	989	425	295	485	615	501	688
LTD Wee Rad - Base	251	658	580	486	180	232	350	100	831	825	1270	1048	425	300	490	615	501	691
LTD Wee Rad - Woody	271	708	580	506	200	232	400	120	851	825	1295	1066	425	365	555	615	501	758
LTD Xtreme Rad - Leg	251	650	630	458	100	227	280	100	881	907	1280	1084	507	350	540	740	554	743
LTD Xtreme Rad - Base	251	650	630	458	100	227	280	100	881	907	1280	1084	507	350	540	740	554	743
LTD Xtreme Rad - Woody	251	680	630	478	120	227	310	100	881	907	1306	1103	507	420	610	740	554	813
LTD Mega Rad	285	720	728	497	100	224	300	130	1013	1006	1435	1229	606	300	490	840	659	744

The Wee Rad installed with a Pioneer double flue shield with the Wee Rad corner wing shields fitted allows for reduced clearances as follows:

[1] Wee Rad - Leg corner clearance (E) can be reduced to 120mm. This in turn also reduces clearances (D) to 426mm, (K) to 1185mm and (L) to 987mm. When fitting the corner wing shields, the Wee Rad - Leg itself must be installed to a corner clearance (E) of 120mm. The corner wing shields are then fitted which gives a wall to shield corner clearance of 100mm.

The following models installed with a Pioneer double flue shield with the side extensions fitted allows for reduced clearances as follows:

[2] Wee Ped corner clearance (E) can be reduced to 115mm. This in turn also reduces clearances (D) to 418mm, (K) to 1170mm and (L) to 978mm.

[3] Classic Rad corner clearance (E) can be reduced to 180mm. This in turn also reduces clearances (D) to 460mm, (K) to 1435mm and (L) to 1131mm.

⚠ WARNING! Important Information

- **WE HIGHLY RECOMMEND YOU READ THIS ENTIRE MANUAL AS INCORRECT OPERATION, MISUSE AND/OR LACK OF MAINTENANCE WILL VOID THE WARRANTY**
- Any modification of the appliance that has not been approved in writing by the testing authority is considered as breaching AS/NZS 4013 and will void the warranty
- Do not use flammable liquids or aerosols in the vicinity of this appliance when it is operating
- Never operate your Metro with the top grill removed
- Do not dry clothes on or near this appliance
- Do not use flammable liquids or aerosols to start or rekindle the fire OR store fuel within the Metro's specified installation clearances
- Never operate your Metro with the door ajar, except on initial start up
- Open the air control fully before opening the Metro's door.

⚠ CAUTION! Important Information

- This appliance should be maintained & operated at all times in accordance with this instruction manual
- This appliance should not be operated with cracked door glass, over worn, faulty or missing door seals
- Do not use driftwood, treated or unseasoned (wet) fuel, the use of most types of preservative treated wood as fuel can be hazardous and will damage your appliance
- Burning unseasoned (wet) fuel or incorrect operation on extended low burn cycles will cause excessive creosote to form. Creosote is very corrosive and excessive buildups will result in the flue pipe, flue spigot and upper burn chamber failing. Failure of the applicance and/or flue system due to creosote damage is not covered under warranty. The formation of such is not an appliance issue it is a fuel and operational issue
- This appliance must be regularly maintained and replacement parts must be authorised Metro parts only
- Do not empty ash into a combustible container.

Congratulations on the purchase of your Metro wood fire

This slow combustion appliance is designed to give you many years of warmth and service, subject to the following key factors. These key factors, if not adhered to are the major causes of unsafe installation, poor performance and flue blockages and potential product failure.

1. Your Metro wood fire must be installed correctly. Metro recommend a competent and suitably qualified NZHHA installer.
2. The only fuel to be used in this appliance shall be wood that meets the following criteria.
   - Less than 25% moisture content
   - Has not been treated with preservatives or impregnated with chemicals or glue,
   - Is not chipboard, particle board, or laminated board,
   - Is not painted, stained or oiled
   - Is not driftwood or other salt impregnated wood
3. The appliance shall be operated at all times in accordance with the "Installation and Operating Instructions" supplied with each appliance.
4. It is preferable that Metro wood fires should be installed with a Metro ECO Flue System.
5. Coal must not be used as a fuel.

Please also note the following important points:

- In New Zealand a building consent is required from your local building authority. The homeowner is responsible for obtaining this consent
- As correct installation is critical to the performance and safe operation of your Metro, it is recommended your Metro be installed by a NZHHA registered installer or a person suitably qualified in the installation of wood fires. Your Metro retailer will be able to arrange professional installation for you
- During the very first fire your Metro will give off an odour and fumes as the firebox paint cures. Do not be alarmed; open all windows and externally opening doors in that room and close any internally opening doors. This curing process will last for approximately one hour and is likely to happen this one time
- Properly seasoned (dry) timber is necessary for the Metro to operate efficiently; firewood that contains a high moisture content will result in flue pipe blockages, reduce heat output and create other issues.

Note: Once split, Softwood usually takes 12 months to season - Hardwood can take up to 24 months to season - Wood must be stored in a location that enables air circulation. Unseasoned wood stored in a closed woodshed without air circulation will still be unseasoned 12 months later.

- It is critical that the fire not be operated with over worn, faulty or missing door seals. Door seals will harden over time and become over-worn (3-4 year's) this will cause air to leak into the fire, causing the appliance to 'over fire'
- It is critical that the fire not be operated with over worn, faulty or missing bricks, baffle plate, promet extension (white board on the baffle plate)
- It is critical that the fire not be operated with cracked or broken door glass.

Please note, the above 3 points require regular inspection/maintenance (every time the ash bed is cleaned out, generally 3-5 times a season) and if not maintained will void the firebox warranty. A glowing firebox or lower fluepipe is just one sign you are over firing your appliance. Please ensure you keep your proof of purchase/receipt on any parts you purchase.

- For optimum performance fuel must be loaded so the logs lay "front to rear" in preference to laying across the width of the firebox. Spaces should be left between the logs to enable oxygen to get to as much of the surface of the fuel as possible
- A small hot fire loaded frequently is more efficient than a large fire burning on a low setting
- Your Metro is covered by a full unconditional 12 month warranty on replacement parts, and a 10 year firebox warranty.

Where to install a Metro wood fire in your home

Wood fires are usually installed in the main living area, which is the section of the home that is usually kept the warmest, being the area in the home most frequently occupied. However, before deciding on the best location for your Metro wood fire you may wish to consider:

- Water heating. If you are intending to have a wetback it is important that the wood fire is as close as practically possible to the water storage cylinder
- Split level homes are best heated when the wood fire is installed on the lower level, as the heated air will rise to the higher levels
- Building construction is another consideration. Specified clearances from walls, curtains etc must be maintained and you need to ensure no structural beams or internal gutters etc are directly above your preferred site. If you have a two storey dwelling you need to consider the second storey to ensure you don't have the flue directly outside a second storey window.

Generally, you can install your Metro in your home anywhere that suits you; Pioneer offer various fan systems to transfer heat to other sections of the home that are not heated sufficiently. It is necessary if using a fan system that the Metro you have purchased has sufficient output to heat the total area you wish to heat. Your Metro retailer or installer will be able to advise if you are uncertain.

Optional wetbacks

Water heating is another key feature of your Metro wood fire; nearly all Metro models can be fitted with a wetback, which are designed to give maximum output with minimal effect on the operation of the fire. Only the Pioneer cast jacket wetback system should be fitted to your Metro; alternative wetbacks will void the Metro's emission approvals and may seriously affect the performance of the appliance and void its warranty.

Other considerations are:

- Distance from your Metro to the storage cylinder will affect the amount of hot water produced
- Your climate & the manner in which you will 'fire' your Metro will determine the amount of hot water produced.

Note: Wetbacks are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail.

Cost Savings

Wetbacks can enable substantial power savings, dependent on the climate in the area in which you live. If you live in a cold climate you are likely to use your Metro for many months of the year, in which case a Pioneer wetback will reduce or even eliminate your water heating costs over those months. If however you live in a warmer climate and use your Metro for only a few hours a day over the colder months, electricity savings will be considerably less.

Water Pressure

A common misconception is that you must have a low-pressure system to have a wetback; this is not true. You must have a 'vented' system and high-pressure cylinders are usually not vented. However you can install an 'indirect' cylinder which contains a secondary coil inside the storage cylinder, enabling you to have a wetback while retaining a high-pressure system.

Wetback	Suitable for models:
2kW Wetback 	• ECO Tiny Rad • ECO Tiny Ped
Side Wetback 	• Tiny Rad Woody • Wee Rad Leg & Wee Rad Base • Wee Rad Woody • Wee Ped • Classic Rad
3kW Wetback 	• Xtreme Rad Leg & Xtreme Rad Base • Xtreme Rad Woody • Xtreme Ped • Mega Rad • All LTD rural models
4kW Wetback 	• All LTD rural models

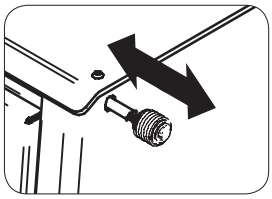
The Wee Rad V2 Base model cannot be fitted with a wetback.

Getting to know your Metro wood fire

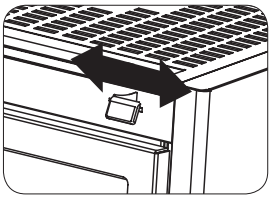
Operating your Metro fire is simple and you will quickly learn how to get the best from it. First take a minute to familiarise yourself with your new Metro.

- Raise the door handle anti-clockwise until the latch releases, and then slowly pull the door open. You will note that if you let the door go before it is at 90° to the appliance, it will fall closed. This is a safety feature that ensures the door cannot fall open if it is not latched securely. For the door to remain open, you must open it fully
- There is a single air control making your Metro fire easy to adjust. This control moves from left to right, which is 'low to high'.

All Metro radiant fires have a wire air control handle located at the upper right hand side of the appliance. Simply pull out to increase burn rate or push in to reduce burn rate.



Radiant fires air control



All other fires air control

All other Metro fires have an air control knob located on the upper front panel of the appliance.

Slide this control knob gently from right to left until you reach a stop. This is a pre-set 'low' position. Your Metro fire must not be operated at a lower burn rate than this pre-set low allows.

Operating your Metro wood fire

If your Metro has only been installed within the past few days, the fire cement seal at the base of the flue will not be fully cured. To ensure the cement sets without blistering it is recommended you burn 2-3 sheets of loosely crumpled newspaper at a time, approximately once every hour over a 6-8 hour period.

During the very first fire your Metro will give off an odour and fumes as the firebox paint cures. Do not be alarmed. Open all windows and externally opening doors in that room and close any internally opening doors. This curing process will last for approximately one hour and is likely to happen this one time.

Start up

Place a quantity of loosely crumpled newspaper on the base of the firebox until it is approximately half full of paper, or place firelighters on the base of the firebox. Add dry kindling and move the air control knob fully to the right, being the 'full open' position.

Light the paper at two or three locations across the front of the door opening and leave the door slightly ajar resting on the latch pin if necessary for a few minutes while the fire establishes. Once the kindling is burning well, open the door and add 2-3 small logs at a time until you have a well-established fire. Usually this will take approximately 30 minutes, during which time the air control should be set on "high" and the door should be closed, except for the initial few minutes and when fuel is being added.

Normal operation

Once the fire is well established, regulate the air control to achieve the desired burn rate and heat output. As you move the air control to the right, burn rate, firebox temperature and heat output will increase, if you move the control to the left they will decrease. Please note:

- Always open the air control fully prior to opening the door, then open the door slowly. Every time you refuel, leave the air control on 'high' for a minimum of 20-25 minutes
- When loading logs, place them end-on, 'front to back'; air spaces should be left between the logs to enable oxygen to get to as much of the surface of the fuel as possible
- Never use the door to force wood into the firebox, as this is likely to break the glass.

Extended burning (rural models only)

It is most important if your Metro is to be refuelled and turned down for an extended period, such as an overnight burn that you operate it correctly:

- The wood used as fuel for extended burning MUST BE FULLY SEASONED (DRY). Once the fuel is loaded, the appliance must be operated on high for a period of at least 20 minutes to drive out residual moisture from the fuel (dry wood is usually 20% water content) and ensure surface area combustion.
- Do not turn the air control down lower than you need to, if you want the Metro to burn overnight, endeavour to obtain an 8 hour burn time, not 12 hours. It will take a few burns to find the correct location of your Metro's air control setting to achieve the length of burn cycle you desire as this setting is affected by several variables including fuel density, flue length and outside wind velocity.
- A smouldering fire over a long time frame is likely to deposit corrosive elements into your system which could be detrimental to your Metro.

⚠ CAUTION! Important Information

- If not operated correctly on extended burn cycles, your Metro is likely to incur flue blockages, corrosion of the upper baffle, lower flue pipe and firebox flue spigot. As these are not covered under warranty if they fail through improper use, it is important you operate your Metro correctly.

Cooking

All Metro's are designed to enable cooking of soups, stews and casseroles etc, and your Metro will easily boil a flat bottom stainless steel kettle. The Radiant Series have a dedicated cooking top enabling large pots to be placed on the cook top, while all other models have a lift-off grill.

Note: Metro's supplied with a lift-off top grill have this feature to enable the grill to be removed for cleaning if you have a spill. The lift-off top grill must be left on when cooking, because if removed the wall temperatures next to the appliance may become excessive and the top of the firebox is generally too hot to cook on directly.

Cleaning and maintenance for your Metro wood fire

Your Metro fire will give you many years of efficient service with minimal maintenance if operated correctly using seasoned fuel. Your Metro fire must be regularly maintained and replacement parts must be authorised Metro fires parts only.

The Metro radiant fires are painted wood fires and coated with 'Pioneer Metallic Black' high temperature paint and will require periodic repainting to keep them looking their best.

All other Metro fires are coated with vitreous enamel. Vitreous enamel is extremely durable and designed to last the life of the appliance. As vitreous enamel is glass, a solid or heavy object dropped or banged against a panel could chip the enamel surface.

All model Metro fires can be cleaned with a soft cloth when the appliance is not in operation.

Door glass

Providing your fuel is properly seasoned, under normal operating conditions the air-wash design of the Metro's firebox will keep the door glass clear. If the glass requires cleaning you may use either a razor blade scraper or crumpled wetted newspaper dipped in wood ash rubbed over the glass.

If your door glass breaks it must be replaced with 5mm thick ceramic glass which is available from your local Metro retailer.

Door seals

Over time, usually 3-4 years, the door and glass seals will become hard and cause air to leak into the firebox, causing the appliance to 'over fire'. Your Metro retailer stocks replacement woven fibreglass door and glass seals, which need replacing when they become hard and over worn.

The door of your Metro is easily removed. Hold it in both hands and lift the hinge end of the door up and over the top hinge pin, then lower the door from the bottom hinge pin.

Side bricks

Hair-line cracks are not uncommon and are a result of the intense heat within the Metro's firebox, coupled with mechanical damage caused by accidental impact when fuel is being loaded. However if the side bricks become cracked to the extent that they start to break up, they must be replaced.

Door adjustment

Provision is available on both sides of the door for adjustment.

To adjust the hinge end of the door, open the door fully, loosen the top hinge nut and slightly lift the latch end of the door; you will see the hinge assembly move back 1-2mm which will usually be sufficient. Retighten, then repeat by loosening the lower hinge nut, this time applying a slight downwards pressure onto the door to move the lower hinge assembly back a similar distance, then retighten.

The door latch is also adjustable, as the latch pin on the right side of the firebox is fitted through a slot which enables the latch pin to be loosened, moved back and re-tightened.

Ash removal

Over a period of time ash will build up in the base of the Metro's firebox and require removal. The time this build-up takes depends on the density and cleanliness of your fuel.

To remove the excess ash your Metro should not be operating.

- Open the door, and using a hearth shovel or similar, empty the excess ash directly into a steel or non-combustible container.
- If the ash is not disposed of immediately, be careful where you store it, as the ash can retain heat for many days and become a fire hazard.
- You must leave a bed of ash in the base of the firebox approximately 10mm deep; this insulates the base of the firebox and improves combustion.

Top baffle

This is a 'sacrificial' wear part of the firebox and should be checked monthly. Usually only the promet (white board) front/underneath section needs to be replaced when it starts to disintegrate.

Note: Cracks in the promet are not uncommon and have no adverse effect on the operation of your Metro. These cracks are the result of intense heat coupled with expansion and contraction. Burning wood which is not properly seasoned, i.e. 25% moisture content or more, will over time cause the promet to disintegrate and require replacement.

Flue systems

Should be checked annually, particularly the bottom end of the lower flue section at its rear lock formed joint. If deterioration is noticed contact your Metro retailer or installer.

The flue pipe should also be swept a minimum of once a year, or as required during the winter season. If smoke enters the room when you open the Metro's door this usually indicates the flue pipe is becoming restricted and needs cleaning. The frequency of flue pipe cleans depends on many factors, with the main variables being:

- The seasoning of the wood. If not properly seasoned you will require frequent flue pipe cleans.
- The density of the wood. Softwoods generally result in more deposits building up in the flue pipe.

To clean the flue pipe of your Metro, proceed as follows:-

- Open the Metro's door fully, reach inside with the palm of your hand face-up and extended, lift the top baffle approximately 20mm, then lift it forward out through the door opening, placing it on a sheet of newspaper you have placed on the front of the floor protector. To prevent jamming, removal and replacement of the top baffle is best performed using both hands.

Note: Some appliances have a two piece top baffle.

- Close the door and slide the air control to the left.
- Once on the roof, remove the cowl from the top of flue system and sweep the flue pipe using a 150mm-diameter flue pipe brush as detailed in the instructions provided with the fluebrush.
- Once the flue pipe is clear, clean and refit the cowl. Remove the excess soot which has fallen into the firebox, leaving a layer of ash 10mm deep on the base of the firebox, then refit the top baffle.

Note: The baffle must be fitted so its rear is touching the back of the firebox; if uncertain refer to page 3 in the installation section at the front of this manual, which shows illustrations of the baffle location.

Troubleshooting your Metro wood fire

If your Metro is installed correctly, your fuel is dry and you operate your fire correctly, you will find it to be a pleasure to use. Metro's many years of experience within the wood heating industry has shown that dissatisfaction is mainly due to:

- unseasoned fuel
- faulty installation
- operational error
- or a combination of the above 3 points.

Correct operation

Modern day wood fires need to be operated hard and fast, more so than low and lazy to ensure the firebox and flue pipe runs hot and efficiently. If the fire and flue pipe is up to temperature it will perform extremely well, the smoke will draw up the flue pipe with ease, and the fire will produce good amounts of heat.

If the fire is operated on low a lot of the time, the door glass will run black, the flue pipe will tend to block up more frequently and the fire will end up smoking into the room when reloading. It's better to have a small fire running hard and fast, rather than a big fire running low and lazy.

The following may be of assistance if you are experiencing any problems with the operation of your Metro Fire.

Smoke enters the room when the Metro's door is ajar

(possible reasons and solutions)

Check flue pipe joins

If the flue pipe joins are not sealed correctly, the flue pipe will not draw as well as it should. The flue pipe join connecting into the flue spigot on top of the Metro is most critical, if this is not sealed correctly, smoke will enter the room when the door is ajar. To check this join is sealed correctly, run a match or lighter flame around the join. If the flame is sucked into the spigot then it is not sealed correctly. This check needs to be done when the fire is not going. Ensure you check the rear of the flue pipe/spigot join, as due to the seam in the flue pipe, this is the most common area for not being sealed correctly.

Ensure the fuel you are using is correctly seasoned

If you are burning unseasoned fuel (wet), the fire will cause nothing but problems. The Metro won't deliver much heat, it will be lazy, smoke will enter the room when the door is ajar, and the door glass will run black. Unseasoned fuel is the main contributor to excessive creosote deposits which can be corrosive to your appliance and flue system.

Flue pipe length is too short

Add more flue pipe as the longer the flue system, the better the draw of the flue pipe. Please note, if you did not purchase the Metro ECO Flue System, you will not have the ECO Cowl which increases draw. We highly recommend the Metro ECO Cowl is fitted as this will increase the draw. If you already have an ECO Cowl and smoke is still entering the room, please add another 600mm length of flue pipe.

Downdraft/Turbulence blockage

If you have checked all of the previous factors and the fire is still smoking into the room, it's possible there may be a down draft issue. Down draft is environmental and can be caused by many variables, and it is purely trial and error to ascertain the cause.

Air turbulence and/or negative air pressure influences around the flue termination can be caused by too close or overhanging trees or natural/ artificial ridges etc. Address these where possible or look to extend the flue above the roofline.

Other options may be:

- 'H' Cowl, designed purely for downdraft issues, but if you have an ECO Cowl fitted as standard, you will also need to add another 600mm of flue pipe to compensate as the H Cowl is shorter in length
- Directional Cowl, designed for high wind areas.

Air control setting

Ensure the air control setting is on high before opening the door to reload, as this increases the draw up the flue pipe. Open the door slowly.

If your Metro did not smoke, but its starting too and is getting worse:

The flue pipe is in need of a clean. It is recommended that the flue pipe be cleaned every season, however if you are burning the fire on low a lot, or are using unseasoned fuel, flue pipe cleans will be required more frequently.

Other issues you may experience

I can smell smoke in the room after a low burn cycle

The smell is creosote that will be seeping through the flue pipe join or out of the flue spigot onto an external surface, thus creating the smell in your room. The cause will be either unseasoned fuel, fuel mass too large, incorrect operation on low burn cycles or a combination. Creosote is very corrosive and excessive buildups will result in the flue pipe and potentially the flue spigot and upper burn chamber failing. The formation of excessive creosote is not an appliance issue, it is a fuel and operational issue. Failure of flue pipe or firebox due to creosote build up is not covered under warranty as excessive creosote build up is only possible from either unseasoned fuel or incorrect operation.

The Metro is noisy as it heats up and cools down

There will always be some expansion and contraction noise as the Metro heats and cools. This can usually be reduced by loosening three nuts at the rear of the appliance. To remedy, locate the 25mm deep cavity at the rear of your Metro between the 'rear panel' and the 'inner rear heat shield'. You will see a 6mm nut and two 6mm bolt heads in this cavity. Using a 10mm ring or open ended spanner, loosen all three so they are finger tight only.

On all Metro freestanding fires the air channel that allows the combustion air to enter the fire is fitted to the top underneath of the door opening. It is fitted with two M6 bolts. Slightly loosen both of these bolts.

The Metro won't turn down as much as it did

The door itself may need readjusting, the hinge and latch is slotted and allows for movement. Loosening the hinge and moving it back a few mm will make the door seal tighter and stop air leaking into the fire. The door and glass seals may be in need of replacing, which is generally required every 3-4 years.

Familiarise yourself with the instructions on page 10 before proceeding with this maintenance.

Warranty details for your Metro wood fire

Metro wood fires are manufactured in New Zealand, using the highest quality of materials, workmanship and the latest manufacturing techniques, which is why we offer a full 10 year firebox warranty and a 1 year parts warranty for your peace of mind.

Metro Warranty

(NZ Consumer laws apply to this warranty)

Pioneer Manufacturing Limited (Pioneer) warrants the steel firebox against defective materials and workmanship which would render it unfit for normal domestic use, from the date of purchase by the original consumer, for a period of 10 years.

Components including panel coating, door retainers, door seals, glass, trim, baffle & bricks are warranted for a period of 1 year from the date of original purchase for normal domestic use against defective materials and workmanship.

All associated accessories including, but not limited to, fans, flue systems, flue shields, wetbacks, tool sets, ash pots etc, are covered by a 1 year warranty against defective materials and workmanship.

It is recommended, but not a condition of this warranty, that a full service/ inspection of the Metro fire be carried out at the end of each winter season.

Warranty Conditions

- The Metro fire must be installed, operated and maintained strictly in accordance with the building code and this installation and operation manual
- The Metro fire must be installed and used in a domestic application
- This warranty covers appliance like for like replacement or repair at the manufacturer's discretion but excludes freight, travel, installation, labour and/or any other associated costs
- Pioneer or their agents are not liable for any loss or expense direct or indirect arising from the failure of any part or operation of the appliance
- Operation of this appliance in violation of the warnings in this operation and installation manual will void this warranty
- Your Metro fire must be regularly maintained and we recommended it is also serviced annually. Proof of servicing may be required. If a wood fire is not regularly maintained and serviced, the life span will be reduced. If your Metro wood fire has been neglected, by not being regularly maintained and serviced, warranty may be declined

⚠ CAUTION! Important Information

Note: The following 3 points require regular inspection/maintenance (every time the ash bed is cleaned out, generally 3-5 times a season) and if not maintained will void the firebox warranty. Please ensure you keep your proof of purchase/receipt on any parts you buy.

- It is critical the fire not be operated with over worn, faulty or missing door seals. Door seals will harden over time and become over-worn (3-4 year's) and will cause air to leak into the fire, causing the appliance to 'over fire'. Do not operate the fire with cracked, or broken door glass
- It is critical the fire not be operated with over worn, faulty or missing bricks, baffle plate or baffle extension (white board on or under the baffle plate)
- A claim under this warranty should be directed to the retailer who supplied the Metro fire. If this is not possible write directly to the manufacturer stating details of fault, model, serial number of your Metro, dated proof of purchase and name of retailer purchased from.

Warranty Exclusions

(This manufacturer's warranty does not cover)

- Service calls which are not related to any defect in the product (i.e. operational, installation or fuel issues). The cost of a service call will be charged if the problem is not found to be a product fault
- Defects caused by factors other than normal domestic use or use in accordance with the product's operation manual
- Defects caused through the product being operated in an 'over-fired' manner resulting in sections of the firebox operating excessively hot to the point that sections glow red. (Note – This will result in distortion of the firebox)
- Defects to the product caused by accident, neglect, misuse or act of God
- The cost of repairs carried out by non-authorised repairers or the cost of correcting such unauthorised repairs
- Required maintenance as set out in this manual.

Service under this manufacturer's warranty must be provided by a repairer authorised by Pioneer Manufacturing Ltd. Such service shall be provided during normal business hours.

⚠ IMPORTANT! Complete and retain these details at time of purchase:

Purchase Date	
Serial Number	
Model	
Colour	
Retailer	

Parts guide for your Metro – Promet, baffles and wetback options

Your Metro wood fire must be regularly maintained and we recommended it is also serviced annually. If a wood fire is not regularly maintained and serviced, the life span will be reduced.

If your Metro wood fire has been neglected, by not being regularly maintained and serviced, with authorised Metro parts replaced as required, your warranty may be declined.

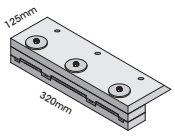
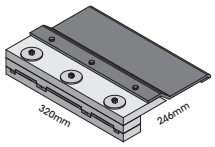
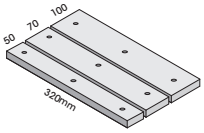
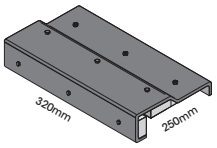
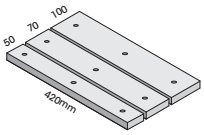
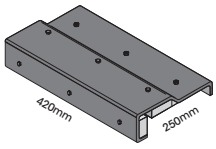
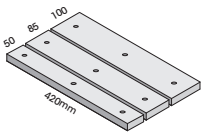
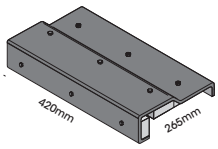
Listed below are the parts and product codes for your Metro wood fire. The promet/baffle should be regularly checked and must always be in place during the operation of your fire.

The baffle should be resting on four support lugs (two on each side of the firebox). It must be hard back against the rear of the firebox with the 'promet extension' (white board) or return front steel edge of the baffle facing forward.

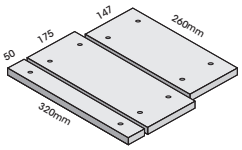
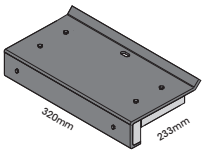
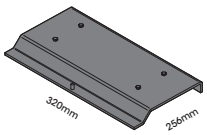
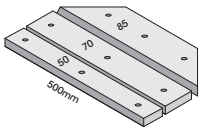
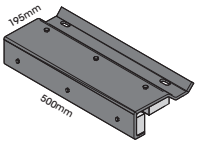
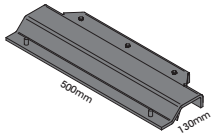
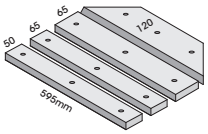
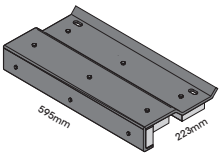
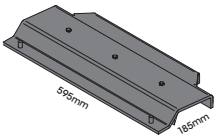
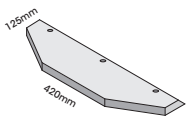
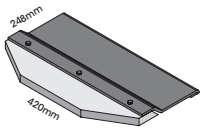
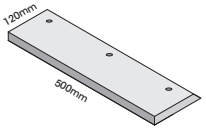
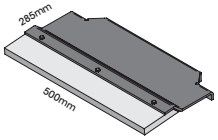
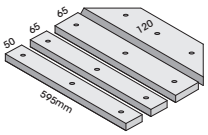
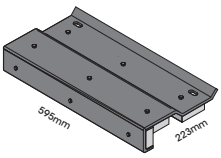
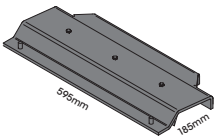
Hairline cracks in the promet extension are not uncommon and will have no adverse effect on the operation and performance of your Metro wood fire. These cracks are the result of intense heat coupled with expansion and contraction and is normal wear and tear.

If the promet extension starts to break up and pieces fall into the firebox it must be replaced.

Note: Impact damage when loading wood and burning wood which is not properly seasoned, i.e. 25% moisture content or more, will cause the promet to disintegrate and require replacement. Always burn dry well seasoned wood and take care when loading wood into the firebox.

Model	Type of promet required / Type of steel baffle(s) required		Wetback options
• Tiny Ped • Tiny Rad	Tiny Promet 500-1550 	Tiny Baffle 500-2050 	2kW Wetback 450-0050 
• Tiny Rad Woody	Tiny Woody Promet Set 500-2004 	Tiny Woody Baffle 500-2504 	Side Wetback 450-0275 
• Wee Rad Base • Wee Rad Leg • Wee Rad Woody • Wee Ped	Wee/R1 Promet Set 500-2005 	Wee/R1 Baffle 500-2505 	Side Wetback 450-0275 
• Wee Rad V2 Base	Wee V2 Promet Set 500-2006 	Wee V2 Baffle 500-2506 	No wetback can be fitted to this appliance

Parts guide for your Metro – Promet, baffles and wetback options

Model	Type of promet required / Type of steel baffle(s) required			Wetback options
• Classic Rad	Classic Rad Promet Set 500-2015 	Classic Rad Front Baffle 500-2520 	Classic Rad Rear Baffle 500-2525 	Side Wetback 450-0275 
• Xtreme Rad Base • Xtreme Rad Leg • Xtreme Rad Woody • Xtreme Ped	Xtreme/R2 Promet Set 500-2010 	Xtreme/R2 Front Baffle 500-2510 	Xtreme/R2 Rear Baffle 500-2515 	3kW Wetback 450-0100 
• Mega Rad	Mega Rad Promet Set 500-2020 	Mega Rad Front Baffle 500-2530 	Mega Rad Rear Baffle 500-2535 	3kW Wetback 450-0100 
• LTD Wee Rad Base • LTD Wee Rad Leg • LTD Wee Rad Woody		LTD Small Promet 500-1700 	LTD Small Baffle 500-2600 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 
• LTD Xtreme Rad Base • LTD Xtreme Rad Leg • LTD Xtreme Rad Woody		LTD Large Promet 500-1850 	LTD Large Baffle 500-2650 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 
• LTD Mega Rad	Mega Rad Promet Set 500-2020 	Mega Rad Front Baffle 500-2530 	Mega Rad Rear Baffle 500-2535 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 

Metro - Visit us online today www.metrofires.co.nz

Metro wood fire specifications

Metro have a Specifications Brochure available which details relevant compliance data for every model. This brochure is updated annually and details the minimum clearances and specifications for all models, which is generally required when applying for a building consent. See your Metro retailer to obtain a copy, or visit www.metrofires.co.nz

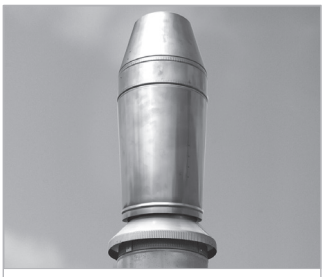
metrofires.co.nz

Visit the Metro website: metrofires.co.nz to view Metro's 'video demos' showing the latest in wood fire technology energy saving options. You can view the entire Metro product range, find out where your nearest Metro retailer is located or simply check out the latest specifications, installation requirements and emission and efficiency data for the Metro of your choice.

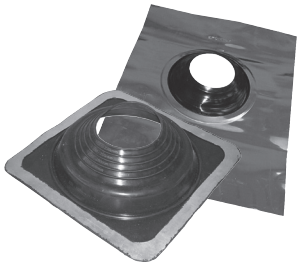
Pioneer heating accessories

Pioneer/Metro Fires offer a wide range of heating accessories designed to complement your Metro wood fire. The range includes ECO flue systems, floor protectors, wetbacks, heat transfer systems, baffles, bricks and more.

For further details talk to your Metro agency or visit www.metrofires.co.nz



ECO Flue Systems



Flashrites and Versatiles

Wetbacks

High Temperature Paint

Corner and Wall Floor Protectors

Heat Transfer Systems

Universal Door Seal Kits

Fire Cement And Silicone

Glass Tape

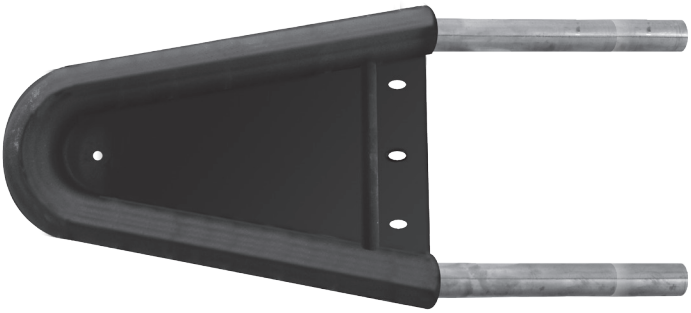
Door Seal Rope

Chubb Smoke Detectors

Metro Side Wetback Installation Instructions

⚠ CAUTION! Important Information

- **Wetbacks must be connected with water before operating the fire. Water must always be available to the wetback while the fire is in operation.**
- **Wetback systems are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail.**
- **Rainwater collection tanks installed lower than the wetback that use a water pump to supply the home, can cause problems if the pump is not operational.**



METRO SIDE WETBACK

⚠ WARNING! Important Information

- **Do not connect to an unvented hot water system.**
- **Install in accordance with AS 3500.4.1 or NZS 4603 and the appropriate requirements of the relevant building code or codes.**

Suitable for installation into the following models:

- Tiny Rad Woody
- Wee Rad Base
- Wee Ped
- Wee Rad
- Wee Rad Woody
- Classic Rad

Please note: This wetback is secured to the outside left hand wall only of the appliance. Left hand is deemed as you are looking at the appliance from the front. No adjustments to your wood fire settings are necessary, this appliance is factory set.

- This Metro requires the rear heat shields to be removed & the circular knock outs removed for copper pipe penetration.
- It is ideal this wetback is installed before the wood fire installation.
- It is recommended the return pipe has a minimum rise of 1 in 12; performance will reduce as the distance to the storage cylinder increases.

Fitting the wetback: (See overleaf for Classic Rad)

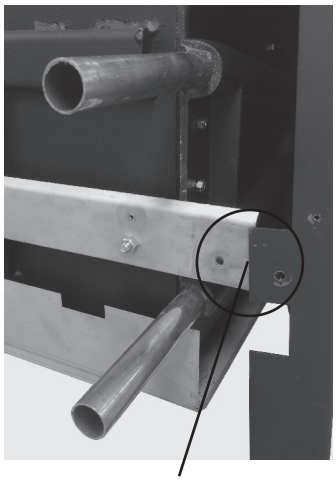
1. For best access during this process remove the wood fire door & internal baffle, place both in a safe area so as not to damage parts or painted surface.
2. At all times aside the removed fastenings to a safe location as these will be needed to refit the necessary parts.
3. Remove both the rear heat shield & the rear inner heat shield, both are fixed into position with 8g pozi screws & the inner heat shield is bolted at top only with one M6 fastening.
4. As you look from the rear of the appliance undo the very right hand M6 bolt in the spreader bar (illustrated below).
5. Spread the side panel away from the rear fixing point to provide access (illustrated below).
6. Remove all countersunk M6 fastenings in the left side wall of the fire box; these are used for fixing the wetback to the outside wall of the appliance.
7. Apply a liberal amount of Pioneer fire cement (supplied) around the full perimeter of the flat face & over the internal flat area. This is needed for improved heat transfer.
8. Insert the wetback into the gap provided by spreading out the side panel, note the lower tube is positioned under the spreader bar. Fix in place with the provided countersunk fastening & nut at the rear centre slot of the wetback first, tighten but allow for a small amount of movement.
9. Line up the front M6 tapped hole in the casting with the front 8mm dia hole in the fire box wall. Using a second countersunk fastening screw into the casting from the internal of the fire box, discard the M6 nut. Tighten both fastenings to ensure a tight fit to the fire box. Insert and fasten any remaining rear fastenings.

   Note: Removal of the baffle as detailed in point 1 allows for easy access through the flue spigot.

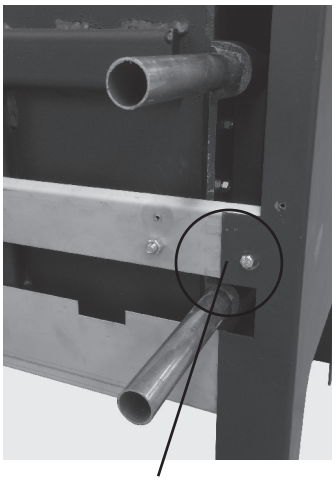
10. Reassemble the rear heat shields, inner heat shield first.

    Note: both require the circular knock out plates removed from the respective heat shields. It is absolutely critical these heat shields are placed back onto the appliance correctly with all bolts & screws in place & done up tightly.

11. The wetback is now fitted & ready for connection into your hot water cylinder using standard plumbing practice.



Right hand M6 bolt undone & side panel 'spread' for access



Wetback installed and side panel re-fastened. Heat shields to go back on for completion

Metro Side Wetback Installation Instructions - continued

Fitting the wetback to the Classic Rad:

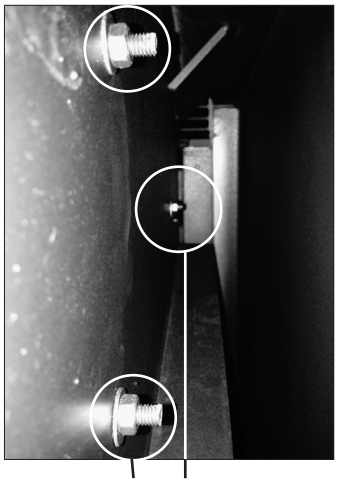
1. For best access during this process remove the wood fire door & internal two piece baffle, place all in a safe area so as not to damage parts or painted surface.
2. At all times aside the removed fastenings to a safe location as these will be needed to refit the necessary parts etc.
3. Remove both the rear heat shield & the rear inner heat shield, both are fixed into position with 8g pozi screws & the inner heat shield is bolted at the top only with one M6 fastening.
4. Remove the three countersunk M6 fastenings in the left side wall of the fire box; these are used for fixing the wet back to the outside wall of the appliance.
5. Apply a liberal amount of Pioneer fire cement from the 70ml tube supplied around the full perimeter of the flat face & over the internal flat area. This is needed for improved heat transfer.
6. Insert the wetback into the gap provided. Fix in place with the provided countersunk fastening & nut at the rear top slot of the wetback first, tighten but allow for a small amount of movement.
7. Line up the front M6 tapped hole in the casting with the front 8mm dia hole in the fire box wall. Using a second countersunk fastening screw into the casting from the internal of the fire box. Insert and fix the last rear fastening and tighten all fastenings to ensure a tight fit to the fire box.

   Note: Removal of the baffle as detailed in point 1 allows for easy access through the flue spigot.

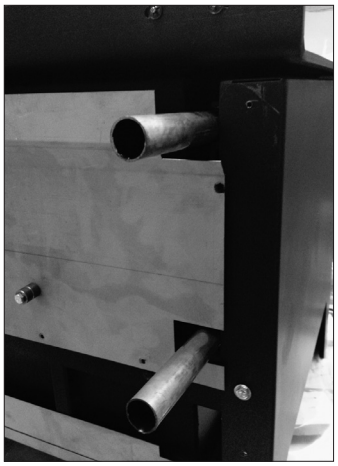
8. Reassemble the rear heat shields, inner heat shield first.

   Note: Remove the circular knock out plates from the outer heat shield. It is absolutely critical these heat shields are placed back onto the appliance correctly with all bolts & screws in place & done up tightly.

9. The wetback is now fitted & ready for plumbing connection into your hot water cylinder using standard plumbing practice.



Classic rad fastening positions for the side wetback



Side wetback placement with inner heat shield re-fitted

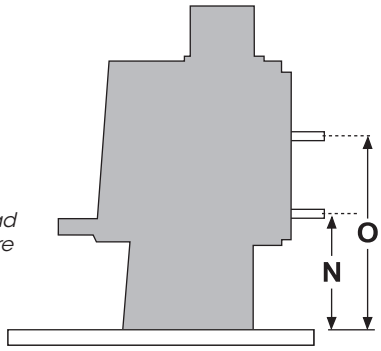
Metro wetback connection heights (Measurements shown are in mm)

Model	N	O
Tiny Rad Woody	365	555
Wee Rad & Wee Rad Base	295	485
Wee Rad Woody	365	555
Wee Ped	295	485
Classic Rad	393	583

Please note:

Wetback connections for the Wee Rad, Wee Rad Base, Wee Rad Woody and Wee Ped are 226mm left of the flue centre facing the Metro/wall.

Wetback connections for the Tiny Rad Woody and Classic Rad are 184mm left of the flue centre facing the Metro/wall.



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

WHANGANUI DISTRICT COUNCIL
Te Kaunihera a Rohe o Whanganui

FORM 7
CODE COMPLIANCE CERTIFICATE NUMBER BCon19/0733

Section 95(3), Building Act 2004

Mr A Hooper, Miss MATAR Turia
236 State Highway 3 South
RD 2
Whanganui 4572

Building Consent No: BCon19/0733

Issue Date: 06/10/2020

The building:

Street address of building:	***Legal description of land where building is located:***
236A State Highway 3 South WHANGANUI	LOT 2 DP 399485 1.0000 ha
Building name:	***Location of building within site/block number:***
Level/unit number:	***Current, lawfully established, use:*** *[include number of occupants per level and per use if more than 1]*
	Single Detached Residential
Year first constructed:	
2020	

The owner:

Name of Owner:	
Mr A Hooper, Miss MATAR Turia	
Mailing address:	***Street Address/registered Office:***
236 State Highway 3 South RD 2 Whanganui 4572	236 State Highway 3 South RD 2 Whanganui 4572

Phone numbers:

Landline:		***Mobile:***	0274416061
Daytime:		***After hours:***	
Facsimile number:			
Email address:		***Website:***	

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

Contact Person:	
Mr DJ Coker	
Mailing address:	***Street Address/registered Office:***
144 Westmere Station Road, RD 1, Whanganui 4571	144 Westmere Station Road, RD 1, Whanganui 4571

Phone number:

Landline:		***Mobile:***	027936216
Daytime:	063454757	***After hours:***	
Facsimile number:			
Email address:		***Website:***	

Building Work

Building consent number:	***Issued by:***
BCon19/0733	Whanganui District Council
Type of Work	
Single Detached Residential	
Description of Work	
Construct a new detached 121m² dwelling.	
Intended Life	***Estimated Value***
Indefinite but not less than 50 years.	$242000.00

Code compliance:

The building consent authority named below is satisfied, on reasonable grounds that the building work complies with the building consent.

*Compliance schedule
There are no specified systems in this building.

This is a final Code Compliance Certificate issued in respect of all of the building work under the above Building Consent.

Signed for and on behalf of the Whanganui District Council:

GJ Hoobin
Building Control Team Leader