



## PRODUCT WARRANTY FOR FAIRVIEW KAPITI JOINERY AND COMPONENTS

Thank you for purchasing your joinery from Fairview Kapiti. There are a number of parts to your joinery that have different warranties so we have set out below the aspects of each warranty and the maintenance required to keep your joinery looking great. We certify that all products supplied by our company meet or exceed the requirements of the New Zealand building code, NZS 4221:1985 Performance of windows and NZS 4223 Glazing in Buildings.

### DESIGN AND TESTING STANDARDS

The aluminium joinery is designed and tested to comply with, the specific wind zone for the area, deflection and weather performance and glazing requirements of the above New Zealand standards. The windows and doors are tested in an international accredited laboratory, using an approved testing engineer and complies with international accreditation NZS/ISO/IEC 17025:1999

### JOINERY WARRANTY

For your peace of mind the aluminium joinery is supported by a 2 year warranty from date of manufacture against failure of materials and workmanship

### GLASS WARRANTY

There is a 10 year warranty on all double glazing units. This does not cover thermal cracking which can occur at any time due to a wide range of factors which are out of our control.

### HARDWARE

There is a 2 year warranty on hardware (Door locks, sash handles etc) as long as the problem is from general wear and tear. Any electronic hardware has a warranty of 1 year. There is no warranty on any plated finishes. Stainless steel is prone to tea staining which is not covered by the warranty, but can generally be cleaned off. There is no warranty within 300 metres from the sea.

### CARE AND MAINTAINENCE OF YOUR JOINERY

To maintain the good looks of your joinery all windows and doors will need regular washing. Looking after your windows is like looking after your car – a regular wash keeps your investment in smart condition. A gentle wash with a mild detergent and soft bristled brush every year should be sufficient. All hardware should be sprayed with silicone lubricant every year to keep it in good working order. Adjustments may need to be made to rollers and hinging post installation, or as buildings settle. If these steps are not followed your warranty may be void

### POWDERCOAT

Fairview Kapiti's standard colour range, the Interpon D1010 Premium architectural powder coatings have a 15 year warranty on Film Integrity and colour integrity. As long as such surfaces are maintained by the property owner.

### CLAIMS

The supplier must be advised of all claims within 7 days of the materials or workmanship fault first becoming apparent. Should a claim be made the supplier will determine the most appropriate course of action to be taken to remedy the claim and reserves the right to nominate who shall carry out any remedial work.

### PAYMENT

This warranty shall become void and shall not apply to work for which the supplier has not received payment in full.

## FULL SERVICE GUARANTEE

*Our Joinery is built in New Zealand for New Zealanders, to the highest quality standards. We ensure every project is completed with the same degree of quality workmanship, and of course this means we stand by our work with a full product and service guarantee.*



NOTE: This warranty is subject to correct installation as outlined in the building code acceptable solution clause E2/AM External moisture or the alternative solution building WANE Window Installation guide.





Electrical Contractors Limited

# Electrical Certificate of Compliance and Electrical Safety Certificate

Reference/Certificate ID No: 73252



This form has been designed to be used by licensed electrical workers to certify that installations or Part installations under **Part 1 or Part 2 of AS/NZS 3000** are safe to be connected to the **specified** system of electrical supply.

## LOCATION AND CONTACT

Location Details: 65 Kohekohe Road, Waikanae  
 Contact Name: Pat White Builders  
 Contact Address: \_\_\_\_\_ Postcode: \_\_\_\_\_  
 Name of Electrical worker: Kane Mansfield  
 Organisation/company: Stones Electrical  
 Registration/Practising licence number: E262709  
 Phone: 0275222251 Email: enquires@secl.co.nz  
 Name of person(s) supervised: Sam Scott-Mcleary, Dave Paulson, Mike Pearce

## COC

Type of work:  Additions  Alterations  New work  
 The prescribed electrical work is:  Low risk  General  High risk (specify):  
 Reference Standards:  Part 1 of AS/NZS 3000  Part 2 of AS/NZS 3000  
 Additional Standards:

Description of work: (including date/s of work and type of supply system)  
 Electrical as per attached Lighting Plan, *50w recess outlets, Gen infinity, AC, Generator (change over main sw), LED strips done by others.*

I certify that the completed prescribed electrical work to which this Certificate of Compliance applies has been done lawfully and safely, and the information in the certificate is correct in that the installation, or part of the installation:

Select those that apply:

- Has been installed in accordance with the specified certified design
- Has an earthing system that is correctly rated (where applicable)
- Contains fittings that are safe to connect to a power supply
- Relies on a supplier Declaration of Conformity
- Has been satisfactorily tested in accordance with the Electricity (Safety) Regulations 2010
- Is safe to connect

Electronic/Other reference: 73252

Certifier's signature: *[Signature]*

### Test Results

Polarity (independent earth):  
 Insulation resistance:  
 Earth Continuity:  
 Bonding:  
 Fault Loop impedance:  
 Other (specify):

Date: 30 / 08 / 2018

Attach or reference. If it is impractical to attach a copy of a particular manufacturer's instructions, or of any certified design or supplier declaration of conformity, provide a reference to where the documents can be found, in a readily accessible format, by electronic means.

## ESC

I certify that the installation, or part of the installation, to which this Electrical Safety Certificate applies is connected to a power supply and is safe to use.

Certifier's name: Kane Mansfield

Registration/Practising licence number: E262709

Certifier's signature: *[Signature]*

Certificate Issue Date: 24 / 07 / 2018  
 Connection Date: 24 / 07 / 2018

**CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED FOR A MINIMUM OF 7 YEARS**  
 This certificate also confirms that the electrical work complies with the building code for the purposes of Section 19(1)(e) of the Building Act 2004.





Electrical Contractors Limited



P.O. Box 175 | Paraparaumu 5254

Phone (04) 296 1727  
Fax (04) 296 1714  
Email enquiries@secl.co.nz  
Website www.stoneselectrical.co.nz

### SUPPLIERS DECLARATION OF CONFORMITY - SDOC

SITE ADDRESS	65 Kohekohe Road, Waikanae	73252
<b>GENERAL</b>		
Schneider Products	<a href="http://www.schneider-conformity.co.nz">www.schneider-conformity.co.nz</a>	✓
HPM Products	<a href="http://www.hpm.co.nz/SDOCs.aspx?pid=435">www.hpm.co.nz/SDOCs.aspx?pid=435</a>	✓
Manrose Products	<a href="http://www.simx.co.nz/compliance">www.simx.co.nz/compliance</a>	✓
Vynco Products	<a href="http://www.vynco.co.nz">www.vynco.co.nz</a>	✓
<b>CABLE</b>		
General Cable	<a href="http://www.generalcable.co.nz/home/our-company/accreditations/supplier-declaration-of-conformity-(sdoc).aspx">www.generalcable.co.nz/home/our-company/accreditations/supplier-declaration-of-conformity-(sdoc).aspx</a>	
Olex/Nexan Cable	<a href="http://www.nexans.co.nz">www.nexans.co.nz</a>	✓
Firstflex Cable	<a href="http://www.firstflex.co.nz/supplier-declaration-conformity-sdoc">www.firstflex.co.nz/supplier-declaration-conformity-sdoc</a>	
Triangle Cable	Available on request	
<b>LIGHTING</b>		
Ambius Lighting	<a href="http://www.ambiuslighting.co.nz">www.ambiuslighting.co.nz</a>	
Phillips Lighting	<a href="http://www.lighting.phillips.co.nz/connect/sdocs.wpd">www.lighting.phillips.co.nz/connect/sdocs.wpd</a>	
Prolux Lighting	<a href="http://www.prolux.co.nz/compliance/supplierdeclarations">www.prolux.co.nz/compliance/supplierdeclarations</a>	
Switch Lighting	<a href="http://www.switch-lighting.co.nz">www.switch-lighting.co.nz</a>	
Gerard Lighting	<a href="http://www.gerardlighting.co.nz">www.gerardlighting.co.nz</a>	
Halcyon Lighting	<a href="http://www.halcyonlights.co.nz/resources/sdocs/">www.halcyonlights.co.nz/resources/sdocs/</a>	
Eurotech Lighting	<a href="http://www.eurotechlighting.co.nz">www.eurotechlighting.co.nz</a>	
NVC Lighting	<a href="http://www.nvcnz.co.nz">www.nvcnz.co.nz</a> - Available on request	
Lighting Pacific Lighting	<a href="http://www.lpled.co.nz/s-doc">www.lpled.co.nz/s-doc</a>	
<b>OTHER</b>		
Teubel Switchboards	<a href="http://www.teubel.co.nz">www.teubel.co.nz</a>	✓
Alexander Towel Ladders	<a href="https://www.alexanderbathroom.co.nz/product/heated-towel-ladders/">https://www.alexanderbathroom.co.nz/product/heated-towel-ladders/</a>	✓
Newtech Towel Ladders	<a href="http://www.newtech.co.nz">www.newtech.co.nz</a>	

"Serious Electrical Contractors"

# Stones

Electrical Contractors Limited

Registered Electrical Contractors  
of the Electrical Contractors Association of New Zealand  
Member of the Electrical Contractors Association of New Zealand



Reference/Record Number:

73252

Issuer (Inspector) details:

Name of Inspector: Neville Wagstaff

Registration #: 1241952

Email Address: neville@secl.co.nz

Telephone: 04 296 1727

Location of Installation:

Location details:

65 Kohokohu Road Waikanae

Location Type:

Domestic

Non-Domestic Accommodation

Industrial

Commercial

Educational

Healthcare

Miscellaneous (other)

Certifying Electrical Work and Certificate of Compliance (CoC) details:

Name of Electrical worker(s):

K. Mansfield

Registration #:

E262709

CoC details:

CoC(s) attached

Certifying Electrical Work and CoC details:

What was inspected:

House Mains, MEN link and main earthing

Specify the regulation(s) and companion standard(s), or identify the certified design, followed when carrying out the inspection:

Electricity Safety Regulations 2010, reprinted 2014, Mains Work-6A (2)(b)

Standards as cited by ESR Schedule 2:

AS/NZS 3000:2007 Part 2 incl amdts 1 & 2

What are the results of the inspection:

Installation passed inspection, test results attached.

Mains &  
main E 0.01

IE Ø  
241  
IE N Ø

Loop  
= 39

PSC  
SP9 A

High Risk Category:

Not to AS/NZS 3000 Part 2 – 6A(2)(a)(i)

Photovoltaic system – 6A(2)(a)(iv)

Electrical medical area – 6A(2)(a)(vi)

High voltage installation – 6A(2)(a)(ii)

Hazardous area – 6A(2)(a)(v)

Mains work – 6A(2)(b)

Mains parallel generation – 6A(2)(a)(iii)

Animal stunning or meat conditioning – 6A(2)(c)

Other – please describe:

Declaration

I hereby confirm that the work described above has been done ~~in~~ / ~~not in~~ accordance with the regulations; and the ~~installation~~ / ~~part installation~~ on which the work has been done is, and will be / ~~not be~~, when energised, electrically safe.

(Note: Strike out or delete the inapplicable words highlighted in red above.)

Signature:

*Wagstaff*

Date:

24/7/18



# Warranty Statement Electrical Services

**Issued by:** Stones Electrical Contractors Ltd

**Address:** P.O. Box 175  
7A Epiha Street, Paraparaumu

In respect to the following:

Electrical cabling and fittings installed in accordance with AS/NZS 3000:2007 Wiring Rules.

**Installed at:** 65 Kohekohe Road, Waikanae  
**For:** Pat White Builders

- As Certifying electricians, currently registered, we certify the electrical works at the above property with a guarantee of our workmanship, in accordance with the Master Electricians Warranty, for a period of 12 months for substandard workmanship.
- All electrical fittings installed at the above address are installed as per manufacturer's instruction and are covered by a Suppliers Declaration of Conformity found on the supplier's website. A copy of the list of suppliers and their web address has been provided as part of our Compliance Documentation.
- For electrical fittings which do not have a web address for compliance, a separate SDOC has been provided.

*This warranty is valid for 12 months from the date of the Code of Compliance as long as Code has been obtained within 60 Calendar days from the issue of this certificate. If not the date on this warranty will be taken as the start of the warranty period.*

*This warranty does not cover any electrical repair or replacement to fittings provided by the home owner.*

Signed:  Date: 30-8-2018

Project Manager Mike Sands

# STATEMENT PIPED SERVICES AND PLUMBING STACKS



## Construction Review

Send or deliver this form to: Kapiti Coast District Council,  
175 Rimu Road, Paraparaumu 5032  
Private Bag 60601, Paraparaumu 5254  
For enquiries, phone 04 296 4700 (Toll Free: 0800 486 486)

### TO BE COMPLETED BY THE INSTALLER

Issued by: Steve Thomas

Registration number: 10945

In respect of Piped Services installed in accordance with G12/AS1 as shown on the approved plans or as per the attached amended plan and Sanitary Plumbing Stacks installed in accordance with G13/AS1 or AS/NZS 3500.2.2

Installed at: 65 Koko Koko Rd

Building Consent No: 1708064

As a certified plumber, currently holding an annual practicing license, certify that I, or personnel under my control, have carried out the installation of the above system and I believe on reasonable grounds that the installation complies with the New Zealand Building Code. Both hot and cold systems have been pressure tested for a period of 15 minutes at a pressure of 1500 kPa.

Name: Steve Thomas

Signature: 

Address: 21 Omaha st

Date: 7/9/18

Phone: 04 2936533

Fax:

Mobile:

Email:

### Kāpiti Coast District Council Office Use Only

Statement author authenticated and current registration verified. Verification and Registration checked through public register on [www.pgdb.co.nz](http://www.pgdb.co.nz).

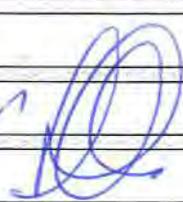
Date:

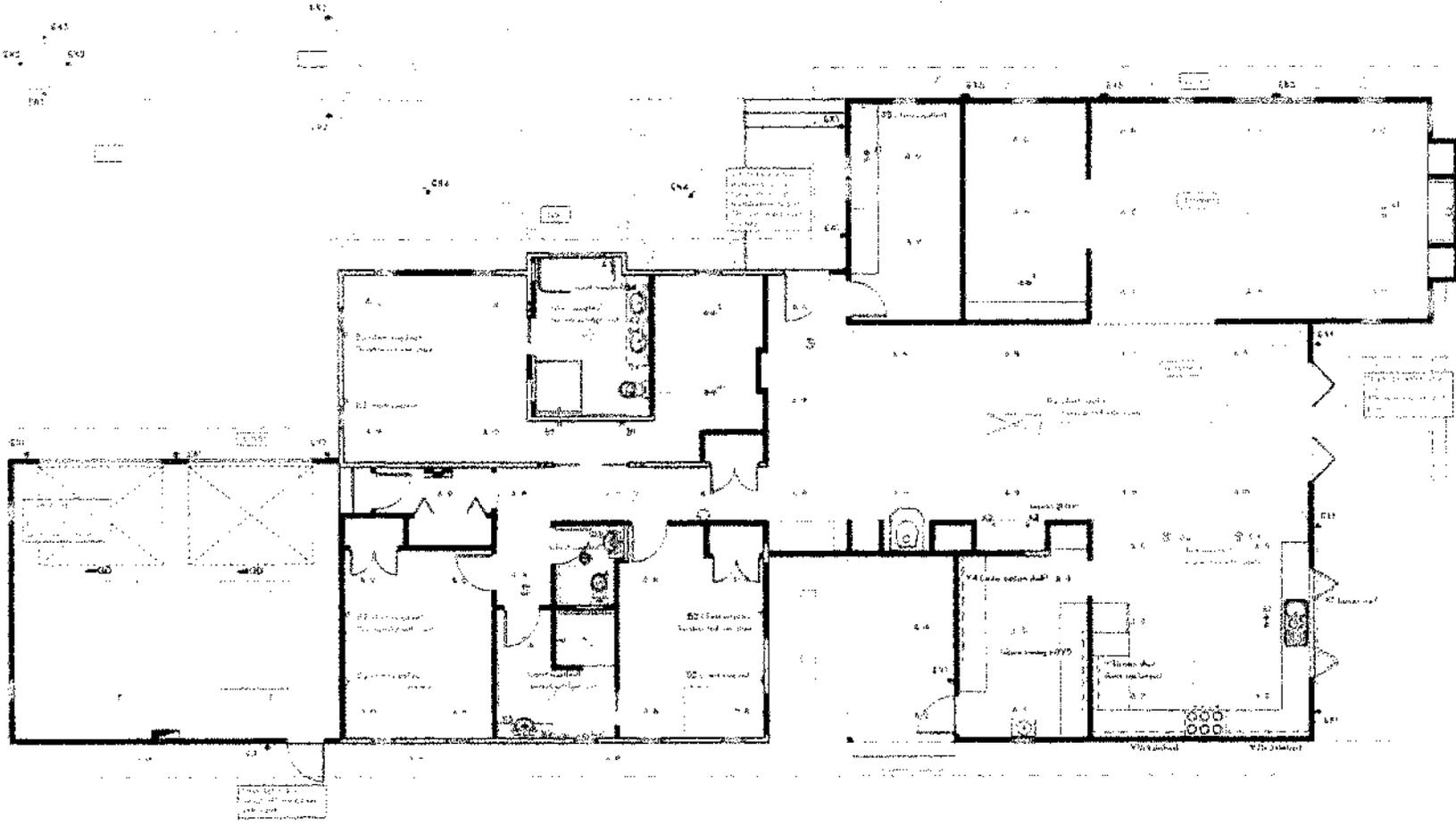
20/9/18

Name:

Gian

Signature:





**LIGHT PLAN**

© SUPPLEMENT

This plan shows the lighting layout for the project. It is a technical drawing and should be used in conjunction with the lighting schedule and specifications. The lighting layout is based on the architectural drawings and the lighting requirements for the project. The lighting layout is subject to change without notice.

**LIGHT**

www.lights.com

PROJECT NAME	DATE
PROJECT LOCATION	PROJECT NO.
PROJECT OWNER	PROJECT MANAGER
PROJECT ARCHITECT	PROJECT ENGINEER
PROJECT CONTRACTOR	PROJECT CONSULTANT
PROJECT LIGHTING DESIGNER	PROJECT LIGHTING MANAGER
PROJECT LIGHTING CONSULTANT	PROJECT LIGHTING SPECIALIST
PROJECT LIGHTING MANUFACTURER	PROJECT LIGHTING DISTRIBUTOR
PROJECT LIGHTING INSTALLER	PROJECT LIGHTING MAINTENANCE

KEY	CODE	DESCRIPTION	FINISH	QTY
A	736121	Main downlight: IP44 10W 36° 2700K LED round recessed down light with 36° tilt and 360° swivel c/w 450mA dimmable driver, 620 lumens, CRI>90, IC rated (83mm dia. cutout) 3 year in home warranty	White	36
A1	736121	Pair of downlight: 2x 10W 36° 2700K LED round recessed down light with 36° tilt and 360° swivel c/w 450mA dimmable driver, 620 lumens, CRI>90, IC rated (83mm dia. cutout) 3 year in home warranty. <i>736121 with 120mm diameter cutout</i>	White	6
A2	730161	Cabinet light: 2.5W LED 5000K round recessed cabinet light c/w non-dimmable CRI93, 200 lumens. Diameter: 55mm Depth: 15mm Cutout: 58mm Comes with 1x 250mA constant current driver to run both fittings. <i>IN SERIES</i>	White	2
A3	17501	Bathroom recessed reading light above bath: IP20 4W 28° 3000K LED round recessed down light with 360° swivel c/w 350mA non-dimmable driver. 218 lumens, IC rated (64mm dia. cutout) 75mm router diameter	White	1
B1	737391 (-27023)	Master bed feature wall light: SW 3000K warm white LED surface mounted indirect up down wall light c/w 500mA integral driver 450mm CRI>93 Height: 95mm Width: 230mm Base: 150mm Projects from wall: 48mm. <i>Finish: matt painted matt black in Rensko - allow for extra 20 days to arrive at site when applicable</i>	Custom painted black	2
B2	n/a	Bedroom wall lights (reading): Client supplied. Inquire with Client. <i>Not</i>		6
B3	n/a	Office wall light: Client supplied. Inquire with Client. <i>Not</i>		1
B4	n/a	Office wall light: Client supplied. Inquire with Client. <i>Not</i>		4
F	753141	Garage surface mounted batten: 1200mm 40W 4000K SMD LED surface mounted ceiling batten c/w integral driver Width: 75mm Depth: 40mm 24000m 55,000 hours CRI>83	White	4
EX1	731791	Exterior up/down columns: IP65 exterior surface mounted fixed up/down wall light c/w 2x 7.5W 3000K LED GU10 lamps. 20 year no-corrosion warranty	Black	10
EX2	732321	Exterior down only columns: IP65 exterior surface mounted fixed up/down wall light c/w 1x 7.5W 2000K LED GU10 lamp. 20 year no-corrosion warranty	Black	2
EX3	4820	Sculpture Inground Light - option 1: 11V low voltage Inground light with 6 table spot - sealed lamp IP68. Comes with 1x 60VA inductive load transformer to run the 4 spots on the same circuit. Comes with 2x 300mm spot - <i>Client to install leads to be done from rough in to install the lights. Not to be done until after the landscaping has been completed. 10% deposit required to install the lights on site.</i>	Raw Copper	4
EX3	6373	Sculpture Inground Light - option 2: 12V low voltage Inground light with 6 adjustable spot - sealed lamp IP68. Comes with 1x 80VA inductive load transformer to run the 4 spots on the same circuit. Comes with 2x 300mm spot - <i>Client to install leads to be done from rough in to install the lights. Not to be done until after the landscaping has been completed. 10% deposit required to install the lights on site.</i>	Raw Copper	6
EX4	44641	Low voltage garden spike spot: IP65 exterior spike bronze adjustable garden spike spot c/w 5W LED 3000K warm white lamp. 75 lumens. <i>Remove IP67 12V/VA garden transformer c/w 6 spots provided at 1/20m</i>	Sold bronze	4
T	705491 (-177021)	Transformer + low voltage cable: IP67 60VA inductive load transformer for 12V 75W. Comes with 1x roll 20M 3.33mm low voltage landscape cable (1 roll for the 2 transformers)	n/a	2

EX5	707261	Low level exterior surface mounted light (230V): IP65 Exterior rated 4W 3000K LED surface mounted square low level wall light c/w integrated 500mA driver in base. 315 lumens. Depth: 35mm Width & Height: 102mm	Black	3
P1		Entrance pendant: 1 lamp (c/w 230V) in 1/2" diameter		2
P2		Living room pendant: 1 lamp (c/w 230V) in 1/2" diameter		1
P3		Bedroom pendant: 1 lamp (c/w 230V) in 1/2" diameter		1
P4		Kitchen island pendant: 1 lamp (c/w 230V) in 1/2" diameter		2
X1	96111	Exterior strip under back kitchen window shelf: 2700mm 9.6Wm IP65 12V LED strip in surface mounted aluminium channel c/w remote 20W constant voltage driver - non IP rated driver. LED strip length non-returnable. Strip length 780	Warm white	1
X2	63791	Strip under ensuite vanity - night light: 2000mm 4.8Wm 12V LED strip in surface mounted aluminium channel c/w remote 12W constant voltage driver. LED strip length non-returnable. Strip length 780	Warm white	1
X3	62791	Strip under bathroom vanity - night light: 2000mm 4.8Wm 12V LED strip in surface mounted aluminium channel c/w remote 12W constant voltage driver. LED strip length non-returnable. Strip length 780	Warm white	1
V1+ V2	AA171	Recessed strips under kitchen shelves (2 shelves each side of hub): 2x 1700mm + 2x 1600mm 9.6Wm 12V LED strip in recessed aluminium channel c/w remote 80W constant voltage driver to run the 4 strips together. LED strip length non-returnable. Strip length 780	Natural white	1
V3	66192	Recessed strip in appliance cupboard (under shelf above appliances): 1260mm 9.6Wm 12V LED strip in recessed aluminium channel c/w remote 20W constant voltage driver. LED strip length non-returnable. Strip length 780	Natural white	1
V4	66171	Recessed strip in laundry (under bottom shelf above counter): 2200mm 9.6Wm 12V LED strip in recessed aluminium channel c/w remote 40W constant voltage driver. LED strip length non-returnable. Strip length 780	Natural white	1
V5	66174	Recessed strip in laundry (above ironing board inside joinery) 1800mm 9.6Wm 12V LED strip in recessed aluminium channel c/w remote 20W constant voltage driver. LED strip length non-returnable. Strip length 780	Natural white	1

**LIGHTING LEGEND**

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**LIGHT**  
L & P

Light & Power Pty Ltd  
100/102 Victoria Road, North Sydney, NSW 1585  
www.lightandpower.com.au

PROJECT: [REDACTED] DATE: [REDACTED]  
DRAWN BY: [REDACTED] CHECKED BY: [REDACTED]  
DATE: [REDACTED] DATE: [REDACTED]



# GAS SAFETY & COMPLIANCE CERTIFICATE

Reference 251

Gas Safety Certificate and Certificate of Compliance made pursuant to Regulations 46 and 52B of the Gas (Safety and Measurement) Regulations 2010 (as amended), and Energy Work Certificate made pursuant to Regulation 19 of the Building Act 2004.

CLIENT NAME	Mr & Mrs Hyndman	INSTALLATION NAME	Same
ADDRESS	65 Kohe Kohe Road Waikanae		same
<b>Install reused Rinnai infinity converted to NG</b> <b>Install Escea DL1400 with vertical flue through roof</b> <b>Install freestanding cooker</b> <b>Install outdoor bayonet for BBQ connection</b>			
GAS TYPE (NG, LPG, Biogas)	NG	GAS SUPPLY PRESSURE	2.5KPA
DATE(S) GASFITTING PERFORMED	14/05/2018	DATE OF GAS CONNECTION	31/08/2018
STANDARD RISK CLASSIFICATION (tick one)	<input type="checkbox"/> Low	<input checked="" type="checkbox"/> General	<input type="checkbox"/> High
NAME, REGISTRATION NUMBER (IF ANY) OF PERSONS WHO CARRIED OUT GASFITTING UNDER SUPERVISION:  Murray Woolcock 07442 Martin Stevenson 14884 Matt Parrish 26146			
<b>CERTIFICATE ATTACHMENTS</b> (tick as applicable) <input type="checkbox"/> Manufacturers Instructions: Enter details of any attachments <input type="checkbox"/> Certified Designs: Enter details of any designs. Architects Drawings.			
"I believe on reasonable grounds that: (a) the gasfitting work described above has been done lawfully and safely; and (b) the work has been done in accordance with (tick one): <input checked="" type="checkbox"/> sections 3 to 6 of AS/NZS 5601.1, or <input type="checkbox"/> sections 3 to 9 of AS/NZS 5601.2; and (c) the work <input type="checkbox"/> has <input checked="" type="checkbox"/> has not (tick one) been done in accordance with a certified design; and (d) the work done <input type="checkbox"/> has <input checked="" type="checkbox"/> has not (tick one) relied on any manufacturers instructions; and (e) this certificate relates to the <input checked="" type="checkbox"/> whole <input type="checkbox"/> part (tick one) installation described above; and (f) the gas installation is connected to a gas supply and is safe to use; and (g) the information contained in this certificate is correct."			
CERTIFIER NAME	Steven Thomas		
REGISTRATION TYPE & NUMBER	10945		
SIGNATURE			
DATE	03/09/2018		



**Master  
Plumbers  
Gasfitters  
Drainlayers**

**STATEMENT  
DRAINAGE WORK INSTALLED  
Construction Review**

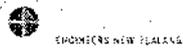


Send or deliver this form to: Kapiti Coast District Council,  
175 Rimu Road, Paraparaumu 5032; Private Bag 60601, Paraparaumu 5254  
For enquiries, phone 04 296 4700 (Toll Free: 0800 486 486)

TO BE COMPLETED BY THE INSTALLER	
Issued by:	Steve Thomas
Registration number:	10945
Tick applicable	
<input checked="" type="checkbox"/>	In respect of: Stormwater Drains installed in accordance with E1 AS1 as shown on the approved plans or as per the attached amended plan.
<input checked="" type="checkbox"/>	In respect of: Private Sewer Drains installed in accordance with G13 AS2 or AS/NZS 3500 .2.2 as shown on the approved plans or as per the attached amended plan.
Installed at:	65 Kuku Kuku Rd
Building Consent No:	170 844
As a certified drainlayer, currently holding an annual practicing license, I certify that I, or personnel under my control, have carried out the installation of the above system and I believe on reasonable grounds that the installation complies with the New Zealand Building Code.	
Name: Steve Thomas	Signature:
Address: 21 Omaha St	Date: 7/9/18.
Phone: 04 293 6533	Fax:
Mobil:	Email:

**Note:** Fully dimensioned as built drain plan to be supplied.(scale 1:100)  
Drains may be laid and backfilled without inspection provided that the drain is left under test with a min of 1.0 m head and the inspection at the lateral left exposed.

Kāpiti Coast District Council Office Use Only	
Statement author authenticated and current registration verified. Verification and Registration checked through public register on <a href="http://www.pgdb.co.nz">www.pgdb.co.nz</a> .	
Name:	
Signature:	Date: 20/9/18



# PRODUCER STATEMENT – PS4 – CONSTRUCTION REVIEW

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

**ISSUED BY:** Seajay Consulting Engineers Ltd  
*(Construction Review Firm)*

**TO:** Neil and Gillian Hyndman  
*(Owner/Developer)*

**TO BE SUPPLIED TO:** Kapiti Coast District Council  
*(Building Consent Authority)*

**IN RESPECT OF:** House alterations  
*(Description of Building Work)*

**AT:** 65 Kohekohe Road, Waikanae  
*(Address)*

**LOT 5 DP 19887 SO .....**

Seajay Consulting Engineers Ltd has been engaged by N & G Hyndman  
*(Construction Review Firm)*

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

or  other Construction observation of foundations, porch beams and associated posts and connections services  
*(Extent of Engagement)*

in respect of clause(s) B1 of the Building Code for the building work described in

documents relating to Building Consent No. BC170844 and those relating to

Building Consent Amendment(s) Nos. Nil issued during the

course of the works. We have sighted these Building Consents and the conditions of attached to them.

Authorised instructions / variations(s) No. 17050-SR01, SI01, SR02, SR03, SR04 (copies attached)

or by the attached Schedule  have been issued during the course of the works.

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

I also believe on reasonable grounds that the persons who have undertaken this construction review have the necessary competency to do so.

I, Craig McGhie am:  CPEng No. 173345  
*(Name of Construction Review Professional)*

Reg Arch No. ....

I am a Member of:  IPENZ  NZIA and hold the following qualifications: NZCE (Civil), BE (Civil) Hon, ME (Fire)

The Construction Review Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than \$200,000\*.

The Construction Review Firm is a member of ACENZ:

**SIGNED BY** Craig McGhie **ON BEHALF OF** Seajay Consulting Engineers Ltd

Date: 21/6/2018 Signature:

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

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

# SITE INSPECTION REPORT



**CONSULTING ENGINEERS**  
**CIVIL • STRUCTURAL • FIRE**

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 Phone (04) 212 5150 • Cell 021 121 4591  
 craig@seajay.co.nz

Job No.: 17050	Report No.: SR01
Date: 16/1/2018	Sheet 1 of
Project: 65 Koke Koke Road Wai Karane	
Area Inspected: Existing Foundations	BC Number:
Inspected by: Craig McEhie	Contractors Rep: Pat White

**Observations:**

027 446 5548  
 waikanaewhites@gmail.com

① Existing perimeter block foundation wall comprises

- 100 mm block
- No reinforcing steel.
- No footing
- is not connected to floor.

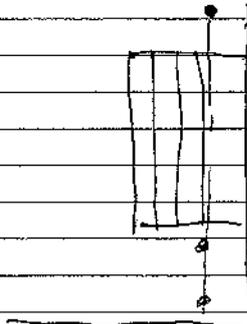
Need alternative detail for girder truss foundations (Seajay to confirm details)

② Need to provide additional subfloor bracing where foundation walls removed (Seajay to confirm details)

③ Bearer line across north side of house to be offset 500mm to allow pile driving rig to clear soffit (Seajay to confirm details)

**Instructions Given:**

④ Contractor to remove existing steps on grid 'e' if possible with out ~~peno~~ damaging floor. Bearer to be resize if necessary to clear steps



Next Inspection: Pile Driving

Approved: (Signed):	Not approved - Hold Point: (Signed):		
Work may proceed: (Subject to completing above instructions)	Work may not proceed (Further design/instruction and re-inspection required)	Re-inspection required (Following completion of above instructions.)	Contractor to supply photographs (For approval following completion of above instructions. Work not to proceed until approval given.)

Note that the above approval does not include statutory inspections and approval which may be required by the Building Consent Authority. Similarly Building Consent Authority approval does not preclude re-inspection or implementation of further instructions directed herewith where the inspection was 'Not Approved'.

**SITE INSTRUCTION**

**Job No.:** 17050

**Instruction No.:** SI01

**Date:** 19/1/2018

**Sheet** 1 of 3

**Project:** 65 Kohe Kohe road, Waikanae

**Issued by:** Craig McGhie

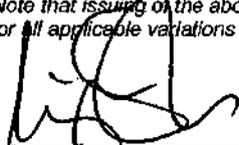
**Contractor:** Pat White Builders  
**Email:** waikanaewhites@gmail.com

**Principal:** Gillian & Neil Hyndman  
**Email:** neil@hyndman.co.nz



Item	Description
1.1	<p>Girder truss foundations.</p> <p>Confirming site discussion regarding construction of the girder truss foundations.</p> <p>The new mass concrete pile foundations adjacent to the unreinforced masonry foundations wall may be offset as shown in sktech 17050 - SK01 attached.</p> <p>A pile shall be driven in the centre of the pads at the new north end bearer line.</p>
1.2	<p>All driven piles shall be provided with a 6kN pile at the top to achieve cantilever bracing pile connections to NZS 3604. This does not apply to the girder truss foundations which require 18kN connections.</p> <p>Refer to revised drawing 17050-S4 – Rev 1 attached.</p>

*Note that issuing of the above instruction does not constitute approval of a variation to contract. Obtain written approval from Principal for all applicable variations to contract prior to work being undertaken.*

  
**Issued**  
**Seajay Consulting Engineers**

**Distribution:**      *Principal:*       *Contractor:*       *Architect:*       *File:*

# CALCULATIONS

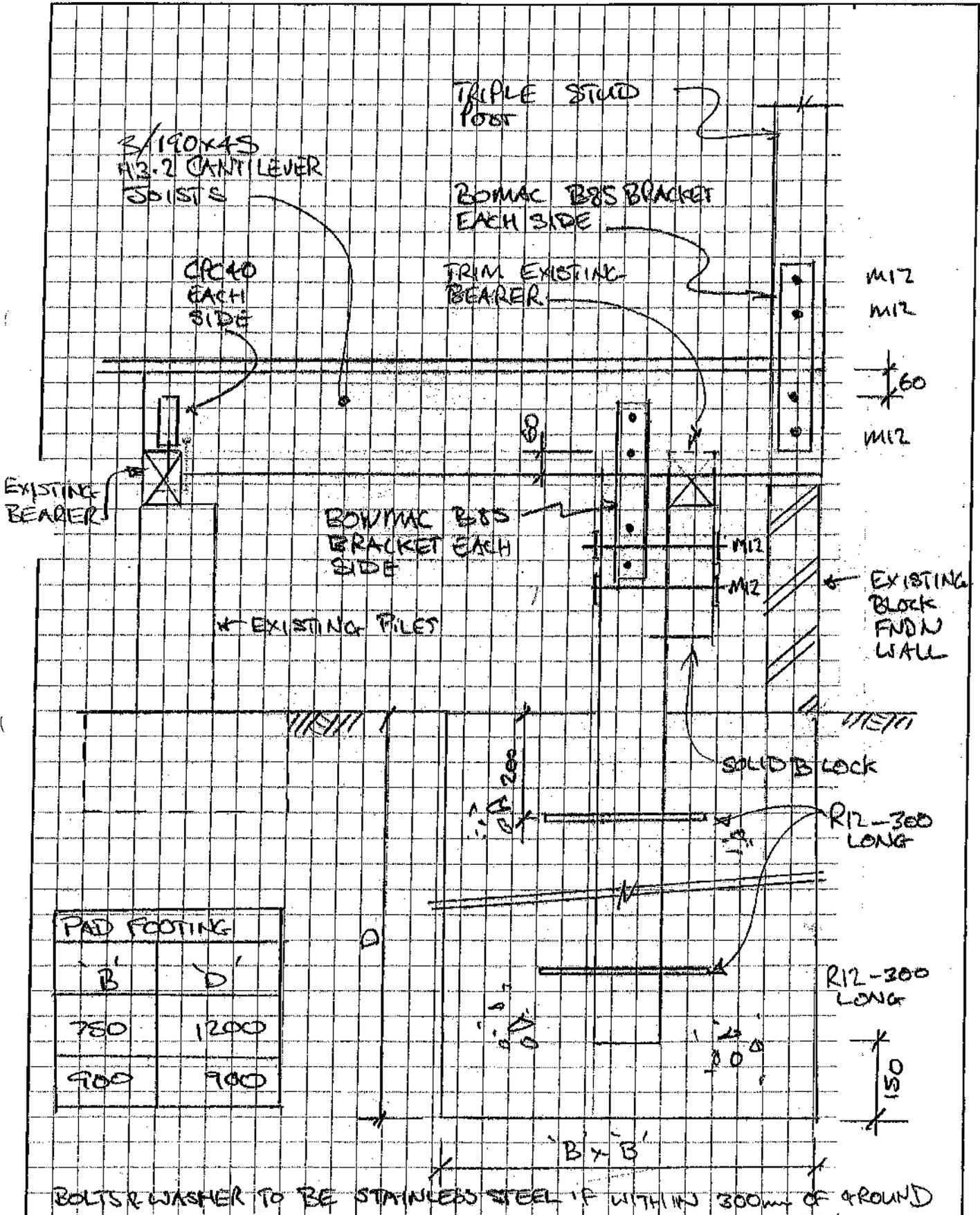
Project No.: 17050      Date: 19/11/2018      Eng: COM      Page: SK01

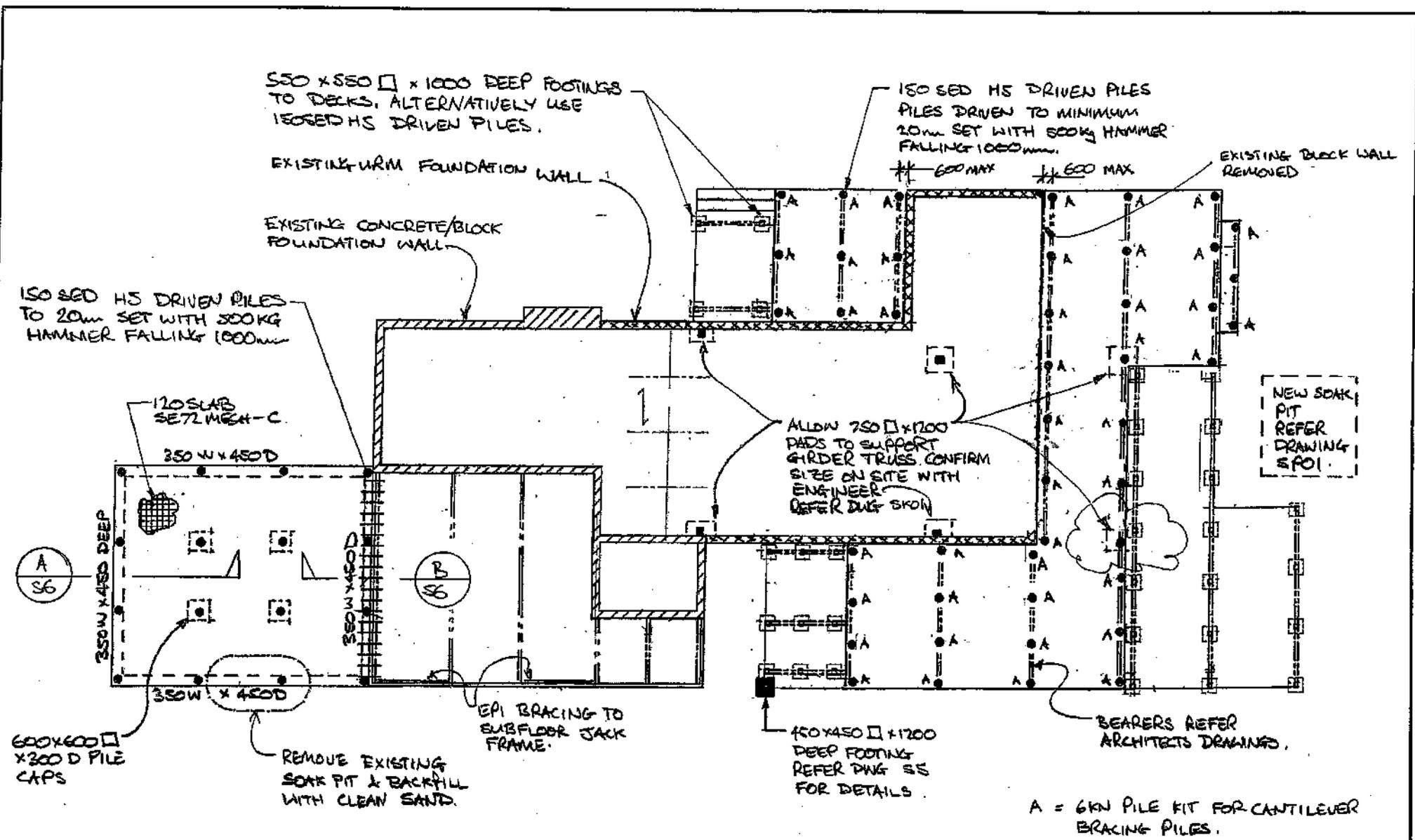
Project: 65 KOHE KOHE ROAD

Description: ALTERNATIVE GIRDER TRUSS A/E

## Seajay C

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cs@seajay.co.nz





**FOUNDATION PLAN**  
1:100

 <p>Seajay CONSULTING ENGINEERS DIVISIONAL ENGINEERS</p> <p>42 Lifford Road, PO Box 9718, Petropoulos 6202 Phone (041) 242 8119 • Fax (041) 221 4081 seajay@seajay.co.nz</p>	CLIENT: G & N HYNDMAN	DATE: AUG 2017	DRAWN: CJM
	PROJECT: 65 KOHEKOME ROAD WAIKANAE	JOB No: 17050	
	TITLE: HOUSE ALTERATIONS FOUNDATION PLAN	SHEET No: S4	REV: 1

## CALCULATIONS

Project No.: 17050    Date: 18/1/2018    Eng: CJM    Page: A1

Project: 65 KOHE KOHE ROAD

Description: REVISED GIRDER TRUSS PILE



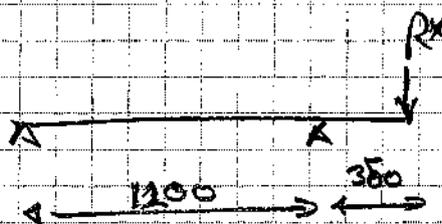
### 1.0 SCOPE

Existing perimeter wall uRM  $\therefore$  need off set pile.

### 2.0 JOISTS

$R_x = 18 \text{ kN}$  up wind

$$M^* = 0.35 \times 18 \text{ kN} = 6.3 \text{ kNm}$$



3 / 140 x 45 MSG8.

$$\phi M_u = 1.6 \text{ kNm} \times 3 = 4.8 \text{ kNm} < 6.3 \text{ kNm} \therefore \text{NG}$$

$$e_{\max} = \frac{4.8 \text{ kNm}}{18 \text{ kN}} = 0.26 \text{ m}$$

Try 3 / 190 x 45

$$\phi M_u = 3.0 \text{ kNm} \times 3 = 9 \text{ kNm} > 6.3 \text{ kNm} \therefore \text{OK}$$

$$\phi U_n = 3 \times 17.2 \text{ kN} = 51.6 \text{ kN} \therefore \text{OK}$$

Backspan Reaction is compression  $\therefore$  OK.

$$R^* = 18 \times \frac{1.55}{1.2} = 18 \text{ kN}$$

$$= 5.0 \text{ kN} \therefore \text{OK}$$

# CALCULATIONS

Project No.:

Date:

Eng:

Page:

Project:

Description:

# Seajay C

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Existing Beam  $L = 1.3m$

$$M_x = 5 \times \frac{1.3}{8}$$
$$= 0.81 \text{ kNm}$$

$$\phi M_u = 1.7 M_R \times \frac{70 \times 100^2}{6} \times K_1 = 1.0 \times K_2 = 1.0$$
$$= 1.98 \text{ kNm} \therefore \text{OK Existing 1960 Beam}$$

Connections:

4 - M12 Bolts, 2 / B85 Brackets.

**Bolted Connection Capacity**

Job No.:

Project :

Description :

Page:

Date : 18/01/2018

Eng: CJM

**Connection Details**

Bolt size	da	<input type="text" value="12"/>	mm	Timber thickness b <sub>1</sub>	<input type="text" value="45"/>	mm
Total Number of Bolts	n	<input type="text" value="4"/>		Timber thickness b <sub>2</sub>	<input type="text" value="45"/>	mm or
Joint Restrained		<input type="text" value="NO"/>		Steel Plate	<input type="text" value="YES"/>	

**Capacity of Timber Member - b1**Effective Timber thickness b<sub>e1</sub> 90 mm**Parallel Capacity :**

$$k_{111} = 2 \quad f_{cj} = 36.1 \text{ MPa}$$

$$Q_{skl} \leq k_{111} f_{cj} d_a^2 \quad \text{and} \quad 0.5 b_e f_{cj} d_a$$

$$Q_{skl} \leq 10.40 \text{ kN} \quad \text{or} \quad 19.49 \text{ kN}$$

$Q_{skl} = 13.00 \text{ kN}$
------------------------------

**Perpendicular Capacity:**

$$k_{p11} = 14.9 \quad f_{pj} = 12.9 \text{ MPa}$$

$$Q_{skp} \leq k_{111} f_{pj} d_a^{1.5} \quad \text{and} \quad 0.5 b_e f_{pj} d_a$$

$$Q_{skp} \leq 7.99 \text{ kN} \quad \text{or} \quad 6.97 \text{ kN}$$

$Q_{skp} = 6.97 \text{ kN}$
-----------------------------

Angle of load to grain  $\theta$  90

$$Q_{sk} = \frac{Q_{skl} \times Q_{skp}}{Q_{skl} \sin^2 \theta + Q_{skp} \cos^2 \theta} = 6.97 \text{ kN}$$

Duration	<input type="text" value="Short term"/>	K <sub>1</sub> =	1
Condition	<input type="text" value="Dry"/>	K <sub>12</sub> =	1
		K <sub>13</sub> =	1
Capacity Reduction Factor		$\emptyset$ =	0.7

$$\emptyset Q_n = \emptyset \times k_1 \times k_{12} \times k_{13} \times n \times Q_{sk}$$

$$0.70 \times 1.00 \times 1.00 \times 1.00 \times 4.00 \times 6.97 = 19.50 \text{ kN}$$

**Capacity of Timber member - b2**Effective Timber thickness b<sub>e2</sub> 90 mm**Parallel Capacity :**

$$k_{111} = 2 \quad f_{cj} = 36.1 \text{ MPa}$$

$$Q_{skl} \leq k_{111} f_{cj} d_a^2 \quad \text{and} \quad 0.5 b_e f_{cj} d_a$$

$$Q_{skl} \leq 10.40 \text{ kN} \quad \text{or} \quad 19.49 \text{ kN}$$

$Q_{skl} = 10.40 \text{ kN}$
------------------------------

**Perpendicular Capacity:**

$$k_{p11} = 14.9 \quad f_{pj} = 12.9 \text{ MPa}$$

$$Q_{skp} \leq k_{111} f_{pj} d_a^{1.5} \quad \text{and} \quad 0.5 b_e f_{pj} d_a$$

$$Q_{skp} \leq 7.99 \text{ kN} \quad \text{or} \quad 6.97 \text{ kN}$$

$Q_{skp} = 6.97 \text{ kN}$
-----------------------------

Angle of load to grain  $\theta =$  90

$$Q_{sk} = \frac{Q_{skl} \times Q_{skp}}{Q_{skl} \sin^2 \theta + Q_{skp} \cos^2 \theta} = 0.00 \text{ kN}$$

$$\emptyset Q_n = \emptyset \times k_1 \times k_{12} \times k_{13} \times n \times Q_{sk}$$

$$0.70 \times 1.00 \times 1.00 \times 1.00 \times 4.00 \times 0.00 = 0.00 \text{ kN}$$

**Dependable Capacity of Bolted fixing**

$\emptyset Q_n = 19.50 \text{ kN}$
------------------------------------

**CALCULATIONS**

Project No. :

Date:

Eng:

Page:

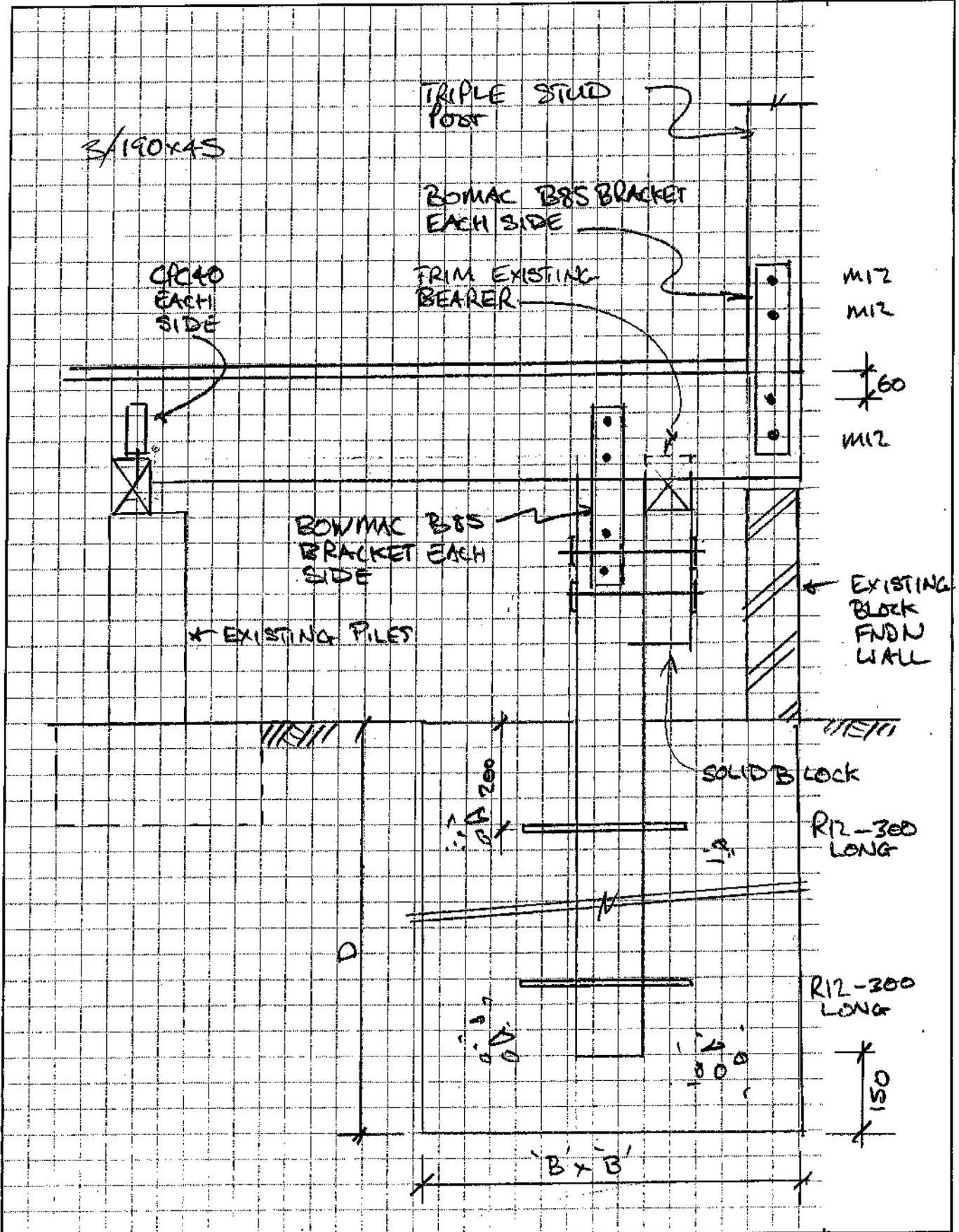
Project:

Description:



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## Subfloor Level Along Resistance Sheet

Job Name:

Wind	EQ
Demand	
915	3488
Achieved	
4996 545%	4420 127%

Line	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind BUs	EQ BUs	4996 545%	4420 127%
A	1	4.00	12	Cantilever Pile	NZS3604	280	120	810	360
	2	3.60		Conc Fndn Wall	Existing	360	360		
B	1	14.00	6.3	Conc Fndn Wall	Existing	1400	1400	1030	630
	2	3.00	6	Cantilever Pile	NZS3604	210	90		
C	1	8.20		Conc Fndn Wall	Existing	620	620	820 OK	620 OK
D	1	42.00	3.2	Conc Fndn Wall	Existing	4200	4200	1270 OK	4230 OK
	2	1.00	7	Cantilever Pile	NZS3604	70	30		
F	1	2.40		EP1	SPD	288	240	856 OK	600 OK
	2	2.40		EP1	SPD	288	240		
	3	4.00	12	Cantilever Pile	NZS3604	280	120		

UTILISE ALL PILES

2060  
NG  
60%  
NBS

Wall  $630 + 620 + 320 = 1570 \text{ BU}$

Drive Piles  
Cantilever  $47 \text{ Piles} \times 30 \text{ BU each} = 1410 \text{ BU}$

2980 BU.

$\% \text{ NBS } 85\%$

OK.

No worse.

could use higher than  $\phi U_u = 100 \text{ BU/m}$  on strip footings built in 2010.

$\therefore \phi U_u = 1570 \times 1.5 + 1410 = 3765 \text{ BU}$

$\therefore 100\% \text{ NBS}$



## Subfloor Level Across Resistance Sheet

Job Name:

Wind	EQ
Demand	
1662	3488
Achieved	

Line	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind BUs	EQ BUs	4526 272%	9630* 104%
N	1	4.20 ✓		Conc Fndn Wall	Existing	420	420	998 OK	900 OK ✓
	2	2.40 ✓		EP1	SPD	288	240		
	3	2.40 ✓		EP1	SPD	288	240		
O	1	4.20 ✓		Conc Fndn Wall	Existing	420	420 ✓	420 OK	420 OK ✓
P&Q	1	4.00 ✓		Conc Fndn Wall	Existing	400	400	470 OK	430 OK ✓
	2	1.00 ✓		Cantilever Pile	NZS3604	70	30		
R	1	3.80 ✓		Conc Fndn Wall	Existing	380	380	500 OK	420 OK ✓
	2	2.00 ✓		Cantilever Pile	NZS3604	140	80		
S	1	9.50 ✓		Conc Fndn Wall	Existing	950	950	1020 OK	980 OK ✓
	2	1.00 ✓		Cantilever Pile	NZS3604	70	30		
T	1	10.00 ✓		Cantilever Pile	NZS3604	700	300	700 OK	300 OK ✓
U	1	6.00 ✓		Cantilever Pile	NZS3604	420	180	420 OK	180 Check ✓

$$\phi W_u = 900 B_u + 120 B_u + 100 B_u + 1410 B_u$$

$$= 3130 B_u$$

2310  
66%

$$\% NBS = \frac{3130}{3788} = 82.7\%$$

Current design 66% NBS.

Proposed 90% NBS



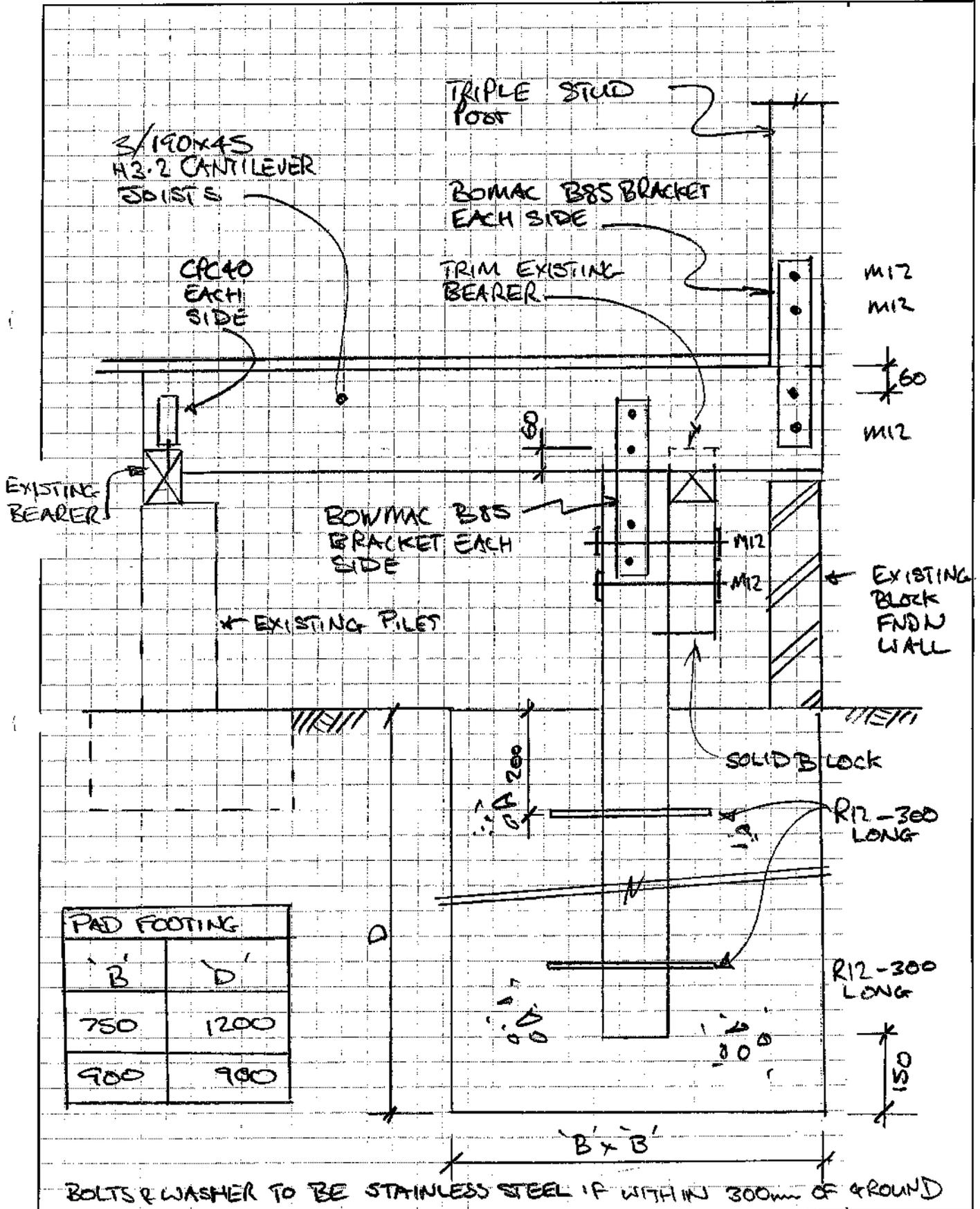
**CALCULATIONS**

Project No.: 17050    Date: 19/11/2018    Eng: CSM    Page: SK01

Project: 65 KOHEKOHE ROAD

Description: ALTERNATIVE GIRDER TRUSS A/E

**Seajay C**  
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# SITE INSPECTION REPORT



**CONSULTING ENGINEERS**  
**CIVIL • STRUCTURAL • FIRE**

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 Phone: (04) 212 5150 • Cell: 021 121 4591  
 craig@seajay.co.nz

Job No.: 17050	Report No. SR02
Date: 1/2/2018	Sheet of
Project: 65 Kohokohi Road Waikanae	
Area Inspected: Foundations	BC Number:
Inspected by: Craig McGhie	Contractors Rep:

Observations:

① Timber Piles 150 SED Driven approx 3m depth (Pile driving contractor to provide as built schedule.)  
 Sets achieve 5-10mm : ok

② Internal Girder truss foundations  
 • 900 x 900 x 900 ok  
 • Firm sand bearing on

Instructions Given:

- ① Pile contractor to provide as built schedule
- ② Install timber piles to Girder truss foundation (Provide photos pre-pour).

Next Inspection: Garage Slab & External Girder truss footings

Approved: (Signed)	Not approved - Hold Point: (Signed)
Work <u>may</u> proceed: (Subject to completing above instructions) ✓	Work may <u>not</u> proceed: (Further design/instruction and re-inspection required.)
Re-inspection required (Following completion of above instructions.)	Contractor to <u>supply photographs</u> (For approval following completion of above instructions. Work not to proceed until approval given.) ✓

Note that the above approval does not include statutory inspections and approval which may be required by the Building Consent Authority. Similarly Building Consent Authority approval does not preclude re-inspection or implementation of further instructions directed herewith where the inspection was 'Not Approved'

# SITE INSPECTION REPORT



**CONSULTING ENGINEERS**  
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 craig@seajay.co.nz

Job No.: 17050	Report No.: SRO3
Date: 9/2/2018	Sheet 1 of 2
Project: 65 Kohokoh Road	
Area Inspected: Foundations	BC Number:
Inspected by: Craig McElhine	Contractors Rep:

Observations:

Garage Slab

- ① 120 Slab SE72 Mesh ok
- ② 350 x 600 D Edge Beam (>450 D) ∴ ok
  - 2 - HD12 T & B
  - R10 - 200 Stirrups
  - HD12 - 'L' Bars at Corners
  - 600 min laps ok.
- ③ 600 x 600 Pads over piles (4 ap) ok
  - 3/HD10 - EW - 1200 long over piles ok
- ④ HD12 - 600 - Dowels to existing slab ok  
 Epoxy grout.

Instructions Given:

Girder Truss Piles

- ① 900 x 900 x 900 Piles with 125 D H5 piles on
- ② 3/12 Dowel Bar through pile ok

Girder Truss Footing (on Grid V)

As per previous site discussions.

Substitute ground beam for piles.  
 Refer pg 2.

Next Inspection: See pg 2

Approved: (Signed)	Not approved - Hold Point: (Signed)
Work <u>may</u> proceed: (Subject to completing above instructions)	Work may <u>not</u> proceed (Further design/instruction and re-inspection required.)
<input checked="" type="checkbox"/>	<input type="checkbox"/>
Re-inspection required (Following completion of above instructions.)	Contractor to supply photographs (For approval following completion of above instructions. Work not to proceed until approval given.)

Note that the above approval does not include statutory inspections and approval which may be required by the Building Consent Authority. Similarly Building Consent Authority approval does not preclude re-inspection or implementation of further instructions directed herewith where the inspection was "Not Approved"

# SITE INSPECTION REPORT



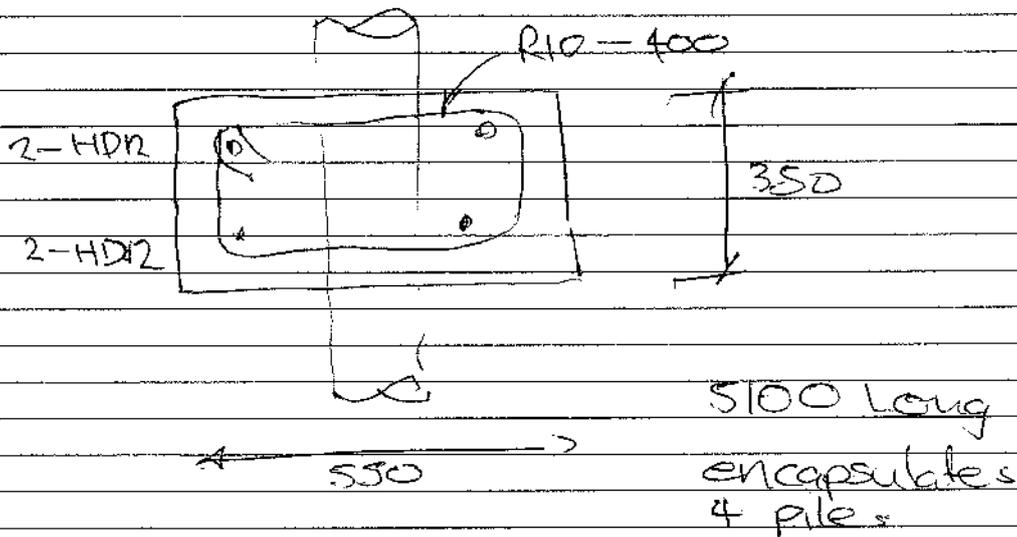
**CONSULTING ENGINEERS**  
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 craig@seajay.co.nz

Job No.: 17050	Report No.: SK03
Date: 9/2/2017	Sheet 2 of 2
Project: 65 kokekoke	
Area Inspected: Foundations	BC Number:
Inspected by: C. McEhie	Contractors Rep:

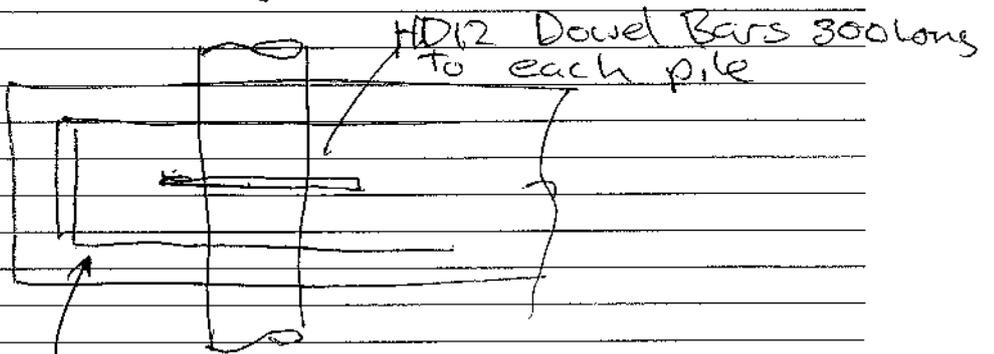
**Observations:**

Revised Ground Beam Grid VI



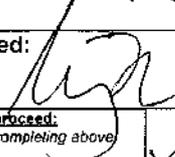
**Instructions Given:**

① Add following steel to ground beam



② OK to pour when ① complete. 4 - HD12 'L' Bars - 600 lap. AT each end of beam

Next Inspection: Post x Beam Connections

Approved: (Signed:  )	Not approved - Hold Point: (Signed: )	Photo of bars added	
Work may proceed: (Subject to completing above instructions)	Work may not proceed: (Further design/instruction and re-inspection required)	Re-inspection required: (Following completion of above instructions.)	Contractor to supply photographs: (For approval following completion of above instructions. Work not to proceed until approval given.)

Note that the above approval does not include statutory inspections and approval which may be required by the Building Consent Authority. Similarly Building Consent Authority approval does not preclude re-inspection or implementation of further instructions directed herewith where the inspection was "Not Approved"

# SITE INSTRUCTION

Job No.: 17050

Instruction No.: SI02

Date: 16/2/2018

Sheet 1 of 3

Project: 65 Kohe Kohe road, Waikanae

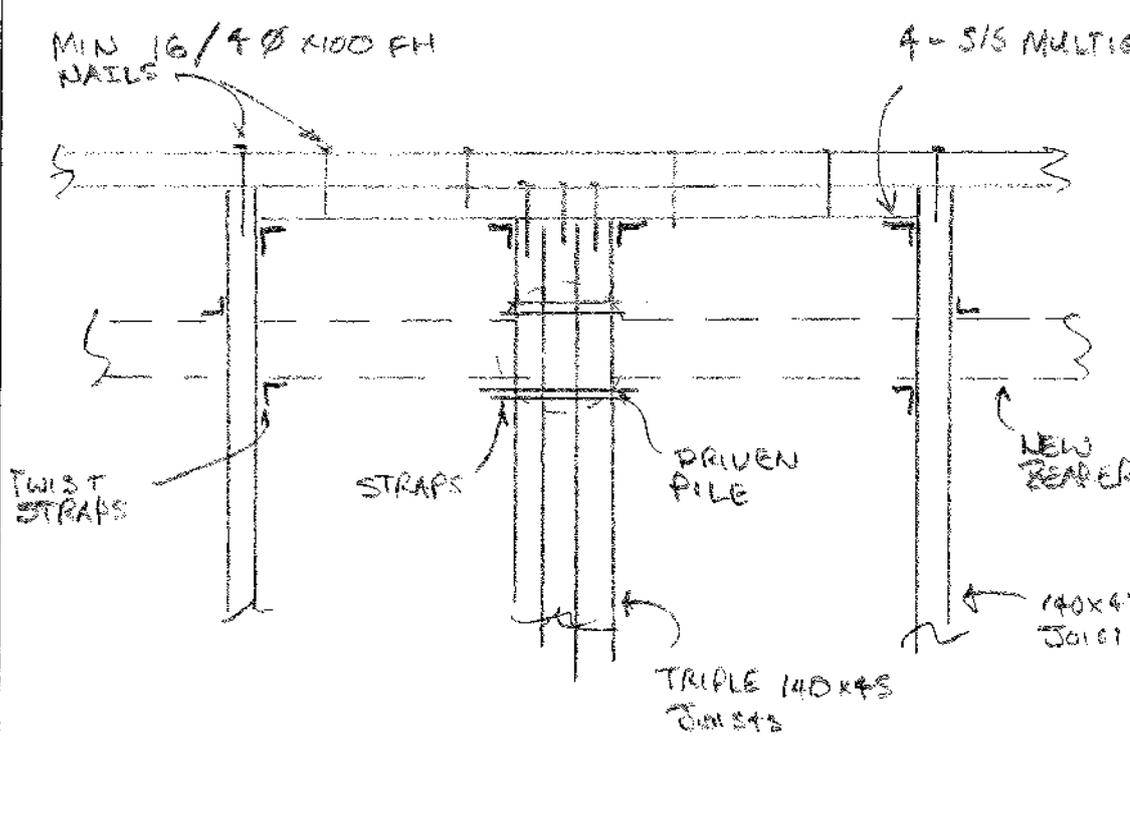
Issued by: Craig McGhie

Contractor: Pat White Builders  
 Email: waikanaewhites@gmail.com

Principal: Gillian & Neil Hyndman  
 Email: neil@hyndman.co.nz



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 craig@seajay.co.nz

Item	Description
2.1	<p>Girder truss boundary joist connection.</p> <p>Confirming site discussions regarding construction of the girder truss boundary joist connection. The connection shall be modified as follows to suit the asbuilt geometry</p> 

Note that issuing of the above instruction does not constitute approval of a variation to contract. Obtain written approval from Principal for all applicable variations to contract prior to work being undertaken.



Issued  
 Seajay Consulting Engineers

Distribution:      Principal:       Contractor:       Architect:       File:

## CALCULATIONS

Project No.: 17050      Date: 16/1/2018      Eng: CAN      Page:

Project: 65 Koke Koke Road.

Description: Revised Girder Truss Supports



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info@seajay.co.nz

1.0 Footing on Grid 'V'

$$A = 16.8 \text{ m}^2$$

Site wind pressure

$$q_{zeu} = 986 \text{ Pa}$$

$$C_{pe} = 0.9$$

$$\therefore R^* = (0.986 \times 0.9 - 0.9 \times 0.3) \times 16.8 \text{ m}^2$$

$$= 10.3 \text{ kN}$$

Weight wall  $W_T = 0.4 \text{ kPa} \times 2.5 \times 2 = 2 \text{ kN}$

Weight floor  $= 0.3 \text{ kPa} \times 0.8 \times 2 = 0.5 \text{ kN}$

2.5 kN

$$0.9 W_T = 0.9 \times 2.5$$

$$= 2.25 \text{ kN}$$

$$\therefore \text{Net uplift } R = 10.3 \text{ kN} - 2.25 \text{ kN}$$

$$= 8 \text{ kN}$$

Revised Pad  $0.6 \times 0.35 \times 4.5 \text{ m}$

$$\therefore \phi W_T = 0.9 \times 0.6 \text{ m} \times 0.35 \text{ m} \times 4.5 \text{ m} \times 24 \text{ kN/m}^3$$

$$= 10.2 \text{ kN} > 8 \text{ kN} \therefore \text{OK}$$

Post Connections

$$R^* = \frac{10.2 \text{ kN}}{0.7} = 14.7 \text{ kN}$$

4/Multigraps Boundary Joist to Joist

$$R_u = 11.9 \times 2 = 23.8 \text{ kN} \therefore \text{OK}$$

# SITE INSPECTION REPORT



**CONSULTING ENGINEERS**  
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 craig@seajay.co.nz

Job No.: 17050	Report No.: SRO4
Date: 20/3/2018	Sheet 1 of
Project: 65 Kohetake Road	
Area Inspected: Beam Over Porch	BC Number:
Inspected by: Craig McGhie	Contractors Rep:

**Observations:**

- ① 290x90 Beam OK
- ② 190x90 Beam OK
- ③ 50x5 Strap S/S OK as per details drawing 17050/SS.
- ④ 190x90 has 2/25x1 Straps T&B ∴ OK
- ⑤ 290x90 has Plates & bolts at house post base but no connection at top.
- ⑥ Ginder truss base connections BS2 brackets OK.

**Instructions Given:**

- ① Install 2 M12 bolt between 290x90 Porch beam & double stud in wall of house.
- ② Recommend that ginder truss connections between top plate & studs be strengthened to match Ginder truss/top plate connection i.e. add 3x 25 Straps to each (6of) post locations. Confirm with KCDC Inspector

Item ① completed 23/3/2018 Refer attached Photo

**Next Inspection:** Missing Bolts Porch Beam

Approved: (Signed)	Not approved – Hold Point: (Signed)		
Work <u>may</u> proceed: (Subject to completing above instructions)	Work may <u>not</u> proceed: (Further design/instruction and re-inspection required.)	Re-inspection required (Following completion of above instructions.)	Contractor to supply photographs (For approval following completion of above instructions. Work not to proceed until approval given.) <input checked="" type="checkbox"/>

Note that the above approval does not include statutory inspections and approval which may be required by the Building Consent Authority. Similarly Building Consent Authority approval does not preclude re-inspection or implementation of further instructions directed herewith where the inspection was "Not Approved".



# INSTALLERS CHECKSHEET: FREESTANDING OR INBUILT FIRE



**Note:** Please have this form completed by the installer and ready for our Building Inspector to collect when doing the final inspection.

Building Consent Number: 170 ~~884~~ 844.

**Installers Details:**

Installers Name: (Please print) Thomas Plumbing

Address: 21 Omaha St Waik Phone: 2936533

**Freestanding Fire or Inbuilt Fire installed at:**

Address: 65 Kohe Kohe Rd Waikanae

For: Mr Hyndman

The following requirements under NZS 7421:1990 or AS/NZ 2918:2001 have been met and the solid fuel burning domestic appliance type and model Masport Akasoa has been installed in accordance with the manufacturer's installation instructions.

**Please Tick (where applicable) the following:**

The chimney has been cleaned.	<input type="checkbox"/>
The chimney is in a sound condition.	<input type="checkbox"/>
The chimney is of pumice and correct dimensions to comply with BRANZ zero clearance certificates.	<input type="checkbox"/>
The chimney is ventilated to manufacturer's requirements.	<input type="checkbox"/>
The appliance is restrained against seismic activity (freestanding & fireplace heaters).	<input checked="" type="checkbox"/>
The Inbuilt heating appliance has been approved by BRANZ as complying with their zero clearance certificate.	<input type="checkbox"/>
The hearth is an approved type according to the manufacturer's requirements.	<input checked="" type="checkbox"/>
The hearth is restrained against seismic activity.	<input checked="" type="checkbox"/>
The fire-surround at its connection to the fire place is fully insulated with approved material [see BRANZ Building Information Bulletin 248 (1986)].	<input type="checkbox"/>
The ash hearth is of correct dimensions according to the installation instructions.	<input checked="" type="checkbox"/>

Signed: *[Signature]* Date: 30-8-18.



THE BUILDING		
Street address:	65 Kohokohe RD	
Suburb:	WAIKANAЕ	
Town/City:		Postcode: 5036
THE PROJECT		
Building consent number:	Bc 170844	
THE OWNER(S)		
Name(s):	MR & MRS Neil Hyndman	
Mailing address:		
Suburb:	AS Above	PO Box/Private Bag:
Town/City:		Postcode:
Phone number:	0274 369441	Email address:
RECORD OF WORK THAT IS RESTRICTED BUILDING WORK		
PRIMARY STRUCTURE		
Work that is restricted building work Tick <input type="checkbox"/>	Description of restricted building work If necessary, describe the restricted building work	Carried out or supervised Tick <input type="checkbox"/> whether you carried out the RBW or supervised someone else.
<input checked="" type="checkbox"/>	ENGINEER - DRIVEN PILES	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised
<input type="checkbox"/>	TIMBER FRAMED	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised
<input type="checkbox"/>	TRUSSES	<input checked="" type="checkbox"/> Carried out <input type="checkbox"/> Supervised
<input type="checkbox"/>	N/A	<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised
<input type="checkbox"/>	AS PLAN	<input checked="" type="checkbox"/> Carried out <input type="checkbox"/> Supervised
<input type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised

# RECORD OF WORK THAT IS RESTRICTED BUILDING WORK

## EXTERNAL MOISTURE MANAGEMENT SYSTEMS

Damp proofing <input type="radio"/>	N/A	<input type="radio"/> Carried out <input type="radio"/> Supervised
Roof cladding or roof cladding system <input type="radio"/>	By OTHERS	<input type="radio"/> Carried out <input checked="" type="radio"/> Supervised
Ventilation system (for example, subfloor or cavity) <input type="radio"/>	N/A	<input type="radio"/> Carried out <input type="radio"/> Supervised
Wall cladding or wall cladding system <input type="radio"/>	BEVEL BACK WEATHER BOARD	<input checked="" type="radio"/> Carried out <input type="radio"/> Supervised
Waterproofing <input type="radio"/>	N/A	<input type="radio"/> Carried out <input type="radio"/> Supervised
Other <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised

### ISSUED BY

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

Name: PAT White	LBP number: 103937
Class(es) licensed in: CARPENTRY	
Plumbers, Gasfitters and Drainlayers registration number (if applicable): 10945	
Mailing address (if different from below): 17 WINDSOR AVE	
Street address/Registered office: WAIKANAЕ	
Suburb:	Town/City:
PO Box/Private Bag:	Postcode: 5036
Phone number:	Mobile: 0274 465548
After hours: WAIKANAЕWHITES@GMAIL.COM	Fax:
Email address:	Website:

### DECLARATION

I, PAT WHITE carried out or supervised the restricted building work recorded on this form.  
 Signature: [Signature] Date: 10-9-2018

# Memorandum from licensed building practitioner: Record of building work

## Section 88, Building Act 2004

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

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

### THE BUILDING

Street address: **65 Kohekohe Road**

Suburb:

Town/City: **Waikanae**

Postcode: **5036**

### THE PROJECT

Building consent number:

### THE OWNER(S)

Name(s):

Mailing address:

Suburb:

PO Box/Private Bag:

Town/City:

Postcode:

Phone number:

Email address:

## RECORD OF WORK THAT IS RESTRICTED BUILDING WORK

### PRIMARY STRUCTURE

Work that is restricted building work	Description of restricted building work	Carried out or supervised
Tick <input checked="" type="checkbox"/>	If necessary, describe the restricted building work.	Tick <input checked="" type="checkbox"/> whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Foundations and subfloor framing <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised
Walls <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised
Roof <input checked="" type="checkbox"/>		<input checked="" type="radio"/> Carried out <input type="radio"/> Supervised
Columns and beams <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised
Bracing <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised
Other <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised

**RESTRICTED BUILDING WORK**

Work that is restricted building work	Description of restricted building work	Carried out or supervised
Tick <input checked="" type="checkbox"/>	If necessary, describe the restricted building work.	Tick <input checked="" type="checkbox"/> whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Damp proofing <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised
Roof cladding or roof cladding system <input checked="" type="checkbox"/>	Installed Iron and Flashings as per manufactures specs	<input checked="" type="radio"/> Carried out <input type="radio"/> Supervised
Ventilation system (for example, subfloor or cavity) <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised
Wall cladding or wall cladding system <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised
Waterproofing <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised
Other <input type="checkbox"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised

## DETAILS

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

Name: **Russell Lawrie**

LBP number: **Bp131831**

Class(es) licensed in:

**Profiled Metal**

Plumbers, Gasfitters and Drainlayers registration number (if applicable):

Mailing address (if different from below):

Street address/Registered office:

Suburb:

Town/City:

PO Box/Private Bag

Postcode:

Phone number:

Mobile: **0220961530**

After hours:

Fax:

Email address: **webroobing@iqmail.com**

Website:

## DECLARATION

**Russell Lawrie**  
I \_\_\_\_\_ carried out or supervised the restricted building work recorded on this form.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**04-07-18**

**APPLICATION WORKFLOW COVERSHEET (Blue Folder)**

Department	For Referral	Comments	Approving Officer / Date
Resource Consents (refer PIM Sheet)	<input checked="" type="checkbox"/>		
Plumbing and Drainage BC2	<input checked="" type="checkbox"/>		Me1 Browler 5/12/17
Building BC2	<input checked="" type="checkbox"/>		Me1 Browler 5/12/17
Fire Design BC8			
Compliance Schedule BC2 & BI6			
Environmental Health			
Reviews required BC2 and BC5		Process review John Peterson	 12/12/17
<b>NOTES:</b>			

Building Consent No.	170844
Building Project	Single level extension to house rook in backhoe marked weather Decol with a corrugated (dorsal) roof
Location (Site Address)	65 Kohere Rd, Waikanae
Building Category	Circle appropriate category <input checked="" type="radio"/> R1 R2 R3 C1 C2 C3

Received:  
  
07 NOV 2017

**Note: A signature confirms that the application contains sufficient information to enable compliance with the building code to be assessed.**

	Name	Date
Vetted and formally received BC1	Craig Harrison	7/11/17
Payment taken and receipted by CSO BC1		
Data entered and invoiced by CSO BC1	Angie	8/11/17
Documentation prepared/scanned	Angie	8/11/17
Plan production and invoicing BC3		
Building Consent signed BC1		
BC, Approved plans and appropriate paperwork sent to applicant or agent with receipt by CSO BC3	Angie	15/12/17
Inspection envelope prepared by CSO with endorsed plans and other appropriate paperwork and filed to cabinet. BC3	Angie	15/12/17

CONSENT DATA INPUT REQUIREMENTS		
Please circle		
Yes	<input checked="" type="radio"/> No	Compliance Schedule
<input checked="" type="radio"/> Yes	<input type="radio"/> No	Restricted building work
Yes	<input checked="" type="radio"/> No	Owner Builder
Yes	<input checked="" type="radio"/> No	Certificate for Public Use

Owner Builder register: ED2526609



Mr & Mrs Hyndman  
65 Kohekohe Road  
Waikanae 5036

15 December 2017

Dear Building Consent Applicant / Building Owner

**Approval of Building Consent – Detached Residential / Outbuilding: 170844**

**Location:** 65 Kohekohe Road, Waikanae  
**Legal Description:** LOTS 5 DP 19887 CT 903/31  
**Description:** Single level extension to house, clad in bevelback backed weatherboard with a corrugated colorsteel roof.

I am pleased to inform you that the above building consent application has been approved. The building consent documents have been issued and are enclosed.

The building consent attached to this letter is consent under the Building Act 2004 to undertake building work in accordance with the plans and specifications that accompanied your application. Under section 49 of that Act, Council is satisfied that the provisions of the building code would be met if the proposed building work were completed in accordance with those plans and specifications. This consent does not affect any duty or responsibility under any other Act or permit any breach of any other Act.

This building consent does not give or imply any rights to transgress beyond your legal boundaries. Any work that is required beyond your legal boundaries can only be undertaken with the permission of the affected owner/s.

**Before starting any work please read ALL the building consent documents carefully and in full so that you, as the owner, understand the conditions under which the consent has been issued.**

**Please note that this building consent includes restricted building work, the details of this are included in this letter.**

**Owner responsibilities**

The owner is responsible for ensuring:

- building work starts within 12 months of the approval of the building consent and that work progresses at a reasonable pace.
- written notice of every licensed building practitioner undertaking restricted building work is provided to Council before that work commences, and any changes are advised in writing

- the approved building consent documents are kept on site during construction and available for the District inspector at inspections
- all required inspections are completed and that a Code Compliance Certificate is obtained once the work has been completed. The list of supporting documentation required before issue of the Code Compliance Certificate and information on filling out the application form for code compliance certificate is attached. Failure to obtain a final inspection and a code compliance certificate may affect your insurance cover and could affect future re-sale of your property.
- no work with noisy equipment is to be carried out before 7.30 a.m. or after 6 p.m. Monday to Saturday. During the week there may be workers on site from 6.30 a.m. quietly preparing for work. Work with noisy equipment is not permitted on Sundays and public holidays.
- all loose materials that are capable of being carried by the wind are either secured or removed from the site. All activities must be carried out in a manner that keeps to a minimum the dust nuisance to adjacent properties.
- no damage occurs to public property, for example footpaths or retaining structures. Should damage occur you will be required to pay for any repairs.
- obtaining an amendment to the building consent for any changes to the approved building consent, prior to that work being undertaken.
- meeting the requirements of any easements, consent notices, covenants, and like listings registered on the title.
- the development contributions invoiced, if any, must be paid before a code compliance certificate can be issued.

### General requirements

**Note:** Your attention is drawn to the notes contained in the 'Addendum to the Consent' and guidance documents referred to.

The following information is relevant to this building consent:

1. The Building Inspector is to be given 24 hours' notice before carrying out the inspections on the attached list. To arrange for inspections by the District Inspector, please contact the building inspectorate on 04 296 4700 between the hours of 8.00am and 4.30pm.
2. Refer to the list of inspections required. Under section 90 of the Building Act 2004 agents authorised by the Council (acting as a Building Consent Authority) 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 that building site; and
  - c. any building.
3. You are responsible for the safety of visitors to the work site including those undertaking building inspections. You must provide safe access to parts of the construction necessary for inspection. Ladder access must be securely founded and tied. Scaffold access and roof edge protection is generally required.

## Section 71 and 72 of the Building Act 2004

### Section 71 Building on land subject to natural hazards

- (1) A building consent authority must refuse to grant a building consent for construction of a building, or major alterations to a building, if—
- (a) the land on which the building work is to be carried out is subject or is likely to be subject to 1 or more natural hazards; or
  - (b) the building work is likely to accelerate, worsen, or result in a natural hazard on that land or any other property.
- (2) Subsection (1) does not apply if the building consent authority is satisfied that adequate provision has been or will be made to—
- (a) protect the land, building work, or other property referred to in that subsection from the natural hazard or hazards; or
  - (b) restore any damage to that land or other property as a result of the building work.
- (3) In this section and sections 72 to 74, **natural hazard** means any of the following:
- (a) erosion (including coastal erosion, bank erosion, and sheet erosion);
  - (b) falling debris (including soil, rock, snow, and ice);
  - (c) subsidence;
  - (d) inundation (including flooding, overland flow, storm surge, tidal effects, and ponding);
  - (e) slippage.

### Section 72 Building consent for building on land subject to natural hazards must be granted in certain cases

Despite section 71, a building consent authority that is a territorial authority must grant a building consent if the building consent authority considers that—

- (a) the building work to which an application for a building consent relates will not accelerate, worsen, or result in a natural hazard on the land on which the building work is to be carried out or any other property; and
- (b) the land is subject or is likely to be subject to 1 or more natural hazards; and
- (c) it is reasonable to grant a waiver or modification of the building code in respect of the natural hazard concerned.

1. to submit technical evidence that your property is not likely to be subject to the hazard that has been identified in association with the land where the building work is proposed.
2. to cancel the consent application with a refund of some of the fees; or
3. to proceed with the consent and have the entry under section 72 of the Building Act 2004 entered onto the Certificate of Title; or
4. to proceed with the consent with the section 72 entry indicating you will challenge the decision by the means of a Determination with the Ministry of Business, Innovation and Employment.
5. to re-design the work so that the cause of the hazard is mitigated.

#### **Costs under Section 72 approval**

We advise that the following additional cost will have to be paid prior to Council issuing the consent under section 72:

- \$260.00 approximately for Notification to the Registrar General of Land, and
- \$140.00 for Council processing time to action this, being a total of \$400.00 (incl GST).

#### **Advice**

We strongly recommend that you seek advice before making any decisions and consider your options carefully.

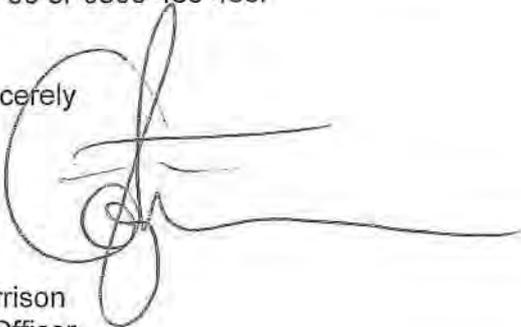
COPY

#### **Next Steps**

We would appreciate your advice in writing on how you would like to proceed by 5 December 2017. If no advice is received by that date, the Council may process the consent and grant it under section 72.

Please do not hesitate to contact me should you wish to discuss this matter further or voluntarily suspend your application to provide additional time to formulate your decision. I am available on 04 296 4700 or 0800 486 486.

Yours sincerely



Craig Harrison  
Building Officer

Mr & Mrs Hyndman  
65 Kohekohe Road  
Waikanae 5036

**Building Consent: 170844**

27 November 2017

Dear Mr & Mrs Hyndman

COPY

**Advice of Intention to Issue a Consent under  
Section 72 of the Building Act 2004**

**Description:** Single level extension to house, clad in bevelback backed weatherboard with a corrugated colorsteel roof.  
**Location:** 65 Kohekohe Road, Waikanae  
**Legal Description:** LOTS 5 DP 19887 CT 903/31

In regards to the Building Consent application, presently being processed by Kāpiti Coast District Council, has been identified as subject to a natural hazard. If we were to grant the consent it would be done under section 72 of the Building Act 2004. The relevant sections are set out at the end of this letter.

After reviewing Landlink's report and based on a report by Jacobs which was commissioned by Kāpiti Coast District Council the land on which the building work is to be carried out is subject or is likely to be subject to 1 or more natural hazards.

The natural hazard identified on the property is inundation (ponding/flooding)

This hazard information has been identified in accordance with the Council's Building Consent-Natural Hazard Guidance Information (<http://www.kapiticoast.govt.nz/Your-Council/Planning/Building/building-consent-guidelines>)

You now have the opportunity to consider the issues. If you still wish to proceed with this application in light of this information please indicate either by email or letter.

**What this means for this consent**

It is important that we make you aware that if a consent is issued under section 72, an entry will be made on the Certificate of Title for the property. This can have serious ramifications for:

- insurance cover,
- mortgage lending,
- property value; and
- on selling.

**Options**

The options available for your consideration are:

## Building Consent Addendum to 170844

Application	Building Consent No. 170844
Mr & Mrs Hyndman 65 Kohekohe Road Waikanae 5036	

Project	
Description:	Dwellings - Alterations & additions Being Stage 1 of an intended 1 Stages Single level extension to house, clad in bevelback backed weatherboard with a corrugated colorsteel roof.
Intended Life:	Indefinite, but not less than 50 years
Intended Use:	Residential Dwelling
Estimated Value:	\$450,000
Location:	65 Kohekohe Road, Waikanae
Legal Description:	LOTS 5 DP 19887 CT 903/31
Valuation No:	1494149900

Designer: Kapiti Architectural Design Ltd PO Box 296 Waikanae :  
Rochelle Dennis - 027 511 4744

Contractor: Seajay Consulting Engineers Ltd PO Box 1713,  
Paraparaumu Beach : Craig McGhie 021 121 4591

### Specific requirements

- Names and registration numbers of the plumber and drainlayer are required before work commences.
- The inspection of all specific design components covered by a producer statement design (PS1), where the designer has recommended construction monitoring, is the responsibility of the Design Engineer who is also required to supply a written report (PS4) to the Council. It is the Design engineer's responsibility to confirm design assumptions.

4. If required inspections, including those by designers of specifically designed elements, are not undertaken you may experience difficulty in obtaining a Code Compliance Certificate for the project. We suggest that at the time of the first inspection you discuss the inspection requirements with the inspecting officer.
5. This building consent will lapse and be of no effect if the building work concerned has not been commenced within 12 calendar months after the date of issue, or within such further period as the territorial authority allows.
6. The contractor is to leave the site clear of all demolition materials and in a tidy state.
7. Easements, consent notices, covenants, and like listings registered on the title are the responsibility of the applicant.
8. Note and comply with endorsements on approved plans.

### **Restricted Building Work**

The following building work associated with this building consent is restricted building work [Section 7 and 402(1)(n) of the Building Act 2004 and Building (Definition of Restricted Building Work) Order 2011]:

Description of restricted building work including design work that is restricted building work
<b><i>Primary structure</i></b>
Foundations and subfloor framing
Walls
Roof
Columns and beams
Bracing
Other
<b><i>External moisture management systems</i></b>
Damp proofing
Roof cladding or roof cladding system
Ventilation system (for example subfloor or cavity)
Wall cladding or wall cladding system
Waterproofing
Other

Please note that the design work and restricted building work must be supervised or carried out by a licensed building practitioner who is licensed to carry out or supervise that kind of building work.

You or your agent will need to provide their details to the Council in writing prior to commencement of the building work. If after the restricted building work commences the named licensed building practitioner(s) ceases to be engaged to carry out or supervise the restricted building work under the building consent, this must also be advised in writing as must also the details of any other licensed building practitioner(s) subsequently engaged to carry out or supervise the restricted building work (Section 87 of the Building Act 2004). A form "Advice of licensed building practitioner(s)" is enclosed for you to use to advise the Council of licensed building practitioner details.

Please also note that it is an offence to engage another person to carry out or supervise restricted building work who is not a licensed building practitioner (Section 86 of the Building Act 2004).

**Other reference material**

- Guide for completing an application for code compliance,  
<http://www.kapiticoast.govt.nz/globalassets/regulatory/building/form-278a-guide-for-ccc-application.pdf>
- A guide to the inspection process  
[http://www.kapiticoast.govt.nz/globalassets/regulatory/building/form\\_559\\_a\\_guide\\_to\\_the\\_inspection\\_process.pdf](http://www.kapiticoast.govt.nz/globalassets/regulatory/building/form_559_a_guide_to_the_inspection_process.pdf)

If you have any questions regarding your building consent or your responsibilities, please contact Kapiti Coast District Council on 04 296 4700 or toll free on 0800 486 486.

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

### Conditions of building consent

This building consent is subject to the following conditions:

1. This building consent is issued subject to notification pursuant to Section 72 of the Building Act 2004. A copy of the building consent will be notified to the appropriate authorities.

### Compliance schedule

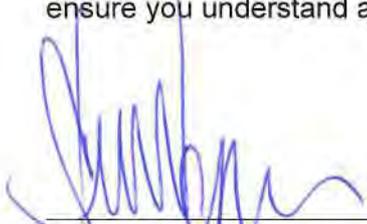
A compliance schedule is not required for the building.

### Attachments

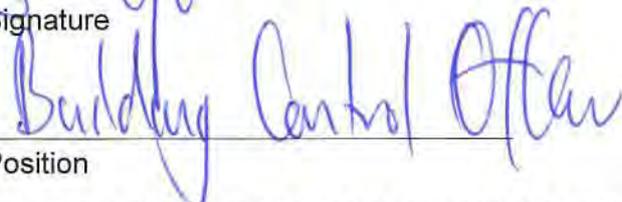
Copies of the following documents are attached to this building consent:

- List of required inspections and supporting documentation required
- Building Consent Addendum
- Plans and specifications
- Advice of licensed building practitioners

**Note:** The cover letter and all attachments to this building consent should be read fully to ensure you understand all conditions of this consent.



Signature



Building Control Officer

Position

On behalf of: KAPITI COAST DISTRICT COUNCIL

Date: 5/12/17

## Relevant Information

Issued in accordance with Building Consent No. 170844

1. Any external cladding system must be completed before a pre-lining inspection for the affected wall can take place.
2. The Building Act 2004 does not specifically name Producer Statements, but it does require that a suitably qualified person verify the design or construction complies with the Building Code. Guidance on the use of producer statements is available at <https://ipenzproduction.blob.core.windows.net/cms-library/docs/default-source/news-publication/engineering-practice/producer-statement-guidance-sheet.pdf?sfvrsn=2>
3. The owner/builder is responsible for clearly defining the site boundary lines and pegs. This may require a survey. NOTE: established fences are not necessarily on the boundary.
4. Plan notes take precedence over general specifications.
5. Both hot and cold water pipes are to be tested to 1500kPa pressure.
6. Earthworks (used regardless as to whether it complies with the District Plan or not): Should a waahi tapu or other cultural site be unearthed during earthworks, the operator and/or owner shall: 1) Cease operations; 2) Inform local Iwi; 3) Inform the New Zealand Historic Places Trust (NZHPT) and apply for an appropriate authority; and 4) Take appropriate action, after discussion with NZHPT, Council and Tangata Whenua, to remedy damage and/or restore the site. NB: In accordance with the Historic Places Act 1983, where an archaeological site is present (or uncovered), authority from the NZHPT is required if the site is to be modified in anyway.

## Building Consent

[Form 5, Building (Forms) Regulations 2004]

170844

Section 51, Building Act 2004

### The building

*Street address of building:* 65 Kohekohe Road, Waikanae  
*Legal description of land where building is located:* LOTS 5 DP 19887 CT 903/31  
*Valuation number:* 1494149900  
*Building name:* N/A  
*Location of building within site/block number:* Refer to plans numbered 473  
*Level/unit number:*

### The owner

*Name of owner:* Mr & Mrs Hyndman  
*Contact person:* As above  
*Mailing address:* 65 Kohekohe Road, Waikanae 5036  
*Street address/registered office:* N/A  
*Phone numbers:*  
*Landline:* - *Mobile:* 027 436 9441  
*After hours:* - *Fax number:* -  
*Email address:* nell@hyndman.co.nz  
*Website:*  
*First point of contact for communications with the council/building consent authority:*  
As above

### Building work

The following building work is authorised by this building consent:

Single level extension to house, clad in bevelback backed weatherboard with a corrugated colorsteel roof.

Residential Dwelling

3. A certifying plumber/drainlayer is to complete the attached producer statement forms and return to Council. Also provide a neat 'as built' drainage plan showing sewer, stormwater and water.

## KAPITI COAST DISTRICT COUNCIL LIVE ENVIRONMENT

Consent No: 170844

Building Category: R1

Site Address: 65 Kohekohe Road, Waikanae

Owner/Agent: Mr & Mrs Hyndman

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### Inspections

The following inspections are required:

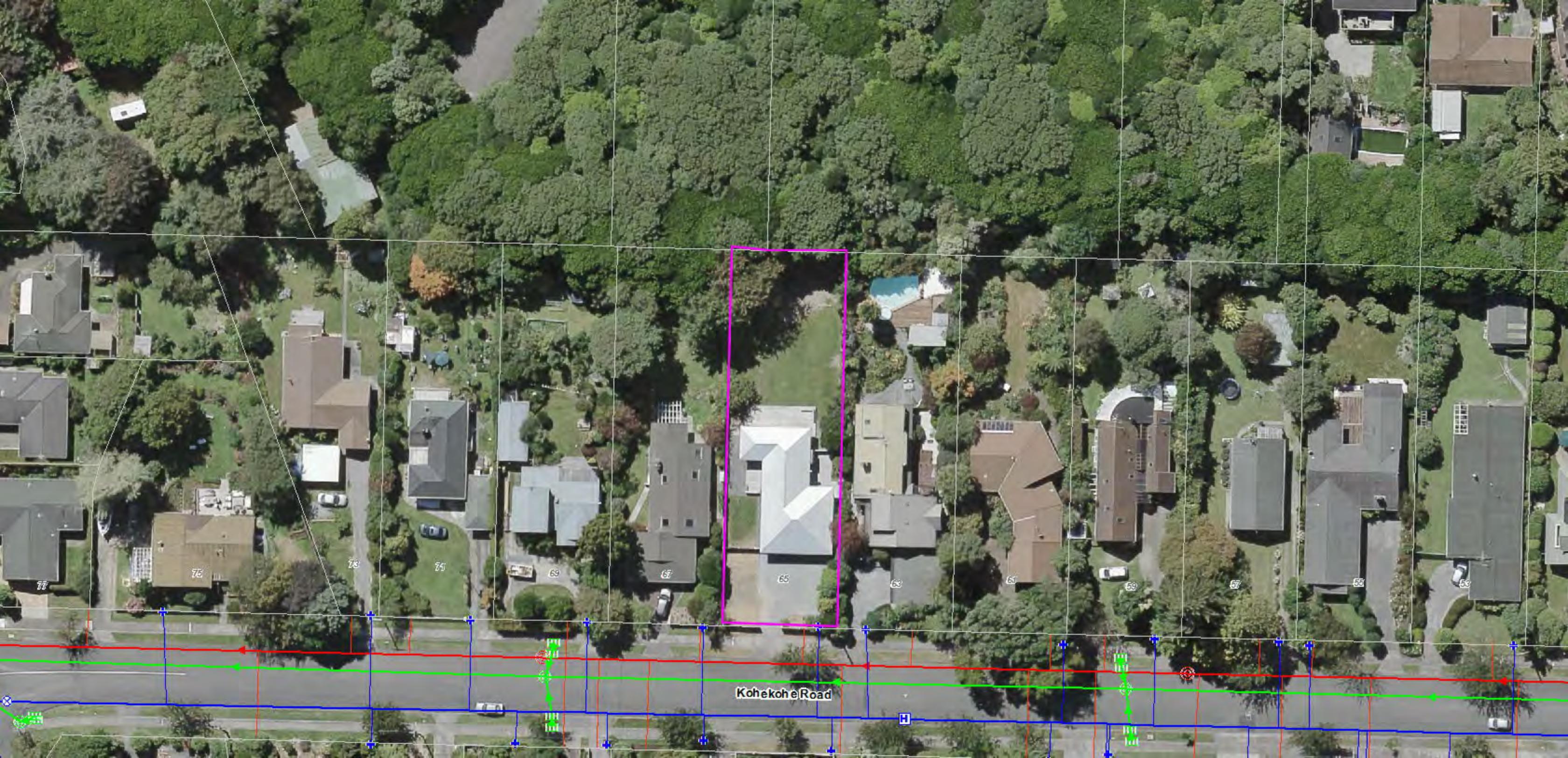
- 1 Foundations
- 1 Piles
- 1 Subfloor
- 1 Pre-Slab Building
- 1 Drainage
- 1 Postline / Wet area Pre Application
- 1 Pre Wrap
- 1 Pre Clad
- 1 Free Standing Solid Fuel Heater
- 1 Wet Area Post-application
- 1 Preline Plumbing
- 1 Final Inspection
- 12 Total Inspections

### Support Documentation

Application for CCC  
Electrical safety certificate  
Gas safety certificate  
As-built drainage plan  
Drainage (Form 126) for stormwater installation  
Construction review PS4 statement for structural engineering  
Membrane applicator certificates - internal wet area  
Timber framing and truss certification  
Record of Work  
Roof installers warranty  
Solid Fuel Heater Installer's Checksheet  
Window manufacturers producer statement

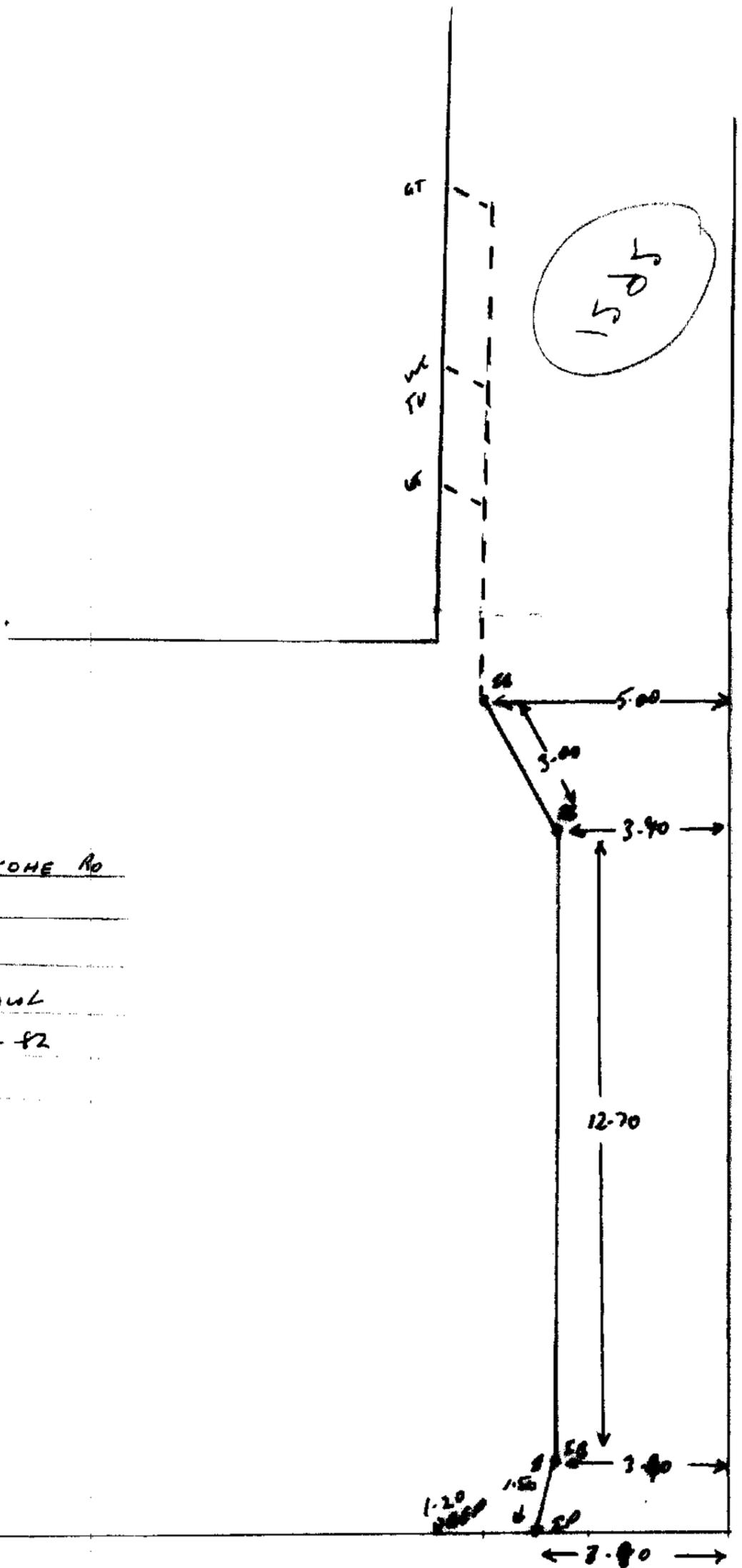
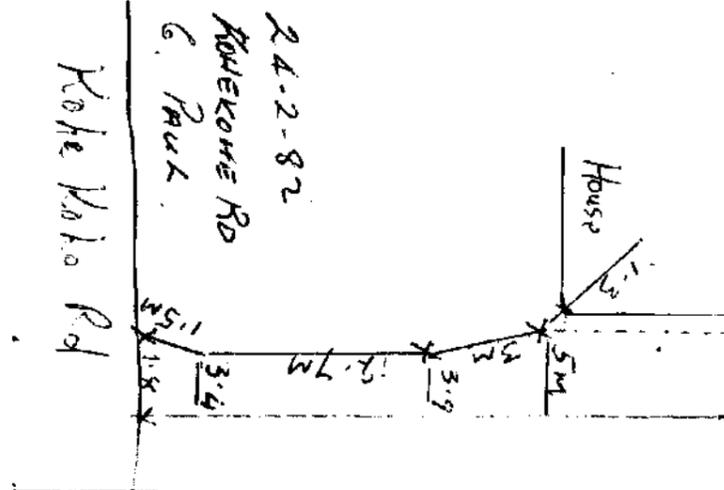
### Licensed Building Practitioners

Designer 1  
Designer 2  
Carpentry 1  
Foundations 1  
Roofing 1



Kohekoh e Road

H



ROAD - 65 KOMEKOME RD  
 LOT - 5  
 D.P - 19887  
 DRAINLAYER - B PAUL  
 DATE - 24-2-82  
 PIPE - P.V.C

APPROVED  
BY BUILDING  
Mel Brownlee  
5/12/2017

CAUTION  
Plans have been digitally  
reproduced and may not  
be to scale.

PROPOSED ADDITIONS &  
ALTERATIONS  
for  
Mr & Mrs Hyndman  
at  
65 Kohekohe Road  
WAIKANAE



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**DRAINAGE PLAN NOTES:**

- All Plumbing and Drainage to be in accordance with AS/NZS 3500:5 for ground floor systems
- Plumber/drainlayer to fill out producer statement and return to council with an as built drainage plan
- Check PIM information for service connections
- pipes to be inspected before covering with sand
- A tempering valve is required to be installed on the hot water service
- Builder to ensure that proposed floor level will allow satisfactory fall of drains to sewer connections

**PIPE GRADIENTS**

- Minimum grades for drains and discharge pipes
  - 65Ø & less = 1 in 40
  - 80Ø & 100Ø = 1 in 60

**DEPTH OF DRAINS**

- Under driveways & right of ways - 500mm
- Under grassed area - 300mm
- Under buildings - 25mm between drain and reinforced concrete slab

**INSPECTION POINTS - drainage**

- Inspection Points shall comply with NZBC G13/AS2 5.7.4.
- Inspection Points shall be located
  - Immediately prior to drain outfalls
  - Immediately inside the boundary of the property served
  - At the junction of every drain with another drain except that no access point is required where the branch drain is less than 2.0m long and only serves a gully trap
  - Every change in horizontal direction of greater than 45°
  - Every change in gradient greater than 45°
  - At intervals (on straight lines) of no less than:
    - 50m where rodding points are used
    - 100mm where access chambers are used
  - Within 2.0m outside the building where a drain enters or exits from under a building
  - At the base of the discharge stack where it meets the discharge pipe

**INSPECTION POINTS - stormwater**

- Inspection points for the inspection & maintenance of stormwater pipes shall comply with NZS/AS3500:5
- Allow for a 90Ø inspection point at the end of each stormwater line
- Inspection points shall be located
  - At no more than 50m intervals
  - Changes in direction greater than 45°
  - Changes in gradient greater than 45°
  - Junctions with other drains - unless the drain is serving a single downpipe and is less than 2m long

**STORMWATER DRAINAGE**

- 100Ø Pipe - minimum 1 in 120 fall

**VENTS**

- Vents shall be 50Ø open vents and shall terminate in the open air in accordance with NZS3500:5 clause 4.33.7 and figure 4.10.
- Vents shall be located where practical in internal non-load bearing framing that does not contain bracing units. Where this cannot be avoided use the BRANZ appraised (number 570) Thru-brackets (Thru Top Plate) for timber framing - note limited to one bracket per stud bay.

**HOT & COLD WATER**

- All pipe work in house to be cross linked polyethylene (PE-X) Kembra Flex or similar
  - 20mm for Main, to bath and to HWC
  - 15mm to all other branches
  - 15mm to exterior taps

**STORMWATER DRAINAGE**

- 100Ø Pipe, minimum 1 in 120 fall

**RAINWATER CALCULATION**

- 10mm/10yrs Average Rainfall = 80mm/hr
- Roof Catchment Area = 423m²
- Quarter round gutter - Catchment capacity = 6300mm², 60m² roof = 425/60 = 7 sections of gutter
- Downpipe Size = colorsteel rectangular (100x50 white with stand off brackets) Catchment 0-25° = 100m²
- Roof Catchment/Downpipe Catchment = 425/100 = 5 DP's

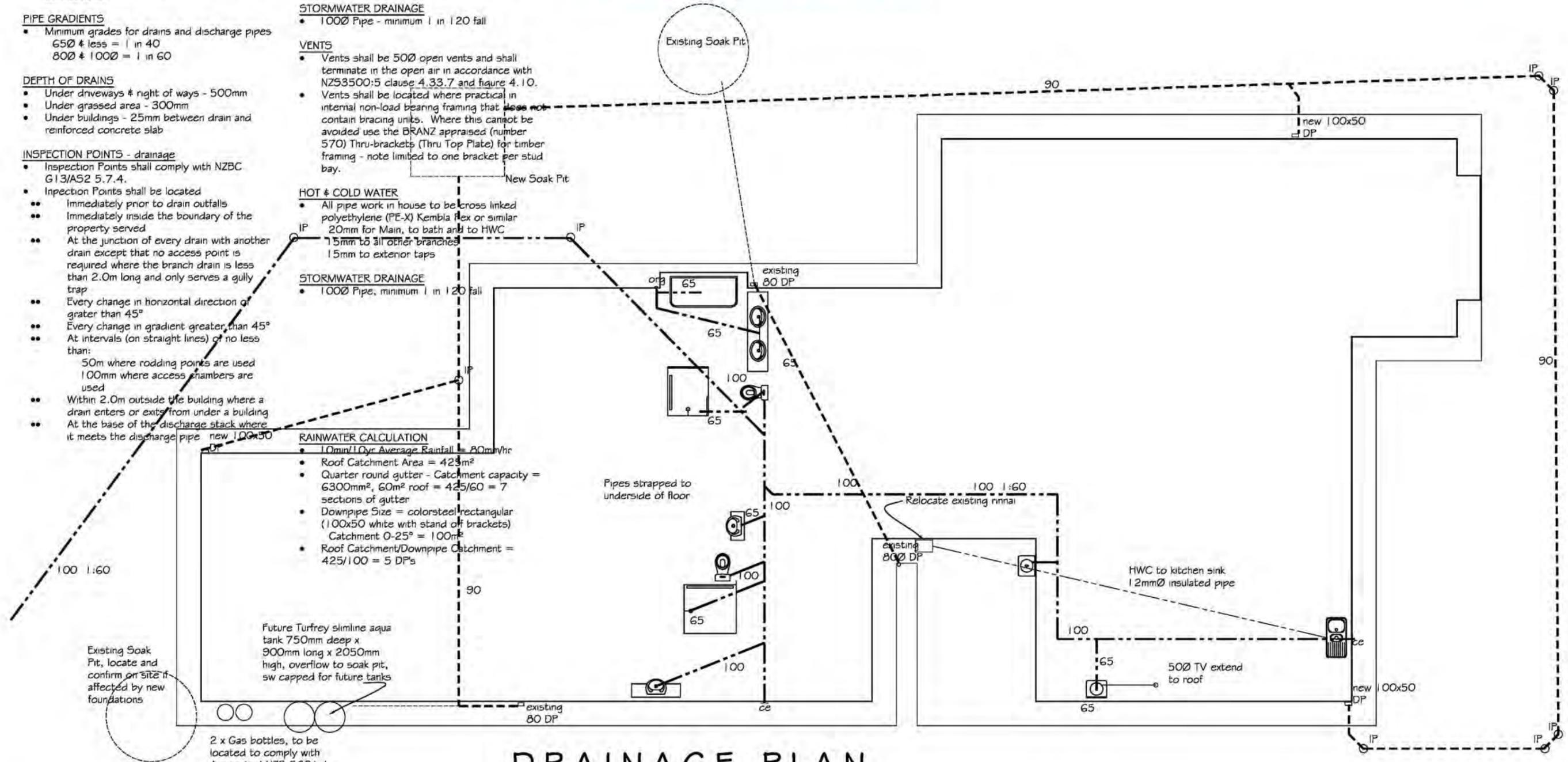
Future Tufrey slimline aqua tank 750mm deep x 900mm long x 2050mm high, overflow to soak pit, sw capped for future tanks

2 x Gas bottles, to be located to comply with Appendix J NZS 5601.1

**BC170844**  
Further Information Received  
30/11/2017

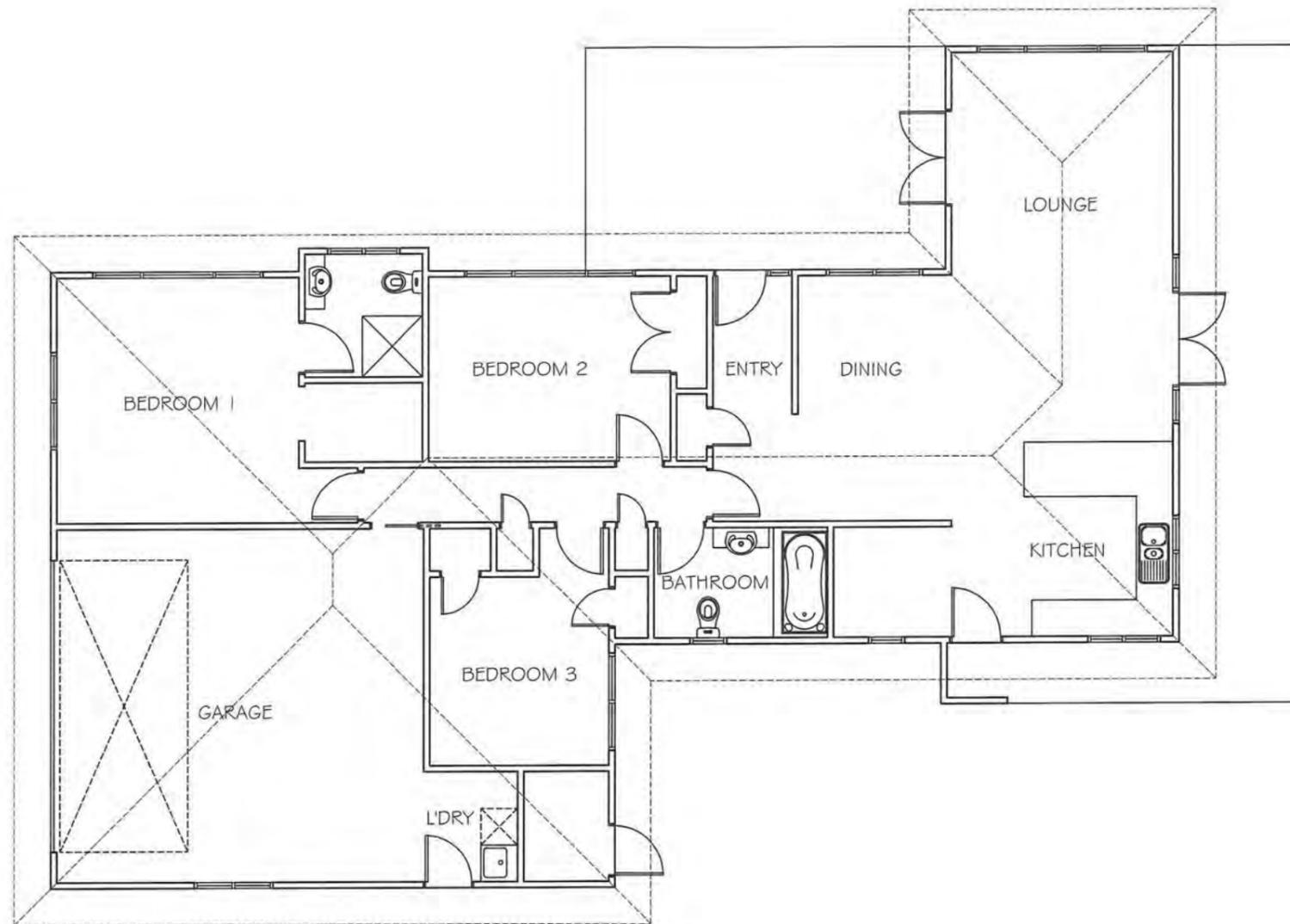
**A CERTIFYING PLUMBER/DRAINLAYER TO FILL OUT ATTACHED PRODUCER STATEMENT FORMS AND RETURN TO COUNCIL. ALSO PROVIDE NEAT ASBUILT DRAINAGE PLAN SHOWING SEWER, STORMWATER AND WATER.**

**BUILDER TO ENSURE THAT PROPOSED FOUNDATION HEIGHT WILL ALLOW A SATISFACTORY DRAINAGE CONNECTION TO THE COUNCILS SEWER.**



**DRAINAGE PLAN**  
Scale 1:100

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	<p>Date: February 2017</p>		<p>Scale: 1:100</p>		
	<p>Revision: B</p>				



# EXISTING FLOOR PLAN

Floor Area = 166.5m<sup>2</sup>

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	<p>BUILDING CONSENT</p>		<p>Date: February 2017</p>	<p>Drawing Number: <b>3</b> Of 24 (A3 Original)</p>	
	<p>Scale: 1:100</p>	<p>Revision: <b>A</b></p>			



EXISTING SOUTH ELEVATION



EXISTING WEST ELEVATION



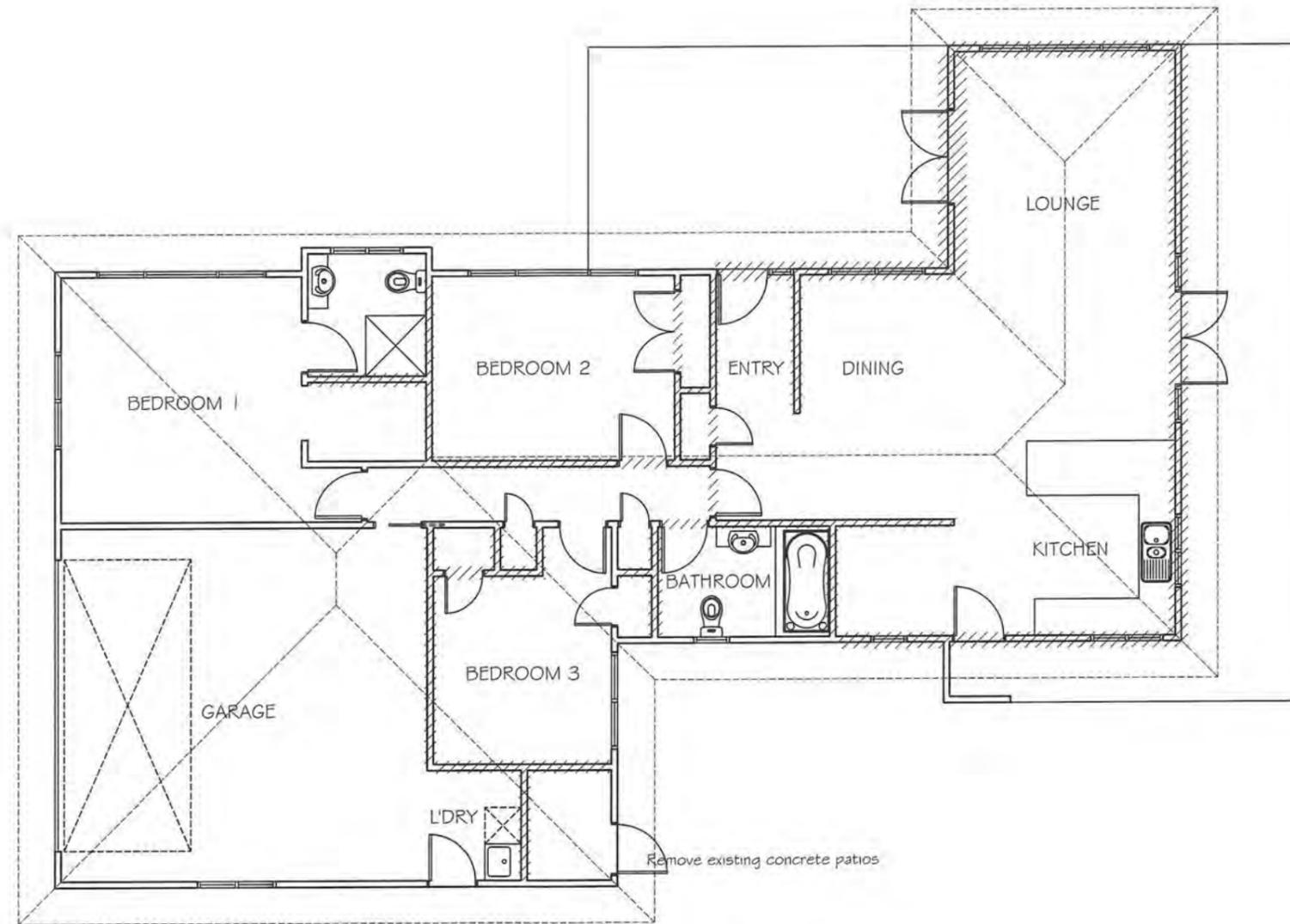
EXISTING NORTH ELEVATION



EXISTING EAST ELEVATION

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# DEMOLITION FLOOR PLAN

Floor Area = 166.5m<sup>2</sup>



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	<p><b>BUILDING CONSENT</b></p>		<p>Date: February 2017</p>	<p>Drawing Number: <b>5</b> Of 24 (A3 Original)</p>		
				<p>Scale: 1:100</p>	<p>Revision: <b>A</b></p>	

07 NOV 2017

**FLOOR PLAN NOTES:**

**GENERAL NOTES:**

- All work must be carried out to conform to relevant sections of the New Zealand Building Code and New Zealand Standards - in particular NZS 3604, NZS 3602 & NZS 4218. All references to Standards shall be taken as reference to the latest revision including amendments.
- Ground bearing must be reconfirmed on site following excavation but prior to placing concrete and reinforcing.
- Confirm site boundaries with licenced surveyor. Fences may not necessarily be on the legal boundary.
- All work to be carried out to best trade practice
- Do Not Scale off Building Consent Documentation issued from TA's as the plans may have been scanned and the scale distorted.
- All habital rooms to have 5% of their floor area as opening windows or approved alternative to achieve ventilation requirements

**INTERNAL LININGS**

**WALLS:**

- Generally - 10mm Standard Gib Board
- Bathrooms - Horizontal Hardiegroove
- Laundry & Kitchen - 10mm Gib Aqualine

**CEILING:**

- Generally - 13mm Standard Gib Board
- Bathrooms, Laundry - 13mm Gib Aqualine board
- Dining pitched ceiling - Horizontal Hardiegroove
- Back block sheet joints and allow for control joints as required by manufacturer

**MOULDINGS:**

- Skirting - 60mm bevelled edge
- Scotia -
- Architraves - 60mm bevelled edge

**HEATING**

- Undertile heating to bathrooms

**GAS FIRE**

- Escea DL1100

**SOLID FUEL BURNING APPLIANCES**

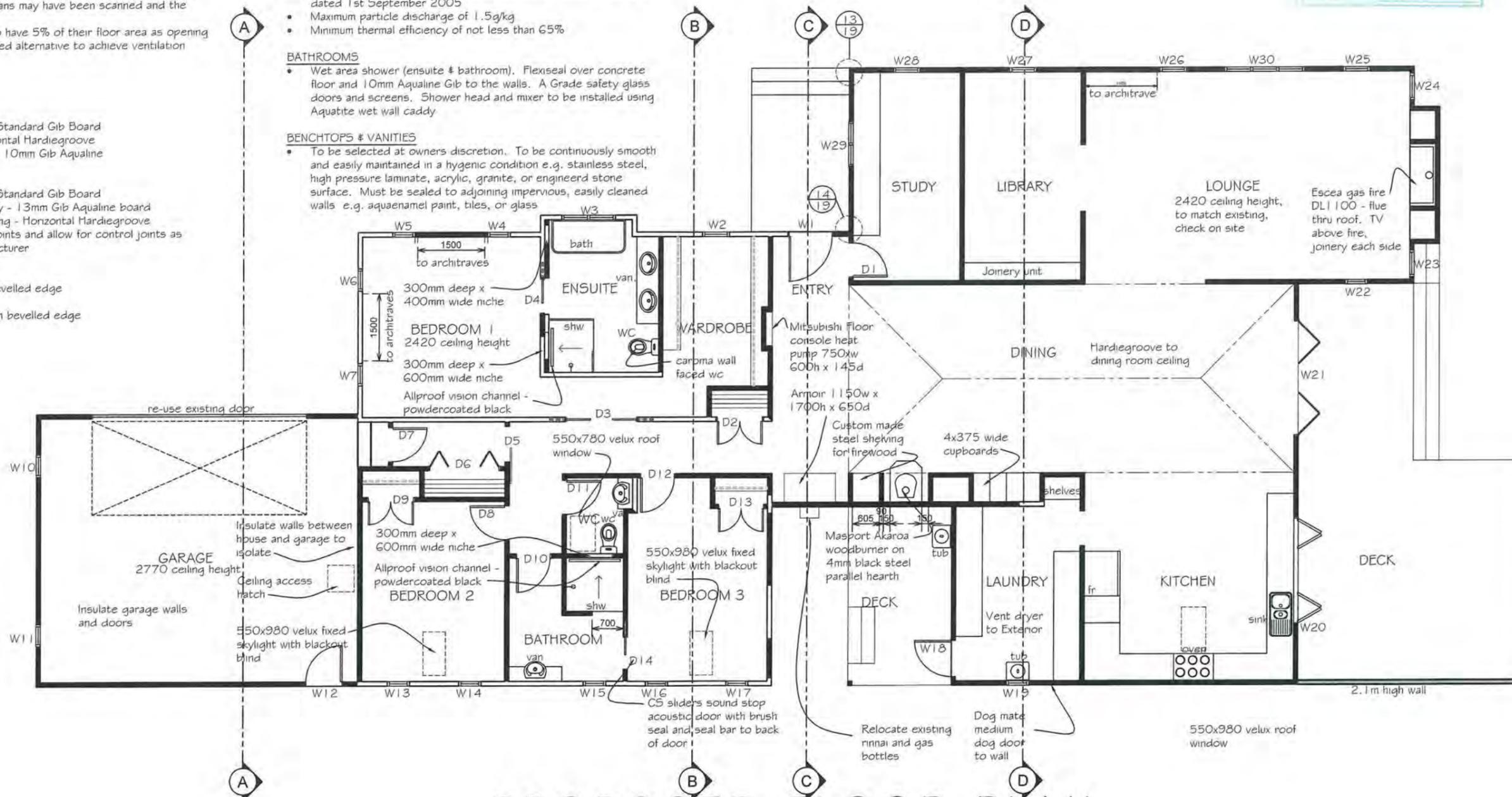
- Masport Akaroa
- Install solid fuel burning appliances to the requirements of NZS 7421:1990; NZS 2918:2001 and applicable specifications subject to local council approval prior to installations. Units must comply with the Ministry of Environment emission standard dated 1st September 2005
- Maximum particle discharge of 1.5g/kg
- Minimum thermal efficiency of not less than 65%

**BATHROOMS**

- Wet area shower (ensuite & bathroom). Flexiseal over concrete floor and 10mm Aqualine Gib to the walls. A Grade safety glass doors and screens. Shower head and mixer to be installed using Aquatite wet wall caddy

**BENCHTOPS & VANITIES**

- To be selected at owners discretion. To be continuously smooth and easily maintained in a hygienic condition e.g. stainless steel, high pressure laminate, acrylic, granite, or engineered stone surface. Must be sealed to adjoining impervious, easily cleaned walls e.g. aquaenamel paint, tiles, or glass



**PROPOSED FLOOR PLAN**

Floor Area = 294m<sup>2</sup>

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	<p>Date: February 2017</p>		<p>Scale: 1:100</p>	<p>Drawing Number: 6 Of 24</p>	
	<p>Revision: A</p>		<p>(A3 Original)</p>		

VISED  
07 NOV 2017

FRAMING PLAN NOTES:

GENERAL NOTES:

This site is in the Very High Wind Zone area

- All work must be carried out to conform to relevant sections of the New Zealand Building Code and New Zealand Standard - in particular NZS 3604, NZS 3602 & NZS 4218. All references to Standards shall be taken as reference to the latest revision including amendments.
- Confirm site boundaries with licenced surveyor. Fences may not necessarily be on the legal boundary.
- All work to be carried out to best trade practice
- Do Not Scale off Building Consent Documentation issued from TA's as the plans may have been scanned and the scale distorted.

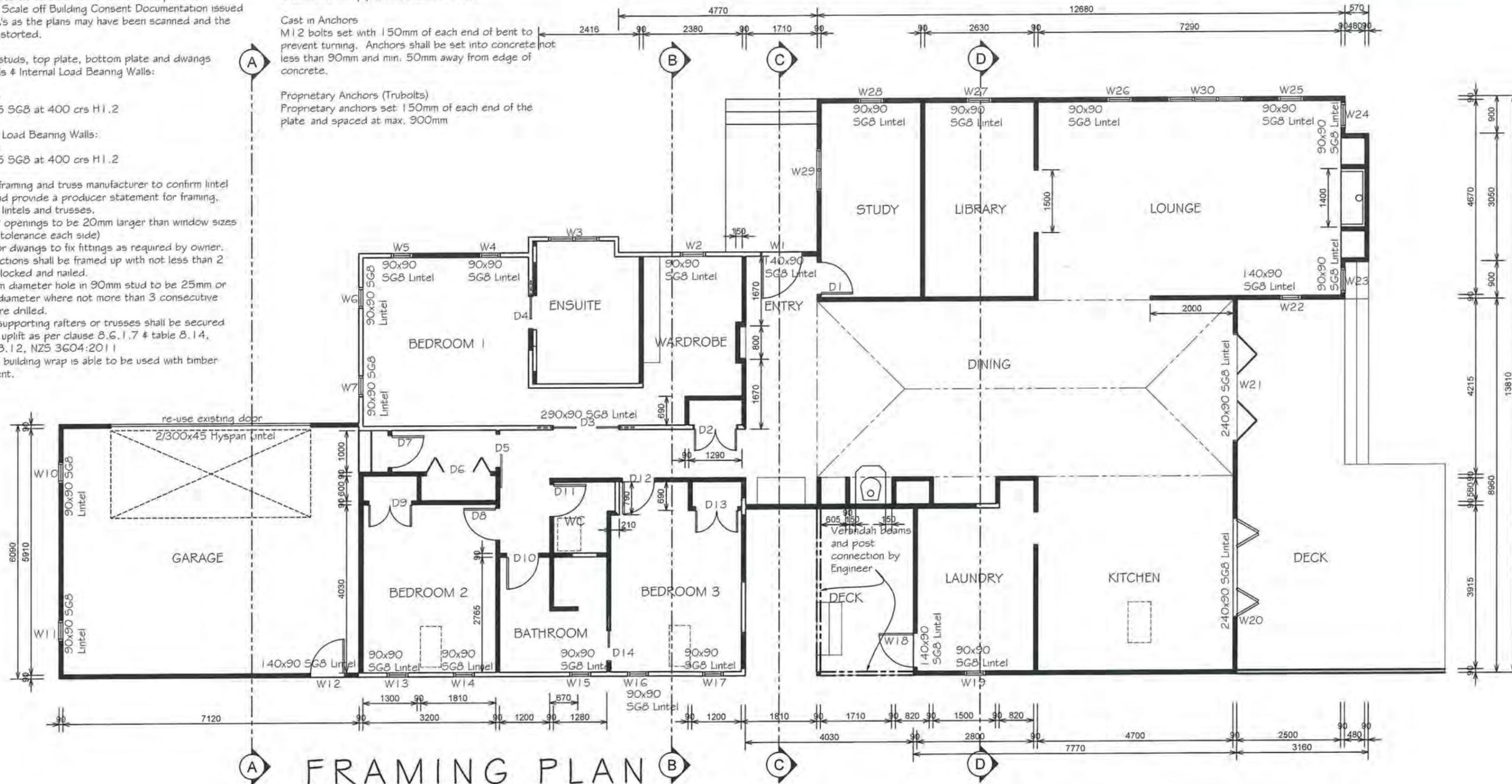
FRAMING - studs, top plate, bottom plate and dwangs  
Exterior Walls & Internal Load Bearing Walls:

Up to 2.8m  
90x45 SG8 at 400 crs H1.2

Interior Non Load Bearing Walls:  
Up to 2.7m  
90x45 SG8 at 400 crs H1.2

- Frenail framing and truss manufacturer to confirm lintel sizes and provide a producer statement for framing, window lintels and trusses.
- Window openings to be 20mm larger than window sizes (10mm tolerance each side)
- Allow for dwangs to fix fittings as required by owner.
- Wall junctions shall be framed up with not less than 2 studs blocked and nailed.
- Maximum diameter hole in 90mm stud to be 25mm or 35mm diameter where not more than 3 consecutive studs are drilled.
- Lintels supporting rafters or trusses shall be secured against uplift as per clause 8.6.1.7 & table 8.14, Figure 8.12, NZS 3604:2011
- Confirm building wrap is able to be used with timber treatment.

- Top Plate Fixing**  
The fixing of top plates supporting roof trusses to wall studs or lintels shall be in accordance with table 8.18, NZS 3604:2011  
Joints in top plates to comply with clause 8.7.3 & figures 8.14-8.16, NZS 3604:2011
- Bottom Plate Fixing**  
Bottom plates of walls shall be fixed to slab-on-ground floors either by cast-in anchors to comply with clause 7.5.12.1 or proprietary post fixed anchors to comply with clause 7.5.12.2
- Cast in Anchors**  
M12 bolts set with 150mm of each end of bent to prevent turning. Anchors shall be set into concrete not less than 90mm and min. 50mm away from edge of concrete.
- Proprietary Anchors (Trubolts)**  
Proprietary anchors set 150mm of each end of the plate and spaced at max. 900mm
- Bottom Plate Fixing**  
External walls and internal wall bracing elements  
100x3.75 - 2 at 600 crs (hand driven)  
90 x 3.15 - 3 at 600 crs (power driven)  
Internal walls (may be nailed to flooring)  
100 x 3.75 - 1 at 600 crs (hand driven)  
90 x 3.15 - 1 at 600 crs (power driven)
- Holes in plates to comply with clause 8.7.5 & figure 8.19, NZS 3604:2011
- Refer to Bracing Plan and Manufacturers specifications for additional framing fixings.



FRAMING PLAN  
Scale 1:100 CHECK ALL DIMENSIONS ON SITE

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**Proposed Additions & Alterations**  
For Mr & Mrs Hyndman  
At 65 Kohekohe Road  
WAIKANAE  
**BUILDING CONSENT**

Revisions:  
A 16/08/17 building consent

Designer: R Dennis	Project Number: 473
Date: February 2017	Drawing Number: 7
Scale: 1:100	Of 24
Revision: A	(A3 Original)

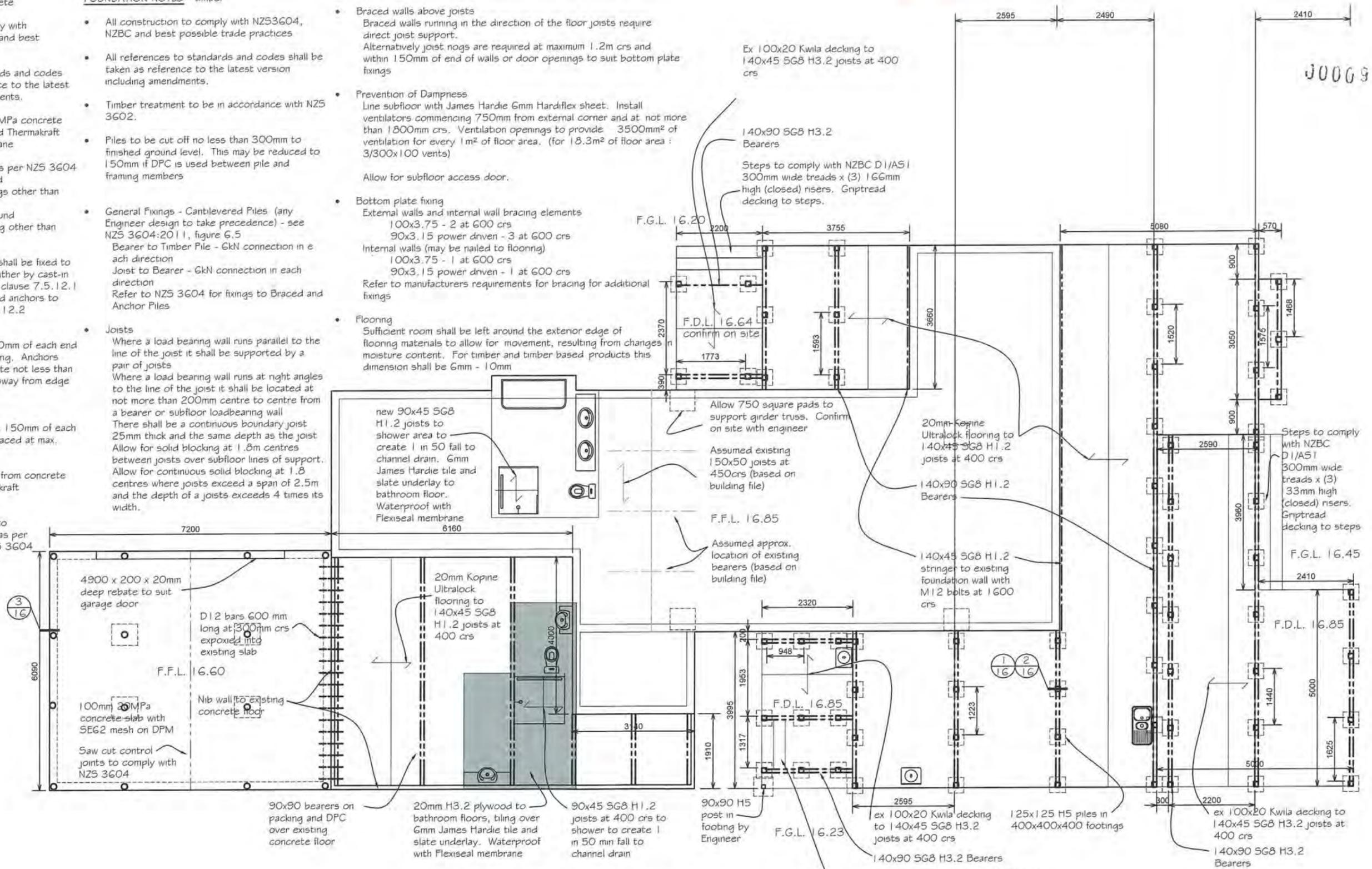
**FOUNDATION NOTES - concrete**

- All construction to comply with NZS3604:2011, NZBC and best possible trade practices
- All references to standards and codes shall be taken as reference to the latest version including amendments.
- Floors to be 100mm 20MPa concrete slab with 500E mesh and Thermakraft Black damp proof membrane
- Minimum floor heights as per NZS 3604  
Protected Ground  
150mm - Claddings other than brick  
Unprotected Ground  
225mm - Cladding other than brick
- Bottom Plate Fixing**  
Bottom plates of walls shall be fixed to slab-on-ground floors either by cast-in anchors to comply with clause 7.5.12.1 or proprietary post fixed anchors to comply with clause 7.5.12.2
- Cast in Anchors**  
M12 bolts set with 150mm of each end of bent to prevent turning. Anchors shall be set into concrete not less than 90mm and min. 50mm away from edge of concrete.
- Proprietary Anchors**  
Proprietary anchors set 150mm of each end of the plate and spaced at max. 900mm
- Framing to be separated from concrete and masonry with Thermakraft Supercourse 500 DPC
- Shrinkage control joints to be formed in floor slab as per section 7.5.8.6 of NZS 3604

**FOUNDATION NOTES - timber**

- All construction to comply with NZS3604, NZBC and best possible trade practices
- All references to standards and codes shall be taken as reference to the latest version including amendments.
- Timber treatment to be in accordance with NZS 3602.
- Piles to be cut off no less than 300mm to finished ground level. This may be reduced to 150mm if DPC is used between pile and framing members
- General Fixings - Cantilevered Piles (any Engineer design to take precedence) - see NZS 3604:2011, figure 6.5**  
Bearer to Timber Pile - GkN connection in each direction  
Joist to Bearer - GkN connection in each direction  
Refer to NZS 3604 for fixings to Braced and Anchor Piles
- Joists**  
Where a load bearing wall runs parallel to the line of the joist it shall be supported by a pair of joists  
Where a load bearing wall runs at right angles to the line of the joist it shall be located at not more than 200mm centre to centre from a bearer or subfloor loadbearing wall  
There shall be a continuous boundary joist 25mm thick and the same depth as the joist  
Allow for solid blocking at 1.8m centres between joists over subfloor lines of support.  
Allow for continuous solid blocking at 1.8m centres where joists exceed a span of 2.5m and the depth of a joists exceeds 4 times its width.

- Braced walls above joists**  
Braced walls running in the direction of the floor joists require direct joist support.  
Alternatively joist nogs are required at maximum 1.2m crs and within 150mm of end of walls or door openings to suit bottom plate fixings
- Prevention of Dampness**  
Line subfloor with James Hardie 6mm Hardiflex sheet. Install ventilators commencing 750mm from external corner and at not more than 1800mm crs. Ventilation openings to provide 3500mm<sup>2</sup> of ventilation for every 1m<sup>2</sup> of floor area. (for 18.3m<sup>2</sup> of floor area : 3/300x100 vents)  
Allow for subfloor access door.
- Bottom plate fixing**  
External walls and internal wall bracing elements  
100x3.75 - 2 at 600 crs  
90x3.15 power driven - 3 at 600 crs  
Internal walls (may be nailed to flooring)  
100x3.75 - 1 at 600 crs  
90x3.15 power driven - 1 at 600 crs  
Refer to manufacturers requirements for bracing for additional fixings
- Flooring**  
Sufficient room shall be left around the exterior edge of flooring materials to allow for movement, resulting from changes in moisture content. For timber and timber based products this dimension shall be 6mm - 10mm



**FOUNDATION PLAN**  
Scale 1:100

Check all Dimensions on Site  
Allow DPC between timber and concrete

Steps to comply with NZBC D1/AS1  
300mm wide treads x (4) 155mm  
high (closed) risers. Griptread  
decking to steps, Handrail to one  
side to comply with NZBC/D1/AS1

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**Proposed Additions & Alterations**  
**For Mr & Mrs Hyndman**  
**At 65 Kohekohe Road**  
**WAIKANAE**  
**BUILDING CONSENT**

Revisions:  
A 16/08/17 building consent  
**REVISED**  
**07 NOV 2017**

Designer: R Dennis	Project Number: 473
Date: February 2017	Drawing Number: 8
Scale: 1:100	Of 24
Revision: A	(A3 Original)

**ROOF PLAN NOTES:**

- Site is High Wind Zone
- Framing in contact with roofing underlay must not be LOSP treated

**FRAMING**

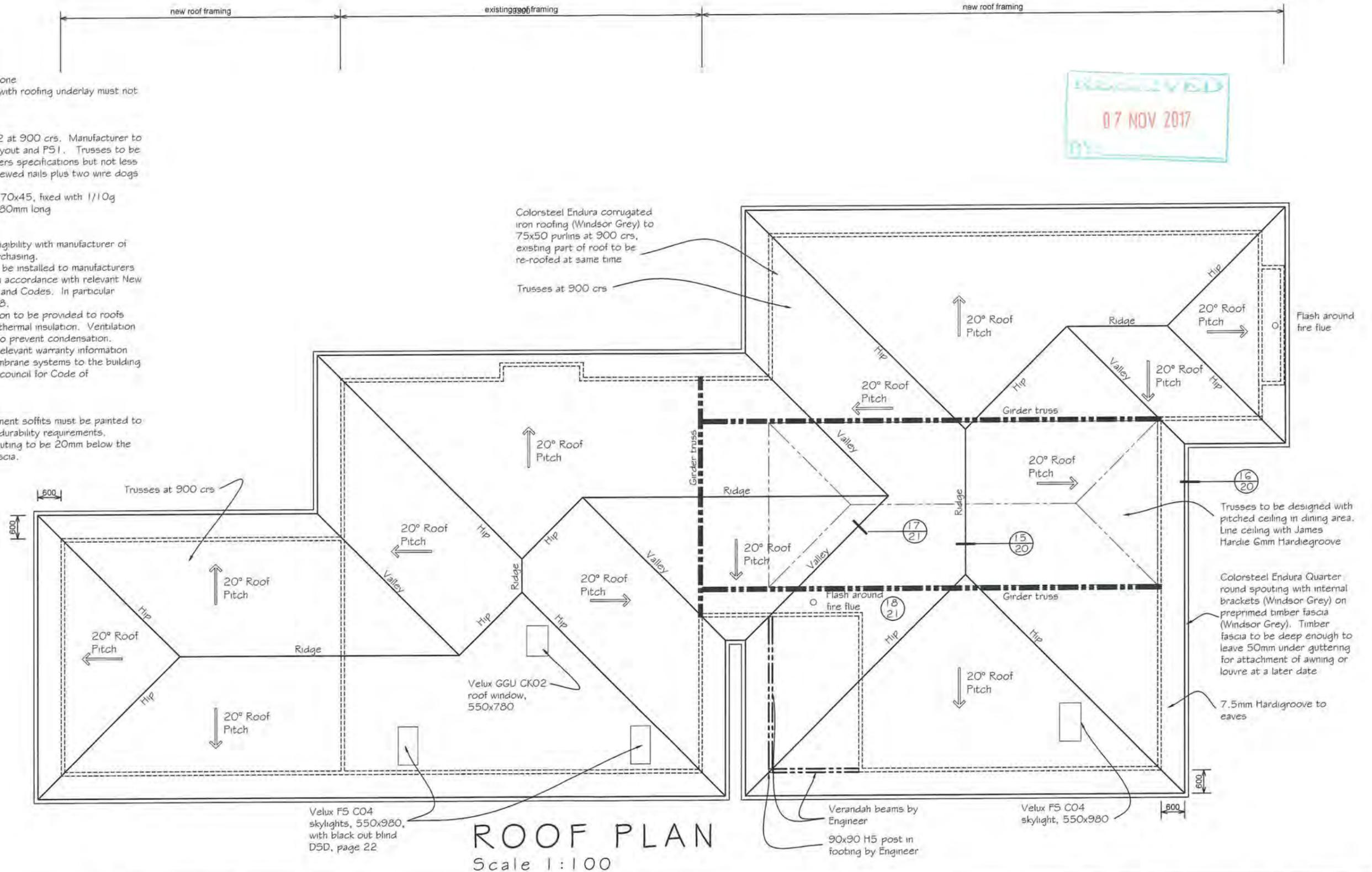
- Trusses to be H1.2 at 900 crs. Manufacturer to provide buildable layout and PSI. Trusses to be fixed to manufacturers specifications but not less than 2/90x3.15 skewed nails plus two wire dogs
- Purlins to be H1.2 70x45, fixed with 1/10g self-drilling screw, 80mm long

**ROOFING**

- Confirm warranty eligibility with manufacturer of roofing prior to purchasing.
- Roofing material to be installed to manufacturers requirements and in accordance with relevant New Zealand Standards and Codes. In particular NZBC, E2 Section 8.
- Cross flow ventilation to be provided to roofs above the layer of thermal insulation. Ventilation must be sufficient to prevent condensation.
- Provide copies of relevant warranty information for roofing and membrane systems to the building owners and to the council for Code of Compliance.

**SOFFITS & SPOUTING**

- Unfinished fibre cement soffits must be painted to comply with NZBC durability requirements.
- Front edge of spouting to be 20mm below the top edge of the fascia.



**ROOF PLAN**  
Scale 1:100

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**Proposed Additions & Alterations**  
**For Mr & Mrs Hyndman**  
**At 65 Kohekohe Road**  
**WAIKANAE**  
**BUILDING CONSENT**

**Revisions:**  
A 16/08/17 building consent

Designer: R Dennis	Project Number: 473
Date: February 2017	Drawing Number: 9 Of 24
Scale: 1:100	(A3 Original)
Revision: A	

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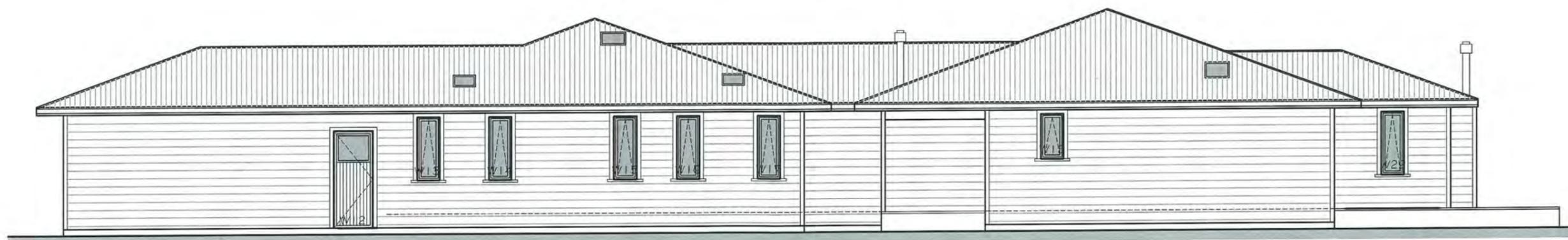
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PROPOSED WEST ELEVATION

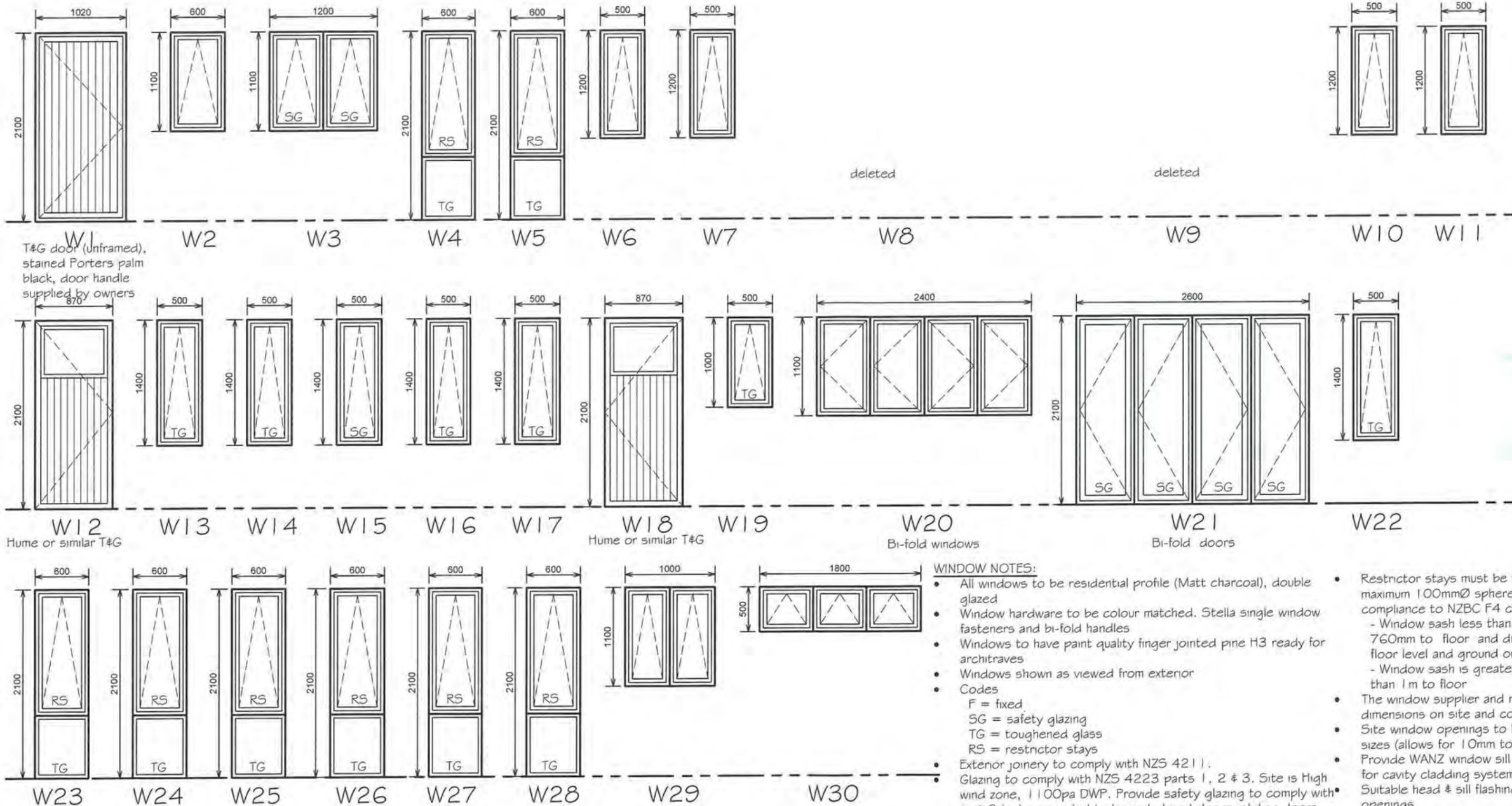


PROPOSED SOUTH ELEVATION PROPOSED NORTH ELEVATION



PROPOSED EAST ELEVATION

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	<p>BUILDING CONSENT</p>	<p>Date: February 2017</p>	<p>Drawing Number: 10 Of 24 (A3 Original)</p>	<p>Scale: 1:100</p>	<p>Revision: A</p>



07 NOV 2017

**WINDOW NOTES:**

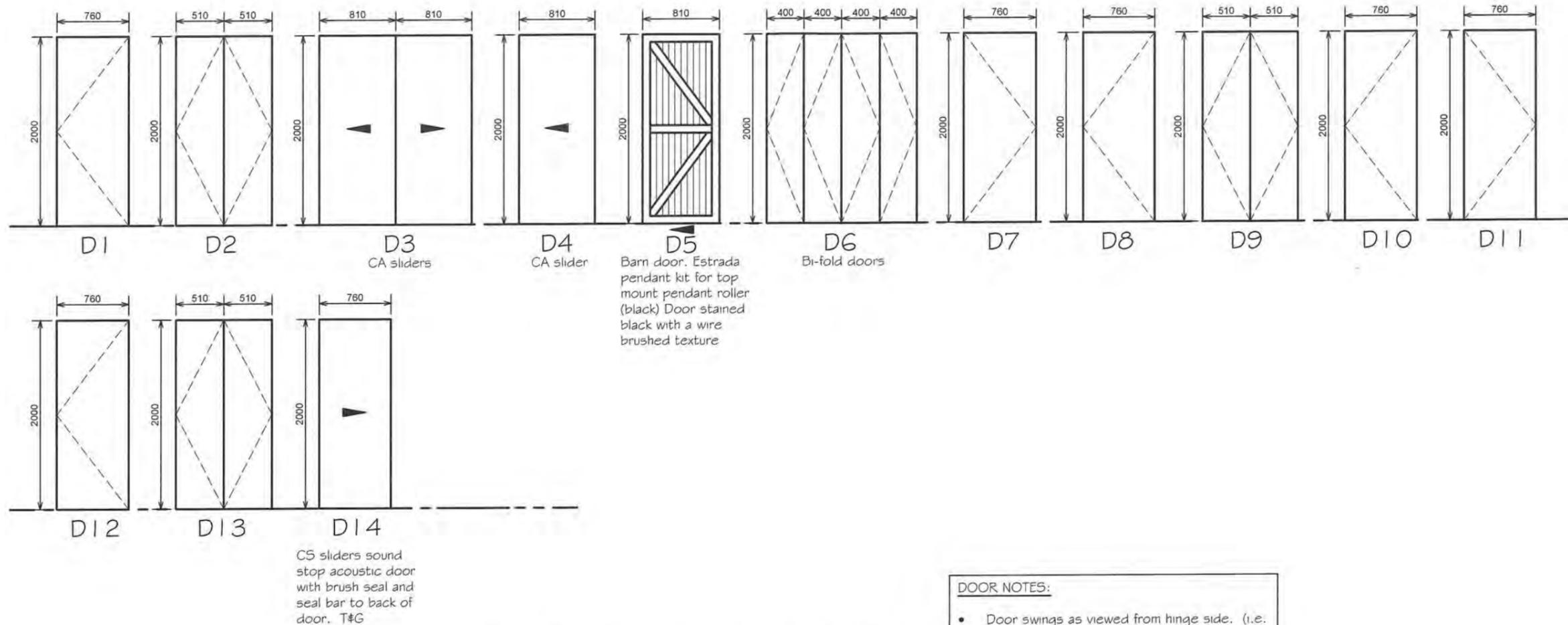
- All windows to be residential profile (Matt charcoal), double glazed
- Window hardware to be colour matched. Stella single window fasteners and bi-fold handles
- Windows to have paint quality finger jointed pine H3 ready for architraves
- Windows shown as viewed from exterior
- Codes  
F = fixed  
SG = safety glazing  
TG = toughened glass  
RS = restrictor stays
- Exterior joinery to comply with NZS 4211.
- Glazing to comply with NZS 4223 parts 1, 2 & 3. Site is High wind zone, 1100pa DWP. Provide safety glazing to comply with part 3 to be provided to hinged glazed doors, sliding doors (without safety rails). Provide safety glazing to side panels, full height windows, windows with low sills and bathroom windows as set out in part 3
- Restrictor stays must be fitted to windows allowing a maximum 100mmØ sphere to pass through in compliance to NZBC F4 clause 2.0, where:
  - Window sash less than 1 m wide and sill less than 760mm to floor and difference in levels between the floor level and ground outside is greater than 1 m.
  - Window sash is greater than 1 m wide and sill is less than 1 m to floor
- The window supplier and main contractor must check all dimensions on site and confirm prior to manufacture.
- Site window openings to be 20mm larger than window sizes (allows for 10mm tolerance each side)
- Provide WANZ window sill support brackets as required for cavity cladding systems to all window or doors. Suitable head & sill flashings to be installed to all openings.
- Building wrap to be returned into window openings and openings to be fitted with Texton detail tape at head corners and Texton sill tape continuously across sill.
- Install foam sealant air seal with PEF backing rod to all sides of windows

High Wind Zone

# WINDOW SCHEDULE

Scale 1:50

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	<p>Building Consent</p>	<p>Date: February 2017</p>	<p>Drawing Number: 11 Of 24 (A3 Original)</p>		



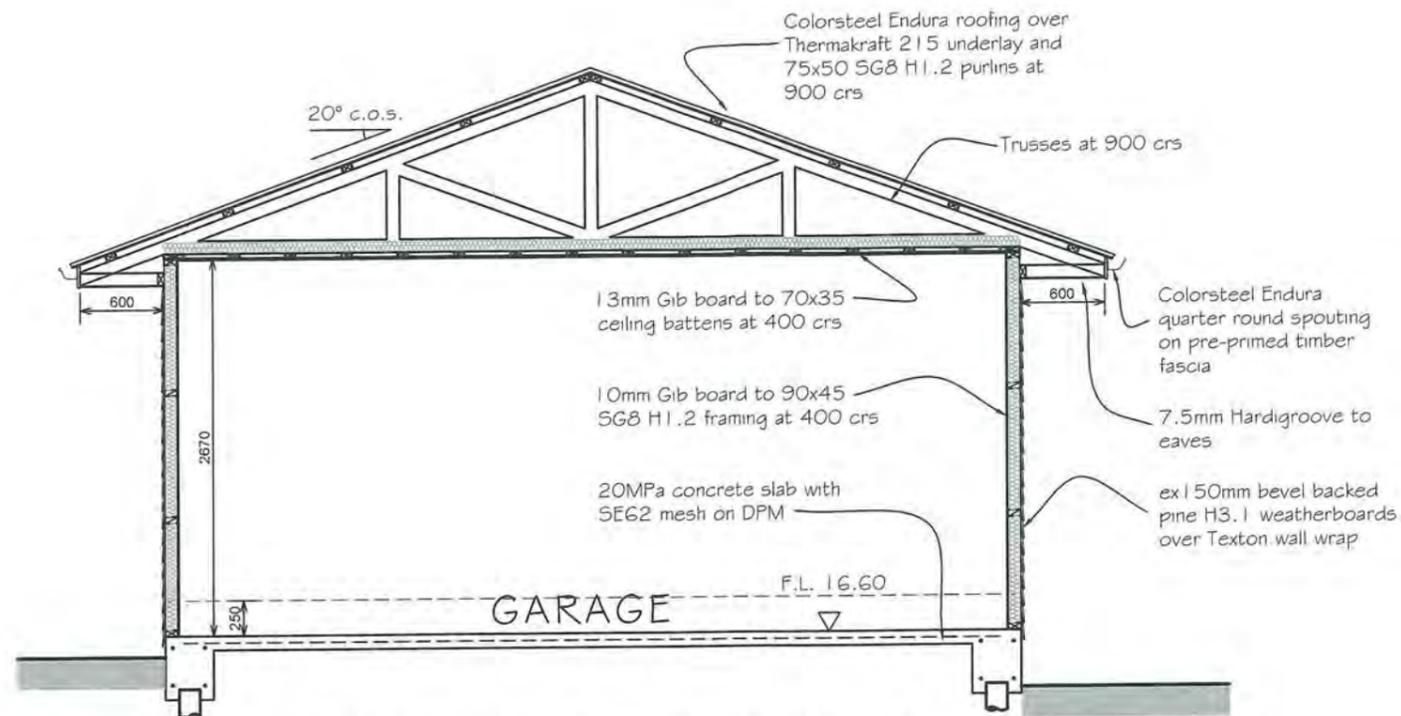
# DOOR SCHEDULE

Scale 1:50

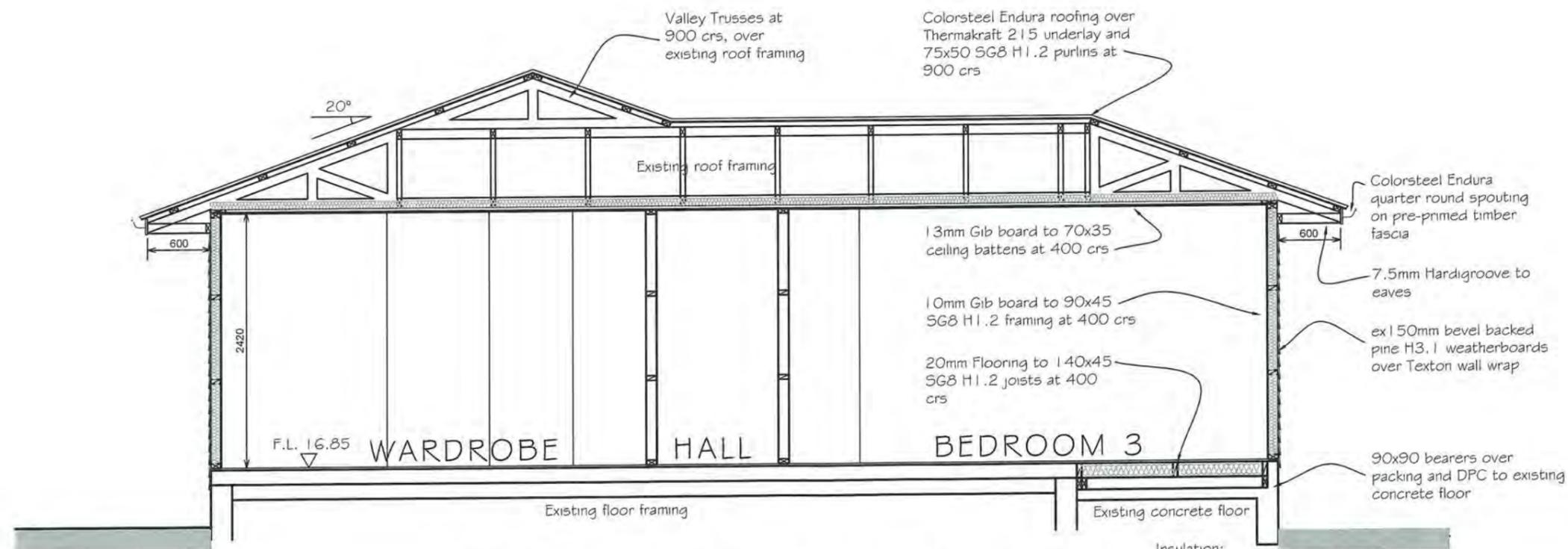
- DOOR NOTES:**
- Door swings as viewed from hinge side. (i.e. pulling door towards you)
  - Doors to be hollow core paint quality T#G Manhattan profile
  - Doors to be prehung in radiata pine paint quality finger jointed ready for architraves
  - Door hardware to be confirmed by owner
  - Doors to be hung and installed plumb to best trade practice
  - Install door stops as selected by owner to adjoining walls
  - Hinges to be Windsor Matt black WB5904
  - Internal door hardware - supplied by owner

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	<p>Date: February 2017</p>		<p>Scale: 1:50</p>	<p>Drawing Number: <b>12</b> Of 24</p>	
	<p>Revision: <b>A</b></p>		<p>(A3 Original)</p>		



CROSS SECTION A-A



CROSS SECTION B-B

Insulation:  
 Floor - double layer R1.8 Expol  
 Walls - R2.6 Pink Batts  
 Ceiling - R3.6 Pink Batts

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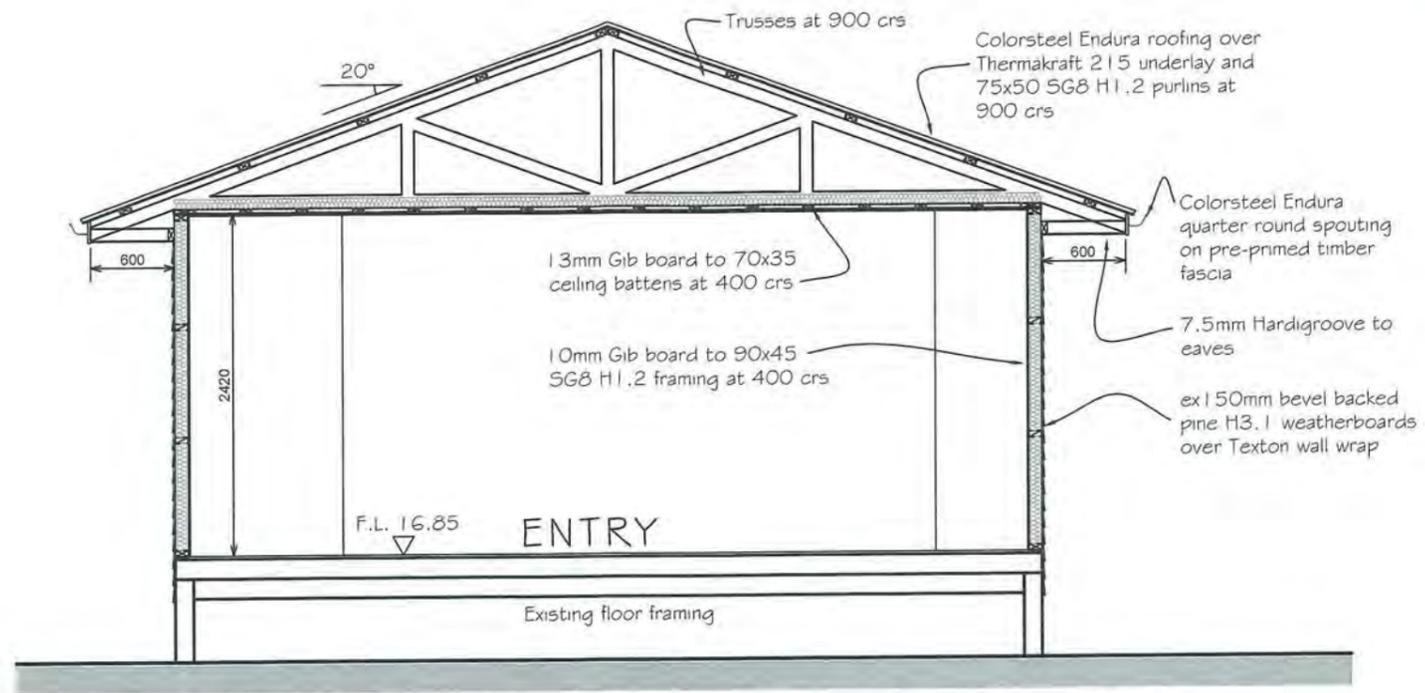
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**Proposed Additions & Alterations**  
**For Mr & Mrs Hyndman**  
**At 65 Kohekohe Road**  
**WAIKANAE**  
**BUILDING CONSENT**

Revisions:  
 A 16/08/17 building consent

Designer:  
 R Dennis  
 Date:  
 February 2017  
 Scale:  
 1:50  
 Revision: A

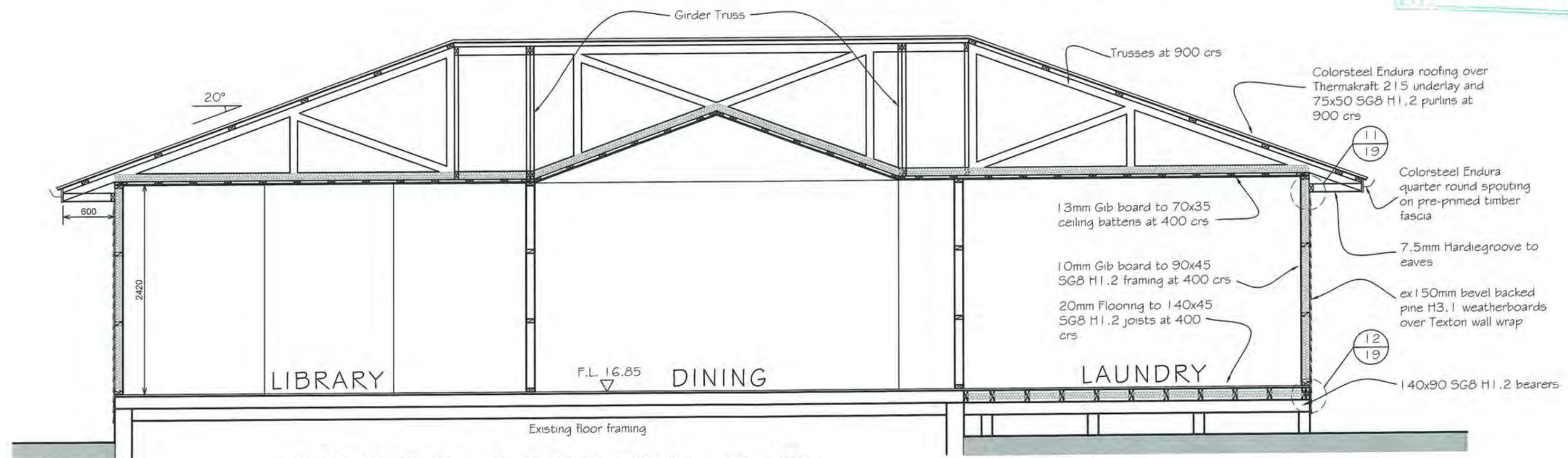
Project Number:  
 473  
 Drawing Number:  
 13  
 Of 24  
 (A3 Original)



CROSS SECTION C-C

Insulation:  
 Floor - double layer R1.8 Expol  
 Walls - R2.6 Pink Batts  
 Ceiling - R3.6 Pink Batts

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CROSS SECTION D-D

Insulation:  
 Floor - double layer R1.8 Expol  
 Walls - R2.6 Pink Batts  
 Ceiling - R3.6 Pink Batts

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 WAIKANAE  
 BUILDING CONSENT**

Revisions:  
 A 16/08/17 building consent

Designer: R Dennis	Project Number: 473
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Scale: 1:50	(A3 Original)
Revision: A	

Electrical Notes

Provide Electrical Certificate after completion and prior to Code of Compliance Certificate being issued

All switches, power points etc to be PDL - owner to confirm series.

Recessed downlights shall be installed to prevent transfer of moisture into ceiling space and maintain minimum clearances from insulation as required by NZECP 54:2001

All power circuits to have RCD at switchboard

TV aerial wiring to be suitable for Sky Digital and for Telstra Clear Cable TV

Phone line wiring to be suitable for internet broadband and jetstream connections

Install approved smoke alarm system as required by NZBC Clause F7

Allow for power for infinity water system in roof

Allow for a light in the roof space with a switch with indicator lamp in room below

Under tile heating to bathrooms

**KITCHEN:**

Allow for power to kitchen for: power points, oven, cooktop, rangehood, dishwasher, in sink-erater, microwave, fridge

Confirm kitchen layout with kitchen designer

**Rangehood**

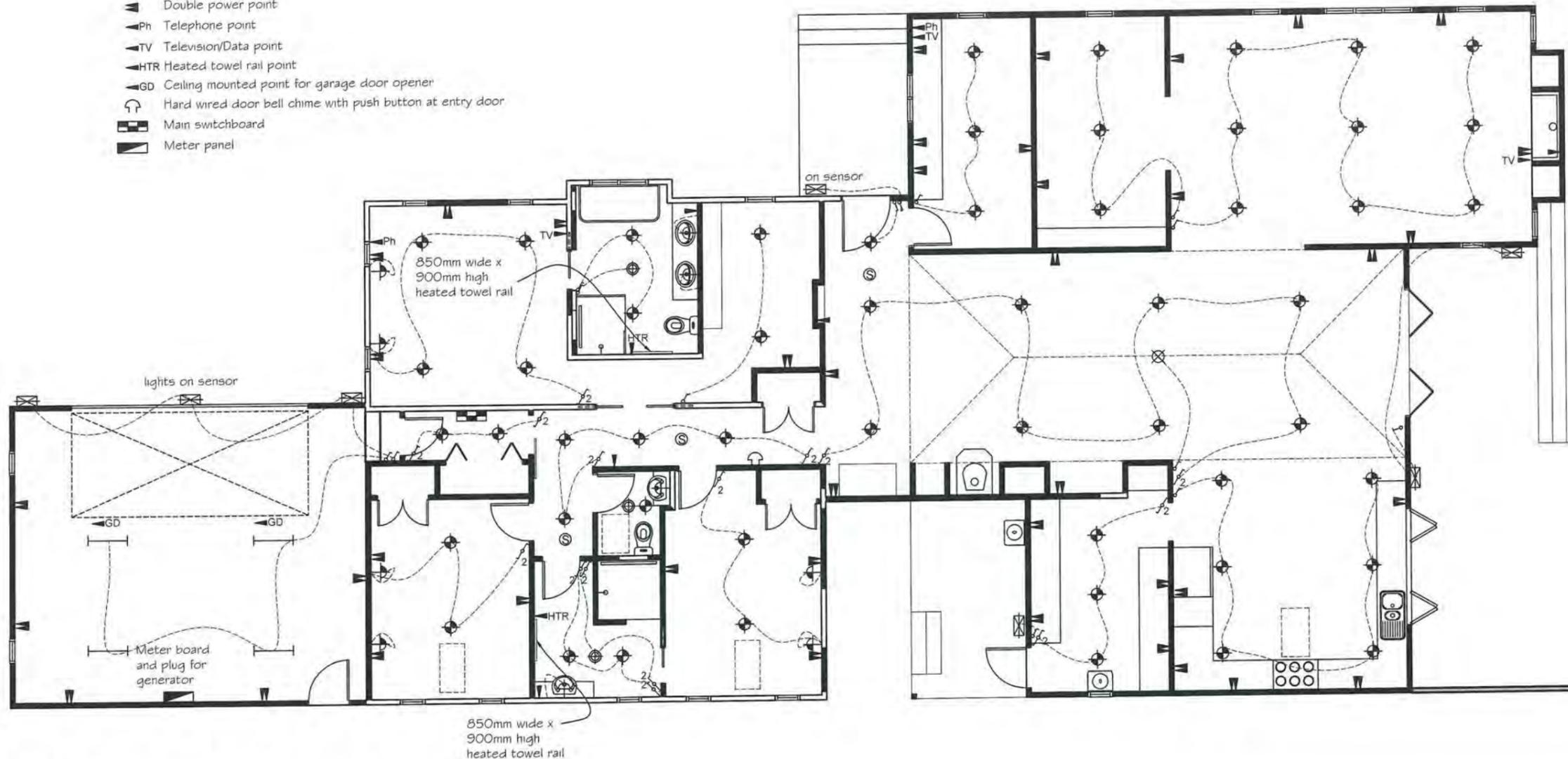
- Install rangehood over hob ducted to the eaves with flexible ducting.
- Rangehood to be selected by owner but to have the following minimum Air Flow Rates to comply with NZBC G4:AS1 and AS1668.2:2002  
For a rangehood set back 150mm from front edge of cooking appliance (may not be set back more than 300mm and the length shall not be less than the length of the cooking appliance  
 $Q = 400 \times L$   
For a range hood extending 150mm beyond the front edge of the cooking appliance  
 $Q = 190 \times P \times H$

Q = exhaust airflow rate, in litres per second  
L = length of the rangehood, in metres  
H = height of hood above cooking appliance, in metres  
P = inside perimeter of hood over all exposed sides, in metres

**ELECTRICAL KEY**

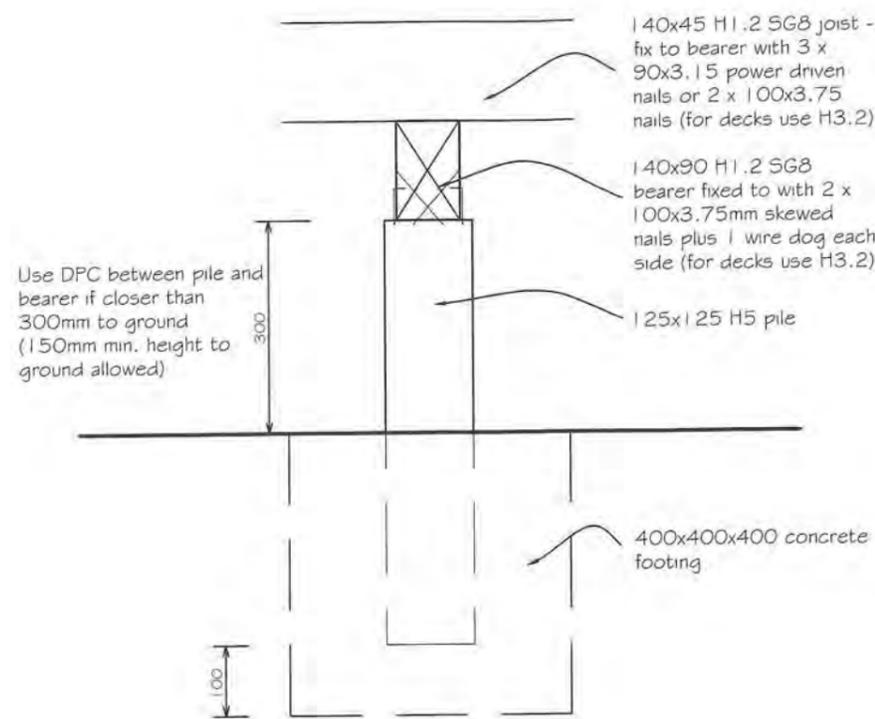
- ⊙ Recessed LED downlight
- ⊗ Ceiling mounted light - hanging
- ⊕ Wall light
- ⊖ Over mirror wall light
- ⊗ Extract fan vented to exterior
- ⊙ Smoke detector
- ⊗ Wall mounted exterior light
- Fluorescent light
- ⌚ One way switch
- ⌚ Multi way switch
- ⬆ Single power point
- ⬆ Double power point
- ⬆ Ph Telephone point
- ⬆ TV Television/Data point
- ⬆ HTR Heated towel rail point
- ⬆ GD Ceiling mounted point for garage door opener
- 🔔 Hard wired door bell chime with push button at entry door
- ⊞ Main switchboard
- ⊞ Meter panel

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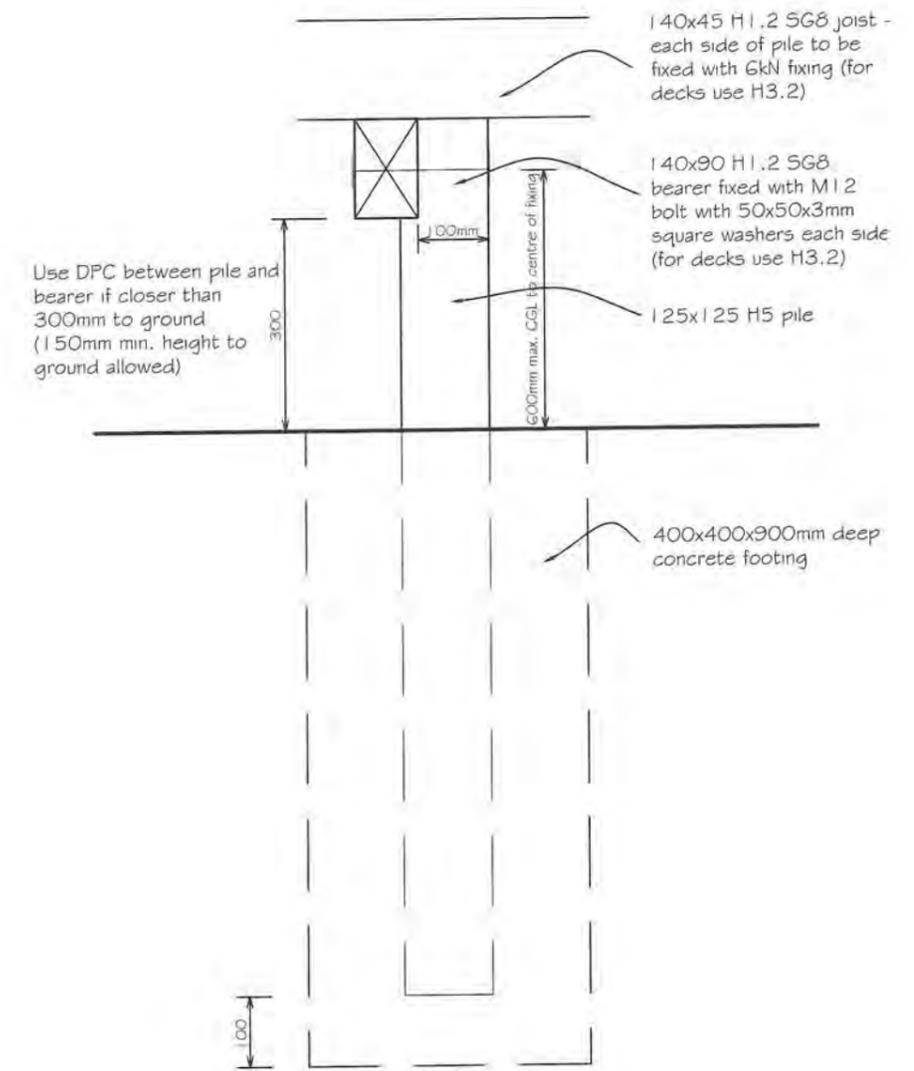


**ELECTRICAL PLAN**  
confirm layout on site with owners

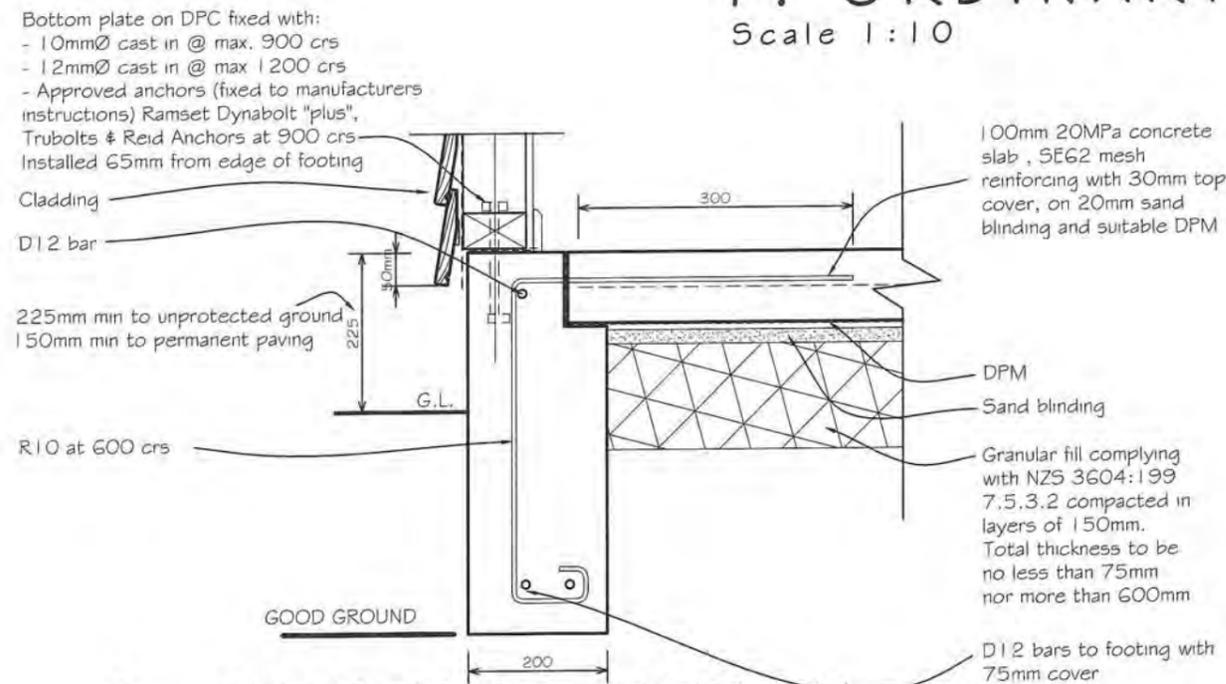
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	Designer: R Dennis	473								
Date: February 2017										
Scale: 1:100	15 Of 24 (A3 Original)									
Revision: A										
BUILDING CONSENT										



**1. ORDINARY PILE**  
Scale 1:10



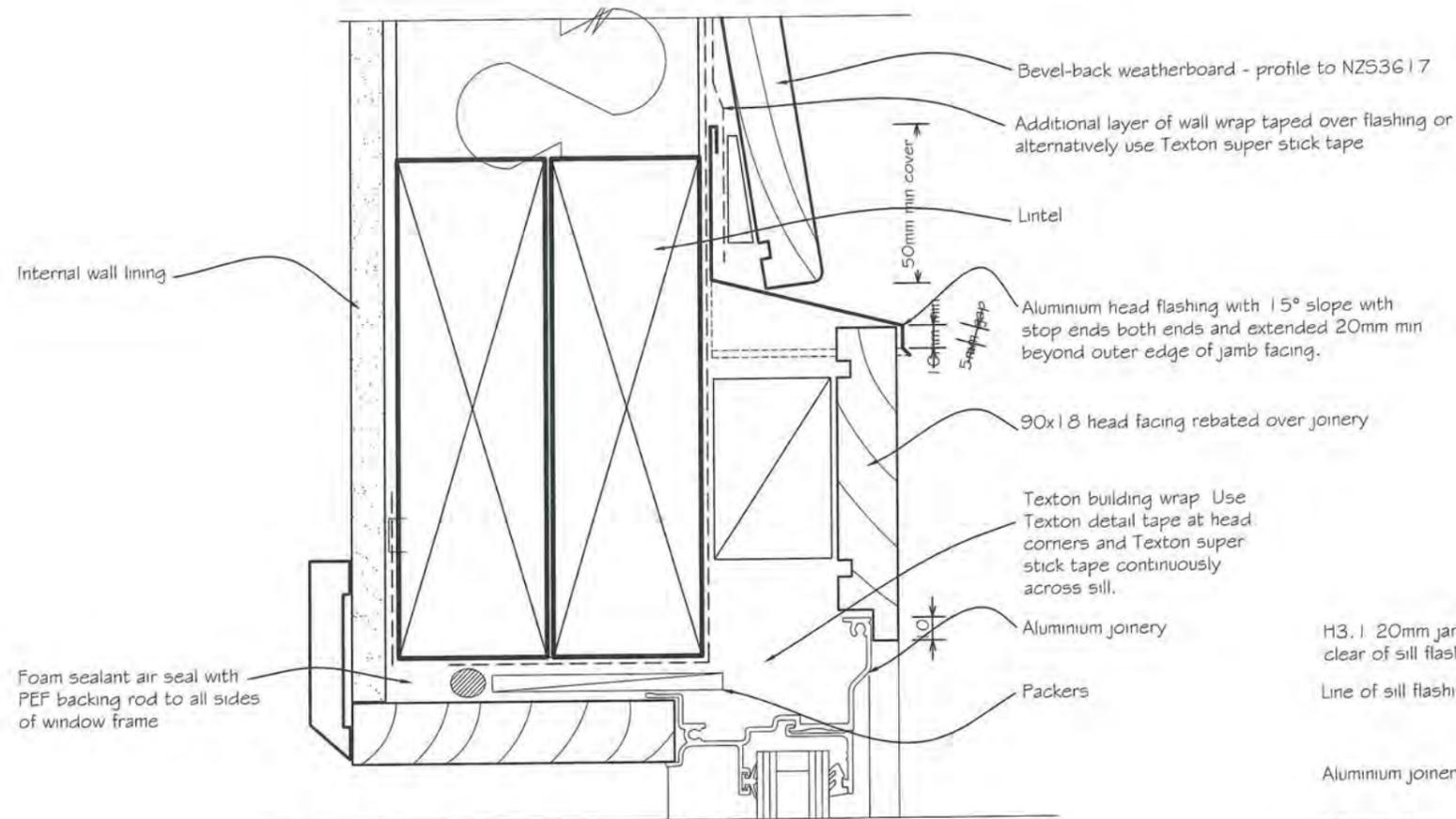
**2. ANCHOR PILE**  
Scale 1:10



**3. FOOTING DETAIL**  
Scale 1:10

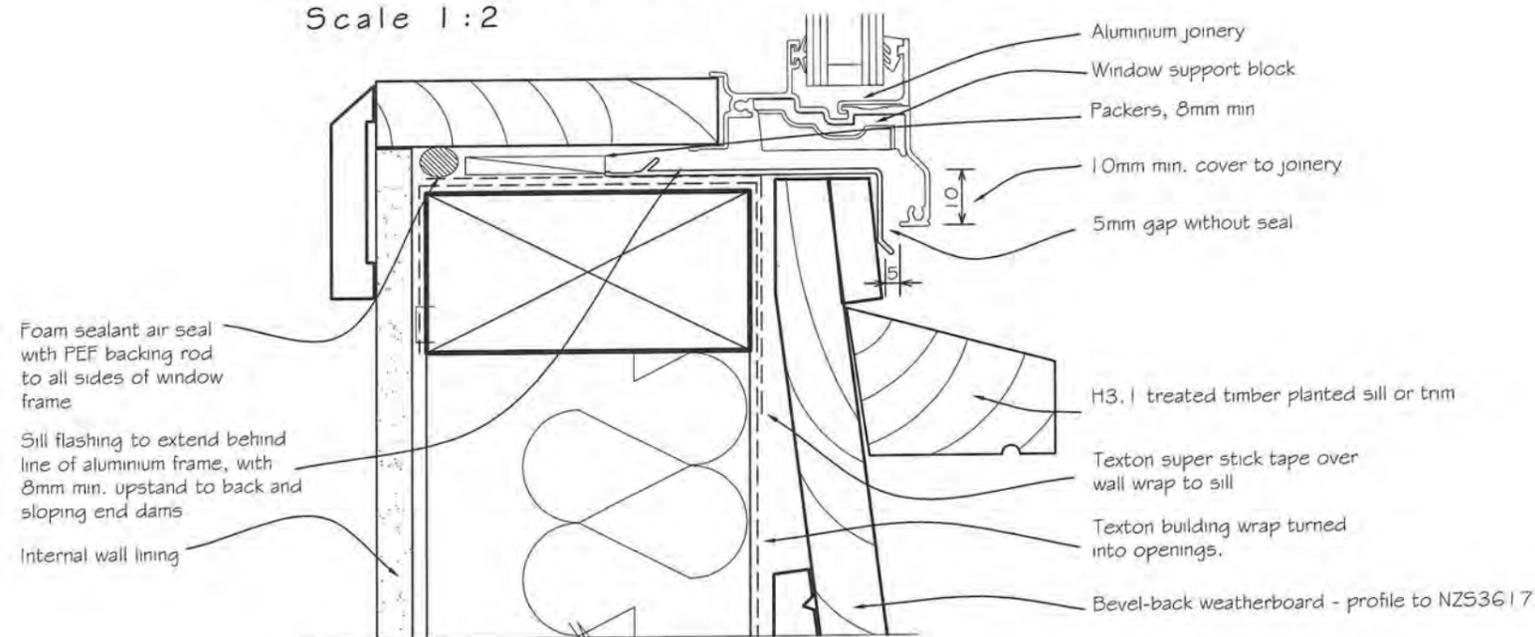
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	<p>Building Consent</p>			<p>Date: February 2017</p>	<p>Drawing Number: <b>16</b> Of 24 (A3 Original)</p>
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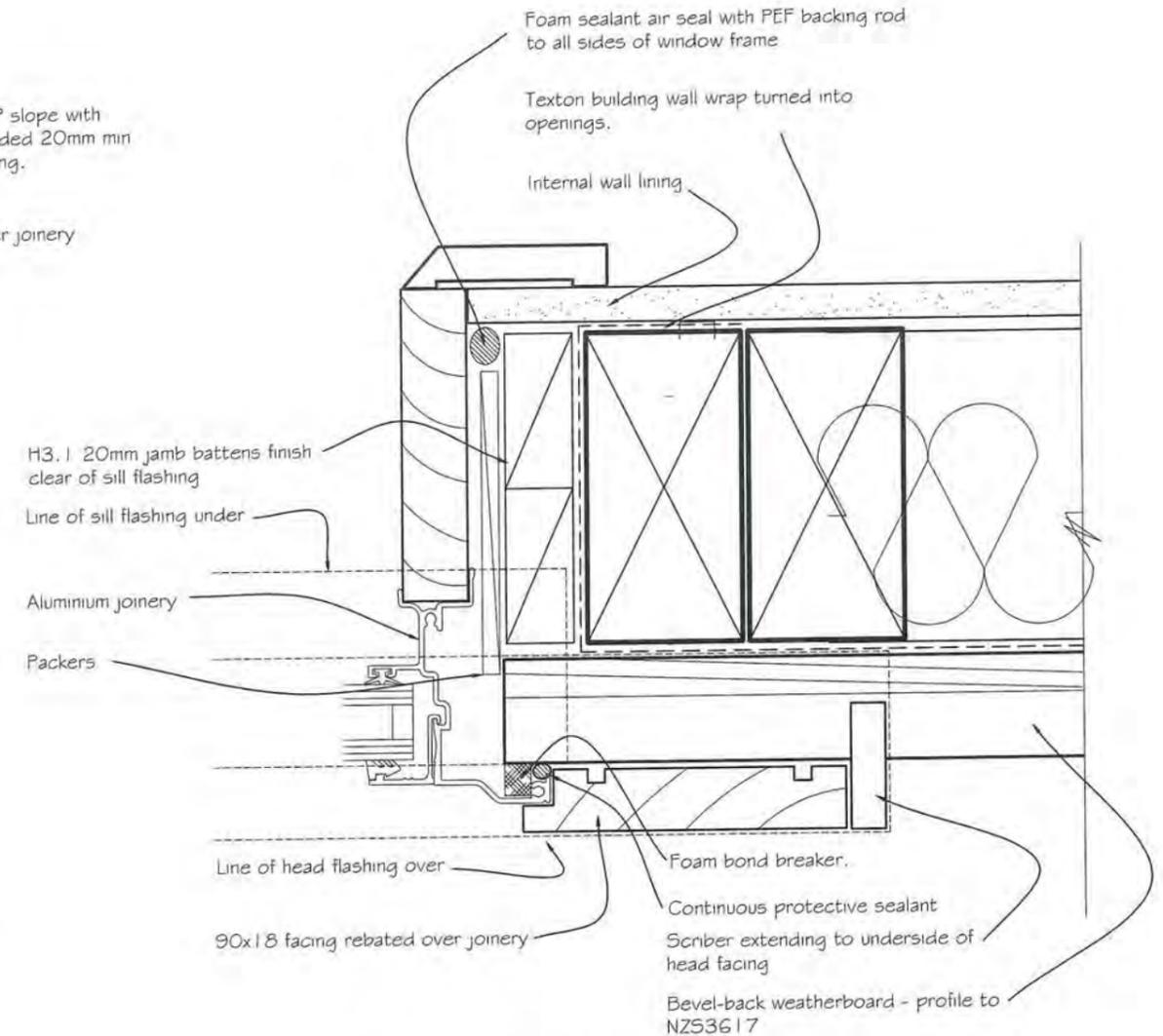
### 4. WINDOW HEAD

Scale 1:2



### 5. WINDOW SILL

Scale 1:2



### 6. WINDOW JAMB

Scale 1:2

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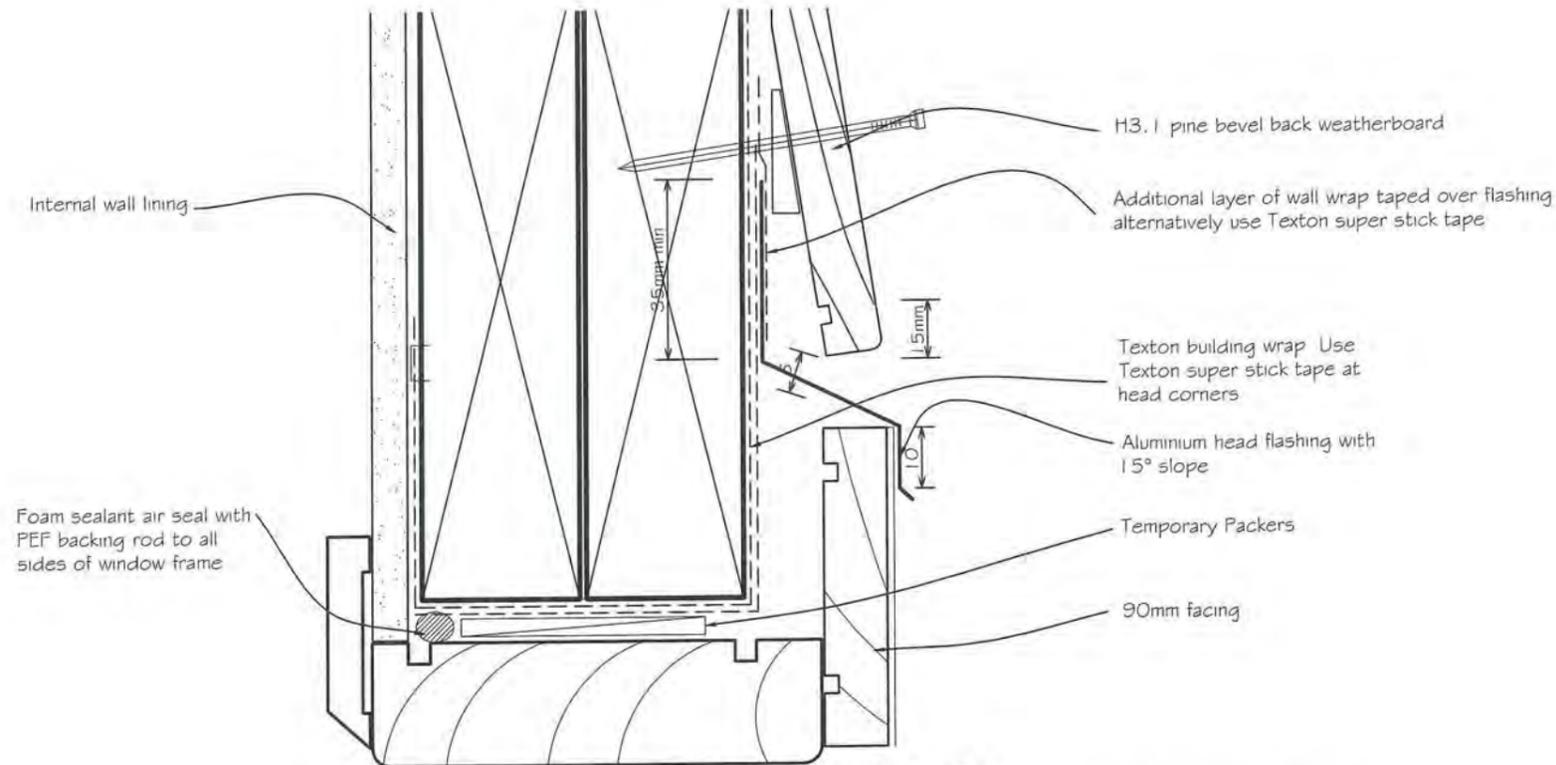
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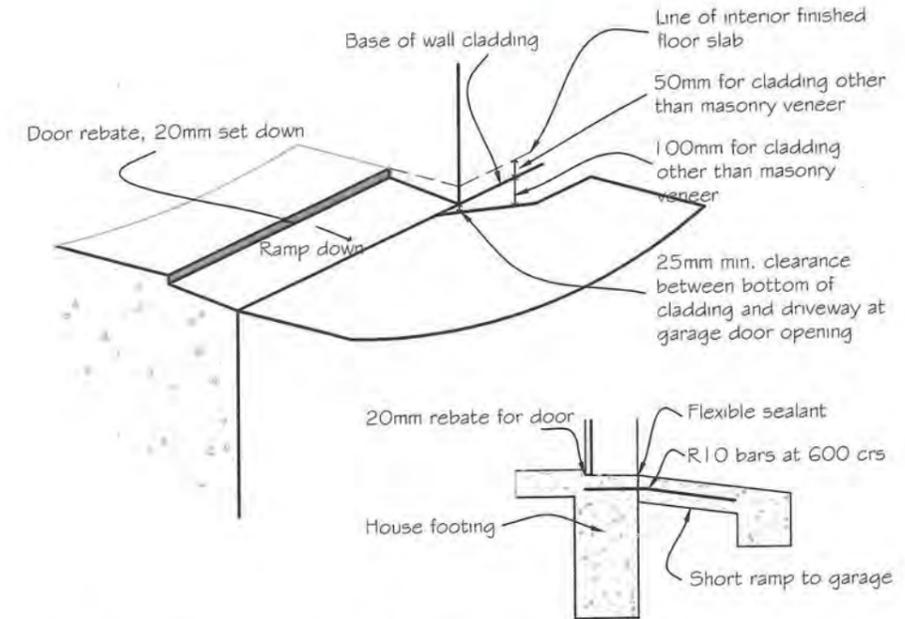
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 Date:  
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 Revision: A

Project Number:  
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 Drawing Number:  
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 Of 24  
 (A3 Original)

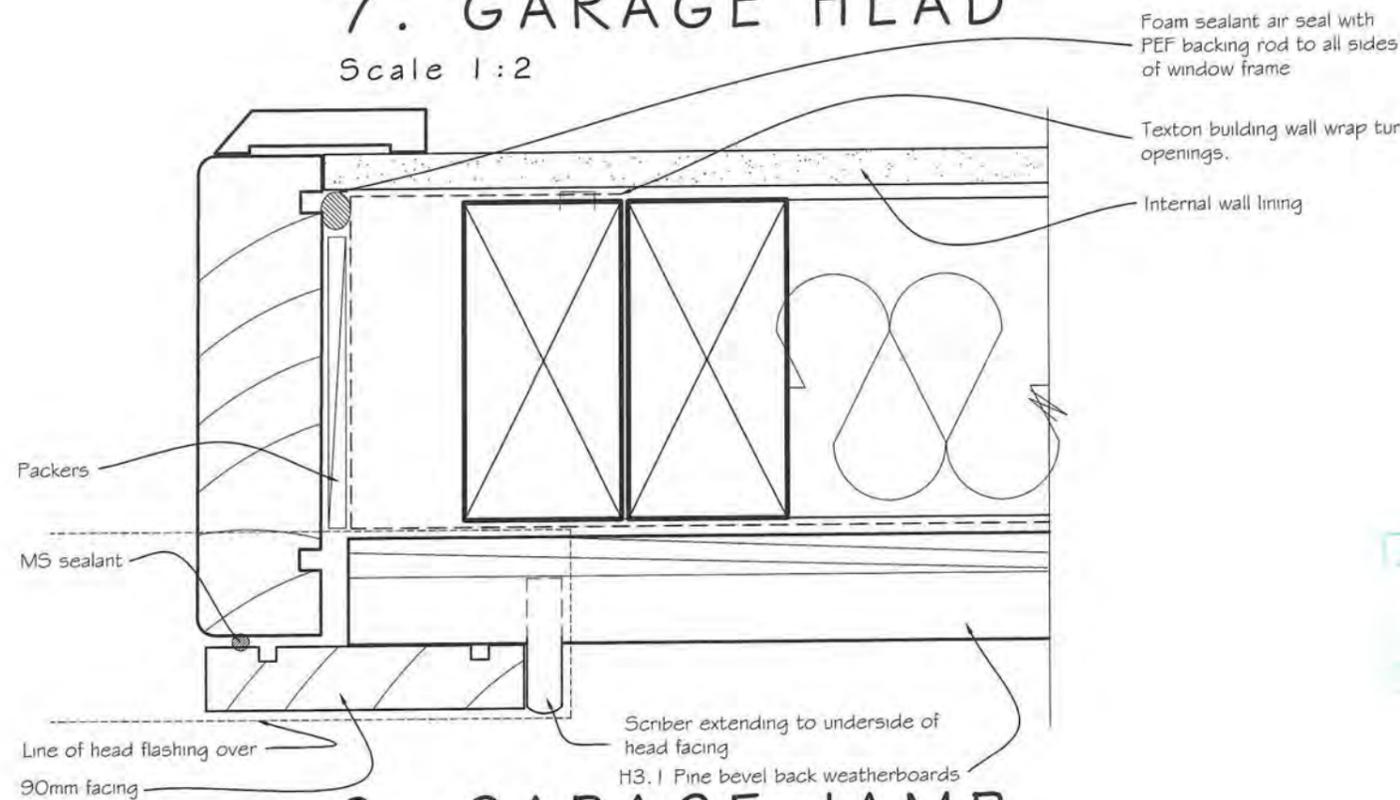


7. GARAGE HEAD

Scale 1:2

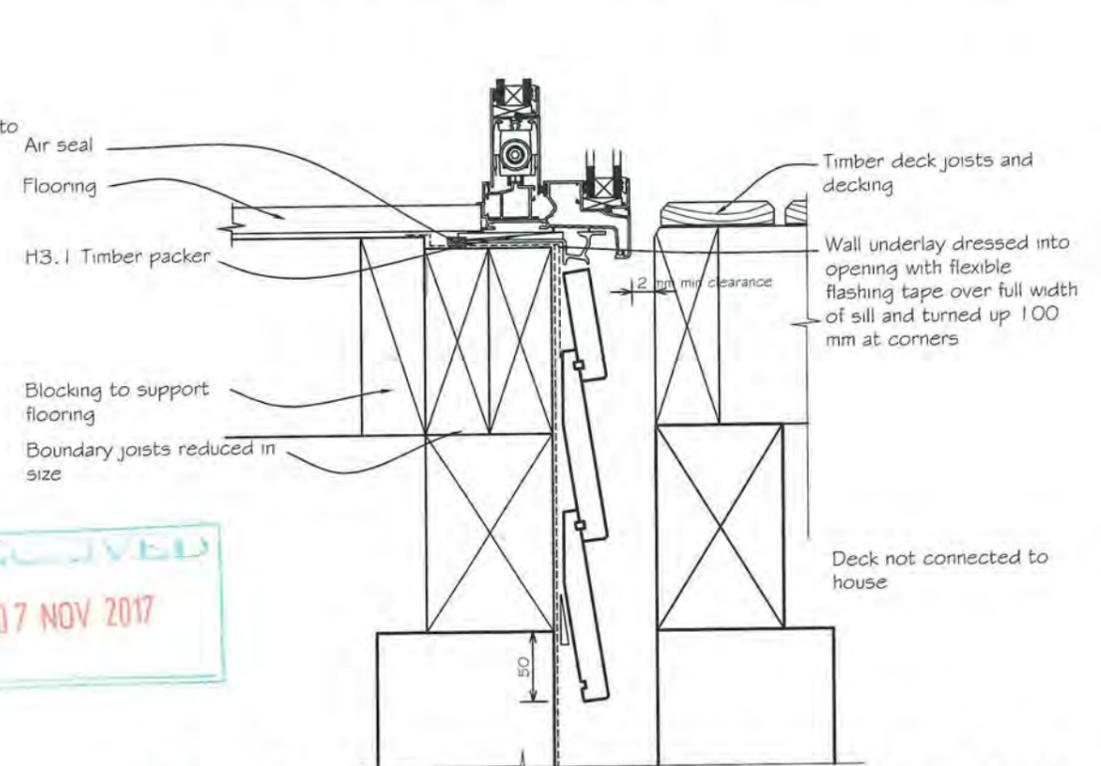


9. GARAGE DOOR AT REBATE



8. GARAGE JAMB

Scale 1:2



10. DOOR SILL AT DECK

Scale 1:5

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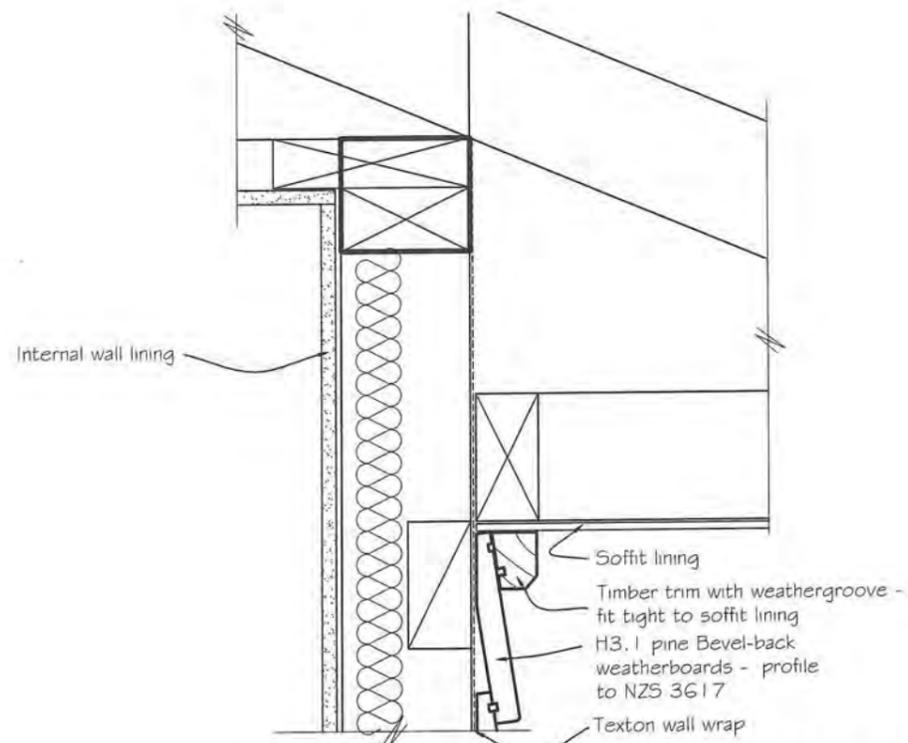
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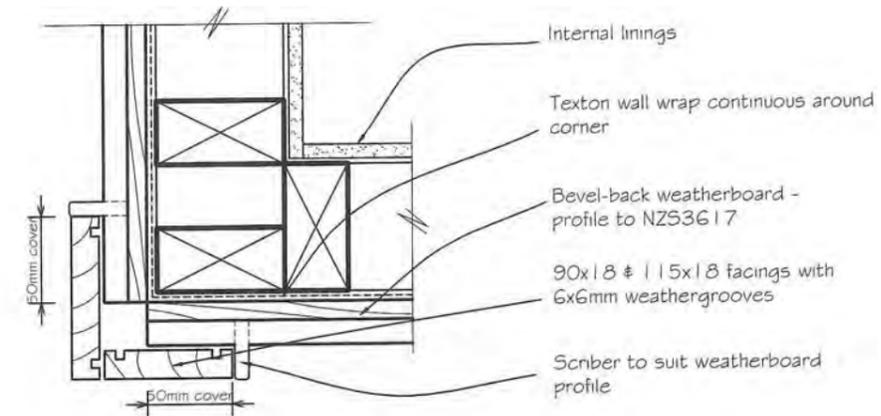
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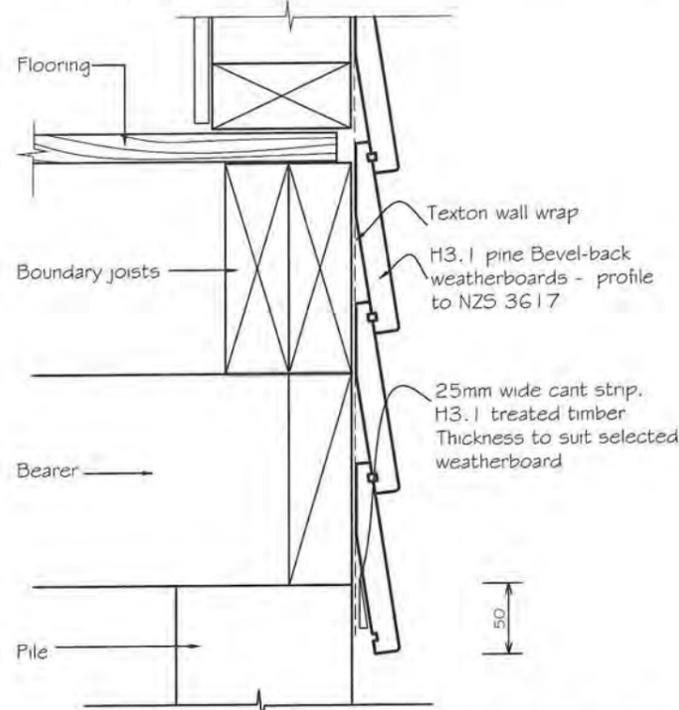
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Date: February 2017	Drawing Number: 18 Of 24
Scale: 1:2; 1:5	(A3 Original)
Revision: A	



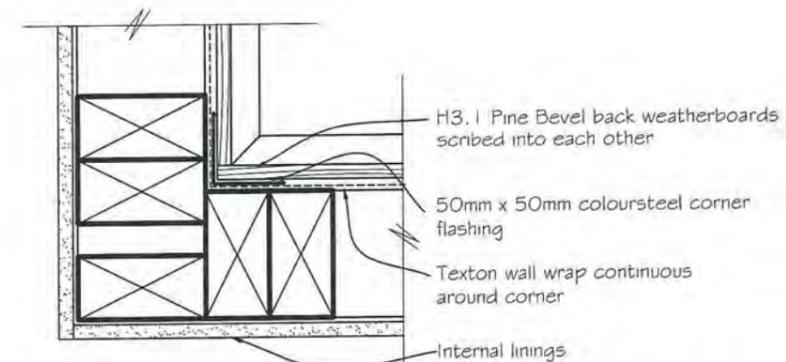
**11. EAVES DETAIL**  
Scale 1:5



**13. EXTERNAL CORNER DETAIL**  
Scale 1:5

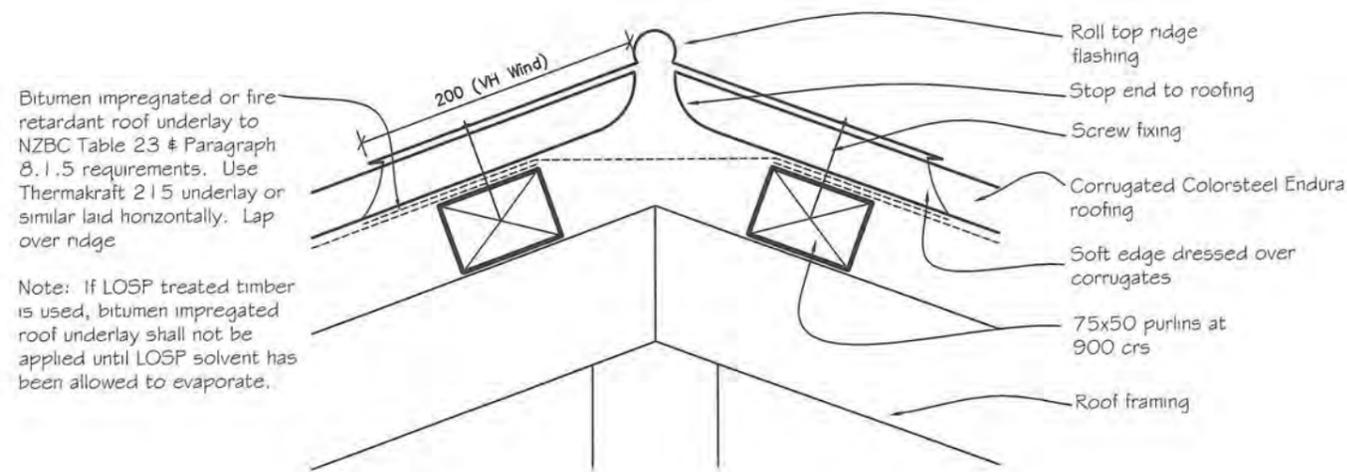


**12. FOUNDATION DETAIL**  
Scale 1:5

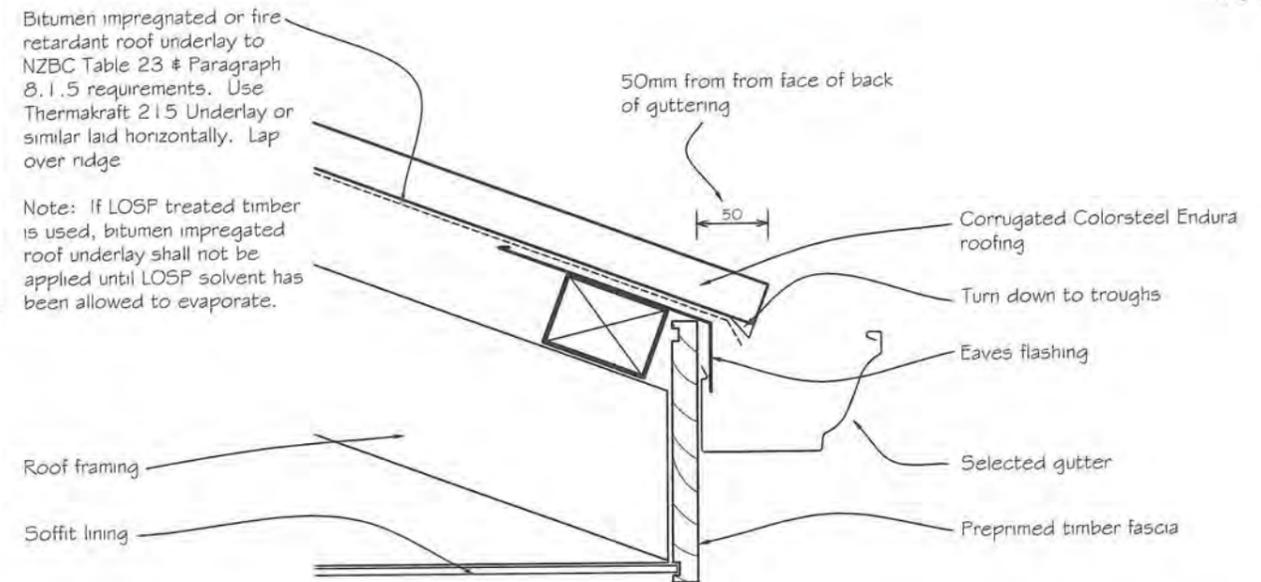


**14. INTERNAL CORNER DETAIL**  
Scale 1:5

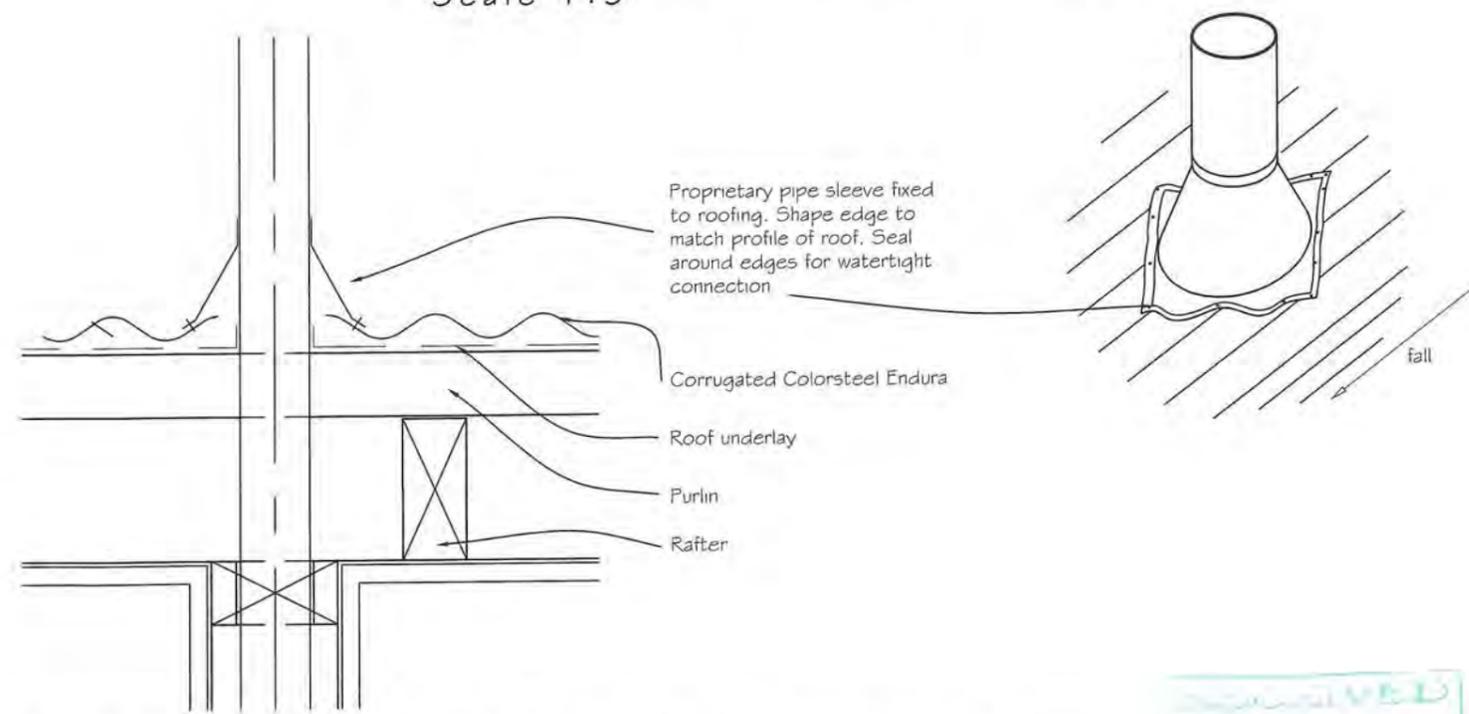
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15. RIDGE DETAIL  
Scale 1:5



16. EAVES DETAIL  
Scale 1:5



PIPE PENETRATION DETAIL  
Scale 1:5 (up to 60mmØ)

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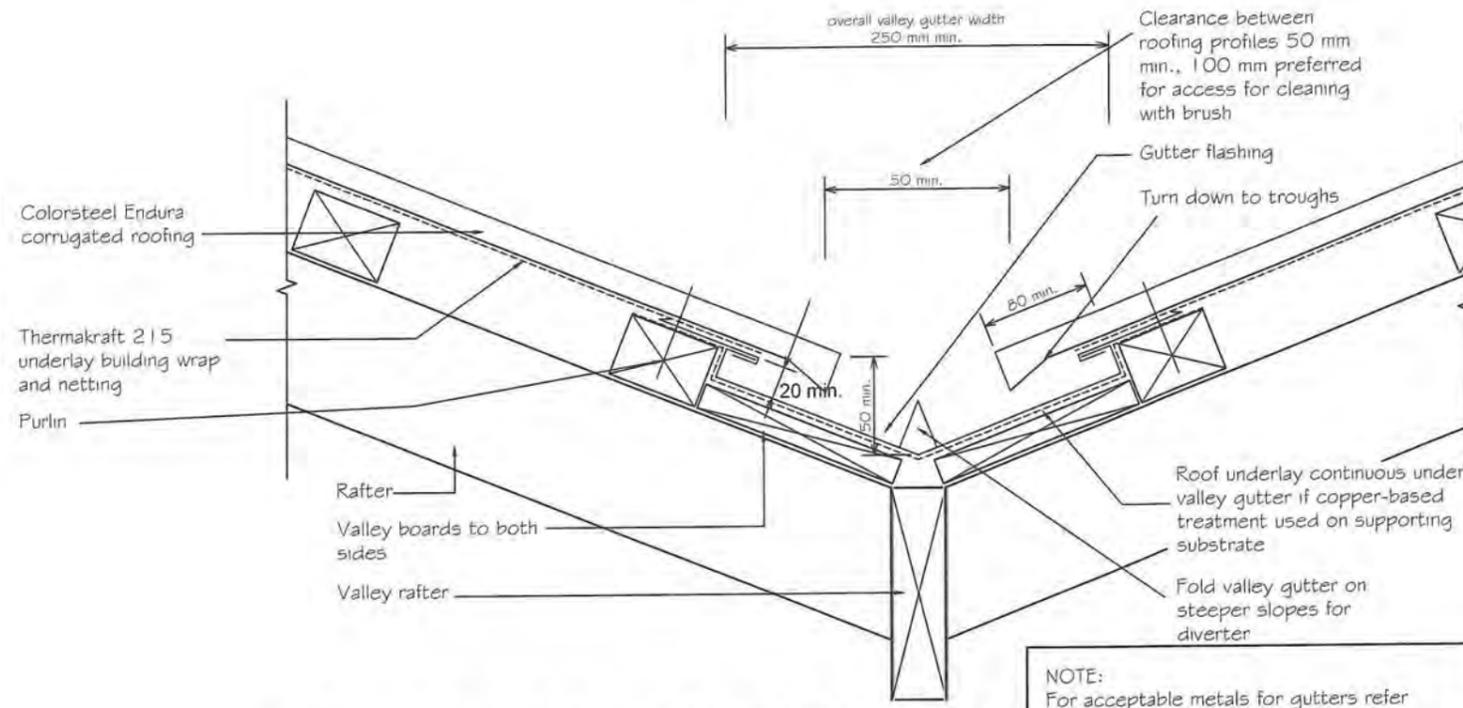
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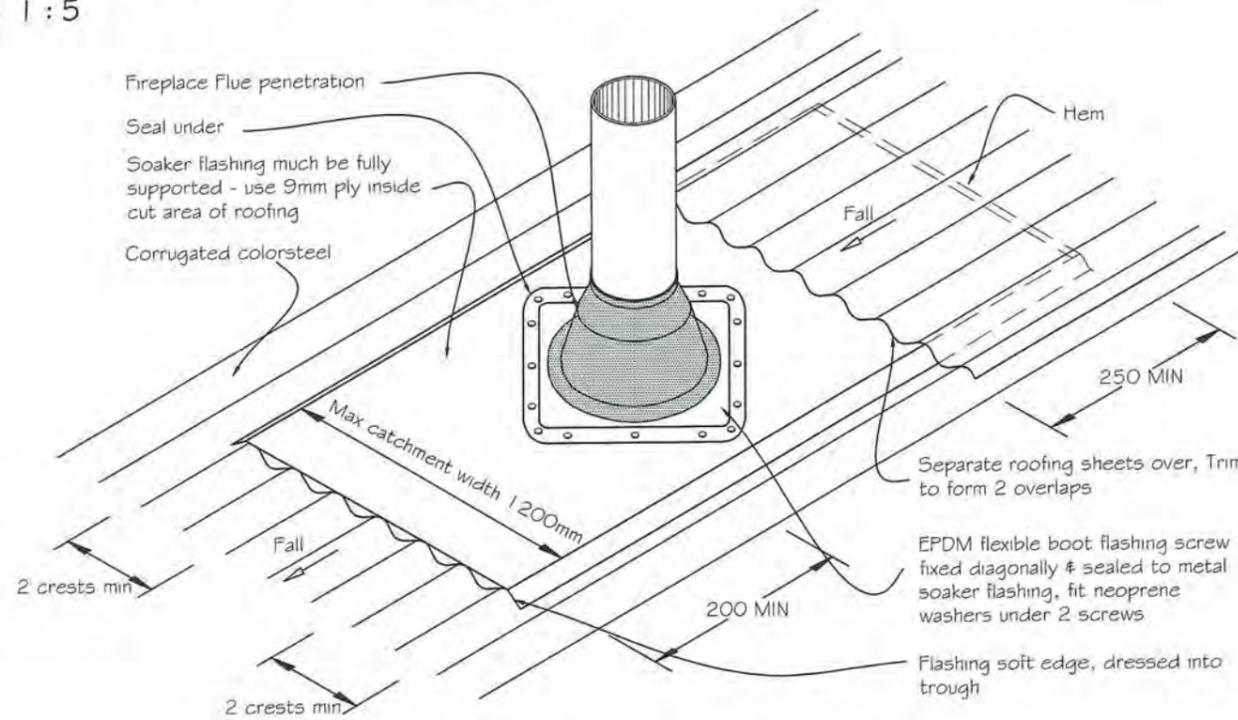
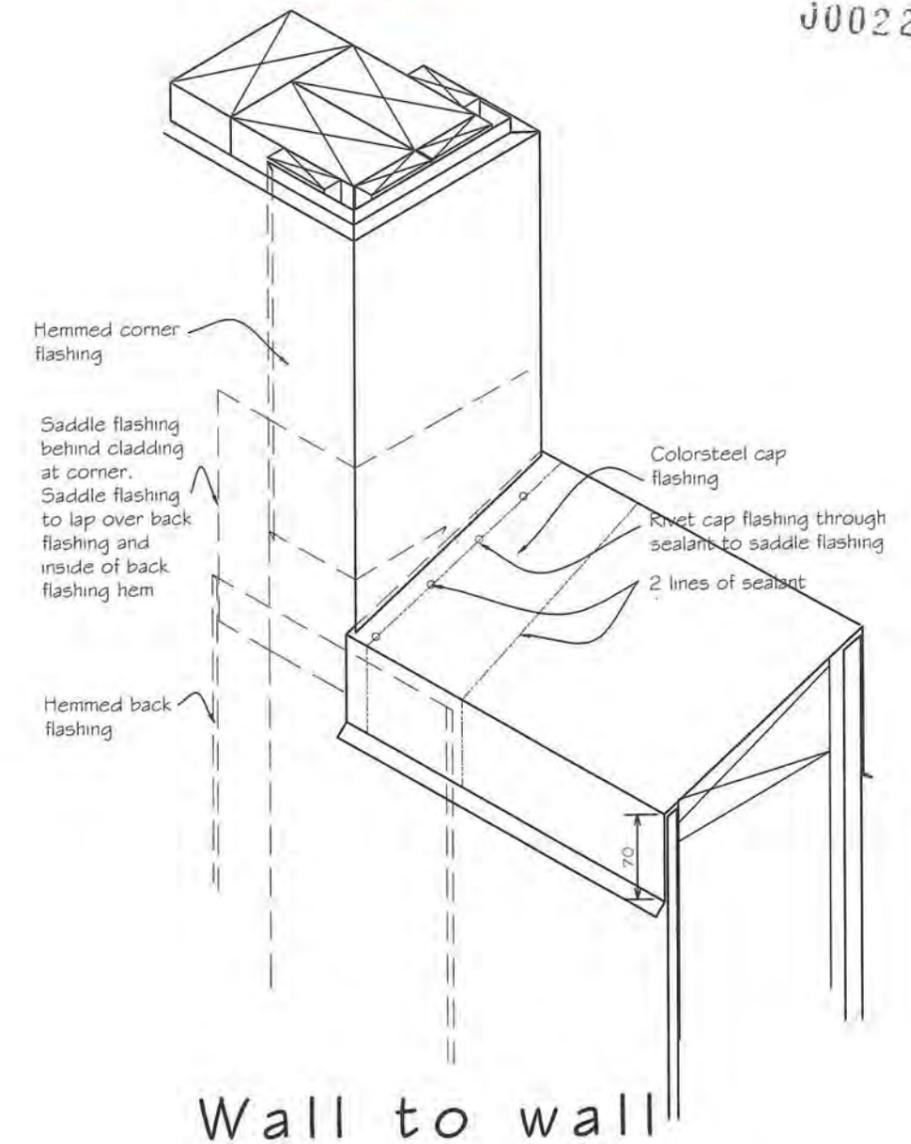
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Designer: R Dennis	Project Number: 473
Date: February 2017	Drawing Number: 20 Of 24 (A3 Original)
Scale: 1:5	Revision: A



NOTE:  
For acceptable metals for gutters refer E2/AS1: Table 20. Make allowance for thermal movement as per E1/AS1: Table 7.

17. VALLEY DETAIL  
Scale 1:5



18. FLUE PENETRATION  
Scale 1:5

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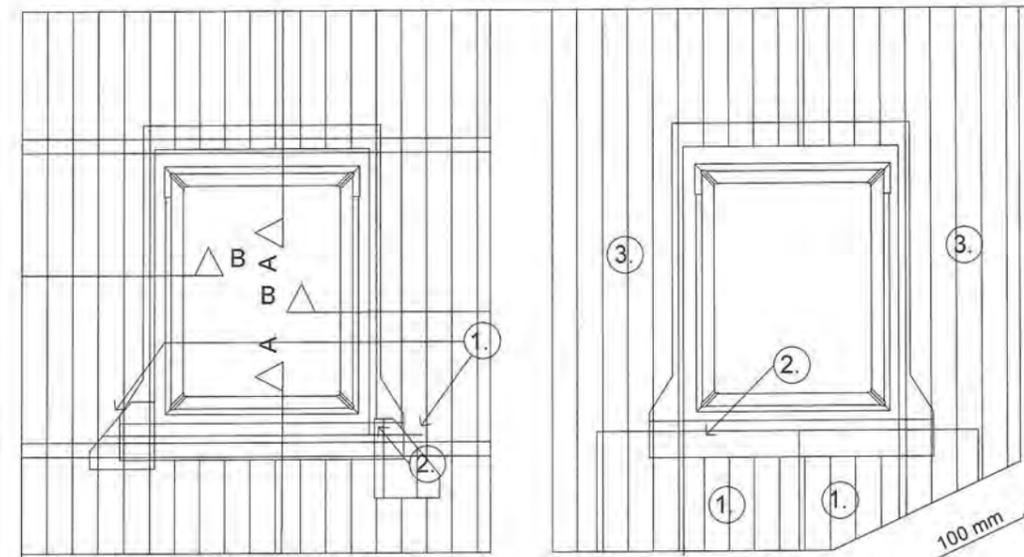
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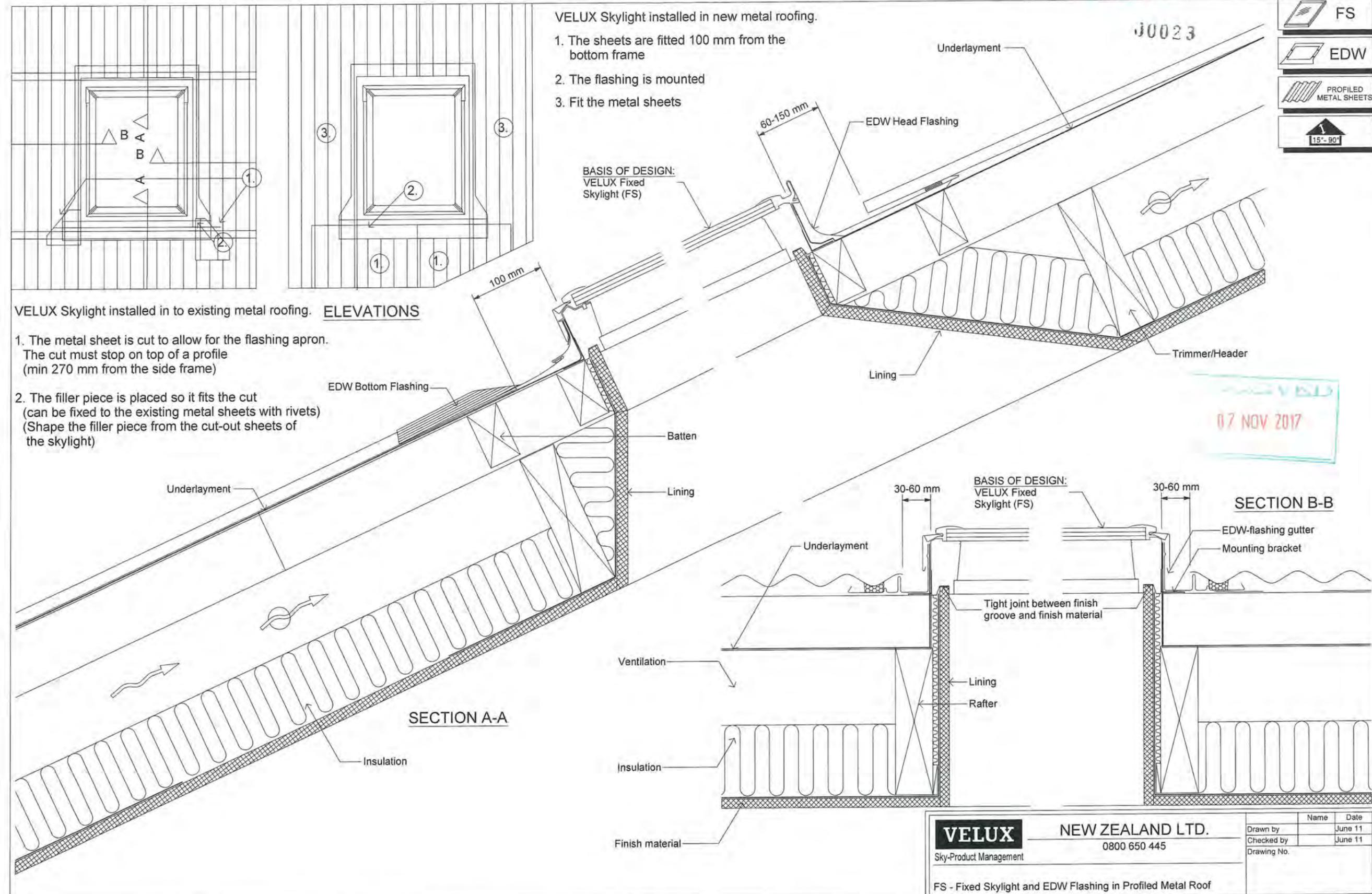
FS  
EDW  
PROFILED METAL SHEETS  
15°-90°

- VELUX Skylight installed in new metal roofing.
1. The sheets are fitted 100 mm from the bottom frame
  2. The flashing is mounted
  3. Fit the metal sheets



VELUX Skylight installed in to existing metal roofing. **ELEVATIONS**

1. The metal sheet is cut to allow for the flashing apron. The cut must stop on top of a profile (min 270 mm from the side frame)
2. The filler piece is placed so it fits the cut (can be fixed to the existing metal sheets with rivets) (Shape the filler piece from the cut-out sheets of the skylight)



07 NOV 2017

<b>VELUX</b> Sky-Product Management	<b>NEW ZEALAND LTD.</b> 0800 650 445		Name	Date
	Drawn by		June 11	
	Checked by		June 11	
FS - Fixed Skylight and EDW Flashing in Profiled Metal Roof			Drawing No.	

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Date: February 2017	Drawing Number: 22 Of 24 (A3 Original)
Scale: nts	Revision: A

10mm toughened A Grade safety glass screen and door. Door hung on glass sidelight. Glass sidelights in 18mm black U channel - adhesive fixed to walls, floor.

Shower mixer fitted in Aquatite wet wall caddy's. Install to manufacturers specifications

Shower recess

1 in 50 fall to channel drain

Non-slip tiles with a 6% maximum water absorption laid over a waterproofing membrane in accordance with AS/NZS 4858

Shower head fitted in Aquatite wet wall caddy's. Install to manufacturers specifications

Wet area membrane to walls not less than 1800mm high

**WET AREA SHOWER**  
Scale 1:10

Wall tiles  
RLA Flexbond ceramic tile wall adhesive

Compressible grout

Wall framing

2 Coats Flexi-seal membrane to wall

Buty Seal Bondbreaker Tape

35x35mm x 0.6mm thick galvanised steel corner angle

Fill joint with RLA sanitary silicone group. Remove sharpness of cut tile edges

10mm Gib Aqualine

**SHOWER CORNER**  
Scale 1:2

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Contractor to verify all dimensions on site prior to commencing work.  
Contact designer if in doubt.

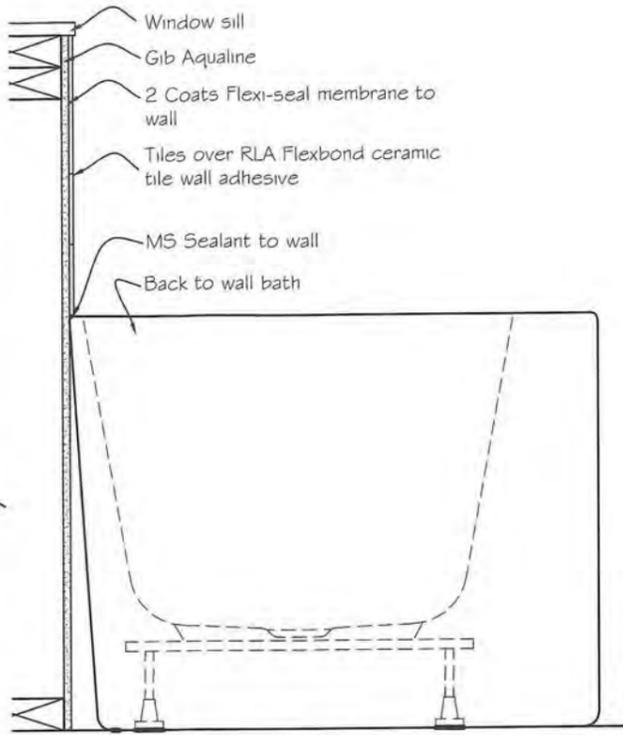
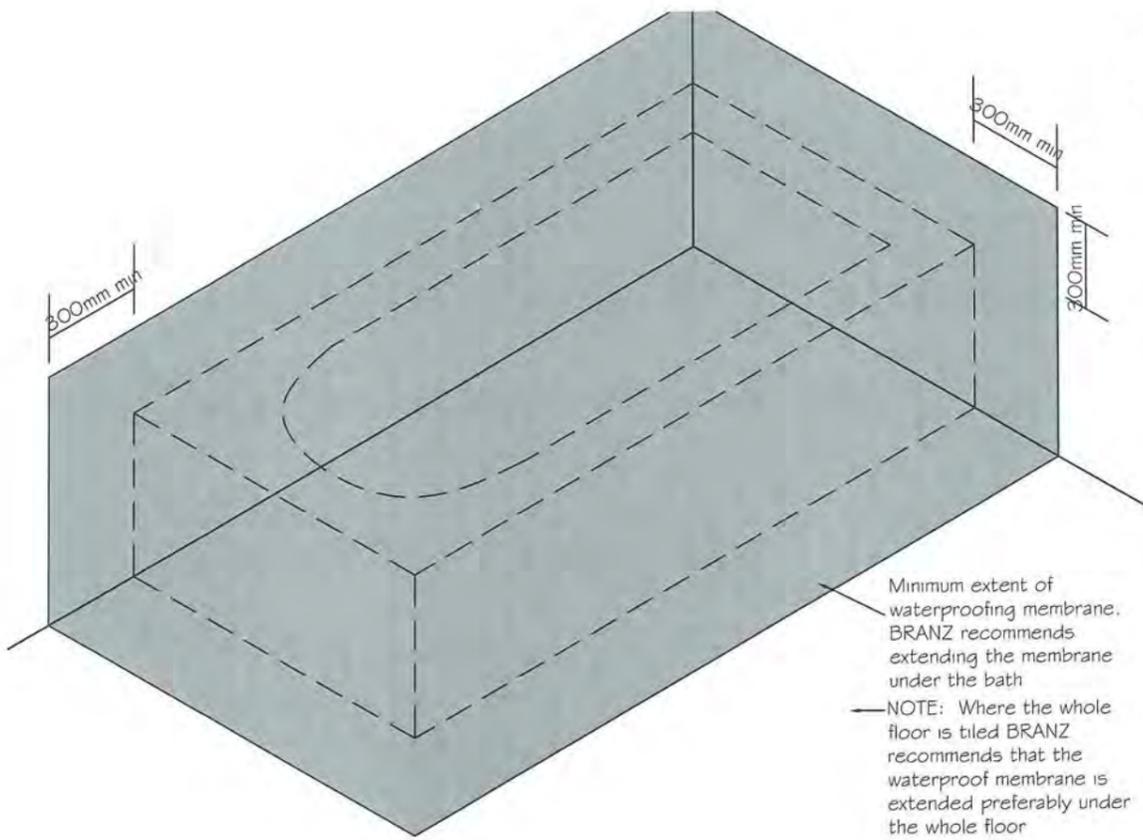
**Proposed Additions & Alterations**  
**For Mr & Mrs Hyndman**  
**At 65 Kohekohe Road**  
**WAIKANAE**  
**BUILDING CONSENT**

Revisions:

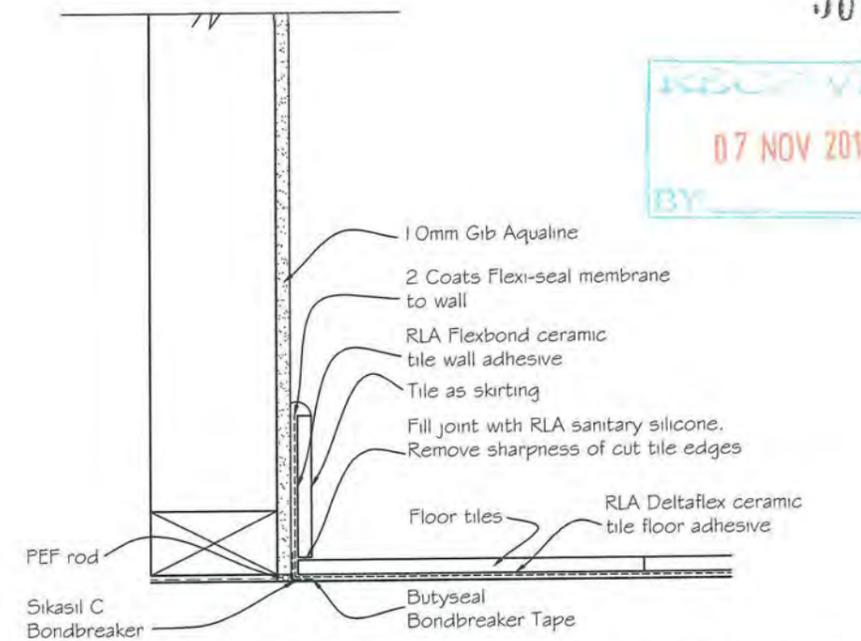
A	16/08/17 building consent
---	---------------------------

Designer: R Dennis	Project Number: <b>473</b>
Date: February 2017	
Scale: 1:10; 1:2	Drawing Number: <b>23</b> Of 24
Revision: <b>A</b>	(A3 Original)

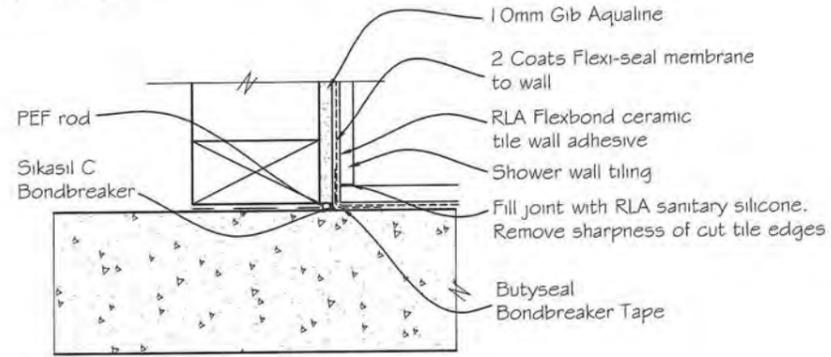
RECEIVED  
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BY



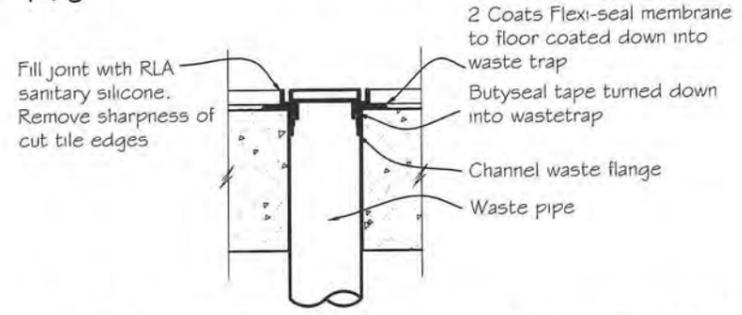
**BATH TO WALL**  
Scale 1:10



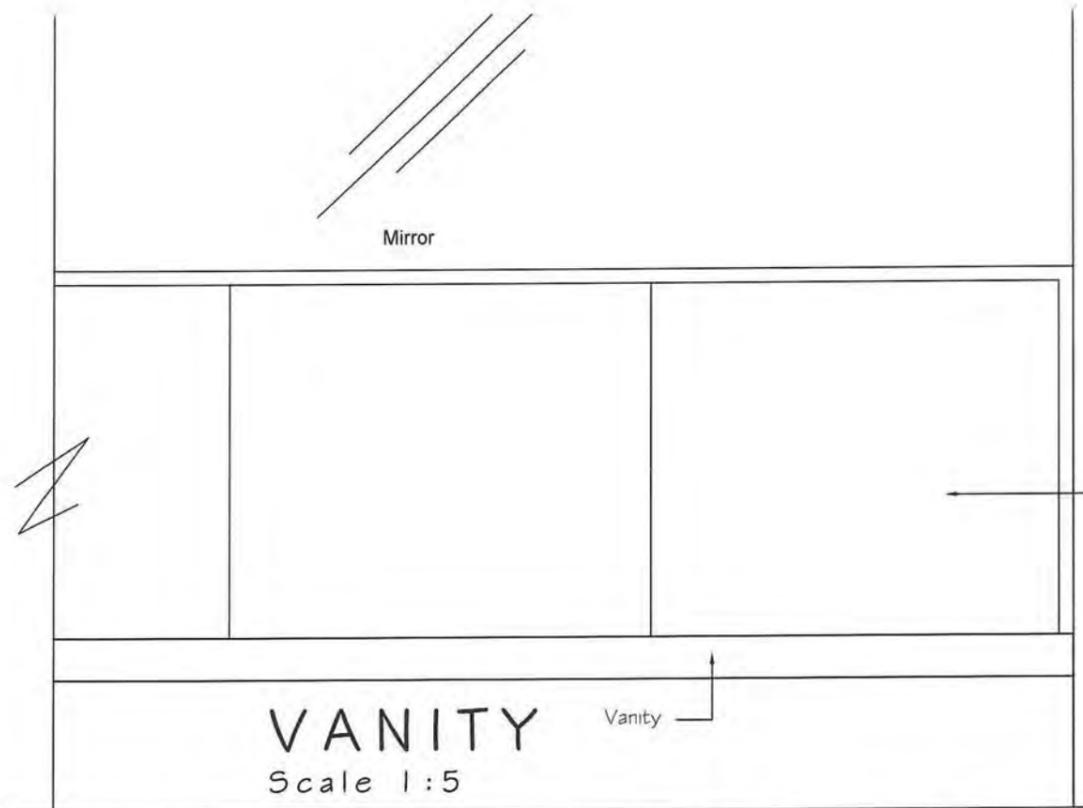
**BATHROOM SKIRTING**  
Scale 1:5



**FLOOR TO WALL DETAIL**  
Scale 1:5



**FLOOR WASTE DETAIL**  
Scale 1:5



Tiles with 2 coats flexi-seal waterproofing membrane behind. BRANZ recommends extending the membrane from the floor - behind the vanity and splashback

**KAPITI ARCHITECTURAL DESIGN LTD** www.kapitidesign.co.nz  
DESIGNED FOR LIVING

P: 04 905 7380 M: 0275 114 744 E: rochelle@kapitidesign.co.nz

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Contractor to verify all dimensions on site prior to commencing work.  
Contact designer if in doubt.

**Proposed Additions & Alterations**  
**For Mr & Mrs Hyndman**  
**At 65 Kohekohe Road**  
**WAIKANAE**

**BUILDING CONSENT**

Revisions:  
A 16/08/17 building consent

Designer: R Dennis	Project Number: 473
Date: February 2017	Drawing Number: 24 Of 24 (A3 Original)
Scale: 1:10; 1:5	
Revision: A	

00026



42 Michael Road, PO Box 1713, Paraparaumu 5252  
Phone: (04) 212 5150 • Cell: 021 121 4591  
craig@seajay.co.nz

# STRUCTURAL CALCULATIONS

**For:**

**65 KOHEKOHE ROAD  
WAIKANAE**

**Preamble:**

The project comprises house additions and alterations. These calculations pertain to the design of:

- a) Foundations : Driven piles and pad footings.
- b) Beams and their connections : Roof beams to porch.
- c) Bracing schedule : To NZS 3604 utilising proprietary Winstone Gib bracing elements.

The ultimate limit state site wind speed has been determined as 40.6m/s based on AS/NZS1170.2 which equates to a high wind zone.

Scala penetrometer soil tests indicate that an ultimate bearing capacity of 300kPa is achieved at a depth of 1200mm to 1800mm. Therefore driven pile foundations have been designed for the house additions and alterations. Pad foundations based on an ultimate bearing capacity of 100kPa at a depth of 1000mm have been design where it is not practicable to drive piles The bearing capacity is to be confirmed on site by the Engineer for each individual foundation.

---

***Note: Calculations are provided for Building Consent Authority information only. Construction details shown on the drawings and in the specification shall take precedence. Contractors/Builders shall follow the drawings and specification unless directed otherwise by the Engineer.***

---

<b>Project:</b>	17050	<b>Date:</b>	4 September 2017
<b>Report No:</b>	SC01	<b>Prepared:</b>	C. McGhie
<b>Revision:</b>	1		NZCE, BE (Civil) Hon, ME (Fire) CPEng, MIPENZ

# SCHEDULE OF INSPECTIONS

## Alterations at 65 Kohekohe Road, Waikanae

Seajay Consulting Engineers Ltd have been engaged to undertake construction monitoring of the specific engineering design items to a IPENZ /ACENZ CM3 level and propose to undertake the following site inspections:

No.	Item of inspection	When required
1	Foundation subgrade	Prior to placing hardfill, sand or concrete blinding layer.
2	Concrete piles	Prior to placing reinforcing steel or timber pile
3	Concrete pile reinforcing steel	Pre-pour
4	Driven timber piles	Foundation pre-pour. <i>(Contractor to provide copy of pile sets to Engineer for review and approval prior to cutting off pile head to height)</i>
5	Foundation beams, pads and slabs	Pre-pour
6	Internal beam and connections	Pre-line or prior to building in to such an extent that remediation work could not be carried out.
7	Internal posts and connections	Pre-line or prior to building in to such an extent that remediation work could not be carried out.
8	External beam and connections	Pre-clad or prior to building in to such an extent that remediation work could not be carried out.
9	External posts and connection	Pre-clad or prior to building in to such an extent that remediation work could not be carried out.

### Notes:

- Inspections shall not be undertaken if a building consent has not been granted by the Building Consent Authority.
- The above items of inspections are the minimum required to enable Seajay Consulting Engineers Ltd to issue a PS4 – Producer Statement Construction Review for the specific engineering design items.
- The above items of inspection do not cover work constructed in accordance with NZS 3604:2011, for which inspections are to be undertaken by the Building Consent Authority.
- The Contractor/Builder is to provide Seajay Consulting Engineers Ltd at least 48 hours' notice of the requirement for an inspection. The above timeframes are indicative, the Engineer and Contractor are to agree the timing of inspection prior to work commencing on site.
- The Contractor /Builder is to provide reasonable and safe access to enable works to be inspected. Assessment of this requirement is at the sole discretion of Seajay Consulting Engineers staff. Seajay Consulting Engineers staff will not undertake an inspection if it is not safe to do so and may leave site and return only when the site and/or access for an inspection has been made safe.
- The above schedule does not necessarily represent the actual number of inspections to be undertaken. The number of inspections will depend on the construction method, sequence of the works and whether or not unforeseen conditions or difficulties are encountered on site.
- The Building Consent Authority shall be notified of the requirement for an inspection of specific design items and afforded the opportunity to inspect.
- The Contractor/Builder shall seek written approval to use alternative details or products prior to undertaking the work. Work found on site not complying exactly with the approved drawings and specifications will fail the inspection and a Producer Statement PS4 will not be issued until remedial work is completed. Cost of redesign and/or re-inspection shall be charged as a variation as necessary.

### Disclaimer:

This document has been prepared solely for N & G Hyndman and the Building Consent Authority for the alterations at 65 Kohekohe Road, Waikanae. The use of and reliance upon the information or opinions contained in this document by others without prior written consent from Seajay Consulting Engineers will be at such person's sole risk. Seajay Consulting Engineers accepts no responsibility or liability for the consequences of the unauthorised use of this document.

Project: 17050

**Memorandum from licensed building practitioner:  
Certificate of design work  
Section 45 and Section 30C, Building Act 2004**



42 Michael Road, PO Box 1713, Pāreparemu 5252  
Phone: (04) 212 5160 • Cell: 021 121 4591  
craig@seajay.co.nz

**OWNER:** Neil & Gillian Hyndman

**BUILDING:** 65 Kohekohe Road  
Waikanae

**BASIS FOR PROVIDING THIS MEMORANDUM**

I am providing this memorandum in my role as the Specialist designer who supervised and/or undertook specific elements of Restricted Building Work (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**

I, Craig McGhie, supervised/undertook the following design work that is restricted building work:

**PRIMARY STRUCTURE: B1**

Design work that is Restricted Building Work		Description (Specific Engineering Design outside of the scope of NZS 3604:2011, unless noted otherwise).
Foundations	✓	Driven piles and pad footings
Walls	x	
Retaining Walls	x	
Beams	✓	Roof beams to porch
Columns	✓	Post to support roof beam
Bracing	✓	Bracing to NZS 3604
Other	x	

**WAIVERS AND MODIFICATIONS**

No waivers or modifications of the building code are required.

**ISSUED BY**

Design Entity/Company : Seajay Consulting Engineer Limited  
Name: Craig McGhie

CPEng number: 173345

**DECLARATION**

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

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

Signature: 

Date: 4/9/2017

**PRODUCER STATEMENT - PS1 - DESIGN**

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

**ISSUED:** Seajay Consulting Engineers Ltd

**TO:** Neil and Gillian Hyndman

(Owner / Developer)

**TO BE SUPPLIED TO:** Kapiti Coast District Council

(Building Consent Authority)

**IN RESPECT OF:** House alterations

(Description of Building Work)

**AT:** 65 Kohekohe Road, Waikanae

(Address)

**LOT 5 DP 19887 SO.....**

We have been engaged by the owner/developer referred to above to provide **structural design services and construction monitoring of specifically designed elements** in respect of the requirements of Clause B1 (B2 of specifically designed elements) of the building code for

All

**Part only as specified of building work:**

- Foundations, Porach roof beams and associated posts and connections

The design carried out by us has been prepared in accordance with Compliance Documents issued by the Ministry of Business, Innovation & Employment B1, VM1 & VM4.

The proposed building work covered by this producer statement is described on the drawings titled 65 Kohekohe Road, Waikanae, House alterations and numbered 17050 S1 to S7

**On behalf of the Design Firm, and subject to:**

- (i) Site verification of the following design assumptions; Bearing capacity of driven piles to achieve a minimum capacity of 45kN and 100kPa under all new pads. Bearing capacities to be confirmed on site by Engineer.
- (ii) All proprietary products meeting their performance specification requirements;

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

CM1  CM2  CM3  CM4  CM5 observation services.

(Engineering Categories)

I, Craig McGhie am CPEng # 173345

I am a member of: IPENZ and hold the following qualifications: NZCE (Civil), BE(Civil) Hon, ME (Fire), MIPENZ, CPEng

The design firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than \$200,000\*.

SIGNED BY Craig McGhie ON BEHALF OF Seajay Consulting Engineers Ltd

Date **4/9/2017**

(Signature).....



## GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1992. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional Engineers New Zealand, Association of Consulting Engineers New Zealand in consultation with the Building Officials Institute of New Zealand. The original suite of producer statements has been revised as at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with reasonable grounds for the issue of a Building Consent or a Code Compliance Certificate, without having to duplicate design or construction checking undertaken by others.

<b>PS1 Design</b>	Intended for the use by a suitably qualified independent design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;
<b>PS2 Design Review</b>	Intended for use by a suitably qualified independent design professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;
<b>PS3 Construction</b>	Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:20031 ; or Schedules E1/E2 of NZIA's SCC 2007 2
<b>PS4 Construction Review</b>	Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate. This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACENZ, IPENZ and NZIA to interpret the Producer Statement.

### Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence-based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as the Institution of Professional Engineers New Zealand (IPENZ) or the New Zealand Institute of Architects (NZIA) provides additional assurance of the designer's standing within the profession. If the design firm is a member of the Association of Consulting Engineers New Zealand (ACENZ), this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent design professional".

### Professional Indemnity Insurance

As part of membership requirements, ACENZ requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to \$500,000.

### Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-5)<sup>3</sup> (OL1-OL4)<sup>2</sup>. The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

### Requirement to provide Producer Statement PS4

Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design Firm's engagement.

### Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

### Refer Also:

1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2003

2 NZIA Standard Conditions of Contract SCC 2007 (1st edition)

3 Guideline on the Briefing & Engagement for Consulting Engineering Services (ACENZ/IPENZ 2004)

[www.acenz.org.nz](http://www.acenz.org.nz)  
[www.ipenz.org.nz](http://www.ipenz.org.nz)  
[www.nzia.co.nz](http://www.nzia.co.nz)

Job No.: 17050  
 Project : 65 Kohe Kohe Road  
 Description : House Alterations

Page: 1  
 Date : 31/08/2017  
 Eng: CJM



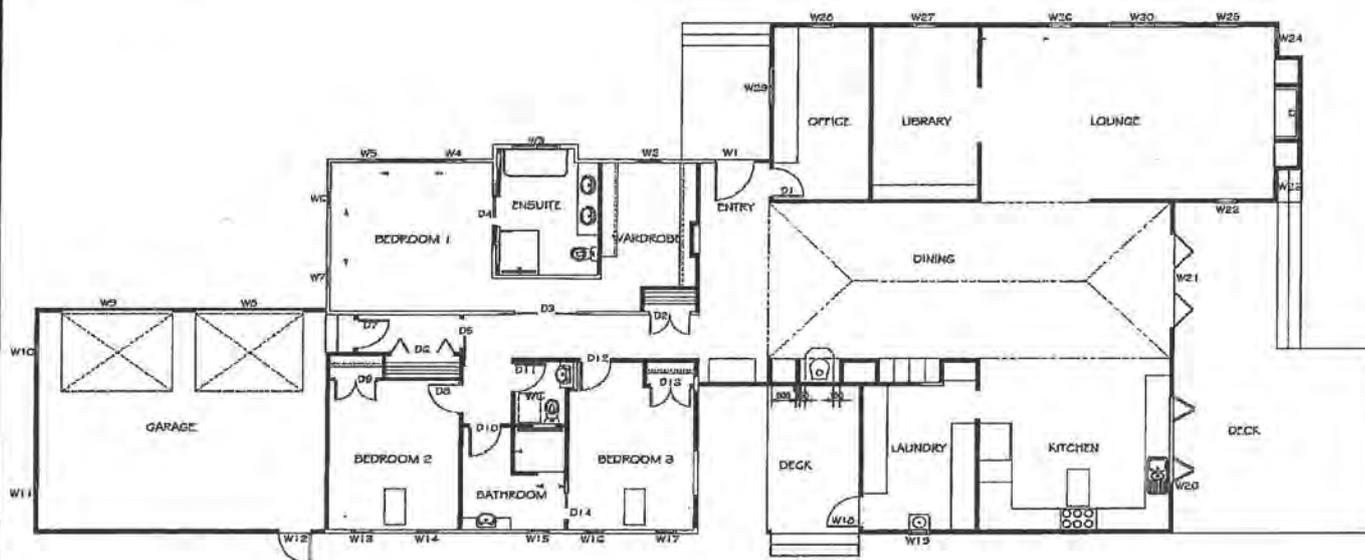
**1.0 SCOPE**

The project comprises additions and alterations to the existing house at 65 Kohe kohe Road , Waikanae.

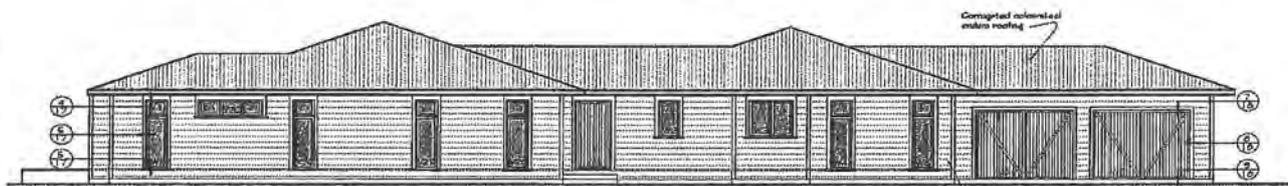
These calculations pertain to the design of:

- a) Foundation design
- b) Roof beam over dining room
- c) Verandah roof beams and post
- d) Raised garage floor design
- e) Bracing Schedule
- f) Soak pit

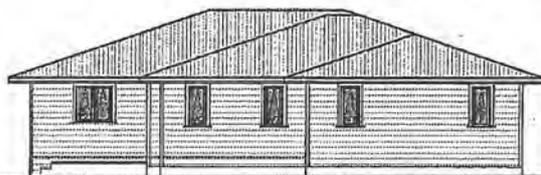
**2.0 GEOMETRY**



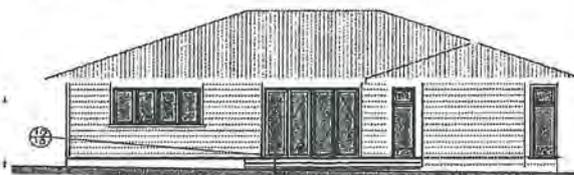
**Proposed Plan (NTS)**



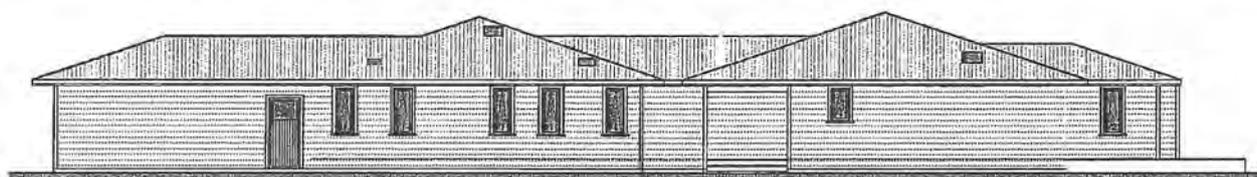
**PROPOSED WEST ELEVATION**



**PROPOSED SOUTH ELEVATION**



**PROPOSED NORTH ELEVATION**



**PROPOSED EAST ELEVATION**

Job No.: 17050  
 Project : 65 Kohe Kohe Road  
 Description : House Alterations

Page: 2  
 Date : 24/08/2017  
 Eng: CJM



**3.0 DESIGN LOADINGS**

a) General [Refer AS/NZS 1170.0]

Importance Level: Normal Structures

Design Life:

Annual Probability of Exceedance:

Loadcase APE:	ULS			SLS1	SLS2
	Wind	Snow	EQ	All	EQ
	500	250	500	25	N/A

b) Gravity [Refer AS/NZS 1170.1]

Occupancy: Domestic

	G	Q	PL
House floors	0.4 kPa	1.5 kPa	1.8 kN
Walls	0.4 kPa	kPa	kN
Roofs	0.3 kPa	0.25 kPa	1.4 kN
Deck	0.4 kPa	2 kPa	1.8 kN

c) Wind [Refer AS/NZS 1170.2]

Site Wind Speed: Wind Region

Wind Direction

$V_{sit,\beta} = V_r M_d (M_{z,cat} M_s M_t)$

$V_{r,ULS} = 45 \text{ m/s}$        $V_{r,SLS} = 37 \text{ m/s}$

$M_d = 1$

$M_s = 1.0$  Sheilding Multiplier (in range of 0.7 - 1.0)

Topographical Multipliers:

$E = 20 \text{ m}$  Site Elevation above Mean Sea Level

$M_h = 1.00$  Hill Shape Multiplier

$M_{Lee} = 1$

$M_e = 1.00$

$M_t = 1.00$

Cat  Terrain Category

Z  m

$M_{z,Cat} = 0.902$

$V_{sit,\beta} = 40.59 \text{ m/s}$        $V_{sit,\beta} = 33.4 \text{ m/s}$

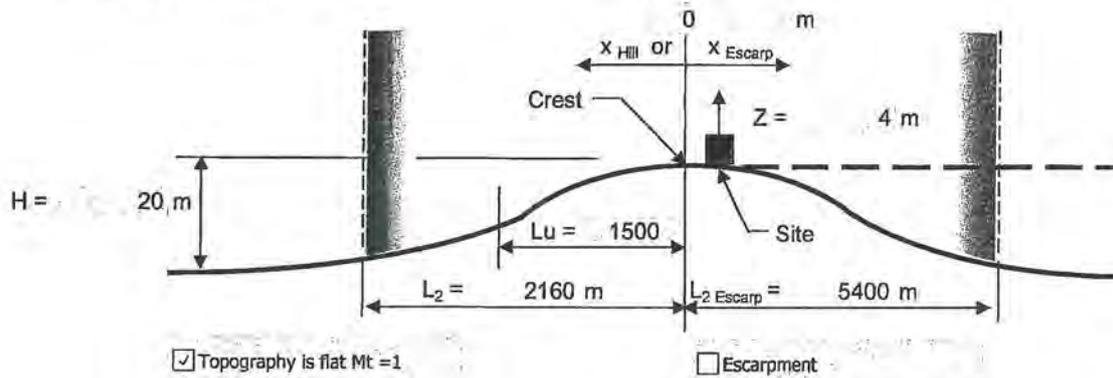
$V_{ULS}$	40.59 m/s	$V_{SLS}$	33.4 m/s
Pzu	989 Pa	Pzs	668 Pa

NZS3604 Wind Zone

Job No.: 17050  
 Project : 65 Kohe Kohe Road  
 Description : House Alterations

Page: 3  
 Date : 24/08/2017  
 Eng: CJM

**Hill Shape Multiplier:**



$L1 = 540 \text{ m}$

$H/2Lu = 0.01$        $H/4 = 5$        $H/10 = 2$

$M_h = 1.0$       Where:  $H/2Lu < 0.05$   
 $= 1 + \left\{ \frac{H}{3.5(z+L1)} \right\} \frac{(1-|x|)}{L_2}$       1.011      Where:  $0.05 < H/2Lu < 0.45$   
 $= 1 + 0.71 \frac{(1-|x|)}{L_2}$       1.710      Where:  $0.45 < H/2Lu$  within separation zone

**$M_h = 1.000$**

**Terrain Category:**

Height of structure      z      7 m  
 Averaging Distance       $x_T$       500 m  
 Lag Distance      xi      140 m

Zone	Zone 1	Zone 2	Zone 3	Zone 4
Terrain Category (Cat)	3	2	0	0
Distance $x_t$	200	300	0	0

**500 OK**

**Effective Terrain Category 2.40**

Job No.: 17050  
 Project : 65 Kohe Kohe Road  
 Description : House Alterations

Page: 4  
 Date : 24/08/2017  
 Eng: CJM



**DESIGN LOADINGS cont**

c) Seismic [Refer NZS 1170.5]

Elastic Site Spectra:  $C(T) = Ch(T) Z R N(T,D)$

Soil Category Deep or Soft soil  sec  
 Structure Period T1  sec  
 Analysis Method   
 Spectral Shape Factor C(T)   
 Region/Town   
 Zone Factor Z   
 Nearest fault   
 Distance to Fault D

Limit State:	ULS	SLS	SLS II
APE:	500	25	N/A
R	1	0.25	N/A
Near fault factor required:	No	No	N/A
Nmax (T)	1.00	1.00	N/A
N(T,D)	1.00	1.00	N/A

<b><math>C(T) = Ch(T) Z R N(T,D)</math></b>	<b>1.200</b>	<b>0.300</b>	<b>N/A</b>
---	--------------	--------------	------------

Horizontal Force Coefficient:  $Cd(T) = C(T) Sp/k\mu$

Where  $\mu < 2.0$  is structure to be detailed for ductility?

Ductility $\mu$	3.5	1	1
Struct.Perf.Factor Sp	0.7	0.7	0.7
Scale factor $k\mu$	2.429	1	1

<b><math>Cd(T) = C(T) Sp/k\mu</math></b>	<b>0.35</b>	<b>0.21</b>	<b>N/A</b>
--	-------------	-------------	------------

NOTE: For equivalent static analysis deflections must be scaled in accordance with Section 6.2.3, NZS 1170.5

**Summary of Horizontal Seismic Coefficients for Levels of Ductility:**

$\mu_{ULS}$	1.0	1.25	1.5	2	3	4	5	6
Cd(T)	1.20	0.97	0.79	0.53	0.39	0.31	0.26	0.22

# GIB EzyBrace® Bracing Software



## Demand Calculation Sheet

### Job Details

Name:  
 Street and Number: 65 Kohekohe Road  
 Lot and DP Number  
 City/Town/District Waikanae  
 Designer CJM  
 Company Seajay Consulting  
 Date Friday, 25 August 2017

### Building Specification

Number of Storeys 1  
 Floor Loading 2 kPa  
 Foundation Type Subfloor  
 Subfloor Cladding Weight Light  
 Cladding Weight **Single** Light  
 Roof Weight Light  
 Room in Roof Space No  
 Roof Pitch (degrees) 20  
 Roof Height above Eaves (m) 1.5  
 Building Height to Apex (m) 4.5  
 Ground to Lower Floor (m) 0.5  
 Average Stud Height (m) 2.42  
 Building Length (m) 31.4  
 Building Width (m) 13.8  
 Building Plan Area (m<sup>2</sup>) 250

### Building Location

Wind Zone = High

Earthquake Zone 3

Soil Type

D & E (Deep to Very Soft)

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

### Bracing Units required for Wind

	Along	Across
Single Level	616	1191
Subfloor Level	916	1662

### Bracing Units required for Earthquake

	Along & Across
Single Level	2799 + 264 GARAGE 3063 BU
Subfloor Level	3488



## Demand Calculation Sheet

### Job Details

Name:	
Street and Number:	65 Kohekohe Road
Lot and DP Number	
City/Town/District	Waikanae
Designer	CJM
Company	Seajay Consulting
Date	Friday, 25 August 2017

### Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	<b>Single</b>
Cladding Weight	Light
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	20
Roof Height above Eaves (m)	1.5
Building Height to Apex (m)	4.5
Ground to Lower Floor (m)	0.5
Average Stud Height (m)	2.42
Building Length (m)	31.4
Building Width (m)	13.8
Building Plan Area (m <sup>2</sup> )	50

*GARAGE SLAB ON GRADE*

### Building Location

<b>Wind Zone = High</b>	<b>Earthquake Zone 3</b>
	Soil Type D & E (Deep to Very Soft)
	Annual Prob. of Exceedance: 1 in 500 (NZS3604:2011 Default)

### Bracing Units required for Wind

	Along	Across
<b>Single Level</b>	<b>616</b>	<b>1191</b>

### Bracing Units required for Earthquake

	Along & Across
<b>Single Level</b>	<b>264</b>

## Single Level Along Resistance Sheet

**Job Name:**

Timber Floor Limit of 120 BUs/m Applied

Wind	EQ
Demand	
616	3063
Achieved	

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind BUs	EQ BUs	3462 562%	3080 101%
a	1	0.85		2.42	GS1-N	GIB®	52	50	507 OK	468 OK
	2	0.85		2.42	GS1-N	GIB®	52	50		
	3	1.00		2.42	GS1-N	GIB®	64	59		
	4	1.00		2.42	GS1-N	GIB®	64	59		
	5	1.70		2.42	GS1-N	GIB®	116	101		
	6	0.85		2.42	GS1-N	GIB®	52	50		
	7	0.85		2.42	GS1-N	GIB®	52	50		
	8	0.85		2.42	GS1-N	GIB®	52	50		
b	1	0.65		2.42	GS1-N	GIB®	37	38	292 OK	273 OK
	2	1.65		2.42	GS1-N	GIB®	113	98		
	3	0.65		2.42	GS1-N	GIB®	37	38		
	4	0.85		2.42	GS1-N	GIB®	52	50		
	5	0.85		2.42	GS1-N	GIB®	52	50		
c	1	5.30		2.42	GS1-N	GIB®	363	315	624 OK	547 OK
	2	3.00		2.42	GS1-N	GIB®	205	179		
	3	0.90		2.42	GS1-N	GIB®	56	53		
d	1	0.50		2.77	GS1-N	GIB®	24	25	373 OK	338 OK
	2	0.50		2.77	GS1-N	GIB®	24	25		
	3	0.50		2.77	GS1-N	GIB®	24	25		
	4	3.20		2.42	GS1-N	GIB®	219	190		
	5	1.20		2.42	GS1-N	GIB®	82	71		
e	1	1.20		2.42	GS1-N	GIB®	82	71	681 OK	592 OK
	2	1.70		2.42	GS1-N	GIB®	116	101		
	3	1.70		2.42	GS1-N	GIB®	116	101		
	4	2.20		2.42	GS1-N	GIB®	151	131		
	5	1.70		2.42	GS1-N	GIB®	116	101		
	6	1.45		2.42	GS1-N	GIB®	99	86		
f	1	5.90		2.42	GS1-N	GIB®	404	351	986 OK	862 OK
	2	1.10		2.42	GS1-N	GIB®	73	65		
	3	1.30		2.42	GS1-N	GIB®	89	77		
	4	1.10		2.42	GS1-N	GIB®	73	65		
	5	1.10		2.42	GS1-N	GIB®	73	65		
	6	4.00		2.42	GS1-N	GIB®	274	238		

*Reduced from 1.8m to 1.7m  
to match drawing 17050 - S2 - Rev 0*

BC170844  
Further Information Received  
04/12/2017



## Single Level Across Resistance Sheet

Job Name:

Timber Floor Limit of 120 BUs/m Applied

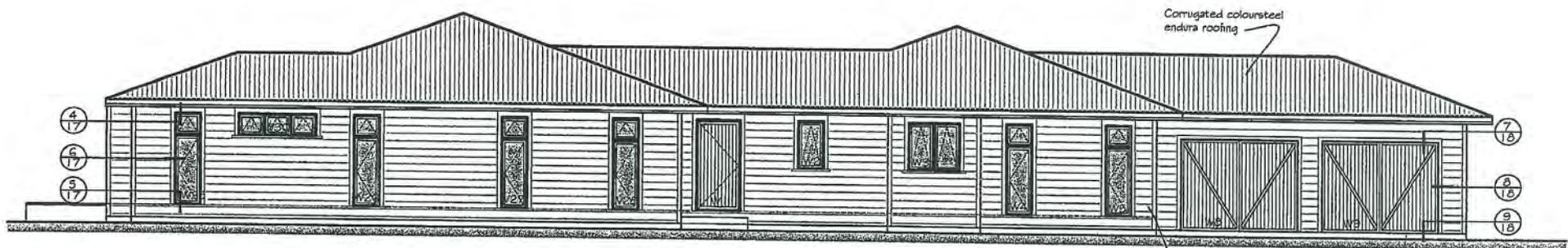
Wind	EQ
Demand	
1191	3063
Achieved	

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind BUs	EQ BUs	3617 304%	3181 104%
m	1	3.20		2.77	GS1-N	GIB®	191	166	191 OK	166 OK
n	1	1.60		2.42	GS1-N	GIB®	109	95	361 OK	314 OK
	2	4.20		2.77	GS1-N	GIB®	251	218		
o	1	1.40		2.42	GS1-N	GIB®	96	83	364 OK	321 OK
	2	0.90		2.42	GS1-N	GIB®	56	53		
	3	3.10		2.42	GS1-N	GIB®	212	184		
p	1	2.20		2.42	GS1-N	GIB®	151	131	151 OK	131 Check
q	1	3.10		2.42	GS1-N	GIB®	212	184	342 OK	298 OK
	2	1.90		2.42	GS1-N	GIB®	130	113		
r	1	4.20		2.42	GS1-N	GIB®	287	250	554 OK	482 OK
	2	3.90		2.42	GS1-N	GIB®	267	232		
s	1	1.10		2.42	GS1-N	GIB®	73	65	257 OK	236 OK
	2	1.70		2.42	GS1-N	GIB®	116	101		
	3	0.60		2.42	GS1-N	GIB®	34	35		
	4	0.60		2.42	GS1-N	GIB®	34	35		
t	1	4.60		2.42	GS1-N	GIB®	315	274	520 OK	452 OK
	2	3.00		2.42	GS1-N	GIB®	205	179		
u	1	1.60		2.42	GS1-N	GIB®	109	95	473 OK	416 OK
	2	1.60		2.42	GS1-N	GIB®	109	95		
	3	0.80		2.42	GS1-N	GIB®	48	47		
	4	3.00		2.42	GS1-N	GIB®	205	179		
v	1	0.80		2.42	GS1-N	GIB®	48	47	404 OK	366 OK
	2	1.80		2.42	GS1-N	GIB®	123	107		
	3	1.20		2.42	GS1-N	GIB®	82	71		
	w1	0.60		2.42	GS1-N	GIB®	34	35		
	w2	1.20		2.42	GS1-N	GIB®	82	71		
	w3	0.60		2.42	GS1-N	GIB®	34	35		

Reduced from 1.3m to 1.2m  
to match drawing 17050-S2 Rev 0

BC170844  
Further Information Received  
04/12/2017

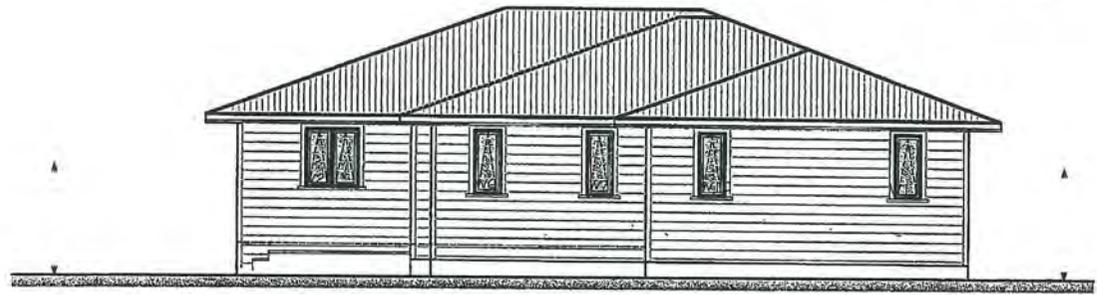




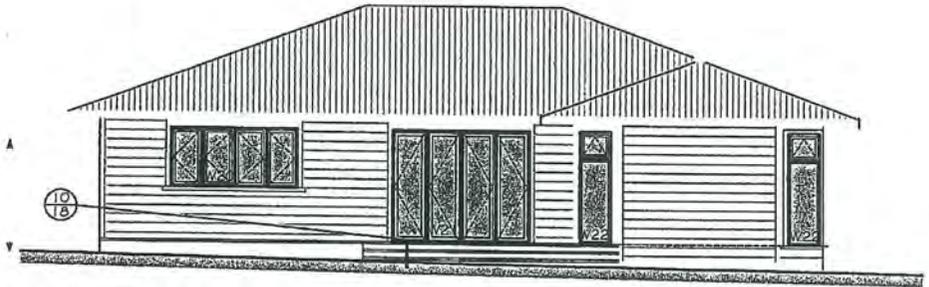
PROPOSED WEST ELEVATION

Corrugated coloursteel endura roofing

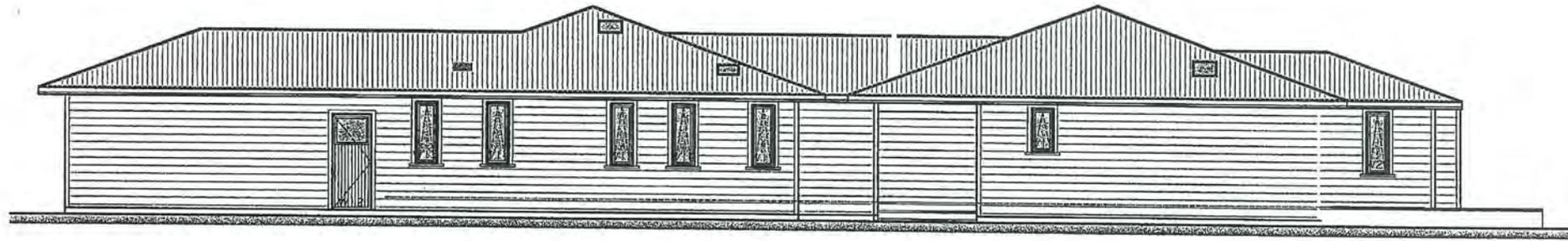
150mm bevel backed weatherboards, to match existing with ex 90mm facings to external corners and openings. sill to windows



PROPOSED SOUTH ELEVATION



PROPOSED NORTH ELEVATION



PROPOSED EAST ELEVATION

## Subfloor Level Along Resistance Sheet

Job Name:

Wind	EQ
Demand	
916	3488
Achieved	

Line	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind BUs	EQ BUs	5916 646%	5380 154%
A	1	3.00		<del>Anchor Pile</del> <b>Braced</b>	NZS3604	480	360		
	2	3.60		Conc Fndn Wall	Existing	360	360		
									840 OK
B	1	14.00		Conc Fndn Wall	Existing	1400	1400		
	2	3.00		<del>Anchor Pile</del> <b>Braced</b>	NZS3604	480	360		
									1880 OK
C	1	6.20		Conc Fndn Wall	Existing	620	620		
									620 OK
D	1	12.00		Conc Fndn Wall	Existing	1200	1200		
	2	1.00		<del>Anchor Pile</del> <b>Braced</b>	NZS3604	160	120		
									1360 OK
F	1	2.40		EP1	SPD	288	240		
	2	2.40		EP1	SPD	288	240		
	3	4.00		<del>Anchor Pile</del> <b>Braced</b>	NZS3604	640	480		
								1216 OK	960 OK



## Subfloor Level Across Resistance Sheet

Job Name:

Wind	EQ
Demand	
1662	3488
Achieved	

Line	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind BUs	EQ BUs	4956 298%	4380 126%
N	1	4.20		Conc Fndn Wall	Existing	420	420		
	2	2.40		EP1	SPD	288	240		
	3	2.40		EP1	SPD	288	240		
								996 OK	900 OK
O	1	4.20		Conc Fndn Wall	Existing	420	420		
P&Q	1	4.00		Conc Fndn Wall	Existing	400	400		
	2	1.00		Cantilever Pile	NZS3604	70	30		
								470 OK	430 OK
R	1	3.60		Conc Fndn Wall	Existing	360	360		
	2	2.00		<del>Anchor Pile</del> Braced Pile	NZS3604	320	240		
								680 OK	600 OK
S	1	9.50		Conc Fndn Wall	Existing	950	950		
	2	1.00		<del>Anchor Pile</del> Braced Pile	NZS3604	160	120		
								1110 OK	1070 OK
T	1	5.00		<del>Anchor Pile</del> Braced Pile	NZS3604	800	600		
S	1	3.00		<del>Anchor Pile</del> Braced Pile	NZS3604	480	360		

Braced driven piles:

If ground clearance. < 600mm then use cantilever piles as per pg 13 & 14.

# GIB EzyBrace® Bracing Software



## Subfloor Level Along Resistance Sheet

Job Name:

Wind	EQ
Demand	
916	3488
Achieved	

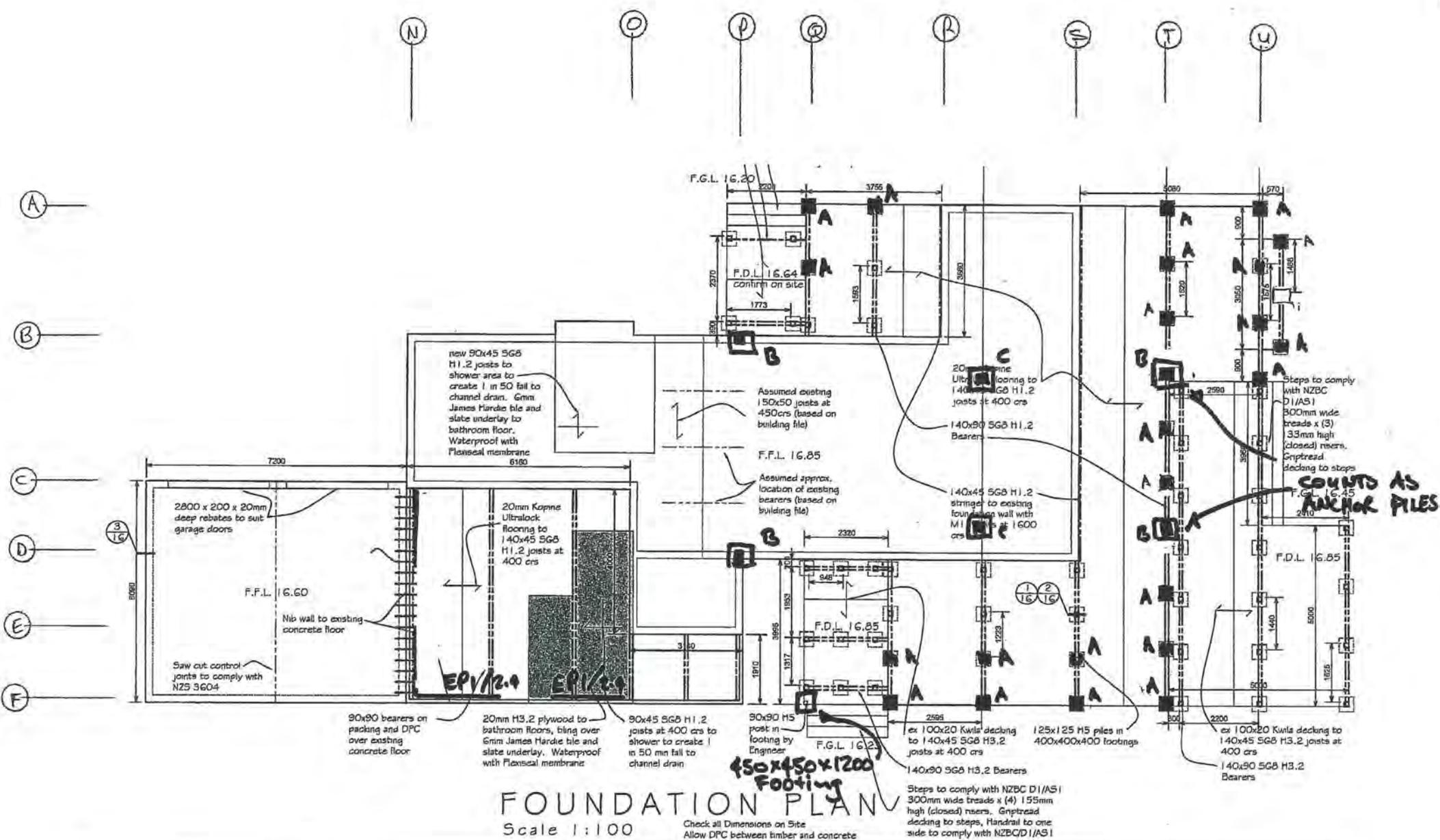
Line	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind BUs	EQ BUs	4996 545%	4420 127%
A	1	4.00		Cantilever Pile	NZS3604	280	120	640 OK	480 OK
	2	3.60		Conc Fndn Wall	Existing	360	360		
B	1	14.00		Conc Fndn Wall	Existing	1400	1400	1610 OK	1490 OK
	2	3.00		Cantilever Pile	NZS3604	210	90		
C	1	6.20		Conc Fndn Wall	Existing	620	620	620 OK	620 OK
D	1	12.00		Conc Fndn Wall	Existing	1200	1200	1270 OK	1230 OK
	2	1.00		Cantilever Pile	NZS3604	70	30		
F	1	2.40		EP1	SPD	288	240	856 OK	600 OK
	2	2.40		EP1	SPD	288	240		
	3	4.00		Cantilever Pile	NZS3604	280	120		



## Subfloor Level Across Resistance Sheet

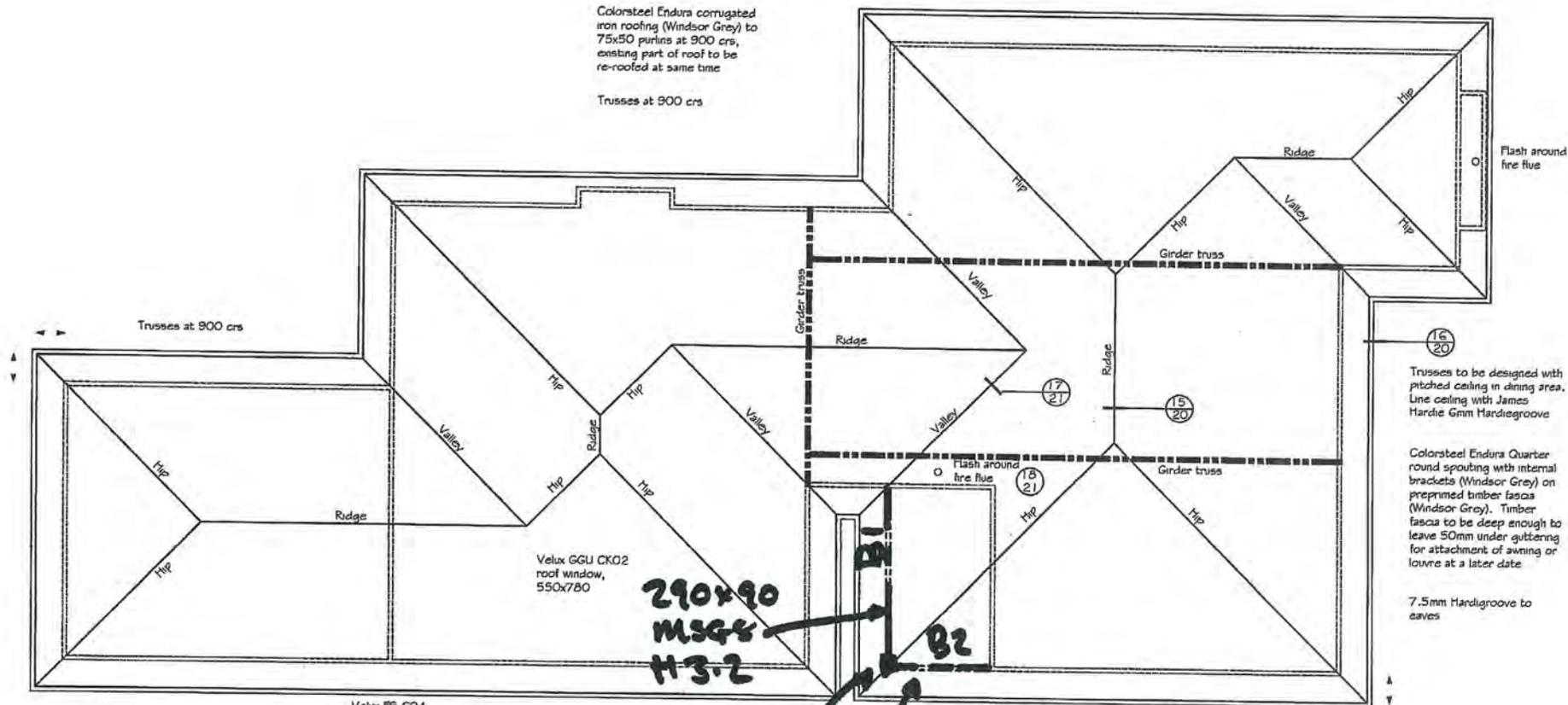
Job Name:

									Wind	EQ
									Demand	
									1662	3488
									Achieved	
Line	Element	Length (m)	Angle (degrees)		Type	Supplier	Wind BUs	EQ BUs	4526 272%	3630 104%
N	1	4.20			Conc Fndn Wall	Existing	420	420		
	2	2.40			EP1	SPD	288	240		
	3	2.40			EP1	SPD	288	240		
									996 OK	900 OK
O	1	4.20			Conc Fndn Wall	Existing	420	420		
P&Q	1	4.00			Conc Fndn Wall	Existing	400	400		
	2	1.00			Cantilever Pile	NZS3604	70	30		
									470 OK	430 OK
R	1	3.60			Conc Fndn Wall	Existing	360	360		
	2	2.00			Cantilever Pile	NZS3604	140	60		
									500 OK	420 OK
S	1	9.50			Conc Fndn Wall	Existing	950	950		
	2	1.00			Cantilever Pile	NZS3604	70	30		
									1020 OK	980 OK
T	1	10.00			Cantilever Pile	NZS3604	700	300		
									700 OK	300 OK
U	1	6.00			Cantilever Pile	NZS3604	420	180		
									420 OK	180 Check



65 KOHE KOHE ROAD  
SUB FLOOR BRACING PLAN

- A = CANTILEVER Piles to NES 3604 \*
- B = 600 □ x 1200 Pile to support girder truss
- C = 750 □ x 1200 Pile to support girder truss
- \* 2 - Cantilever piles may be substituted for each



Colorsteel Endura corrugated iron roofing (Windsor Grey) to 75x50 purlins at 900 cns, existing part of roof to be re-roofed at same time

Trusses at 900 cns

Trusses at 900 cns

Velux GGU CK02 roof window, 550x780

Velux F5 CO4 skylights, 550x980, with black out blind DSD, page 22

**ROOF PLAN**  
Scale 1:100

Verandah beams by Engineer  
90x90 H5 post in footing by Engineer

Velux F5 CO4 skylight, 550x980

Flash around fire flue

Trusses to be designed with pitched ceiling in dining area. Line ceiling with James Hardie Ginn Hardiegroove

Colorsteel Endura Quarter round spouting with internal brackets (Windsor Grey) on preprimed timber fascia (Windsor Grey). Timber fascia to be deep enough to leave 50mm under guttering for attachment of awning or louvre at a later date

7.5mm Handiegroove to eaves

**290x90  
MSG8  
H3.2**

**190x90 MSG8 H3.2**

**90x90 MSG8 H5  
450 x 450 x 1200 Footing**

**SIMPLY SUPPORTED ROOF BEAM DESIGN**

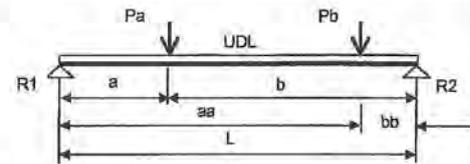


Job No.: 17050  
 Project Title : 65 Kohekohe Road  
 Description : Verandah Beam  
 Beam No : 1

Page: 1  
 Date : 25/08/2017  
 Engineer : CJM

**Loading:**  
 Span L 4.00 m  
 Loaded Width S 1.80 m  
 Minimum Spacing Sm 2.30  
 Effective Length Rs 0.90  
(equals 0 for fully restrained)

**Wind:**  
 Vzu 44 m/s  
 Qzu 1.16 kPa  
 Wind Zone High



**UDL**  
 Unit area loads:  
 Gravity G 0.30 kPa  
 SID Gs 0.00 kPa  
 Live Q 0.00 kPa  
 1.4kN Point Load Governs - Set Q = 0

**Upward**  
 Cpe -1.5  
 Cpl 0  
 Cpn -1.5  
 Ka (Area) 1  
 Kl (local) 1  
 Kp (Porosity) 1  
 Kc (Comb) 1  
**Peu -1.74 kPa**

**Beam Type:**

Type  Rafter or  Beam

Material

Beam

Precamber

**Material Properties:**

Timber/Filitch grade

Glulam N/A

Filitch Plate N/A

**Point Load A**  
 Gravity P<sub>Ga</sub> 0.00 kN  
 SID P<sub>Gsa</sub> 0.00 kN  
 Live P<sub>La</sub> 1.40 kN  
 Wind Up P<sub>Ua</sub> 0.00 kN  
 Wind Down P<sub>Da</sub> 0.00 kN  
 Live Load Area A<sub>a</sub> 1.00 m<sup>2</sup>  
 Position a 2.00 m  
 Distance b 2.00 m

**Downward**  
 Cpe 0.6  
 Cpl 0  
 Cpn 0.6  
 Ka (Area) 1  
 Kl (local) 1  
 Kp (Porosity) 1  
 Kc (Comb) 1  
**Ped 0.70 kPa**

**Point Load B**  
 Gravity P<sub>Gb</sub> 0.00 kN  
 SID P<sub>Gsb</sub> 0.00 kN  
 Live P<sub>Lb</sub> 0.00 kN  
 Wind Up P<sub>Ub</sub> 0.00 kN  
 Wind Down P<sub>Db</sub> 0.00 kN  
 Live Load Area A<sub>b</sub> 1.00 m<sup>2</sup>  
 Position aa 2.50 m  
 Distance bb 1.50 m

**Line loads:**  
 Gravity  kN/m  
 Total W<sub>G</sub> 0.00 kN/m  
 Live Loads  kN/m  
 Total W<sub>L</sub> 0.00 kN/m

**Wind Up**  kN/m  
 Total W<sub>WU</sub> 0.00 kN/m

**Wind Down**  kN/m  
 Total W<sub>WD</sub> 0.00 kN/m

**Load Combinations:**

		Unfactored				ULS			SLS		
		G	Q	W <sub>u</sub>	W <sub>d</sub>	Loadcase 1	Loadcase 2	Loadcase 3	Loadcase 4	Loadcase 5	
						1.2G&1.5Q	0.9G &W <sub>u</sub>	1.2G &W <sub>d</sub>	G&ψIQ	W <sub>s</sub>	
<b>UDL</b>	Total W*	0.54	0.00	-3.14	1.25	0.85	-2.65	1.90	0.54	2.23	kN/m
<b>Point Load A</b>	Total Pa*	0.00	1.40	0.00	0.00	2.10	0.00	0.00	0.56	0.00	kN
<b>Point Load B</b>	Total Pb*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	kN
<b>Reactions:</b>	Left Reaction R1*	1.08	0.70	-6.27	2.51	2.35	-5.30	3.81			kN
	Right Reaction R2*	1.08	0.70	-6.27	2.51	2.35	-5.30	3.81			kN

**Beam Properties:** 300x100 Gauged Timber Grade VSG8 & MSG 8 (Wet)

Section Modulus Z<sub>ex</sub> 1261500 mm<sup>3</sup> Bending Strength f<sub>b</sub> 11.7 Mpa  
 Shear Area A<sub>v</sub> 26100 mm<sup>2</sup> Shear Strength f<sub>s</sub> 2.4 Mpa  
 2nd Moment Area I<sub>x</sub> 182.92 x10<sup>8</sup> mm<sup>4</sup> Mod. Elasticity E 4.355 GPa

Strength Modifiers α<sub>m,as</sub> or K1: K8 0.800  
 K2 2 (applies to timber beams only)

**Strength:** 300x100 Gauged Timber VSG8 & MSG 8 (Wet)

Design Moment M\* 5.30 kNm < φM<sub>bx</sub> 9.45 kNm OK  
 Design Shear V\* 5.30 kN < φV<sub>u</sub> 26.5 kN OK

**Deflections:** 300x100 VSG8 & MSG 8 (Wet)

Load case G&Q  
 Δ = 4.6 mm = L/Δ 869 >400 OK  
 = S<sub>m</sub>/Δ 500 >200 OK

Load case G&ψIQ  
 Δ = 6.4 mm = L/Δ 626 >500 OK

Load case W<sub>s</sub>  
 Δ = 9.3 mm = L/Δ 429 >300 OK  
 = S<sub>m</sub>/Δ 247 >150 OK

USE: 300x100 Gauged Timber Grade VSG8 & MSG 8 (Wet)

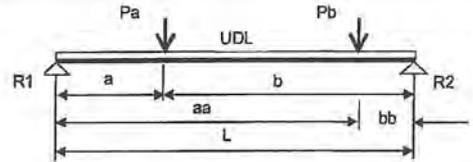
**SIMPLY SUPPORTED ROOF BEAM DESIGN**

Job No.: 17050 Page: 1  
 Project Title : 65 Kohekohe Road Date : 25/08/2017  
 Description : Verandah Beam  
 Beam No : 2 Engineer : CJM



**Loading:**  
 Span L 2.30 m  
 Loaded Width S 1.20 m  
 Minimum Spacing Sm 4.00  
 Effective Length Rs 0.90  
 (equals 0 for fully restrained)

**Wind:**  
 Vzuz 44 m/s  
 Qzuz 1.16 kPa  
 Wind Zone High



**UDL**  
 Unit area loads:  
 Gravity G 0.30 kPa  
 SID Gs 0.00 kPa  
 Live Q 0.00 kPa  
 1.4kN Point Load Governs - Set Q = 0

**Upward**  
 Cpe -1.5  
 Cpl 0  
 Cpn -1.5  
 Ka (Area) 1  
 Kl (local) 1  
 Kp (Porosity) 1  
 Kc (Comb) 1  
 Peu -1.74 kPa

Beam Type:

Type  Rafter or  Beam  
 Material Gauged Timber  
 Beam 200x100  
 Precamber No Precamber  
**Material Properties:**  
 Timber/Filitch grade VSG8 & MSG 8 (Wet)  
 Glulam N/A GL 10  
 Filitch Plate N/A Grade 250

**Point Load A**  
 Gravity Pca 0.00 kN  
 SID Pcab 0.00 kN  
 Live Pca 1.40 kN  
 Wind Up Pua 0.00 kN  
 Wind Down Pda 0.00 kN  
 Live Load Area A\_a 1.00 m<sup>2</sup>  
 Position a 1.15 m  
 Distance b 1.15 m

**Downward**  
 Cpe 0.6  
 Cpl 0  
 Cpn 0.6  
 Ka (Area) 1  
 Kl (local) 1  
 Kp (Porosity) 1  
 Kc (Comb) 1  
 Ped 0.70 kPa

**Point Load B**  
 Gravity Pcb 0.00 kN  
 SID Pcab 0.00 kN  
 Live Pcb 0.00 kN  
 Wind Up Pub 0.00 kN  
 Wind Down Pdb 0.00 kN  
 Live Load Area A\_b 1.00 m<sup>2</sup>  
 Position aa 2.50 m  
 Distance bb -0.20 m

**Line loads:**  
 Gravity 0.00 kN/m  
 Wind Up 0.00 kN/m  
 Total W<sub>GL</sub> 0.00 kN/m  
 Total W<sub>WU</sub> 0.00 kN/m  
 Live Loads 0.00 kN/m  
 Wind Down 0.00 kN/m  
 Total W<sub>GD</sub> 0.00 kN/m  
 Total W<sub>WD</sub> 0.00 kN/m

**Load Combinations:**

		Unfactored				ULS			SLS	
		G	Q	Wu	Wd	Loadcase 1 1.2G&1.5Q	Loadcase 2 0.9G & Wu	Loadcase 3 1.2G & Wp	Loadcase 4 G&ψIQ	Loadcase 5 Ws
<b>UDL</b>										
Total	W*	0.36	0.00	-2.09	0.84	0.43	-1.77	1.27	0.36	1.48
<b>Point Load A</b>										
Total	Pa*	0.00	1.40	0.00	0.00	2.10	0.00	0.00	0.56	0.00
<b>Point Load B</b>										
Total	Pb*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Reactions:</b>										
Left Reaction	R1*	0.41	0.70	-2.40	0.96	1.55	-2.03	1.46		
Right Reaction	R2*	0.41	0.70	-2.40	0.96	1.55	-2.03	1.46		

**Beam Properties:** 200x100 Gauged Timber Grade VSG8 & MSG 8 (Wet)  
 Section Modulus Zex 541500 mm<sup>3</sup> Bending Strength fb 11.7 Mpa  
 Shear Area Av 17100 mm<sup>2</sup> Shear Strength fs 2.4 Mpa  
 2nd Moment Area Ix 51.44 x10<sup>8</sup> mm<sup>4</sup> Mod. Elasticity E 4.355 GPa

Strength Modifiers αm, αs or K1, K8 0.800  
 K2 2 (applies to timber beams only)

**Strength:** 200x100 Gauged Timber VSG8 & MSG 8 (Wet)  
 Design Moment M\* 1.49 kNm < φMbx 4.05 kNm OK  
 Design Shear V\* 2.03 kN < φVu 17.3 kN OK

**Deflections:** 200x100 VSG8 & MSG 8 (Wet)

Load case G& Q  
 Δ = 2.2 mm = L/Δ 1060 >400 OK  
 = S<sub>m</sub>/Δ 1844 >200 OK

Load case G& ψIQ  
 Δ = 2.4 mm = L/Δ 943 >500 OK

Stiffness Modifier K2 = 2

Load case Ws  
 Δ = 2.4 mm = L/Δ 953 >300 OK  
 = S<sub>m</sub>/Δ 1657 >150 OK

USE: 200x100 Gauged Timber Grade VSG8 & MSG 8 (Wet)

**Timber Post Design**

Job No.: 17050  
 Project : 65 Kohekohe Road  
 Description : Verandah Post

Page:  
 Date : 25/08/2017  
 By: CJM



<b>Post Height:</b>	<b>Post Size:</b>	<b>Post Slenderness:</b>	
Lex = 2.7 m	dx = 90 mm	Bending:	S1 = 0.0
Ley = 2.7 m	dy = 90 mm	Axial: k10x = 1	S2 = 30
		k10y = 1	S3 = 30

**Material:**

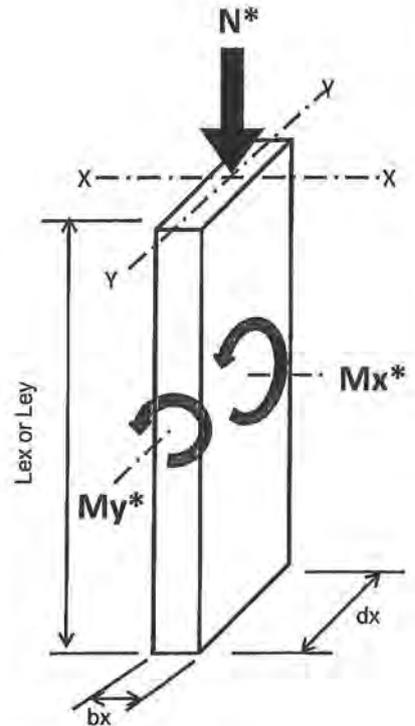
Type:  MSG6 wet  
 ft = 3.0 MPa  
 fc = 10.0 MPa  
 fb = 7.5 MPa  
 E = 4.8 GPa  
 Condition:  Green

**Section Properties:**

A = 8100 mm<sup>2</sup>  
 Zx = 121500 mm<sup>3</sup>  
 Zy = 121500 mm<sup>4</sup>  
 Ix = 5467500 mm<sup>4</sup>  
 Iy = 5467500 mm<sup>4</sup>

**Post Loading:**

Load Duration:  Brief  
 Compression: N\*c = 5.27 kN  
 Tension: N\*t = 7.3 kN  
 Bending Moment: M\*x = 0 kNm  
 M\*y = 0 kNm  
 1.2G&Wd  
 0.9G&Wu



**Post Capacity:**

	<b>Axial</b>	
Capacity Reduction	φ =	0.8
Load Duration	k1 =	1
Load Sharing	k4 =	1
Axial Comp Stability	k8x =	0.351
	k8y =	0.351
	<b>Bending</b>	
Capacity Reduction	φ =	0.8
Load Duration	k1 =	1
Load Sharing	k4, K5 =	1
Lateral Stability	k8x =	1.00

Compression:	φNcx = φ . K1 . K4 . K8x . A . fc	22.7 kN	OK
	φNcy = φ . K1 . K4 . K8y . A . fc	22.7 kN	OK
Tension:	φNt = φ . K1 . K4 . K8 . A . fc	19.4 kN	OK
Bending:	φMbx = φ . K1 . (K4 or K5) . K8 . Zx . fb	0.73 kNm	OK
	φMby = φ . K1 . (K4 or K5) . K8 . Zy . fb	0.73 kNm	OK

**Combined Actions:**

<b>Compression</b>	SR = N*c/φNc <sub>(MIN)</sub> + M*x/φMbx + M*y/φMby	0.23 OK
<b>Tension</b>	SR = N*t/φNt + M*x/φMbx + M*y/φMby	0.38 OK
<b>USE 90 x 90 MSG6 POST</b>		

# Verandah Beam/Post Footing.

Square Foundations Cone Failure														
Pile Size	0.45 m		Weight Soil	17	kN/m <sup>3</sup>									
Post Diameter	0.1 m		Weight Post	5	kN/m <sup>3</sup>									
Cone Angle	7°		Weight Concrete	24	kN/m <sup>3</sup>									
Cone Failure												Effective Soil Properties		
Pile Depth m	Cone depth m	Cone Width m	Volume Cone m <sup>3</sup>	Vol Under Pile	Volume Pile m <sup>3</sup>	Volume soil m <sup>3</sup>	Volume Post	Weight Pile kN	Weight soil kN	Total weight kN	φ Weight (φ = 0.9) kN	Clays αSu kPa	Sands/Gravels β (<0.7)	Comment
0.60	2.43	0.30	0.29	0.124	0.122	0.04	0.005	2.8	0.8	3.6	3.2	1.4	0.27	
0.70	2.53	0.31	0.33	0.124	0.142	0.06	0.005	3.3	1.0	4.3	3.9	1.6	0.28	
0.80	2.63	0.32	0.37	0.124	0.162	0.08	0.006	3.8	1.4	5.1	4.6	1.9	0.28	
0.90	2.73	0.34	0.41	0.124	0.182	0.10	0.007	4.2	1.8	6.0	5.4	2.2	0.29	
1.00	2.83	0.35	0.46	0.124	0.203	0.13	0.008	4.7	2.2	6.9	6.2	2.5	0.29	
1.10	2.93	0.36	0.51	0.124	0.223	0.16	0.009	5.2	2.7	7.9	7.1	2.8	0.29	
1.20	3.03	0.37	0.56	0.124	0.243	0.19	0.009	5.7	3.3	8.9	8.1	3.1	0.30	←
1.30	3.13	0.38	0.62	0.124	0.263	0.23	0.010	6.1	3.9	10.0	9.0	3.4	0.30	
1.40	3.23	0.40	0.68	0.124	0.284	0.27	0.011	6.6	4.6	11.2	10.1	3.7	0.31	
1.50	3.33	0.41	0.74	0.124	0.304	0.32	0.012	7.1	5.4	12.4	11.2	4.0	0.31	
1.60	3.43	0.42	0.81	0.124	0.324	0.37	0.013	7.5	6.2	13.7	12.4	4.3	0.32	
1.70	3.53	0.43	0.89	0.124	0.344	0.42	0.013	8.0	7.1	15.1	13.6	4.6	0.32	
1.80	3.63	0.45	0.96	0.124	0.365	0.48	0.014	8.5	8.1	16.6	14.9	5.0	0.33	
1.90	3.73	0.46	1.05	0.124	0.385	0.54	0.015	9.0	9.1	18.1	16.3	5.3	0.33	
2.00	3.83	0.47	1.13	0.124	0.405	0.60	0.016	9.4	10.2	19.7	17.7	5.7	0.33	
2.10	3.93	0.48	1.22	0.124	0.425	0.67	0.016	9.9	11.4	21.3	19.2	6.1	0.34	
2.20	4.03	0.50	1.32	0.124	0.446	0.75	0.017	10.4	12.7	23.1	20.8	6.4	0.34	
2.30	4.13	0.51	1.42	0.124	0.466	0.83	0.018	10.8	14.1	24.9	22.4	6.8	0.35	
2.40	4.23	0.52	1.52	0.124	0.486	0.91	0.019	11.3	15.5	26.9	24.2	7.2	0.35	
2.50	4.33	0.53	1.63	0.124	0.506	1.00	0.020	11.8	17.1	28.9	26.0	7.6	0.36	
2.60	4.43	0.54	1.75	0.124	0.527	1.10	0.020	12.2	18.7	31.0	27.9	8.0	0.36	
3.00	4.83	0.59	2.27	0.124	0.608	1.54	0.024	14.1	26.1	40.3	36.2	9.7	0.38	

β  
max  
0.2 Very loose sand  
0.3 loose sand/gravel  
0.5 medium sand/gravel  
0.7 Dense sand/gravel

Note:

From scale test  
p = 2 Blow/100mm  
of depth 1200mm  
∴  $Q_{ult} = 100 \text{ kPa}$ .

$$R_u^* = -7.3 \text{ kN} < \phi R_u = 8.1 \text{ kN} \text{ for } 450 \square \text{ Pile } 1200 \text{ deep}$$

$$R_b^* = 5.3 \text{ kN} < \phi R_b = 0.45 \times 0.45 \times 0.5 \times 100 \text{ kPa} = 10 \text{ kN} \therefore \text{OK Bearing - uplift governs.}$$

Need concrete pile for uplift.

# CALCULATIONS

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## 6.0 FOUNDATIONS :

Scala Test (3 of) show soft soil.  
to a depth of 1200mm to 1800mm  
across site  $\therefore$  use driven pile foundations.

150 SED	→	15m set	$\phi R_u = 60kN$
	→	25m set	$\phi R_u = 45kN$
	→	50m set	$\phi R_u = 25kN$

500 kg Hammer Falling 1000mm.

Use driven timber piles to NZS 3604 for bearing.

### FLOOR ONLY:

$S_{joist} = 2.6m$	}	50m set	[Table 6.2 NZS 3604]
$S_{piles} = 1.52m$			

### FLOOR & ROOF:

$S_{joists} = 2.6m$	}	25m set	[Table 6.2 NZS 3604]
$S_{piles} = 1.52m$			
$S_{roof} = 2.75m$			

$\therefore$  Beaver span governs piles to be driven to 25m min set.

Use target set 20mm to ensure meet min set requirements.

**Pile Driving Calculations - Hiley Formulae**

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pile Capacity

**Pile Driving Resistance:**

$$R_u = W_h n / (S + C/2)$$

Load	P* <sub>u</sub>	60 kN
Capacity Reduction   FS		0.4
Ultimate Load	R <sub>u</sub>	150 kN

**Hammer:**

Type	Winch operated drop hammer		80% Fall of Hammer
Size	W	500 kg	4.9 kN
Drop	h	1000 mm	800 mm

**Pile Head:**

Head of timber pile	<input type="checkbox"/>
+ 75mm packing under helmet or cap	<input type="checkbox"/> Check
Helmet Weight	0 kg

**Pile Geometry:**

Type	Timber Pile					
Denomination	150SED (eg. 150SED or 200UC46 or 350x350 CONCRETE)					
Area	Ag	17600 mm <sup>2</sup>				
Weight/Unit Length	W <sub>u</sub>	7 kg/m				
Length	L	2	2.4	2.8	3.2	3.6 m
Weight of Pile	W <sub>p</sub>	14.0	16.8	19.6	22.4	25.2 kg

**Efficiency of Blow:**

$n = W + P e^2 / (W + P)$  Where:  $W > P e$   
 or  
 $n = W + P e^2 / (W + P) - (W - P e)^2 / (W + P)$  Where:  $W < P e$

Coeff. Of Restitn.	e	0.25				
Wght Pile+Helmet	P	14.0	16.8	19.6	22.4	25.2 kg
Is $W > P e$		Yes	Yes	Yes	Yes	Yes
Efficiency of Blow	n	0.97	0.97	0.96	0.96	0.96

**Sum of Temporary Compression:**

$C = C_c + C_q + C_p$  mm  
 Ground Quake Conditions High  
 Driving Conditions Hard Driving

C <sub>c</sub>	C <sub>q</sub>	C <sub>c</sub> +C <sub>q</sub>	C <sub>p</sub>		
3	6.5	9.5	1.05 x L mm		
C <sub>p</sub>	2.1	2.52	2.94	3.36	3.78 mm
C	11.6	12.0	12.4	12.9	13.3 mm

**Set:**

Pile Length	L	2	2.4	2.8	3.2	3.6 m
Pile Set S	S	19.7	19.4	19.0	18.7	18.3 mm/blow

**Summary:**

Pile Type	150SED		TIMBER PILE			
Working Load	R <sub>w</sub>	60 kN				
Ultimate Capacity	R <sub>u</sub>	150 kN				
Driving Stress	f* <sub>a</sub>	8.5 MPa				
Pile Length	L	2	2.4	2.8	3.2	3.6 m
Pile Set S	S	19.7	19.4	19.0	18.7	18.3 mm/blow

**Pile Driving Calculations - Hiley Formulae**

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pile Capacity

**Pile Driving Resistance:**

$$R_u = W_{hn} / (S + C/2)$$

Load	P*U	45 kN
Capacity Reduction   FS		0.4
Ultimate Load	R <sub>u</sub>	112.5 kN

**Hammer:**

Type	Winch operated drop hammer		80% Fall of Hammer
Size	W	500 kg	= 4.9 kN
Drop	h	1000 mm	
		x 0.8	= 800 mm

**Pile Head:**

Head of timber pile	<input checked="" type="checkbox"/>
+ 75mm packing under helmet or cap	<input type="checkbox"/> Check
Helmet Weight	0 kg

**Pile Geometry:**

Type	Timber Pile	
Denomination	150SED	(eg. 150SED or 200UC46 or 350x350 CONCRETE)
Area	A <sub>g</sub>	17600 mm <sup>2</sup>
Weight/Unit Length	W <sub>u</sub>	7 kg/m
Length	L	2, 2.4, 2.8, 3.2, 3.6 m
Weight of Pile	W <sub>p</sub>	14.0, 16.8, 19.6, 22.4, 25.2 kg

**Efficiency of Blow:**

$n = W + Pe^2 / (W + P)$  Where : W > Pe  
 or  $n = W + Pe^2 / (W + P) - (W - Pe)^2 / (W + P)$  Where : W < Pe  
 Coeff. Of Restitn. e = 0.25

Wght Pile+Helmet	P	14.0	16.8	19.6	22.4	25.2 kg
Is W > Pe		Yes	Yes	Yes	Yes	Yes
Efficiency of Blow	n	0.97	0.97	0.96	0.96	0.96

**Sum of Temporary Compression:**

$C = C_c + C_q + C_p$  mm  
 Ground Quake Conditions  High  
 Driving Conditions  Medium Driving

C <sub>c</sub>	C <sub>q</sub>	C <sub>c</sub> +C <sub>q</sub>	C <sub>p</sub>	0.7 x L	mm
2	5	7			
C <sub>p</sub>	1.4	1.68	1.96	2.24	2.52 mm
C	8.4	8.7	9.0	9.2	9.5 mm

**Set:**

Pile Length	L	2	2.4	2.8	3.2	3.6 m
Pile Set S	S	29.8	29.5	29.2	28.9	28.6 mm/blow

**Summary:**

Pile Type	150SED TIMBER PILE	
Working Load	R <sub>w</sub>	45 kN
Ultimate Capacity	R <sub>u</sub>	112.5 kN
Driving Stress	f* <sub>a</sub>	6.4 MPa
Pile Length	L	2, 2.4, 2.8, 3.2, 3.6 m
Pile Set S	S	29.8, 29.5, 29.2, 28.9, 28.6 mm/blow

# Pile Driving Calculations - Hiley Formulae

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pile Capacity

### Pile Driving Resistance:

$$R_u = W_h n / (S + C/2)$$

Load  $P^*u$  25 kN  
 Capacity Reduction | FS 0.4  
 Ultimate Load  $R_u$  62.5 kN

### Hammer:

Type Winch operated drop hammer  80% Fall of Hammer  
 Size W 500 kg 4.9 kN  
 Drop h 1000 mm x 0.8 = 800 mm

### Pile Head:

Head of timber pile   
 + 75mm packing under helmet or cap  Check  
 Helmet Weight 0 kg

### Pile Geometry:

Type	Timber Pile <input type="checkbox"/>					
Denomination	<b>150SED</b> (eg. 150SED or 200UC46 or 350x350 CONCRETE)					
Area	Ag	<b>17600</b> mm <sup>2</sup>				
Weight/Unit Length	Wu	<b>7</b> kg/m				
Length	L	<b>2</b>	<b>2.4</b>	<b>2.8</b>	<b>3.2</b>	<b>3.6</b> m
Weight of Pile	Wp	<b>14.0</b>	<b>16.8</b>	<b>19.6</b>	<b>22.4</b>	<b>25.2</b> kg

### Efficiency of Blow:

$n = W + Pe^2 / (W + P)$  Where:  $W > Pe$   
 or  
 $n = W + Pe^2 / (W + P) - (W - Pe)^2 / (W + P)$  Where:  $W < Pe$

Coeff. Of Restitn. e **0.25**

Wght Pile+Helmet	P	14.0	16.8	19.6	22.4	25.2	kg
Is $W > Pe$		Yes	Yes	Yes	Yes	Yes	
Efficiency of Blow	n	0.97	0.97	0.96	0.96	0.96	

### Sum of Temporary Compression:

$C = C_c + C_q + C_p$  mm  
 Ground Quake Conditions  High  
 Driving Conditions  Easy Driving

	$C_c$	$C_q$	$C_c + C_q$	$C_p$	
	1	2	3	$0.35 \times L$	mm
$C_p$		0.7	0.84	0.98	1.12 1.26 mm
C		3.7	3.8	4.0	4.1 4.3 mm

### Set:

Pile Length	L	2	2.4	2.8	3.2	3.6	m
Pile Set S	S	59.3	59.0	58.6	58.2	57.8	mm/blow

### Summary:

Pile Type	<b>150SED TIMBER PILE</b>						
Working Load	Rw	<b>25 kN</b>					
Ultimate Capacity	Ru	<b>62.5 kN</b>					
Driving Stress	f*a	<b>3.6 MPa</b>					
Pile Length	L	2	2.4	2.8	3.2	3.6	m
Pile Set S	S	59.3	59.0	58.6	58.2	57.8	mm/blow

Table 6.2 – Spacing of driven round timber piles (see 6.6.3.1)  
 (a) 1.5 kPa floor load

A Piles supporting floors only							
Maximum span* of joists	Maximum spacing of piles (span of bearer) when the maximum set per blow (mm) does not exceed:						
	25	50	100				
(m)	(m)	(m)	(m)				
1.6	2.00	2.00	2.00				
2.0	2.00	2.00	1.60				
2.4	2.00	2.00	1.35				
2.8 > 2.6 m	2.00	2.00 > 1.52	1.15				
3.2	2.00	2.00	1.00				
3.6	2.00	1.80	0.90				
4.0	2.00	1.60	-				
4.4	2.00	1.45	-				
4.8	2.00	1.35	-				
5.2	1.85	1.25	-				
5.6	1.75	1.15	-				

B Piles supporting floors and walls							
Maximum span* of joists	Maximum loaded dimension† of wall supporting:		Maximum spacing of piles (span of bearer) supporting:				
	Light roof	Heavy roof	1 storey when the maximum set (mm) per blow does not exceed:			2 storeys when the maximum set (mm) per blow does not exceed:	
			25	50	100	25	50
(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
1.2	2.4	1.2	2.00	2.00	1.60	2.00	2.00
1.6	3.2	1.6	2.00	2.00	1.20	2.00	1.70
2.0	4.0	2.0	2.00	2.00	0.95	2.00	1.40
2.4	4.8	2.4	2.00	1.60	-	1.70	1.15
2.8 ✓	5.6 ✓	2.8	2.00	1.40	-	1.45	1.00
3.2	6.0	3.2	-	-	-	1.30	0.85
3.6	6.0	3.6	-	-	-	1.15	-
4.0	6.0	4.0	1.45	0.95	-	1.05	-
4.4	6.0	4.4	1.30	0.90	-	0.95	-
4.8	6.0	4.8	1.20	-	-	0.85	-
5.2	6.0	5.1	1.10	-	-	-	-
5.6	6.0	5.6	1.00	-	-	-	-

\* Span is the average of the joist spans on either side of the bearer under consideration.  
 † For definition of loaded dimension see 1.3.

# CALCULATIONS

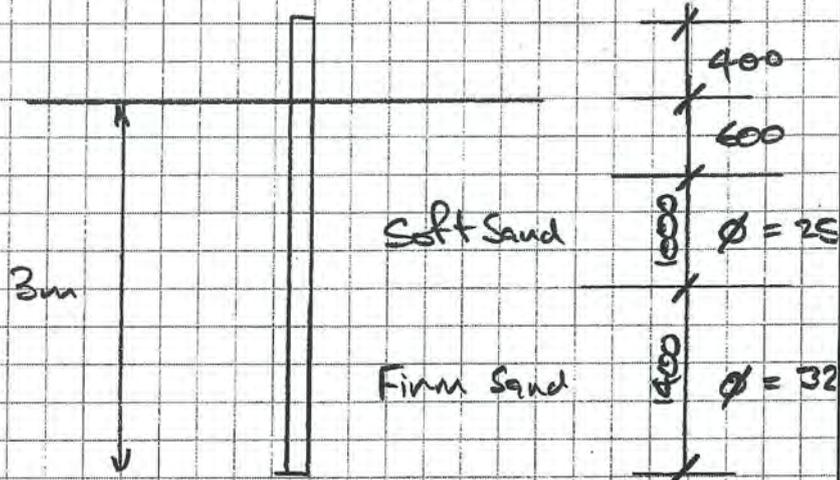
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## Subfloor Bracing Capacity of Piles



Ignore  
 $\gamma = 16 \text{ kN/m}^3$   
 $\gamma = 18 \text{ kN/m}^3$

$\phi_{Uu} = 100 \text{ BU}$		NES 3604
$= 36 \text{ BU}$	Wind	70 BU
	Seismic	30 BU
	Same order	

Refer bracing schedule pgs 11 & 12.

Note: will install braced pile if final ground levels permit.

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## Cantilevered Timber Post Embedment

### Loads:

Height pole above GL:  $f = 1$  m  
Horizontal load  $P^* = 5$  kN  
Load duration

### Design Actions

Base moment  $M^* = 5.0$  kN.m  
Maximum moment  $M^*_{Max} = 8.6$  kN.m  
Depth to  $M^*_{max}$   $gs = 1.06$  m

### Soil properties:

Density  $\gamma = 16$  kN/m<sup>3</sup>  
Angle of friction  $\Phi = 25$  degrees  
Pile depth  $L = 3$  m  
Pile diameter  $D_s = 150$  mm  
Capacity reduction factor  $\phi = 0.65$   
Passive earth pressure  $K_p = 2.46$

### Pole Strength:

Pole/post size

Round SED post  
 $d = 150$  mm Dia.

### Bending strength:

Capacity Reduction Factor  
Load duration factor

$\phi M_b = \phi k_1 \cdot k_{20} \cdot k_{21} \cdot f_b \cdot Z$   
 $\phi = 0.8$   
 $K_1 = 1.00$   
 $K_{20} = 0.95$   
 $K_{21} = 0.9$   
 $f_b = 38.00$  MPa  
 $Z = 331341$  mm<sup>3</sup>  
 $\phi M_b = 8.61$  kNm  
 $M^* = 5.00$  kNm

OKAY BENDING STRENGTH

### Shear strength:

Capacity Reduction Factor  
Load duration factor

$\phi V_u = \phi k_1 \cdot k_{20} \cdot k_{21} \cdot f_s \cdot A_v$   
 $\phi = 0.8$   
 $K_1 = 1.00$   
 $K_{20} = 1.00$   
 $K_{21} = 1.00$   
 $f_s = 3.10$  Mpa  
 $A_v = 11781$  mm<sup>2</sup>  
 $\phi V_u = 29.22$  kN  
 $V^* = 5.00$  kN

OKAY SHEAR STRENGTH

### Deflection:

$E = 8700$  MPa  
 $I_{xx} = 2.49E+07$  mm<sup>4</sup>  
 $\Delta = 7.7$  mm

$H/\Delta = 129.7196$

### Pile Strength:

Lateral Capacity of Pile :  $\phi P_u = \phi K_p \cdot D_s \cdot L^3 \cdot \gamma / 2(f+L) = 12.97$  kN  $> P^* = 5$  kN OKAY

### Pole Bending below Groundline:

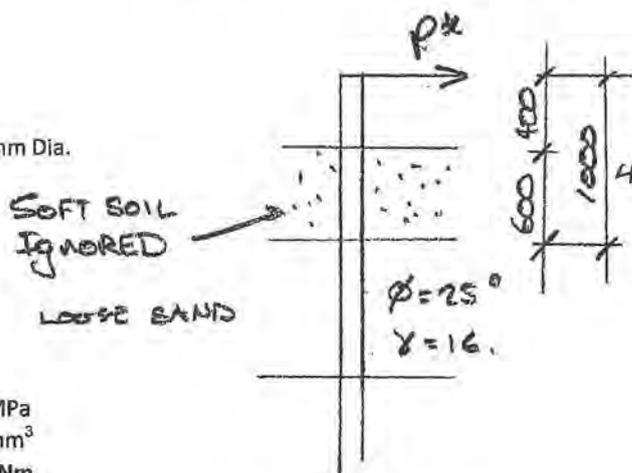
(Allows 3mm/m taper on round poles)

$d_{gs} = 156$  mm  
 $\phi M_b = 9.7$  kNm  
 $M^* = 8.6$  kNm

$d_{gs} = 0$  mm  
 $\phi M_b = 0.00$  kNm  
 $M^* = 8.6$  kNm

OKAY BENDING STRENGTH

NO GOOD - PROVIDE REINFORCING STEEL



∴ WIND BRACING CAPACITY ⇒

$$V^* = 5 \text{ kN} \times 20 = 100 \text{ BU.}$$

$$V^*_{EQ} = 100 \text{ BU} \times \frac{0.35g (\mu = 3.5)}{0.197g (\mu = 1.25)} = 36 \text{ BU.}$$

Note that either the pole/post or pile needs to be able to carry the maximum pile moment below ground level. Provide a larger pole/post or pile or pile reinforcing steel where required.

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## FLOOR SLAB GARAGE - 6m x 7.2m IN PLAN

$G = 3.0 \text{ kPa}$       120mm slab (Max)

$Q = 2.5 \text{ kPa}$

$P = 13 \text{ kN}$

$L_{max} = 7.2 \text{ m} / 3 = 2.4 \text{ m}$

$W^*_{1.2G \& 1.5Q} = 1.2 \times 3.0 + 1.5 \times 2.5 \text{ kPa}$   
 $= 7.35 \text{ kPa}$

$W^*_{1.2G} = 3.6 \text{ kPa}$

$P^*_{1.5P} = 1.5 \times 13$   
 $= 19.5 \text{ kN}$

### DESIGN ACTIONS (from spreadsheets).

			1.2G & 1.5Q	1.2G & 1.5P.
Bending	X	$M^*$	2.21 kNm/m	3.57 kNm/m
	Y	$M^*$	2.74 kNm/m	4.00 kNm/m
120 SLAB - S572 MESH				
		$\phi 10$	4.39 kNm/m ∴ OK	4.39 kNm/m ∴ OK
Shear	X	$V^*$	23.1 kN/m	15.7 kN/m
	Y	$V^*$	22.6 kN/m	15.6 kN/m
120 SLAB - S572 MESH				
		$\phi 10$	32 kN/m ∴ OK	32 kN/m ∴ OK

**CONCRETE SLABS AND WALLS**

(Capacities shown are per metre width of slab)

**General Parameters**

Type		Slab on Grade		
Depth	D		120 mm	
Concrete Cover To Outside of Reinf. Bars			60 mm	
Concrete Compressive Strength	f'c or fm		20 MPa	
Material Type		Concrete		

**Shear Capacity**

Capacity Reduction Factor	$\phi$	0.75
Concrete Shear Stress	$vc = 0.17\sqrt{f'c}$ or $0.8V_{bm}$ or $v_b$	0.76 MPa
<b>Shear Capacity</b>	<b><math>\phi Vu = \phi \cdot vc \cdot d \cdot B</math></b>	<b>32 kN</b>

**Flexural Capacity****Reinforcement**

Nomination		SE72		
Bar Diameter	db		7 (mm)	
Bar Spacing	s		200 (mm)	
Reinforcement Area	As		192 (mm <sup>2</sup> )	
Steel Yield Strength	fy		500 (MPa)	
Reinforcement Ratio	$\rho$		0.0034	

**Ultimate Moment Capacity**

Capacity Reduction Factor	$\phi$	0.85 Flexure only
Steel Tension	$T = As \cdot fy$	96 (kN)
Compression Stress Block Depth	$a = T / (0.85 f'c \cdot B)$	6 (mm)
Depth to Steel	d	56.5 (mm)
<b>Ultimate Moment Capacity</b>	<b><math>\phi Mu = \phi \cdot T \cdot (d - a/2)</math></b>	<b>4.39 (kNm)</b>

**Cracking Moment**

Capacity Reduction Factor	$\phi$	0.6 Flexure only
Concrete Rupture Stress	$fr = 0.6\sqrt{f'c}$	2.68 MPa
Section Modulus	$Z = BD^2/6$	2.4E+6 (mm <sup>3</sup> )
<b>Cracking Moment Capacity</b>	<b><math>\phi M_{cr} = \phi \cdot fr \cdot Z</math></b>	<b>3.86 (kNm)</b>

**Minimum Steel****Slabs and Footings (CI 7.3.30 & 8.4.3.4 NZS 3101:1995)**

CI 7.3.30.1	As min = 0.0014 BD	168 mm <sup>2</sup>
	or As min = 0.7/fy BD	168 mm <sup>2</sup>
CI 7.3.30.2	As min	1000 mm <sup>2</sup>

=> **Minimum Steel Required in Slabs & Footings** 168 mm<sup>2</sup> <==**Concrete Walls With Grade 300 Steel (CI 7.3.31.2 NZS 3101:1995)**

Minimum Horizontal Steel	As min = 0.0025 BD	300 mm <sup>2</sup>
Minimum Vertical Steel	As min = 0.0015 BD	180 mm <sup>2</sup>

**Concrete Walls With Mesh or Grade 500 Steel**

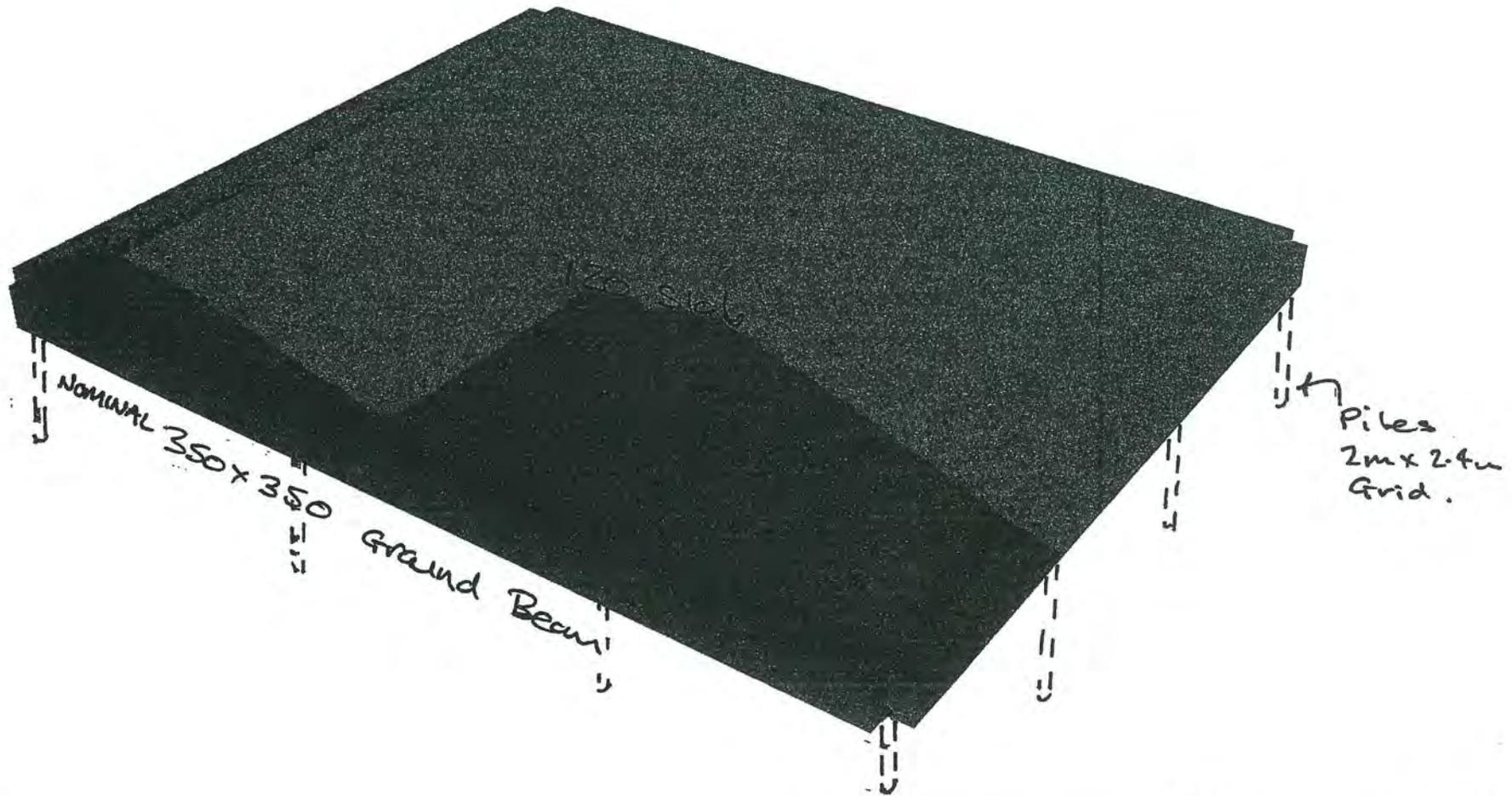
Minimum Horizontal Steel	As min = 0.0020 BD	240 mm <sup>2</sup>
Minimum Vertical Steel	As min = 0.0012 BD	144 mm <sup>2</sup>

**Masonry Walls (CI10.3.4.1 NZS 4230:1990)**

Minimum Hori. and Vert. Steel	As min = 0.0007 BD	84 mm <sup>2</sup>
Minimum Total Steel	As min = 0.0020 BD	240 mm <sup>2</sup>

**Maximum Steel**

Balanced Steel Ratio	$\rho_b = \frac{0.85 f'c \beta_1 \epsilon_s}{fy (\epsilon_s + fy)}$	0.0158
	$\beta_1 =$	0.85
	$\epsilon_s =$	200000 MPa
<b>Maximum Steel</b>	<b>As max = 0.75 <math>\rho_b</math> B d</b>	<b>668 mm<sup>2</sup></b>

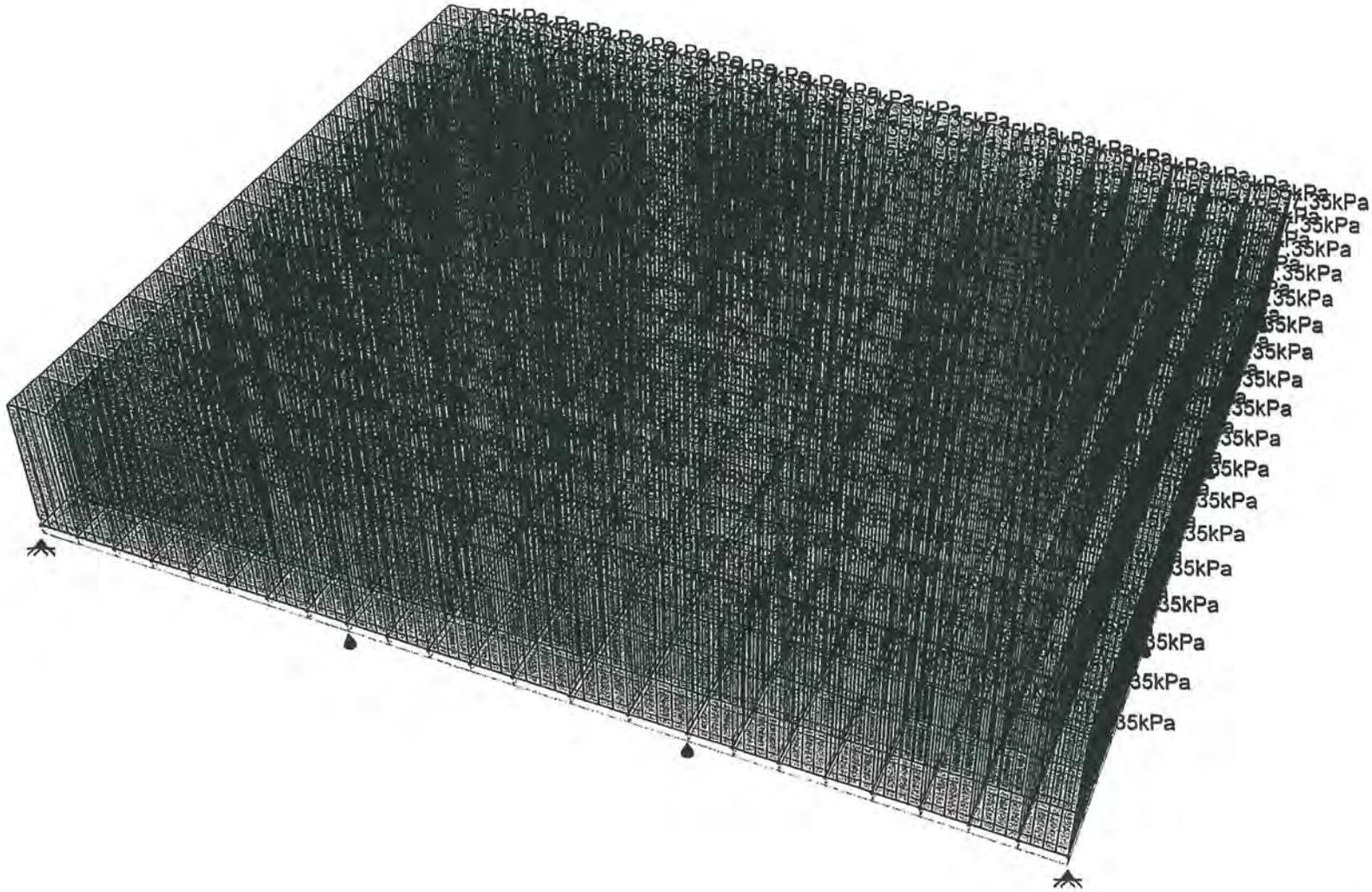


Viewpoint (-55,32)

Materials:  
■ 1 AS-CONC2009-25

Sections:  
■ 1 Section 1

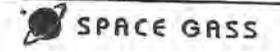
Load case 4  
■ 4 1.2G&1.5Q



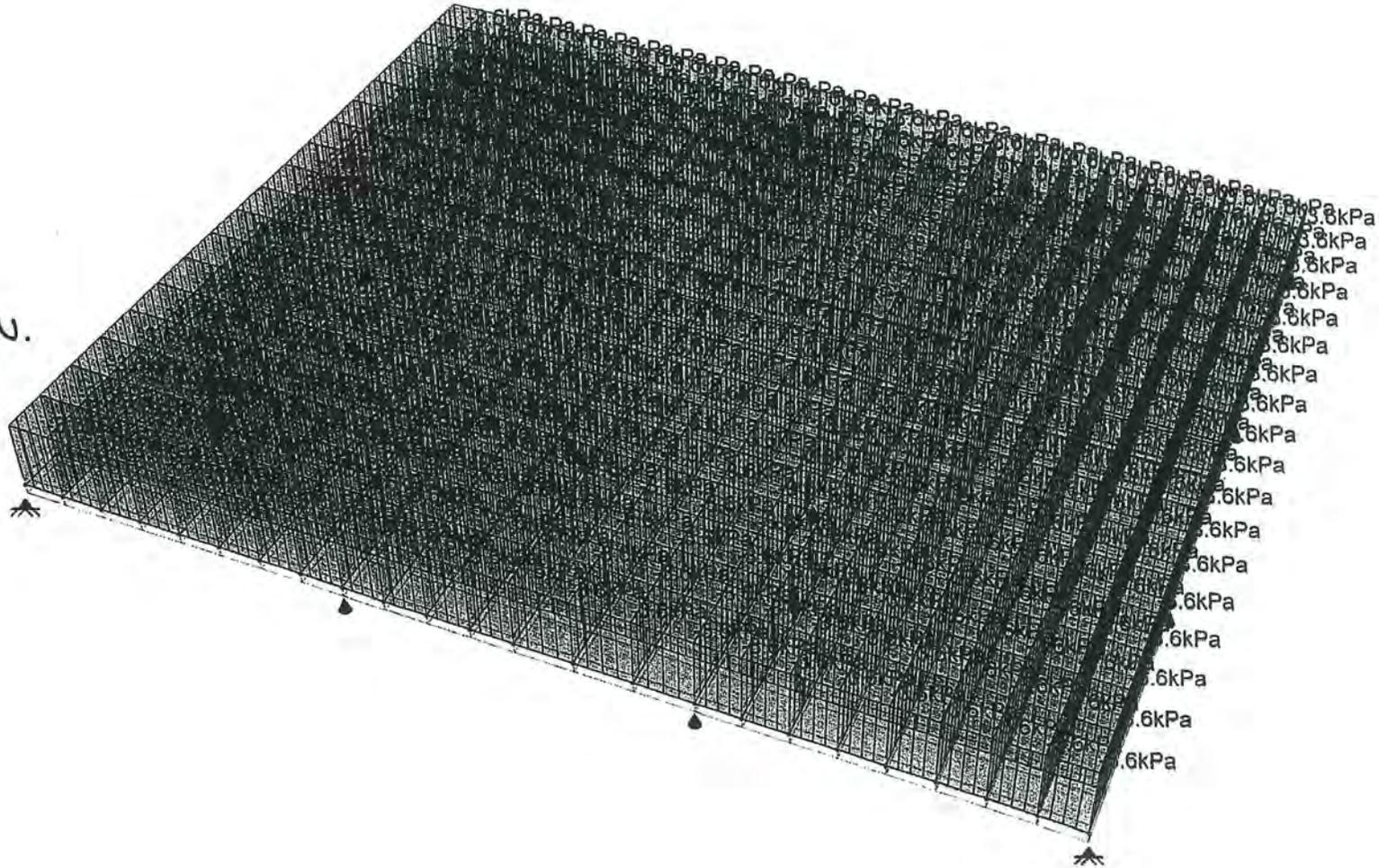
Viewpoint (-67,40), Loads

Materials:  
■ 1 AS-CONC2009-25

Load case 3  
■ 3 1.2G&1.5P



$P = 19.5 \text{ kN}$



Viewpoint (-67,40), Loads

Materials:  
■ 1 AS-CONC2009-25

Load case 4

■ 4 1.2G&1.5Q

X Moment:

■ 2.21 kNm/m

■ 1.48 kNm/m

□ 0.75 kNm/m

■ 0.03 kNm/m

■ -0.70 kNm/m

■ -1.43 kNm/m

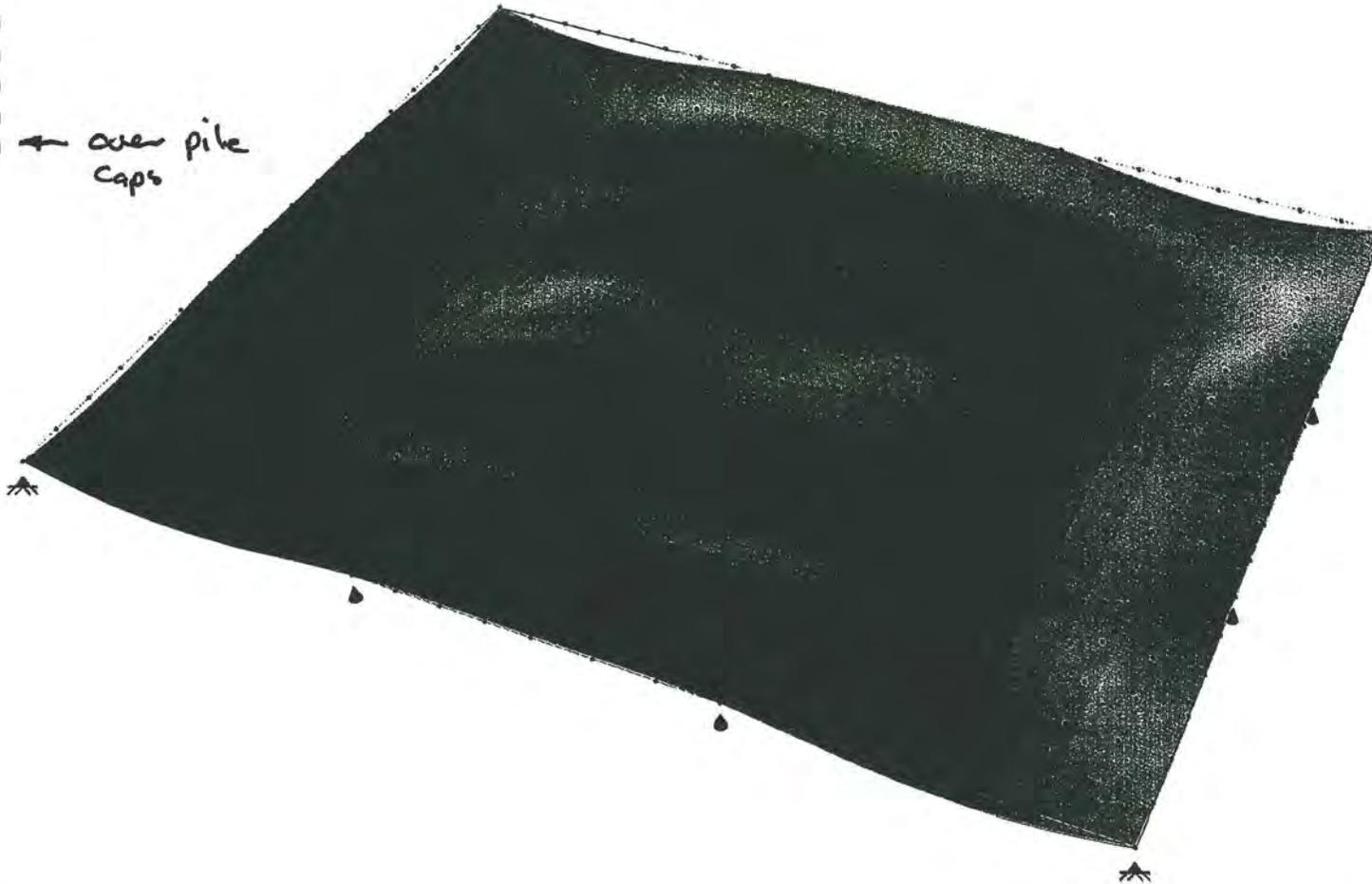
■ -2.15 kNm/m

■ -2.88 kNm/m

■ -3.61 kNm/m

← Maximum slab.

← over pile caps

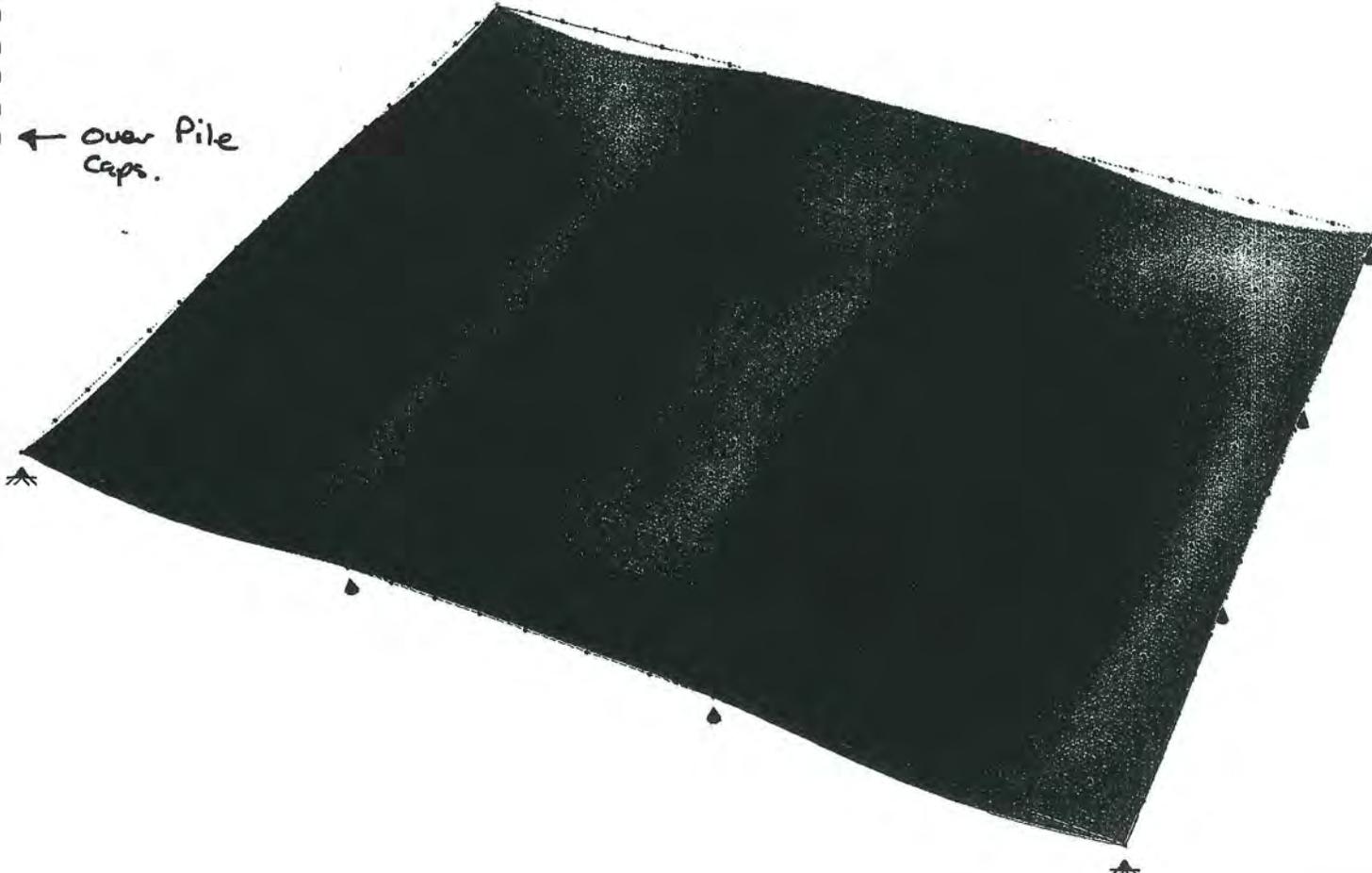


Load case 4  
■ 4 1.2G&1.5Q

- Y Moment:
- 2.74 kNm/m
  - 1.86 kNm/m
  - 0.98 kNm/m
  - 0.09 kNm/m
  - -0.79 kNm/m
  - -1.67 kNm/m
  - -2.56 kNm/m
  - -3.44 kNm/m
  - -4.32 kNm/m

← Maximum Slab.

← over Pile Caps.



- Load case 4  
■ 4 1.2G&1.5Q
- XZ Transverse Shear Force:
- 23.11 kN/m
  - 17.33 kN/m
  - 11.55 kN/m
  - 5.78 kN/m
  - 0.00 kN/m
  - -5.78 kN/m
  - -11.55 kN/m
  - -17.33 kN/m
  - -23.11 kN/m



Load case 4  
■ 4 1.2G&1.5Q

YZ Transverse Shear Force:

- 22.34 kN/m
- 16.73 kN/m
- 11.12 kN/m
- 5.51 kN/m
- -0.11 kN/m
- -5.72 kN/m
- -11.33 kN/m
- -16.94 kN/m
- -22.56 kN/m



Viewpoint (-66,40), Displacements, Contours

Materials:  
■ 1 AS-CONC2009-25

Sections:  
■ 1 Section 1



- Load case 3  
■ 3 1.2G&1.5P
- X Moment:  
■ 3.57 kNm/m  
■ 2.79 kNm/m  
□ 2.02 kNm/m  
■ 1.25 kNm/m  
■ 0.48 kNm/m  
■ -0.30 kNm/m  
■ -1.07 kNm/m  
■ -1.84 kNm/m  
■ -2.62 kNm/m



Viewpoint (-66,40), Displacements, Contours

Materials: 1 AS-CONC2009-25  
Sections: 1 Section 1

- Load case 3  
■ 3 1.2G&1.5P
- Y Moment:
- 4.00 kNm/m
  - 3.11 kNm/m
  - 2.22 kNm/m
  - 1.33 kNm/m
  - 0.44 kNm/m
  - -0.45 kNm/m
  - -1.34 kNm/m
  - -2.23 kNm/m
  - -3.12 kNm/m





- Load case 3  
■ 3 1.2G&1.5P
- XZ Transverse Shear Force:
- 15.69 kN/m
  - 11.98 kN/m
  - 8.27 kN/m
  - 4.56 kN/m
  - 0.84 kN/m
  - -2.87 kN/m
  - -6.58 kN/m
  - -10.30 kN/m
  - -14.01 kN/m



Viewpoint (-66,40), Displacements, Contours

Materials: 1 AS-CONC2009-25  
Sections: 1 Section 1

Load case 3  
■ 3 1.2G&1.5P

YZ Transverse Shear Force:

- 15.58 kN/m
- 11.94 kN/m
- 8.29 kN/m
- 4.65 kN/m
- 1.01 kN/m
- -2.64 kN/m
- -6.28 kN/m
- -9.92 kN/m
- -13.57 kN/m



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## CALCULATIONS

Project No.:

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Project:

Description:

# Seajay

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ralg@seajay.co.nz

### Pile Cap:

$$M_{max}^* = 4.32 \text{ kNm/m over pile cap}$$

$$\phi M_u = 4.39 \text{ kNm/m Slab } \therefore \text{ok.}$$

Provide nominal 4 - HD10 - EW.

### Edge Beam

$$\begin{aligned} W_{1.2G}^* &= 0.3 \text{ kPa} \times 4.5 \text{ m} \times 1.2 = 1.62 \text{ kN/m} \\ &= 0.4 \text{ kPa} \times 2.6 \text{ m} \times 1.2 = 1.24 \text{ kN/m} \\ &= 2.86 \text{ kN/m}. \end{aligned}$$

Roof  
Wall.

$$Q_{\text{roof}}^* = 0.25 \text{ kPa} \times 1.5 \times 4.5 \text{ m} = 1.7 \text{ kN/m}.$$

$\therefore$  Need to add  $W^* = 1.7 + 2.68 = 4.38 \text{ kN/m}$  to perimeter Beams

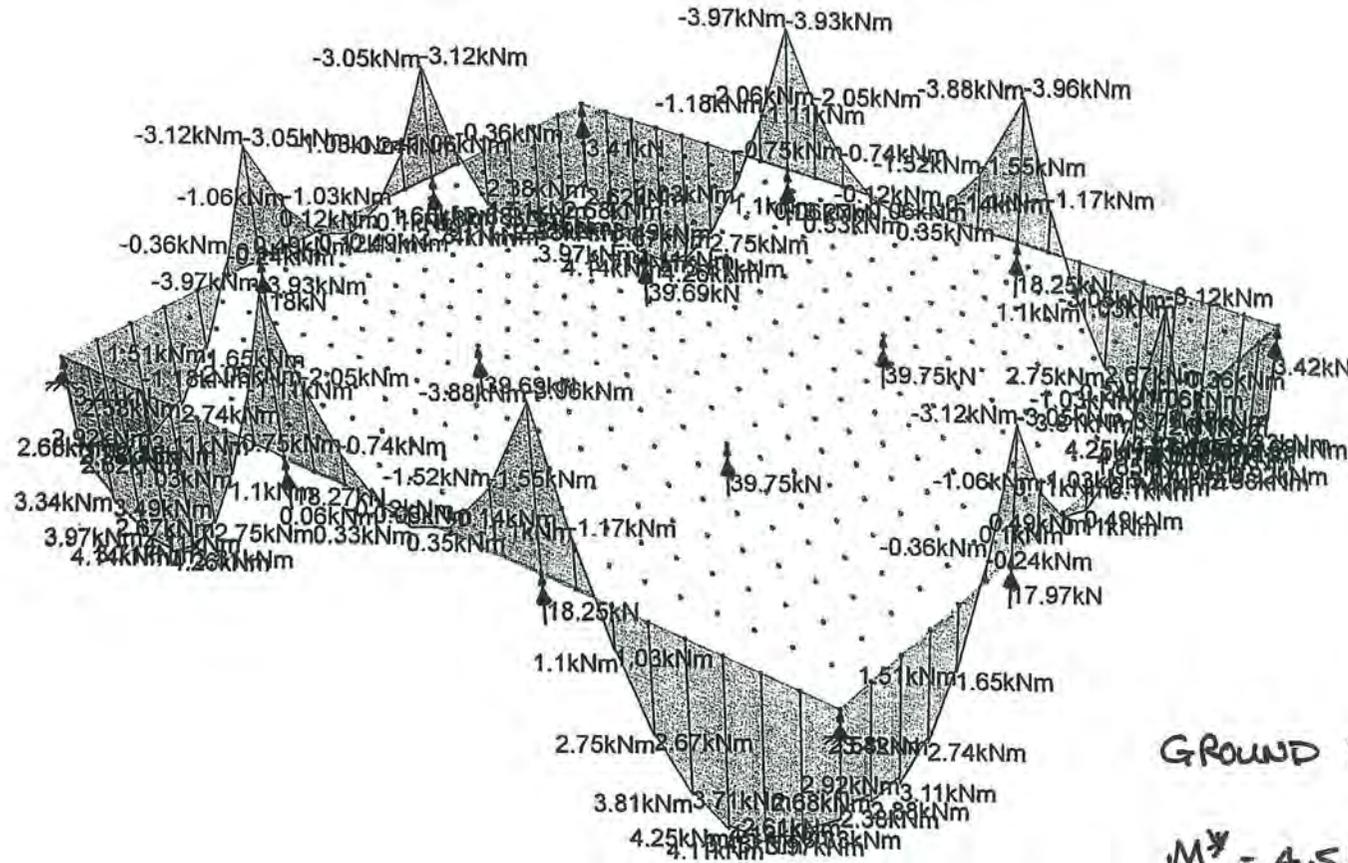
Maximum GB Moment + Shear depends on when point load is applied. Apply over Ground Beam

$\therefore$

$$\begin{aligned} M_{max}^* &\sim 2.1 \text{ kNm} + \frac{3}{16} \times 19.5 \text{ kN} \times 2.4 \text{ m} + 4.38 \text{ kN/m} \times 2.4^2/8 \\ &= 14.0 \text{ kNm} > M^* \text{ SLAB APPLIED LOADS.} \end{aligned}$$

$$\begin{aligned} V^* &= 3.9 \text{ kN} + 19.5 \text{ kN} + (4.38 \times 2.4 \text{ m} / 2) \\ &= 28 \text{ kN} = \text{Max perimeter pile load.} \end{aligned}$$

Load case 4  
 ■ 4 1.2G&1.5Q



GROUND BEAM

$M^y = 4.5 \text{ kNm} \quad 1.2G + 1.5Q$   
 $M^y_{max} = 5.2 \text{ kNm} \quad 1.2G + 1.5Q$   
 $M^x_{1.2G} = 2.1 \text{ kNm}$

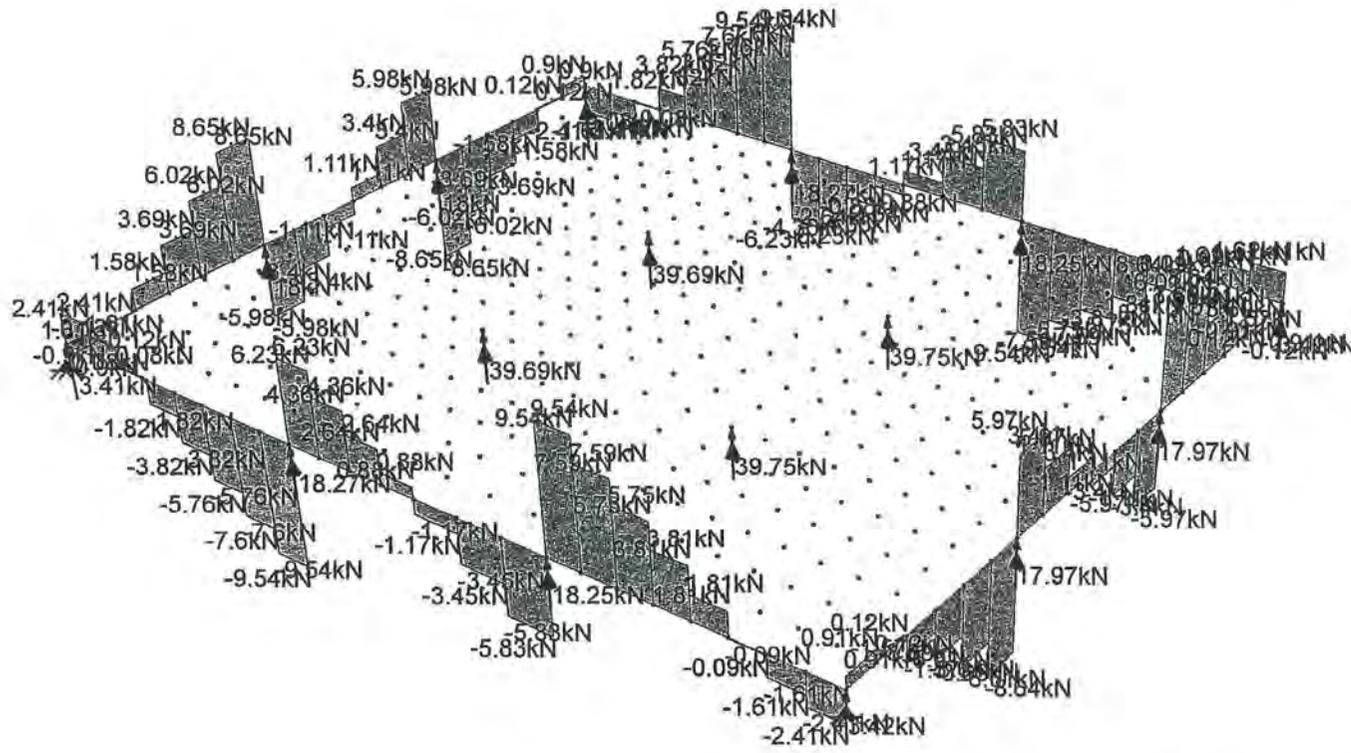


Viewpoint (-55,32), Moments, Reactions

Materials:  
 ■ 1 AS-CONC2009-25  
 Sections:  
 ■ 1 Section 1



Load case 4  
 ■ 4 1.2G&1.5Q



Viewpoint (-55,32), Shears, Reactions

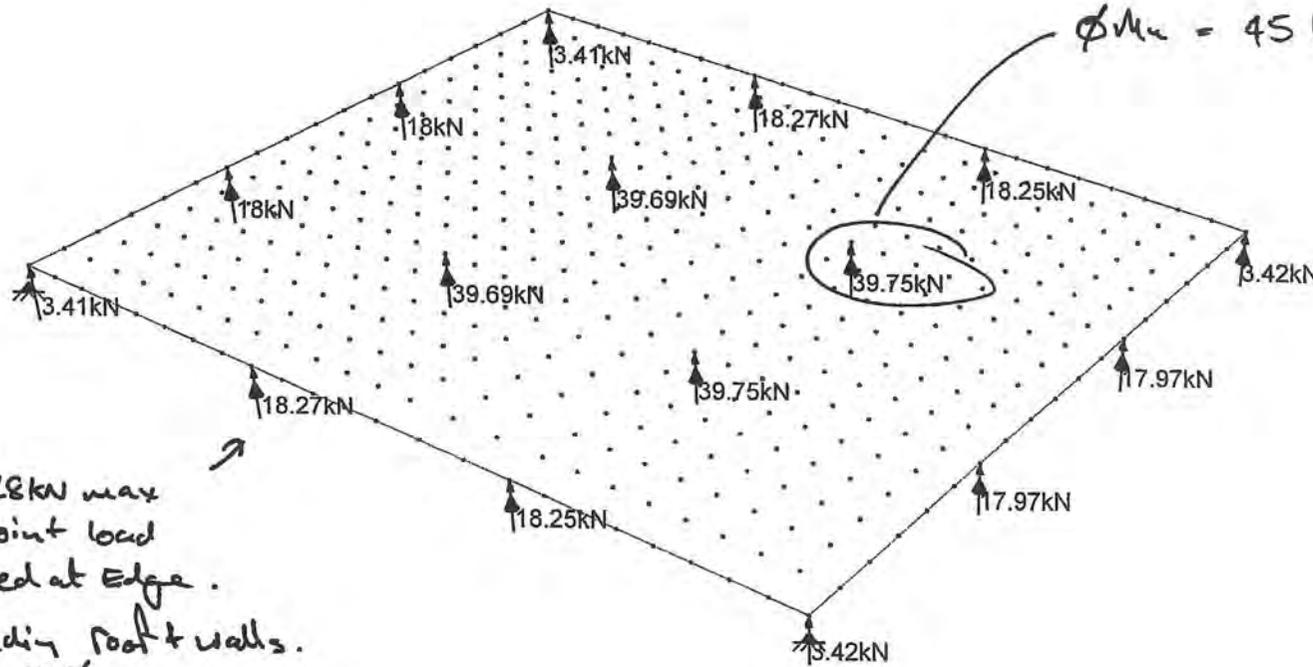
GROUND BEAM

$V^* = 9.8 \text{ kN}$  1.2G & 1.5Q  
 $V^* = 10.4 \text{ kN}$  1.2G & 1.5Q  
 $V^*_{1.2G} = 3.9 \text{ kN}$

Materials: ■ 1 AS-CONC2009-25  
 Sections: ■ 1 Section 1



Load case 4  
 ■ 4 1.2G&1.5Q



150 SED Pile  
 2m - 3.5m Deep.  
 ∴ OK.  
 25mm Set.  
 Use target set  
 20mm

$R^* = 28 \text{ kN}$  max  
 if point load  
 Applied at Edge.  
 Including roof + walls.  
 @ 4.4kN/m over

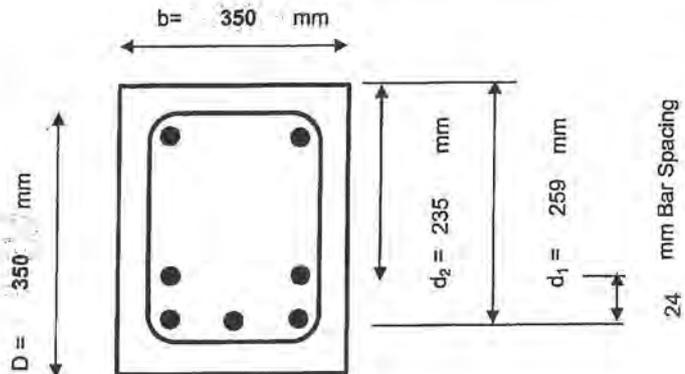


**CONCRETE BEAM DESIGN**

Job No.: \_\_\_\_\_ Date: 31/08/2017  
 Project Title: \_\_\_\_\_  
 Description: \_\_\_\_\_  
 Beam No.: \_\_\_\_\_ Engineer: CJM

**Geometry:**

Reinforcing Bars				
Call	db	fy	No.	As
	mm	MPa		mm <sup>2</sup>
HD12	12	500	2	226
None				0
HD12	12	500	2	226
Total				226

**Stirrups:**

Stirrups:	D10
Dia. ds	10 mm
No. Legs n	2
Spacing S	200 mm
Grade fyt	300 Mpa
Area Av	157 mm <sup>2</sup>

**Concrete:**

fc	25 MPa
Ec	23500 MPa
εc	0.003

**Beam Design Actions:**

Moment  $M^* = 14$  kNm Shear  $V^* = 28$  kN

**Flexural Strength:**

			Steel Strain	fs
Initial Comp. Block	$a = A_s f_y / (0.85 f_c b)$	15.2 mm	1st Iteration	
Neutral Axis	$C = a/0.85$	17.9 mm	Row 1	0.0025 500
As effective	$A_s \text{ eff} =$	226.19 mm	Row 2	0.0023 450
Comp. Block	$a = A_s \text{ eff} f_y / (0.85 f_c b)$	15.2 mm	2nd Iteration	
	$C = a/0.85$	17.9 mm	Row 1	0.0025 500
			Row 2	0.0023 450 100.0% OK

**Flexural Strength**  $\phi M_u = 0.85 A_s F_y (d-a/2)$  24.2 kNm >  $M^* = 14$  kNm OK

Minimum Steel:  $A_s \text{ min} = \sqrt{f_c} b d / 4 f_y$  227 mm<sup>2</sup> <  $A_s = 226$  mm<sup>2</sup> NG  
 (cl 9.3.8.2.1)  $A_s \text{ min} = 1.4 b d / f_y$  254 mm<sup>2</sup> <  $A_s = 226$  mm<sup>2</sup> NG

Maximum Steel: Balanced Steel Ratio  $\rho_b = \frac{0.85 f_c \beta_1 \epsilon_s E_s}{f_y (\epsilon_s E_s + f_y)}$  0.020  
 (cl 9.3.8.1)  $\beta_1 = 0.85$   
 $E_s = 200000$  MPa  
 $A_s \text{ max} = 0.75 \rho_b B d$  3828 mm<sup>2</sup> >  $A_s = 226$  mm<sup>2</sup> OK

**Shear Strength:**

Concrete Shear  $V_c = (0.07 + 10 \rho_w) \sqrt{f_c} b d$  43.0 kN  
 $V_c \text{ min} = 43.0$  kN  
 $V_c = 0.2 \sqrt{f_c} b d$  91 kN  
 Steel Shear:  $V_s = A_v f_y t d / s$  61 kN

**Shear Capacity**  $\phi V_u = 0.75 (V_c + V_s)$  78 kN >  $V^* = 28$  kN OK

Minimum Steel:  $A_v \text{ min} = (1/16) \sqrt{f_c} b s / f_y$  73 mm<sup>2</sup> <  $A_v = 157$  mm<sup>2</sup> OK  
 (cl 9.3.9.4.14)

$\phi V_c = 0.75 \times 43 \text{ kN} = 32 \text{ kN} > 28 \text{ kN} \therefore \text{OK. Without shear steel.}$   
 provide stirrups at 200 centres.

# CALCULATIONS

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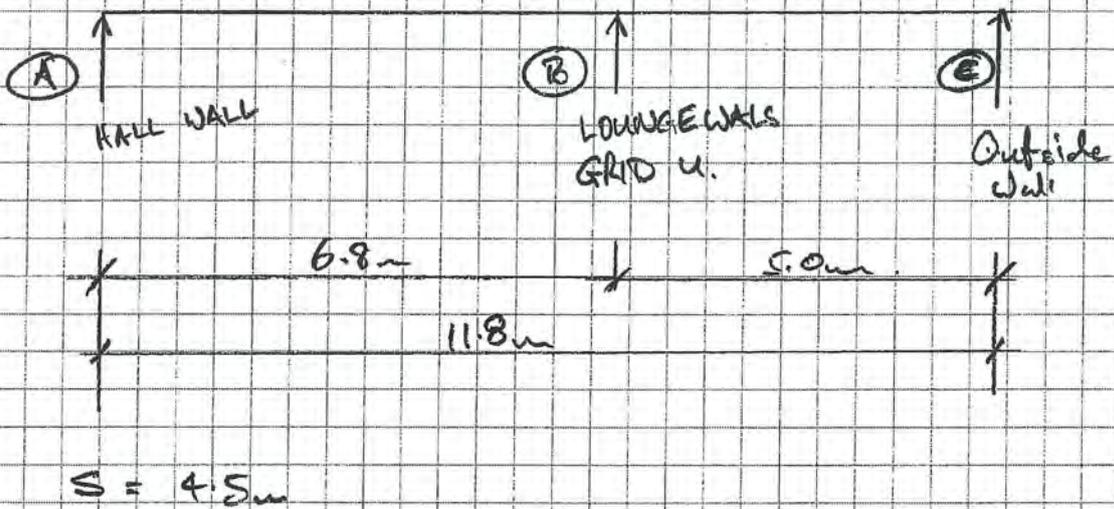
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## FOUNDATIONS UNDER GIRDER TRUSS

Inside existing building envelope ∴ use hand dug pits 1200 deep to soil with seals readings 2 Bows/100 Quilt  $\geq 150 \text{ kPa}$   
 $\phi_{\text{Quilt}} \geq 50 \text{ kPa}$



	(A)	(B)	(C)
$L =$	$6.8 \text{ m} / 2$ $= 3.4 \text{ m}$	$11.8 \text{ m} / 2$ $= 5.9 \text{ m}$	$\frac{5 \text{ m} + 2 \cdot 5 \text{ m}}{2}$ $= 3.75 \text{ m}$
$S =$	$4.5 \text{ m}$	$4.5$	$4.5$
$A_{\text{Roof}} =$	$15.3 \text{ m}^2$	$26.5 \text{ m}^2$	$16.8 \text{ m}^2$
$W_{\text{Ogg} + W_{\text{u}}} =$	$0.77 \text{ kPa}$	$0.77 \text{ kPa}$	$0.77 \text{ kPa}$
$R_{\text{Roof}} =$	$11.8 \text{ kN}$	$20.4 \text{ kN}$	$12.93 \text{ kN}$
Weight Walls.			
$\phi W (0.4 \text{ kPa} \times 2 \text{ m}) =$	$1.8 \text{ kN}$	$1.8 \text{ kN}$	$1.8 \text{ kN}$ (2m of wall)
$R_{\text{net}} =$	$- 10 \text{ kN}$	$18.6 \text{ kN}$	$11.1 \text{ kN}$

**Square Foundations Cone Failure**

Pile Size	0.6 m	Weight Soil	17	kN/m <sup>3</sup>
Post Diameter	0.125 m	Weight Post	5	kN/m <sup>3</sup>
Cone Angle	7 °	Weight Concrete	24	kN/m <sup>3</sup>

Cone Failure												Effective Soil Properties		
Pile Depth m	Cone depth m	Cone Width m	Volume of Cone m <sup>3</sup>	Vol Under Pile	Volume Pile m <sup>3</sup>	Volume soil m <sup>3</sup>	Volume Post	Weight Pile kN	Weight soil kN	Total weight kN	φ Weight (φ=0.9) kN	Clays αSu kPa	Sands/Gravels	
													β (<0.7)	Comment
0.60	3.04	0.37	0.57	0.293	0.216	0.06	0.007	5.0	1.0	6.0	5.4	1.4	0.27	
0.70	3.14	0.39	0.62	0.293	0.252	0.08	0.009	5.9	1.3	7.2	6.5	1.6	0.27	
0.80	3.24	0.40	0.69	0.293	0.288	0.10	0.010	6.7	1.8	8.5	7.7	1.9	0.27	
0.90	3.34	0.41	0.75	0.293	0.324	0.13	0.011	7.6	2.3	9.8	8.9	2.1	0.28	
1.00	3.44	0.42	0.82	0.293	0.360	0.17	0.012	8.4	2.8	11.3	10.1	2.4	0.28	
1.10	3.54	0.44	0.89	0.293	0.396	0.21	0.013	9.2	3.5	12.7	11.5	2.6	0.28	
1.20	3.64	0.45	0.97	0.293	0.432	0.25	0.015	10.1	4.2	14.3	12.9	2.9	0.29	
1.30	3.74	0.46	1.05	0.293	0.468	0.29	0.016	10.9	5.0	15.9	14.3	3.2	0.29	
1.40	3.84	0.47	1.14	0.293	0.504	0.34	0.017	11.8	5.8	17.6	15.9	3.5	0.29	
1.50	3.94	0.48	1.23	0.293	0.540	0.40	0.018	12.6	6.8	19.4	17.5	3.8	0.30	
1.60	4.04	0.50	1.33	0.293	0.576	0.46	0.020	13.5	7.8	21.3	19.1	4.1	0.30	
1.70	4.14	0.51	1.43	0.293	0.612	0.52	0.021	14.3	8.9	23.2	20.9	4.4	0.30	
1.80	4.24	0.52	1.54	0.293	0.648	0.59	0.022	15.1	10.1	25.2	22.7	4.7	0.31	
1.90	4.34	0.53	1.65	0.293	0.684	0.67	0.023	16.0	11.4	27.4	24.6	5.0	0.31	
2.00	4.44	0.55	1.76	0.293	0.720	0.75	0.025	16.8	12.8	29.6	26.6	5.3	0.31	
2.10	4.54	0.56	1.89	0.293	0.756	0.84	0.026	17.7	14.2	31.9	28.7	5.6	0.32	
2.20	4.64	0.57	2.01	0.293	0.792	0.93	0.027	18.5	15.8	34.3	30.8	6.0	0.32	
2.30	4.74	0.58	2.15	0.293	0.828	1.02	0.028	19.3	17.4	36.7	33.1	6.3	0.32	
2.40	4.84	0.59	2.28	0.293	0.864	1.13	0.029	20.2	19.2	39.3	35.4	6.6	0.33	
2.50	4.94	0.61	2.43	0.293	0.900	1.23	0.031	21.0	21.0	42.0	37.8	7.0	0.33	
2.60	5.04	0.62	2.58	0.293	0.936	1.35	0.032	21.9	22.9	44.8	40.3	7.4	0.33	
3.00	5.44	0.67	3.24	0.293	1.080	1.87	0.037	25.2	31.8	57.0	51.3	8.8	0.35	

β max  
 0.2 Very loose sand  
 0.3 loose sand/gravel  
 0.5 medium sand/gravel  
 0.7 Dense sand/gravel

$R^* = 11.1 \text{ kN} < \phi R_u = 12.9 \text{ kN} \therefore 600 \times 600 \text{ D} \times 1.2 \text{ m deep footing ok.}$

Check Bearing:

$$R_{1.2G \& 1.5Q} = (1.2 \times 0.3 \text{ kR} + 1.5 \times 0.25 \text{ kR}) \times 16.8 \text{ m}^2 = 12.3 \text{ kN}$$

$$q_{10} = \frac{12.3 \text{ kN}}{0.6 \times 0.6} = 34 \text{ kR} < \phi q_{ult} = 50 \text{ kR} @ 1200 \text{ deep} \therefore \text{ok uplift governs.}$$

**Square Foundations Cone Failure**

Pile Size	0.75 m	Weight Soil	17	kN/m <sup>3</sup>
Post Diameter	0.125 m	Weight Post	5	kN/m <sup>3</sup>
Cone Angle	7 °	Weight Concrete	24	kN/m <sup>3</sup>

Cone Failure												Effective Soil Properties		
Pile Depth m	Cone depth m	Cone Width m	Volume Cone m <sup>3</sup>	Vol Cone Under Pile	Volume Pile m <sup>3</sup>	Volume soil m <sup>3</sup>	Volume Post	Weight Pile kN	Weight soil kN	Total weight kN	φ Weight (φ = 0.9) kN	Clays		
												αSu kPa	β (<0.7)	Comment
0.60	3.65	0.45	0.98	0.573	0.338	0.07	0.007	8.0	1.2	9.2	8.2	1.3	0.26	
0.70	3.75	0.46	1.06	0.573	0.394	0.10	0.009	9.3	1.7	10.9	9.8	1.6	0.26	
0.80	3.85	0.47	1.15	0.573	0.450	0.13	0.010	10.6	2.2	12.8	11.5	1.8	0.27	
0.90	3.95	0.49	1.24	0.573	0.506	0.16	0.011	11.9	2.8	14.7	13.3	2.1	0.27	
1.00	4.05	0.50	1.34	0.573	0.563	0.20	0.012	13.3	3.5	16.7	15.1	2.3	0.27	
1.10	4.15	0.51	1.44	0.573	0.619	0.25	0.013	14.6	4.2	18.8	17.0	2.6	0.28	
1.20	4.25	0.52	1.55	0.573	0.675	0.30	0.015	15.9	5.1	21.0	18.9	2.8	0.28	
1.30	4.35	0.53	1.66	0.573	0.731	0.36	0.016	17.2	6.0	23.3	21.0	3.1	0.28	
1.40	4.45	0.55	1.78	0.573	0.788	0.42	0.017	18.6	7.1	25.6	23.1	3.4	0.28	
1.50	4.55	0.56	1.90	0.573	0.844	0.48	0.018	19.9	8.2	28.1	25.3	3.6	0.29	
1.60	4.65	0.57	2.03	0.573	0.900	0.55	0.020	21.2	9.4	30.6	27.6	3.9	0.29	
1.70	4.75	0.58	2.16	0.573	0.956	0.63	0.021	22.6	10.7	33.3	30.0	4.2	0.29	
1.80	4.85	0.60	2.30	0.573	1.013	0.71	0.022	23.9	12.1	36.0	32.4	4.5	0.29	
1.90	4.95	0.61	2.44	0.573	1.069	0.80	0.023	25.2	13.6	38.9	35.0	4.8	0.30	
2.00	5.05	0.62	2.60	0.573	1.125	0.90	0.025	26.5	15.3	41.8	37.6	5.1	0.30	
2.10	5.15	0.63	2.75	0.573	1.181	1.00	0.026	27.9	17.0	44.8	40.3	5.4	0.30	
2.20	5.25	0.65	2.92	0.573	1.238	1.11	0.027	29.2	18.8	48.0	43.2	5.7	0.30	
2.30	5.35	0.66	3.09	0.573	1.294	1.22	0.028	30.5	20.7	51.2	46.1	6.0	0.31	
2.40	5.45	0.67	3.26	0.573	1.350	1.34	0.029	31.8	22.8	54.6	49.1	6.3	0.31	
2.50	5.55	0.68	3.44	0.573	1.406	1.47	0.031	33.2	24.9	58.1	52.3	6.6	0.31	
2.60	5.65	0.69	3.63	0.573	1.463	1.60	0.032	34.5	27.2	61.7	55.5	7.0	0.32	
3.00	6.05	0.74	4.46	0.573	1.688	2.20	0.037	39.8	37.4	77.2	69.5	8.3	0.33	

β  
max  
0.2 Very loose sand  
0.3 loose sand/gravel  
0.5 medium sand/gravel  
0.7 Dense sand/gravel

$R^* = 18.6 \text{ kN} < \phi R_u = 18.9 \text{ kN}$  750 x 750 x 1200 Footing.

Check bearing.

$R^* = 2G + 1.5Q = (1.2 \times 0.3 + 1.5 \times 0.25) \times 26.5 \text{ m}^2 = 19.4 \text{ kN}$

$q_b = \frac{19.4 \text{ kN}}{0.75 \times 0.75} = 34.6 \text{ kPa} < \phi q_{ult} = 50 \text{ kPa @ 1200 deep} \therefore \text{ok. uplift governs.}$

## CALCULATIONS

Project No. :	Date:	Eng:	Page: 45
Project:			
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### DECK FOUNDATIONS

Bearer spacing  $L_1 = 2.4m$  Max

Pile spacing  $L_2 = 1.8m$  Max

$$G = 0.4kR$$

$$Q = 2.0kR$$

Blue stone pavers  $600 \times 600 \square = 21kg$  ea

$$\therefore G_{SID} = 21 \times 9.81 / 0.6^2$$

$$= 572 \text{ N/m}^2 = 0.6 \text{ kR}$$

$L_1 = 1.5m$  where blue stone pavers being used

$$R^* = 1.2G + 1.5Q$$

	Front Deck	Rear Deck
G	1.0kR	0.4kR
Q	2.0kR	2.0kR
$R^* = 1.2G + 1.5Q$	4.20kR	3.48kR
$L_1$	1.5m	2.4m
$L_2$	1.8m	1.6m
A <sub>floor</sub>	2.7m <sup>2</sup>	3.84m <sup>2</sup>
$R^*$	11.3kN	13.36kN

$\therefore$  Design  $R_{req} = R^* = 14kN$

## CALCULATIONS

Project No. :	Date:	Eng:	Page: 451.
Project:			
Description:			

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Scala reading 1 Blow / 50mm @ 0.5 - 1m depth

$$\therefore Q_{ULT} = 100 \text{ kR}$$

$$\begin{aligned} \phi Q_{ULT} &= 0.5 \times 100 \text{ kR} \\ &= 50 \text{ kR} \end{aligned}$$

$$\therefore A_b = \frac{R^*}{\phi Q_{ULT}}$$

$$= \frac{14 \text{ kN}}{50 \text{ kN}}$$

$$= 0.28 \text{ m}^2$$

$$\therefore b = \sqrt{A_b}$$

$$= \sqrt{0.28 \text{ m}^2}$$

$$= 0.52 \text{ m} \quad \square$$

Provide 550 IJ pad footing approx 1000 deep on driven piles to a 50m set. Pg 21



# Scala Penetrometer Test Results

Job No: 17050  
 Date: 31/08/2017  
 Project: Additions & Alterations  
 Description: 65 Kohekohe Road, Waikanae



Depth (mm)	Scala penetrometer Tests Results (Blows/100mm Penetration)			
	Test 1	16.50m	Test 2	16.40m
0 - 100	0		0	
100 - 200	0		0	
200 - 300	3		2	
300 - 400	1.2		1.34	
400 - 500	0.8		2	
500 - 600	1.34		1.5	
600 - 700	1.67		1.17	
700 - 800	2		1.67	
800 - 900	1.5		2	
900 - 1000	1.5		2	
1000 - 1100	1		2	
1100 - 1200	2		3	
1200 - 1300	2		7	
1300 - 1400	3		4	
1400 - 1500	2		8	
1500 - 1600	4		15	
1600 - 1700	3		14	
1700 - 1800	6		10	
1800 - 1900	7		0	
1900 - 2000	7		0	
2000 - 2100	7		0	
2100 - 2200	7		0	
2200 - 2300	6		0	
2300 - 2400	5		0	
2400 - 2500	6		0	
2500 - 2600	11		0	
2600 - 2700	10		0	
2700 - 2800	0		0	
2800 - 2900	0		0	
2900 - 3000	0		0	
3000 - 3100	0		0	
3100 - 3200	0		0	
3200 - 3300	0		0	
3300 - 3400	0		0	
3400 - 3500	0		0	
3500 - 3600	0		0	
3600 - 3700	0		0	
3700 - 3800	0		0	
3800 - 3900	0		0	
3900 - 4000	0		0	

RL: 14.80m

$Q_{ult} \geq 300kPa$

RL: 15.20m

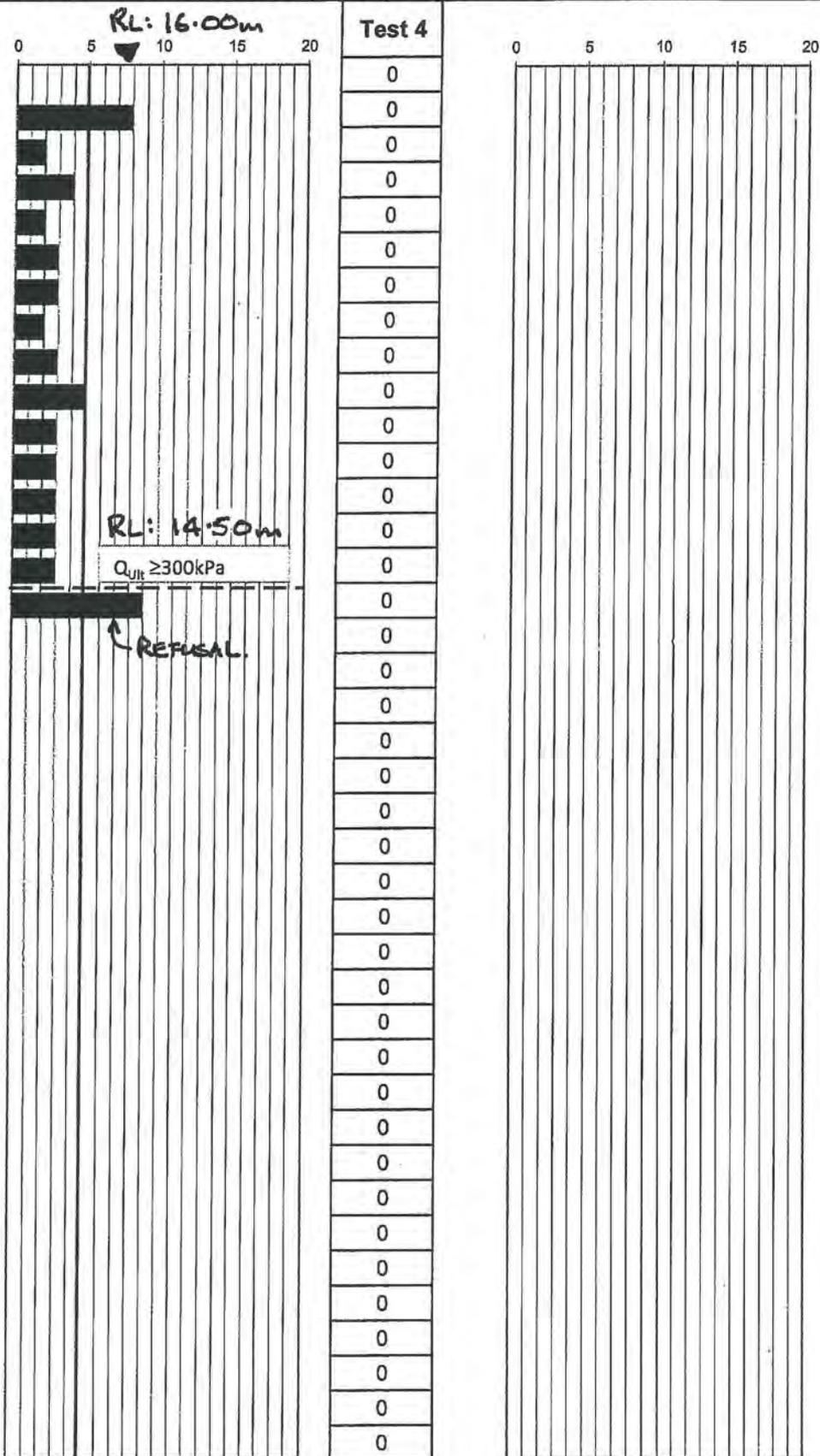
$Q_{ult} \geq 300kPa$

# Scala Penetrometer Test Results



Job No: 17050  
Date: 31/08/2017  
Project: Additions & Alterations  
Description: 65 Kohekohe Road, Waikanae

Depth (mm)	Scala penetrometer Tests Results (Blows/100mm Penetration)	
	Test 3	Test 4
0 - 100	0	0
100 - 200	8	0
200 - 300	2	0
300 - 400	4	0
400 - 500	2	0
500 - 600	3	0
600 - 700	3	0
700 - 800	2	0
800 - 900	3	0
900 - 1000	5	0
1000 - 1100	3	0
1100 - 1200	3	0
1200 - 1300	3	0
1300 - 1400	3	0
1400 - 1500	3	0
1500 - 1600	9	0
1600 - 1700	0	0
1700 - 1800	0	0
1800 - 1900	0	0
1900 - 2000	0	0
2000 - 2100	0	0
2100 - 2200	0	0
2200 - 2300	0	0
2300 - 2400	0	0
2400 - 2500	0	0
2500 - 2600	0	0
2600 - 2700	0	0
2700 - 2800	0	0
2800 - 2900	0	0
2900 - 3000	0	0
3000 - 3100	0	0
3100 - 3200	0	0
3200 - 3300	0	0
3300 - 3400	0	0
3400 - 3500	0	0
3500 - 3600	0	0
3600 - 3700	0	0
3700 - 3800	0	0
3800 - 3900	0	0
3900 - 4000	0	0







### High Intensity Rainfall System V3

Results for 65 Kohekohe Road, Waikanae

Intensity-Duration-Frequency results (produced on Friday 25th of August 2017)

Sitename: 65 Kohekohe Road, Waikanae

Coordinate system: NZMG

Easting: 2683041

Northing: 6034651

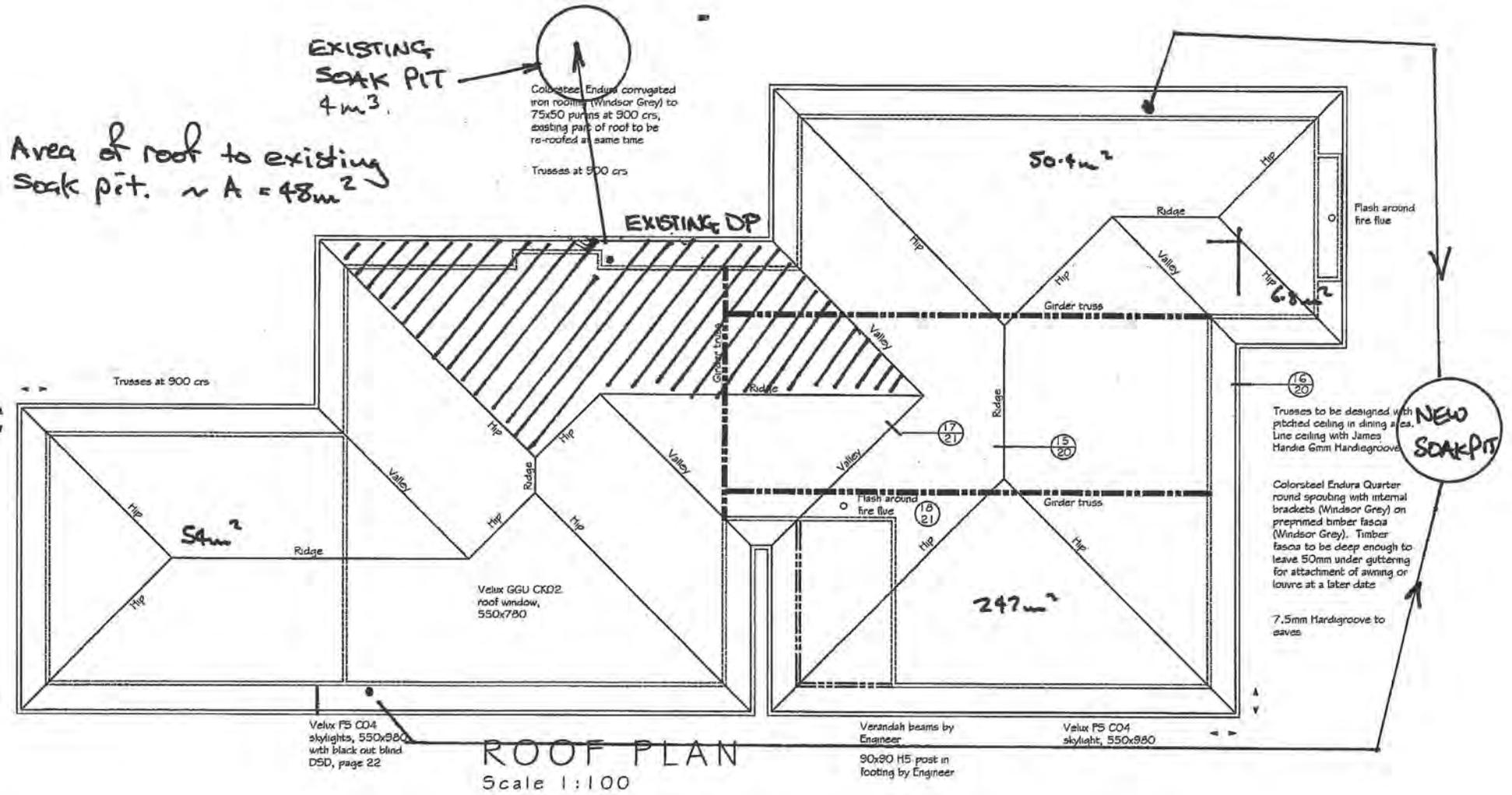
### Rainfall intensities (mm/h)

ARI (y)	aep	Duration									
		10m	20m	30m	60m	2h	6h	12h	24h	48h	72h
1.58	0.633	43.8	30.6	24.8	17.4	11.8	6.5	4.4	3.0	1.8	1.3
2.00	0.500	46.8	33.0	26.8	18.8	12.8	6.9	4.7	3.2	1.9	1.4
5.00	0.200	59.4	41.7	34.0	23.8	16.0	8.5	5.7	3.8	2.3	1.7
10.00	0.100	69.6	48.9	39.8	27.9	18.6	9.7	6.5	4.3	2.6	1.9
20.00	0.050	81.0	56.7	46.2	32.4	21.4	11.1	7.3	4.9	2.9	2.1
30.00	0.033	88.2	61.8	50.4	35.3	23.2	12.0	7.9	5.2	3.1	2.3
40.00	0.025	93.6	65.7	53.4	37.5	24.6	12.6	8.3	5.5	3.3	2.4
50.00	0.020	98.4	69.0	56.0	39.3	25.8	13.2	8.6	5.7	3.4	2.5
60.00	0.017	102.0	71.7	58.2	40.8	26.7	13.6	8.9	5.8	3.5	2.6
80.00	0.012	108.6	76.2	61.8	43.4	28.3	14.4	9.4	6.1	3.6	2.7
100.00	0.010	114.0	79.8	64.8	45.5	29.6	15.0	9.7	6.3	3.8	2.8

Design Return Period ARI = 10 year,

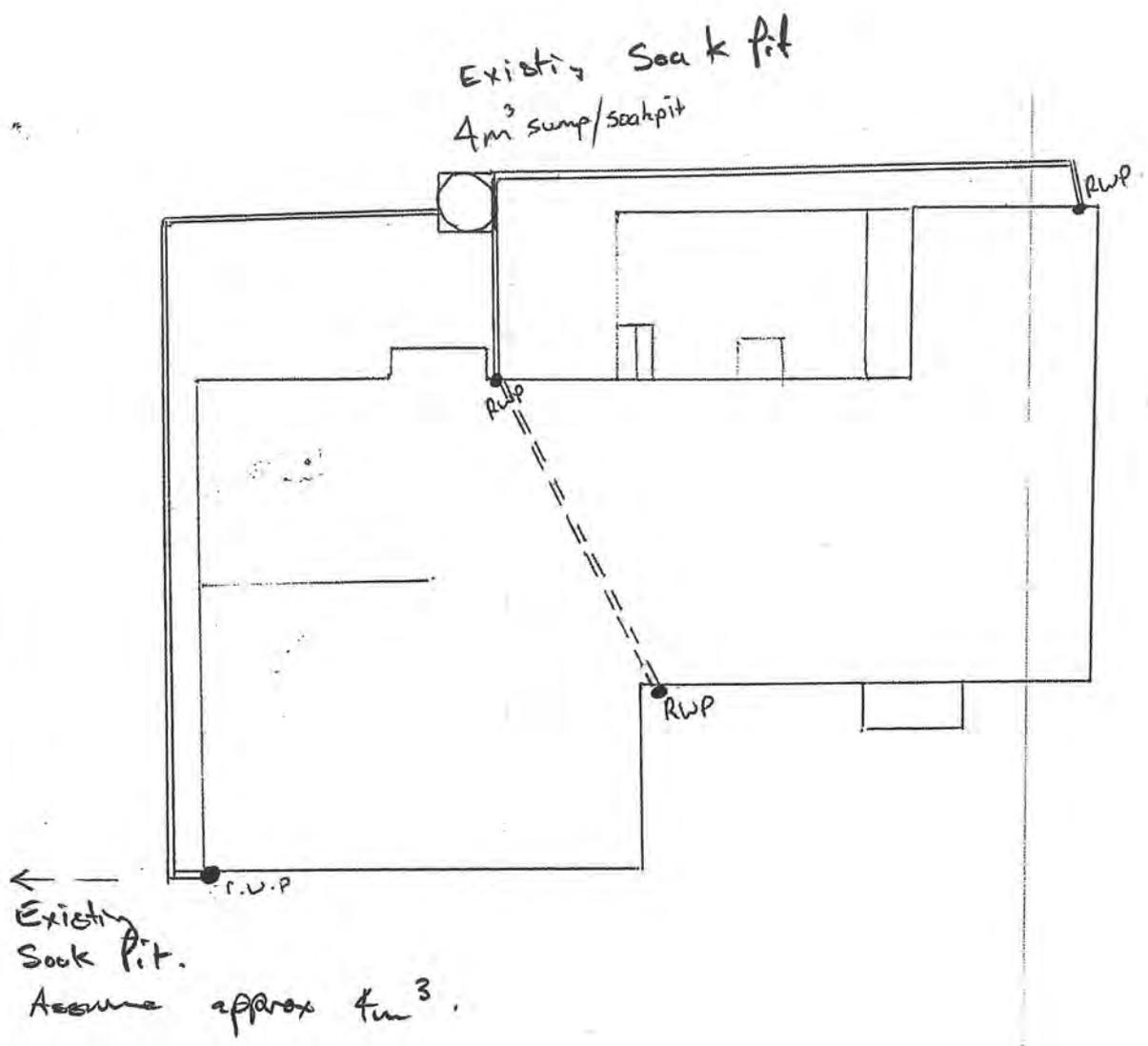
Design Duration t = 60 minutes

Design Intensity i = 27.9 mm/hour.



Total Area of Roof =  $358 \text{ m}^2 \times 1/\cos 20^\circ$   
=  $380 \text{ m}^2$

check existing soakage rate.



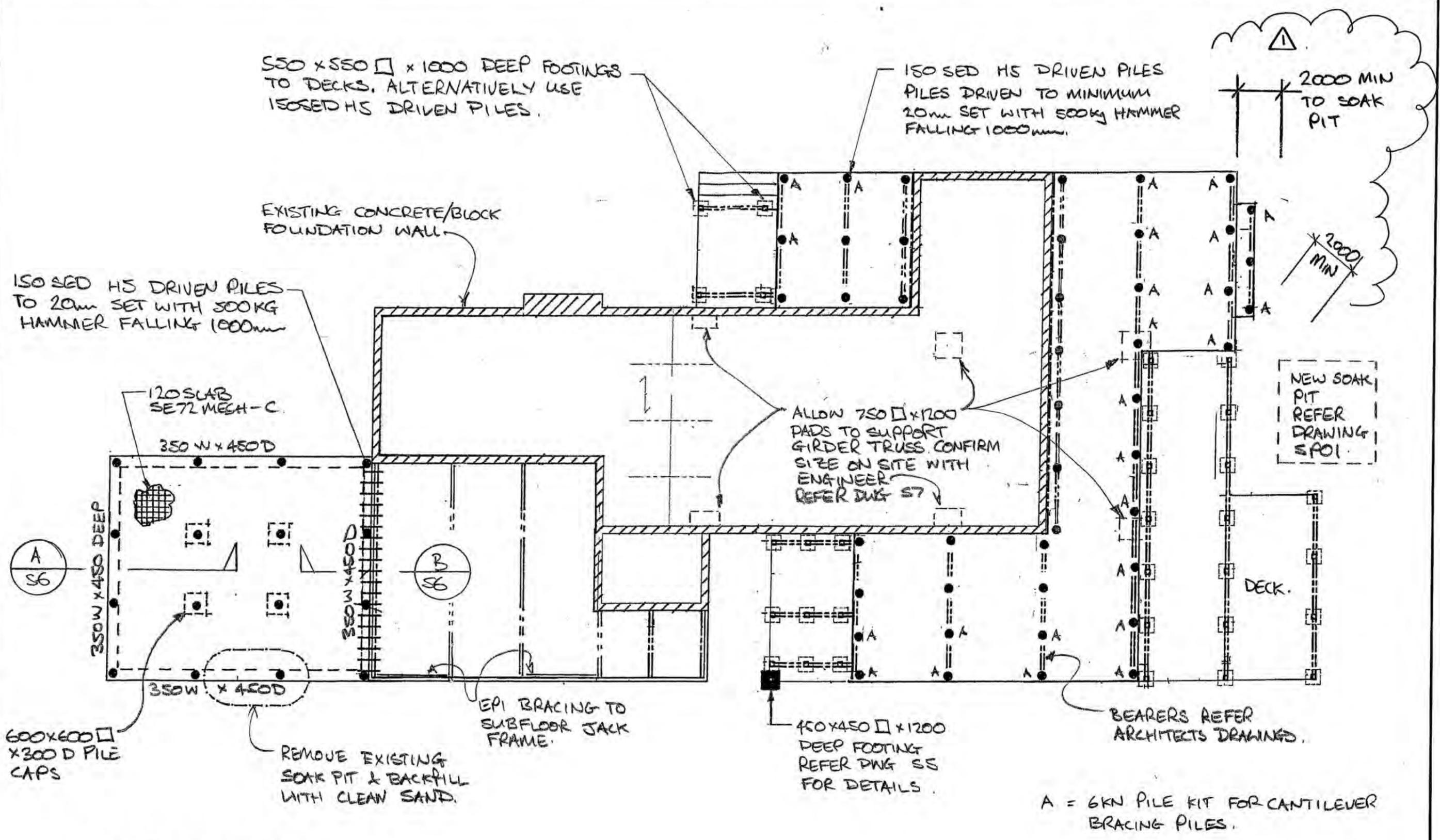
EXISTING SOAK PIT.

$4m^3 \times 2 = 8m^3 \sim 200m^2$  Roof

Proposed New SOAK PIT

$15.5m^3$   $\sim 380m^2$  New Roof.

Soakage Rate Existing  $\sim 300$  m/hour.



**FOUNDATION PLAN**  
1:100

BC170844  
Further Information Received  
04/12/2017

 <p>CONSULTING ENGINEERS CIVIL • STRUCTURAL • FIRE</p> <p>42 Michael Road, PO Box 1713, Paraparaumu 5252 Phone: (04) 212 5150 • Cell: 021 121 4501 craig@sejay.co.nz</p>	CLIENT: G & N HYNDMAN	DATE: AUG 2017	DRAWN: CJM
	PROJECT: 65 KOHEKOHE ROAD WAIKANAЕ	JOB No: 17050	
	TITLE: HOUSE ALTERATIONS FOUNDATION PLAN	SHEET No: S4	REV: 1

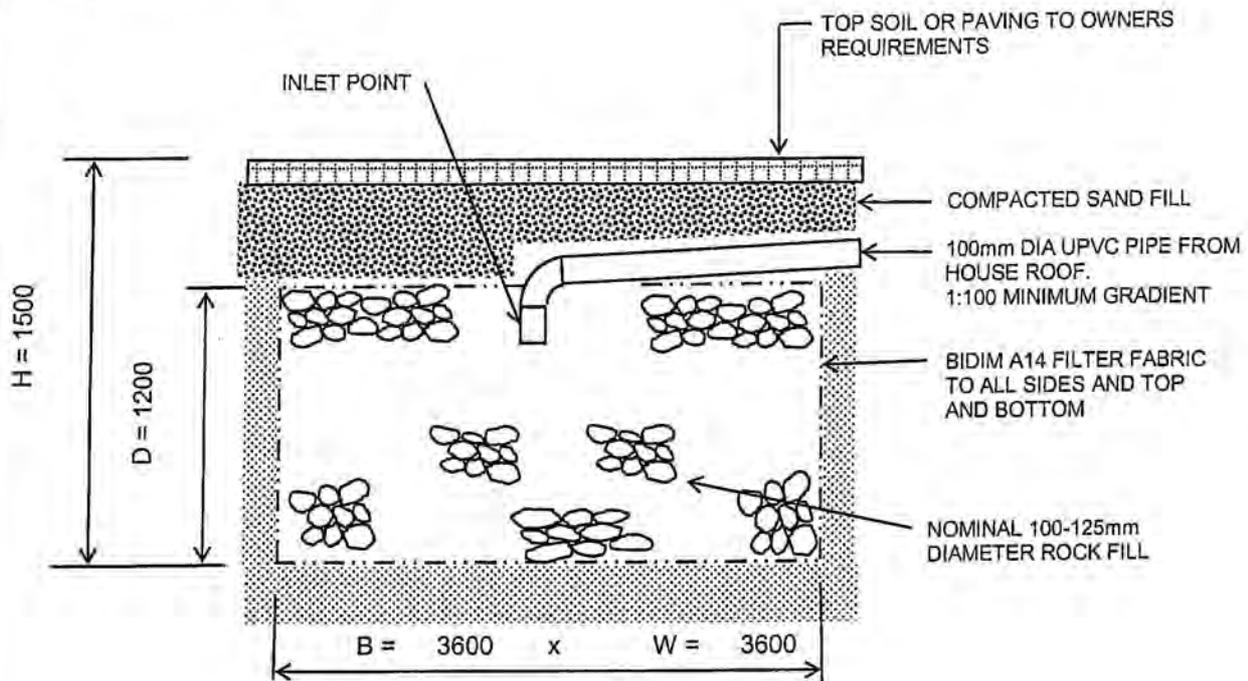
## SOAKAGE PIT DESIGN

Job No.: 17050  
Project Title : 65 Kohkohe Road  
Description : Soak Pit

Page: SP01  
Date : 25/08/2017  
Engineer : CJM

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### ROCK FILLED SOAKAGE PIT



### SOAKAGE PIT - DETAIL

(NTS)

#### NOTES:

- 1) THE CONTRACTOR IS TO CHECK THE SOAKAGE RATE ON SITE ONCE THE LOCATION OF THE SOAK PIT HAS BEEN CONFIRMED PRIOR TO CONSTRUCTION.
- 2) BIDIM A14 FILTER FABRIC TO BE LAPPED AND JOINED AT ALL SIDES AND TOP AND BOTTOM IN ACCORDANCE WITH MANUFACTURER WRITTEN SPECIFICATION
- 3) ROCK FILL TO BE NO FINES CLEAN ROUNDED RIVER STONE BETWEEN 100mm AND 125mm DIAMETER. NO CUT, FRACTURED OR SHARP EDGES ARE PERMITTED. ROCKS BROKEN IN TRANSIT OR ON SITE SHALL NOT BE USED AND SHALL BE REMOVED AND REPLACE FROM SOAK PIT.
- 4) SOAK PIT TO BE INSTALLED AGAINST NATURAL GROUND. DO NOT BACK FILL AGAINST SIDES OF SOAK PIT.
- 5) BACKFILL OVER SOAK PIT WITH MINIMUM 100mm THICKNESS OF CLEAN SAND TO PROTECT FILTER FABRIC. EXCAVATED MATERIAL MAY BE USED OVER THE SAND LAYER. PLACE TOP SOIL AND LANDSCAPE TO OWNER REQUIREMENTS
- 6) PIPES TO BE UPVC SUPPLIED, INSTALLED AND TESTED IN ACCORDANCE WITH AS/NZS 1280, AS/NZS 1254 AND E1/AS1. JOINTS SHALL BE ELASTOMETIC OR SOLVENT WELDED. WORK SHALL BE CARRIED OUT BY A CERTIFIED DRAIN LAYER.
- 7) A CIRTEX RAINSMART MODULAR SYSTEM MAY BE USED IN LIEU OF THE ROCK FILL. THE SYSTEM SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN SPECIFICATION. DIMENSIONS SHALL BE:

B =	2800 mm
W =	2800 mm
D =	1200 mm
H =	1500 mm

300mm MINIMUM GROUND COVER

BC170844  
Further Information Received  
04/12/2017

**GENERAL NOTES:**

- 1) REFER ARCHITECT'S DRAWINGS FOR SETOUT AND DIMENSIONS, UNLESS NOTED OTHERWISE.
- 2) ALL DIMENSIONS TO BE CONFIRMED ON SITE. DO NOT SCALE OFF DRAWINGS
- 3) ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.
- 4) PRODUCT SUBSTITUTIONS SHALL NOT BE MADE OR ALTERNATIVE DETAILS USED WITHOUT PRIOR APPROVAL FROM THE ENGINEER. WORK SHALL BE CONSTRUCTED STRICTLY IN ACCORDANCE WITH APPROVED DRAWINGS. THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR CLARIFICATION PRIOR TO UNDERTAKEN ANY WORK IF THEY CONSIDER THAT THERE ARE ANY ERRORS, DISCREPANCIES OR AMBIGUITIES IN THE DRAWINGS OR UNFORSEEN SITE CONDITIONS MAKE DETAILS IMPRACTICAL TO CONSTRUCT.
- 5) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THE STRUCTURE IS ADEQUATELY SUPPORTED DURING CONSTRUCTION.
- 6) SPECIFIC DESIGN WORK IS TO BE INSPECTED BY THE ENGINEER PRIOR TO CLOSING IN OR BUILDING IN TO THE POINT WHERE REMEDIAL WORK CANNOT BE CARRIED OUT ENGINEER REQUIRES 48 HOUR NOTICE BEFORE ANY INSPECTIONS.
- 7) STRUCTURAL DETAILS OF THE EXISTING BUILDING TO BE CONFIRMED ONSITE WHEN BUILDING HAS BEEN OPENED UP FOR INSPECTION.

**FOUNDATION NOTES:**

- 8) CONTRACTOR TO LOCATE ALL UNDERGROUND SERVICES PRIOR TO COMMENCING AND PROTECT AS NECESSARY.
- 9) ALL TOPSOIL AND OTHER SOFT MATERIAL SHALL BE REMOVED TO ENSURE THAT FOOTINGS ARE FOUNDED ON SOLID GROUND HAVING AN ULTIMATE BEARING CAPACITY NOT LESS THAN 300kPa. CONFIRM ON SITE WITH ENGINEER.
- 10) A MINIMUM OF 150mm FREE DRAINING BASE COURSE SHALL BE PLACED UNDER ANY SLABS. BASECOURSE SHALL BE A WELL GRADED AP20 WITH NOT MORE 5% PASSING 2.2mm SIEVE. PROVIDE MINIMUM 25mm COMPACTED SAND BLINDING TO PROTECT DPM.
- 11) HARDFILL SHALL BE NO FINES QUARRY ROCK OR CLEAN RIVER RUN OR PIT RUN SHINGLE AP60, COMPACTED IN LAYERS NOT EXCEEDING 150mm BY APPROVED VIBRATING COMPACTOR TO ACHIEVE COMPACTION TO NZS 4402. EXCAVATED MATERIAL SHALL NOT BE USED FOR HARDFILL WITHOUT APPROVAL OF THE ENGINEER.
- 12) EXCAVATIONS SHALL BE KEPT FREE OF WATER AT ALL TIMES.
- 13) PILES SHALL BE AUGERED OR HAND DUG TO THE DEPTHS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER ONSITE TO THE REQUIRED BEARING LAYER. CONTRACTOR TO PROVIDE TEMPORARY SHORING/LINERS AS NECESSARY IN SOFT/LOOSE GROUND. PILES SHALL BE POURED AGAINST NATURAL GROUND.
- 14) ENSURE BOTTOM OF PILE HOLES ARE FREE FROM WATER AND LOOSE MATERIAL. COMPACT BASE OF PILE HOLE AS NECESSARY TO ACHIEVE SOLID BEARING.
- 15) PILES SHALL NOT BE EXCAVATED BELOW THE GROUND WATER TABLE. STOP WORK IMMEDIATELY AND CONTACT THE ENGINEER FOR A REVISED FOUNDATION DESIGN SHOULD THE GROUND WATER TABLE BE ENCOUNTERED.
- 16) TIMBER PILES SHALL BE FOUNDED ON AN APPROVED BEARING PAD OR MINIMUM 150MM THICKNESS CONCRETE PLUG.
- 17) TIMBER PILES SHALL BE TREATED TO TPC SPECIFICATION H5. CUT ENDS SHALL NOT BE PLACED IN THE GROUND. CUT ENDS SHALL BE PAINTED WITH AN APPROVED NAPATHENE BASED COATING SUCH AS "METALEX". STEEL SHALL BE SEPARATED FROM THE PILES WITH AN APPROVED PAINT SYSTEM OR DPC.
- 18) FOR DRIVEN PILES THE PILING CONTRACTOR SHALL PROVIDE PILE DRIVING EQUIPMENT DETAILS AND A RECORD OF PILE SETS FOR ALL PILES. PILES SHALL BE DRIVEN WITHIN 50mm OF THE PLAN POSITION AND HAVE A VERTICAL ALIGNMENT OF NOT GREATER THAN 1:200. PILES DRIVEN WITH A VIBRATING HAMMER SHALL HAVE THE SET MEASURED/TESTED WITH A DROP HAMMER FOR NO FEWER THAN 10% OF THE PILES. THE ENGINEER MAY DIRECT FURTHER PILES TO BE TESTED AS REQUIRED.
- 19) CONTRACTOR TO RECORD THE ASBUILT DEPTHS OF ALL PILES.
- 20) BACKFILL AROUND ALL FOUNDATIONS WITH APPROVED CLEAN EXCAVATED SOIL ON COMPLETION.
- 21) REMOVE SURPLUS MATERIAL FROM SITE.

**CONCRETE/MASONRY NOTES :**

- 22) CONCRETE WORK SHALL COMPLY WITH THE REQUIREMENTS OF NZS3109
- 23) ALL MASONRY WORK SHALL COMPLY WITH THE REQUIREMENTS OF NZS 4210. USE 800g/m<sup>3</sup> OF SIKA CAVEX EXPANSION AGENT, OR SIMILAR APPROVED FOR MASONRY BLOCK INFILL.
- 24) VERTICAL CONTROL JOINTS IN BLOCK WALLS SHALL BE PROVIDED AT 6m MAXIMUM CENTRES COMPLYING WITH NZS 4229.
- 25) CONTROL JOINTS IN THE FORM OF 5mm WIDE BY 20mm DEEP SAWCUTS SHALL BE PROVIDED IN ALL SLABS AT NOT MORE THAN 5m CENTRES OR AT THE LOCATIONS SHOWN ON THE DRAWINGS. CUT EACH ALTERNATE MESH BAR BACK 50mm FROM EACH SIDE OF JOINT. WHERE REQUIRED FILL JOINTS WITH FLEXIBLE SEALANT SIKAFLEX 11FC OR SIMILAR APPROVED.
- 26) IF THE MAXIMUM HEIGHT DIMENSIONS OF WALLS VARY FROM THAT SHOWN ON THE DRAWINGS THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY. IT IS THE CONTRACTOR'S RESPONSIBILITY FOR SETOUT ON SITE AND DETERMINING THE ACTUAL WALL HEIGHTS AS THESE MAY VARY FROM THAT SHOWN ON THE DRAWINGS FOLLOWING STRIPPING OF SITE AND EXCAVATION OF FOOTINGS.
- 27) CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 100mm AND BE:
  - SLABS AND FOOTINGS N25 (25MPa)
  - BLOCK FILL N20 (20MPa)
  - PILES N20 (20MPa)
  - TIDY SLABS N10 (10MPa)
  - COASTAL ENVIRONMENT N25 (25MPa)
- 28) ALL REINFORCEMENT SHALL COMPLY WITH AS/NZS4671. BARS DENOTED "HD" SHALL BE GRADE 500E. BARS DENOTED "D" OR "R" SHALL BE GRADE 300E. MESH SHALL BE GRADE 500E.
- 29) MINIMUM CONCRETE COVER SHALL BE:
  - INTERIOR FORMWORK/SLAB 25mm
  - EXTERIOR FORMWORK 50mm
  - DPC 50mm
  - BLOCK WALLS 60mm
  - IN CONTACT WITH GROUND 75mm
- 30) MINIMUM STEEL LAPS SHALL BE:
  - 10mm DIAMETER 400mm
  - 12mm DIAMETER 600mm
  - 16mm DIAMETER 850mm
  - 1.5 X MESH SPACING OR MESH SPACING +50mm WHICHEVER IS GREATER.
- 31) REINFORCING BARS BENT OR FABRICATED ON SITE SHALL BE FABRICATED USING APPROPRIATE EQUIPMENT DESIGN FOR BENDING REINFORCING STEEL. BEND RADIUS SHALL COMPLY WITH NZS3109. HD BARS SHALL NOT BE REBENT.
- 32) WELDING OF REINFORCING STEEL IS NOT PERMITTED.
- 33) REINFORCING STEEL SHALL BE SUPPORTED ON APPROVED CHAIRS AND SPACER AND SECURELY FIXED IN PLACE TO ENSURE THAT THE REINFORCING STEEL DOES NOT MOVE DURING CONCRETE PLACEMENT OR WHILE BEING WALK ON.
- 34) SURFACE FINISHES SHALL BE, UNLESS SHOWN OTHERWISE ON THE ARCHITECTURAL DRAWINGS:
  - SLABS U3
  - EXPOSED FORMWORK F4
- 31) CONCRETE SHALL BE CURED IN ACCORDANCE WITH NZS3109 FOR A MINIMUM PERIOD OF 7 DAYS.
- 32) HOLDING DOWN BOLTS, WELD PLATES AND CASTIN ITEMS SHALL BE CAST INTO THE SLABS, FOOTINGS, WALLS AND BEAMS. BOLTS SHALL BE BENT TO PREVENT ROTATION. BOLTS, WELD PLATES AND CASTIN ITEMS SHALL BE LOCATED WITH AN APPROPRIATE TEMPLATE HELD RIGIDLY IN PLACE DURING THE CONCRETE POUR. PROPRIETARY CHEMICAL OR MECHANICAL BOLT FIXING SHALL NOT BE SUBSTITUTED WITHOUT APPROVAL OF THE ENGINEER.
- 33) RAMSET EPCON C6 EPOXY GROUT (OR SIMILAR APPROVED) SHALL BE USED FOR ALL DRILLED AND EPOXY GROUTED ITEMS AND FIXINGS WHERE SHOWN ON THE DRAWING OR APPROVE BY THE ENGINEER.

**TIMBER NOTES:**

- 34) TIMBER WORK TO BE CARRIED OUT IN GENERAL ACCORDANCE WITH NZS3604 AND NZS 3603.
- 35) UNLESS NOTED OTHERWISE ON DRAWINGS, ALL BOLTED TIMBER CONNECTIONS TO HAVE :
  - 10mm DIA BOLTS TO HAVE 38x38x3 SQUARE WASHER
  - 12mm DIA BOLTS TO HAVE 50x50x3 SQUARE WASHER
  - 16mm DIA BOLTS TO HAVE 65x65x5 SQUARE WASHER
- 36) WASHER AND BOLT HEADS SHALL NOT BE CHECKED INTO THE TIMBER. CONTRACTOR SHALL COORDINATE BRACKET AND CLEAT ORIENTATION WITH SUBTRADES TO ENSURE THAT CHECKING IN OF BOLTS AND WASHER IS NOT REQUIRED. TIMBER THAT HAS BEEN CHECKED FOR WASHER AND BOLTS HEADS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR EXPENSE.
- 37) TIMBER CONNECTIONS NOT SHOWN TO BE IN ACCORDANCE WITH NZS3604. TIMBER SIZES NOT SHOWN REFER ARCHITECT.
- 38) TIMBER TREATMENT TO TCP SPECIFICATIONS, UNLESS SHOWN OTHERWISE ON ARCHITECTURAL DRAWINGS, SHALL BE :
 

- EMBEDDED IN GROUND	H5
- IN CONTACT WITH GROUND	H4
- EXTERIOR TIMBER NOT IN CONTACT WITH GROUND	H3.2
- INTERIOR	H1.2
- 39) TIMBER SHALL BE SEPARATED FROM CONCRETE WITH A MALTHOID DPC OR SIMILAR APPROVED.
- 40) GALVANISED STEEL PLATES AND WASHER SHALL BE GREASED OR SEPARATED FROM TIMBER WITH A TREATMENT H3.1 AND ABOVE.
- 41) ALL FIXINGS SHALL BE STAINLESS STEEL IN COASTAL ENVIRONMENTS

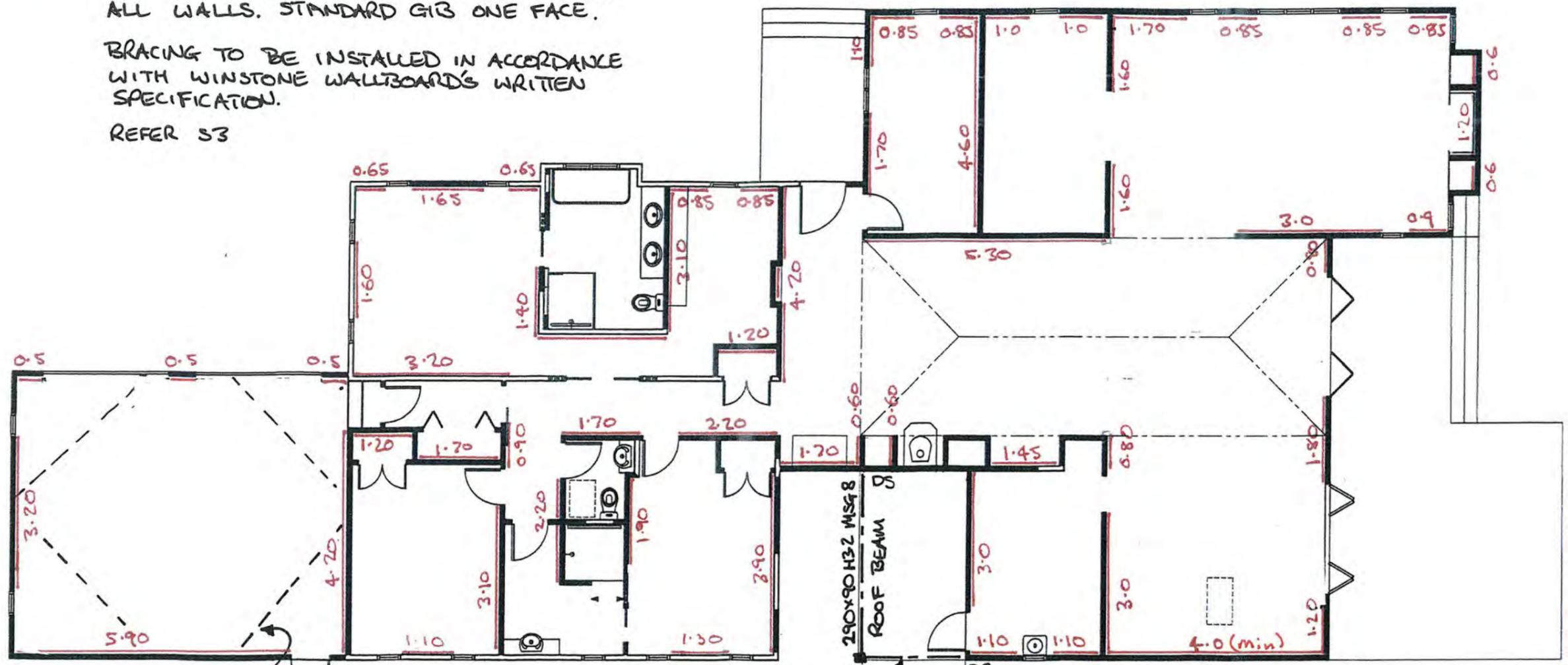
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CLIENT:	G & N HYNDMAN	DATE:	AUG 2017	DRAWN:	CJM
PROJECT:	65 KOHEKOHE ROAD WAIKANAE	JOB No:	17050		
TITLE:	HOUSE ALTERATIONS STANDARD NOTES	SHEET No:	S1	REV:	0

**BRACING KEY:**

1.7 WINSTONE WALLBOARDS GSI-N BRACING ELEMENT (NUMBER DENOTES LENGTH) TO ALL WALLS. STANDARD GIB ONE FACE.  
 BRACING TO BE INSTALLED IN ACCORDANCE WITH WINSTONE WALLBOARDS WRITTEN SPECIFICATION.  
 REFER S3



90x45 DRAGON TIES INSTALLED IN ACCORDANCE WITH FIGURE 8.1 NZS 3604. REFER S3

290x90 H3.2 MSG8 ROOF BEAM  
 190x90 H3.2 MSG8 (ROOF BEAM)  
 90x90 HS MSG8 POST  
 REFER DRAWING S5 FOR BEAM DETAILS  
 DS = DOUBLE STUD.

**PLAN**  
 1:100

BC170844  
 Further Information Received  
 04/12/2017



CLIENT: G & N HYNDMAN	DATE: AUG 2017	DRAWN: CJM
PROJECT: 65 KOHEKOHE ROAD WAIKANAЕ	JOB No: <b>17050</b>	
TITLE: HOUSE ALTERATIONS BEAM AND BRACING PLAN	SHEET No: <b>S2</b>	REV: <b>0</b>

GIB EzyBrace® Systems specification GS1-N

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

**WALL FRAMING**

Wall framing to comply with;

- NZBC B1 – Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 – Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

**BOTTOM PLATE FIXING**

**Timber floor**

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

**Concrete floor**

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and 600mm centres thereafter.

External Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for external wall bottom plate fixing.

**WALL LINING**

- Any 10mm or 13mm GIB® plasterboard lining.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

**PERMITTED ALTERNATIVES**

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

**FASTENING THE LINING**

**Fasteners**

32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

**Fastener centres**

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

**JOINTING**

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.

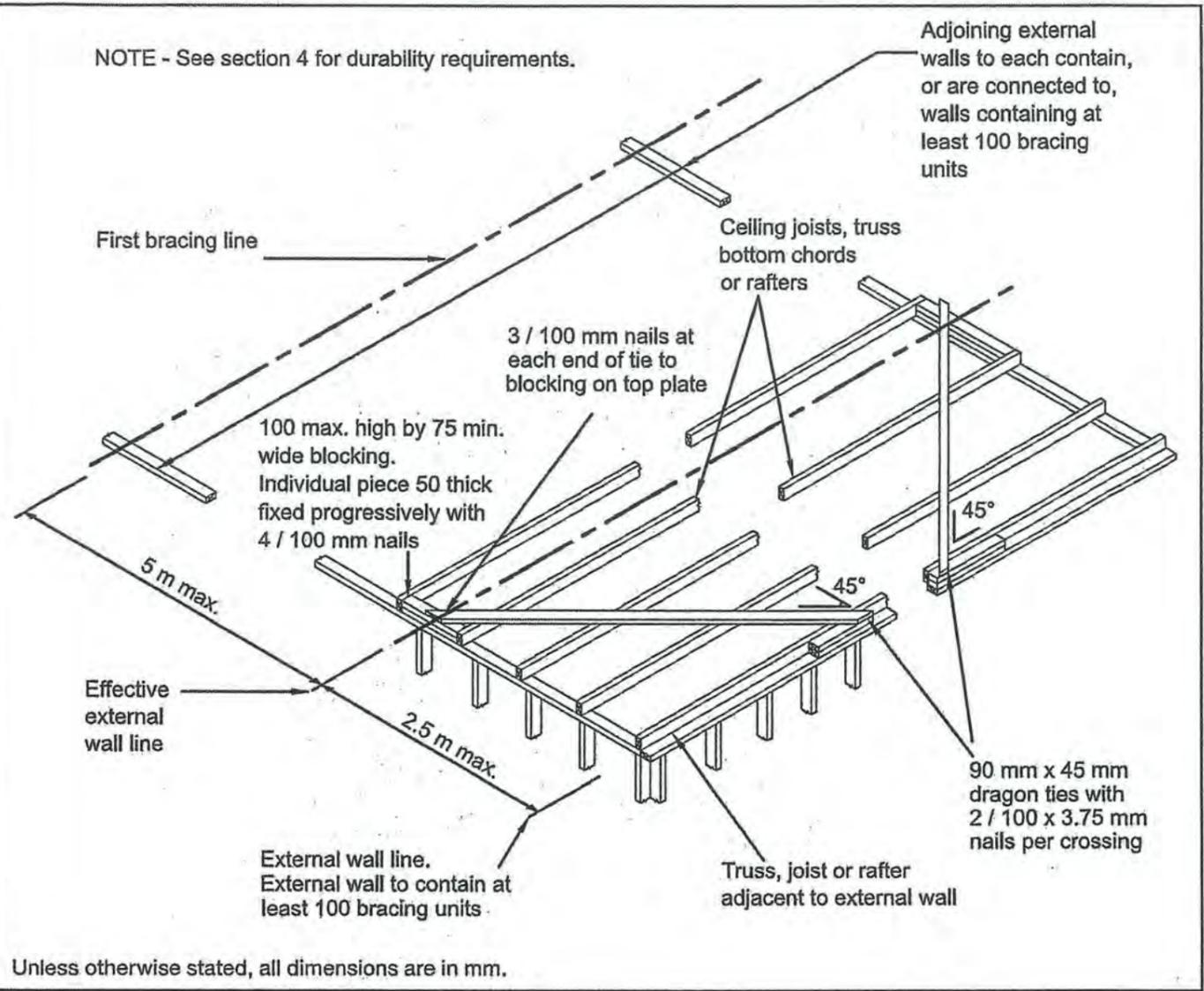
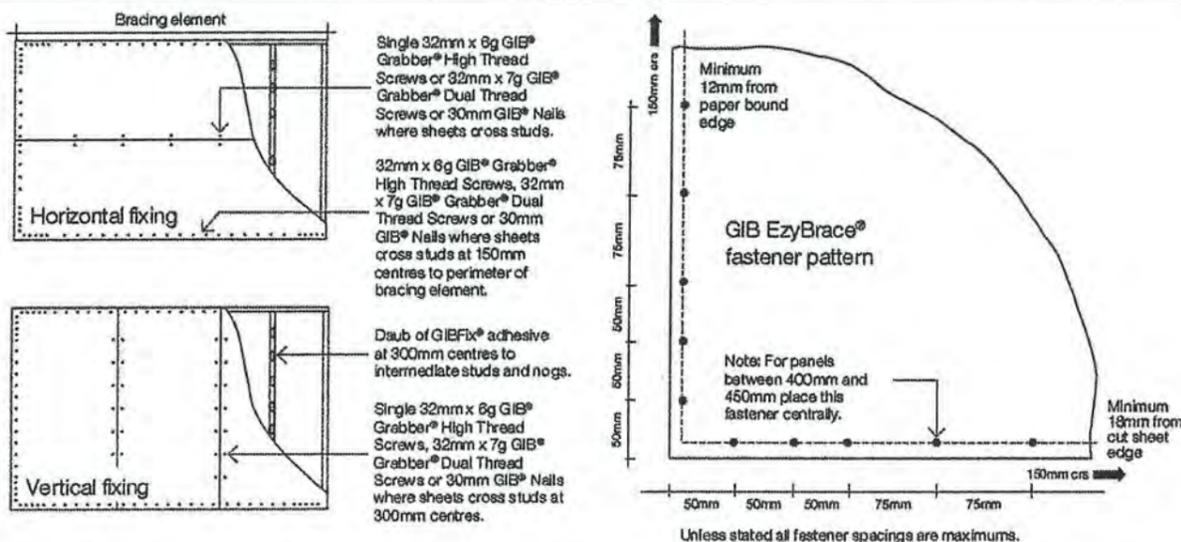


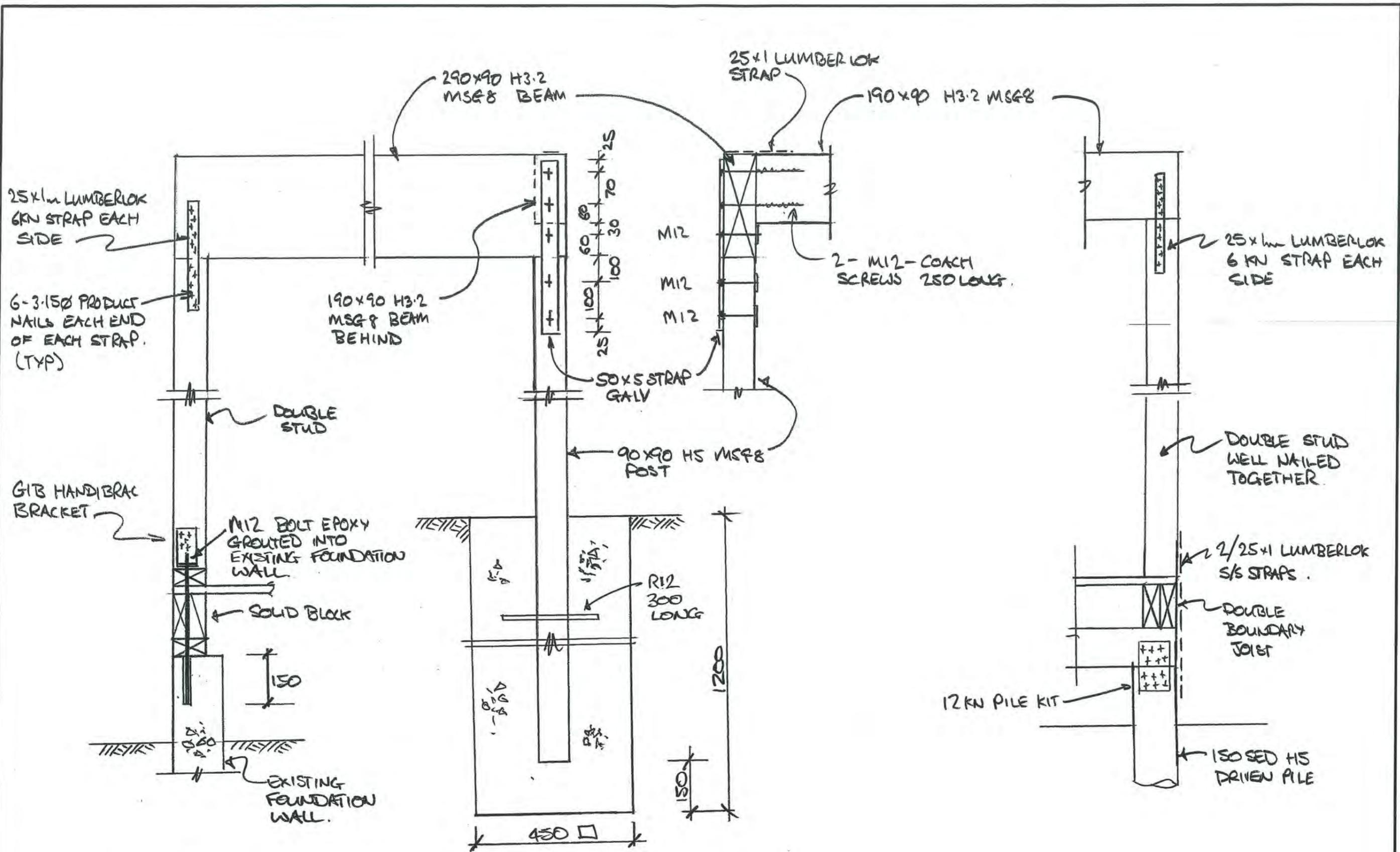
Figure 8.1 – Dragon ties (see 8.3.3.1)



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

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CLIENT:	G & N HYNDMAN	DATE:	AUG 2017	DRAWN:	CJM
PROJECT:	65 KOHEKOHE ROAD WAIKANAE	JOB No:	17050		
TITLE:	HOUSE ALTERATIONS BRACING DETAILS	SHEET No:	S3	REV:	0

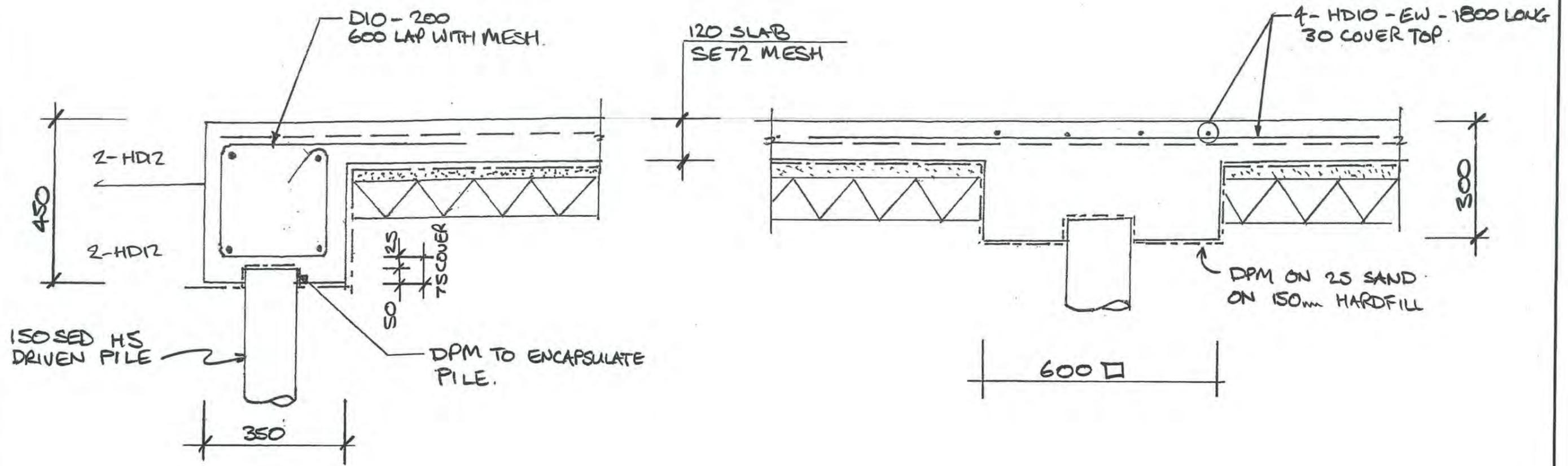


PORCH ROOF BEAM DETAILS.

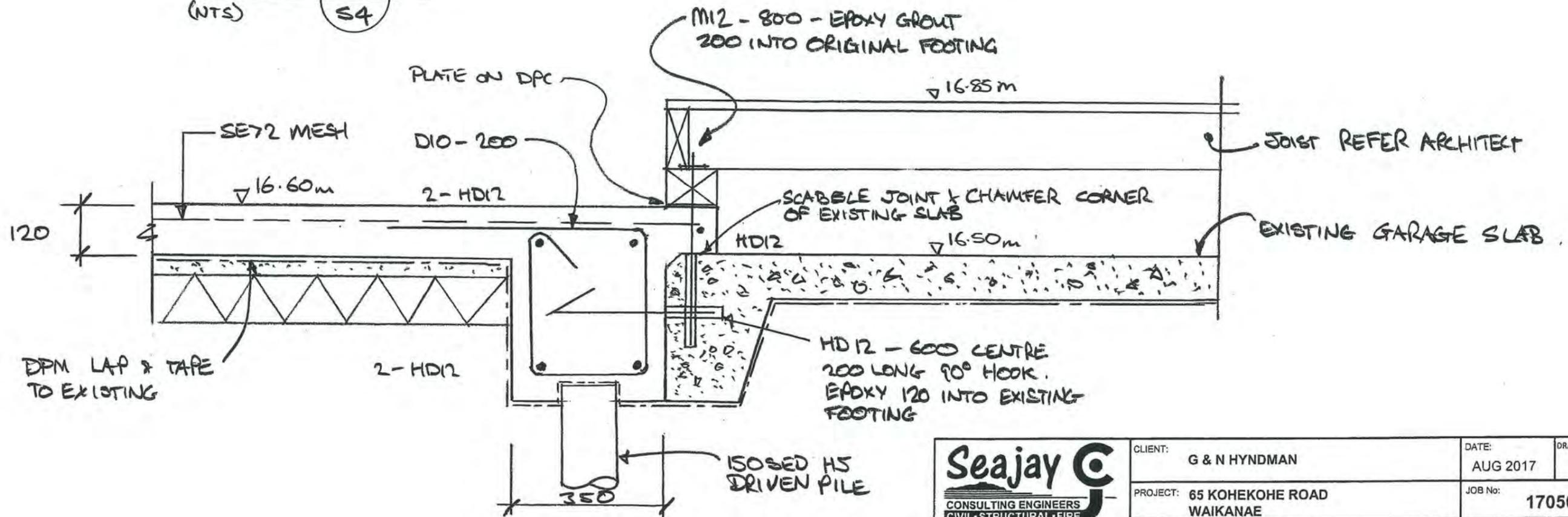
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CLIENT:	G & N HYNDMAN	DATE:	AUG 2017	DRAWN:	CJM
PROJECT:	65 KOHEKOHE ROAD WAIKANAЕ	JOB No:	17050		
TITLE:	HOUSE ALTERATIONS DETAILS 1	SHEET No:	S5	REV:	0

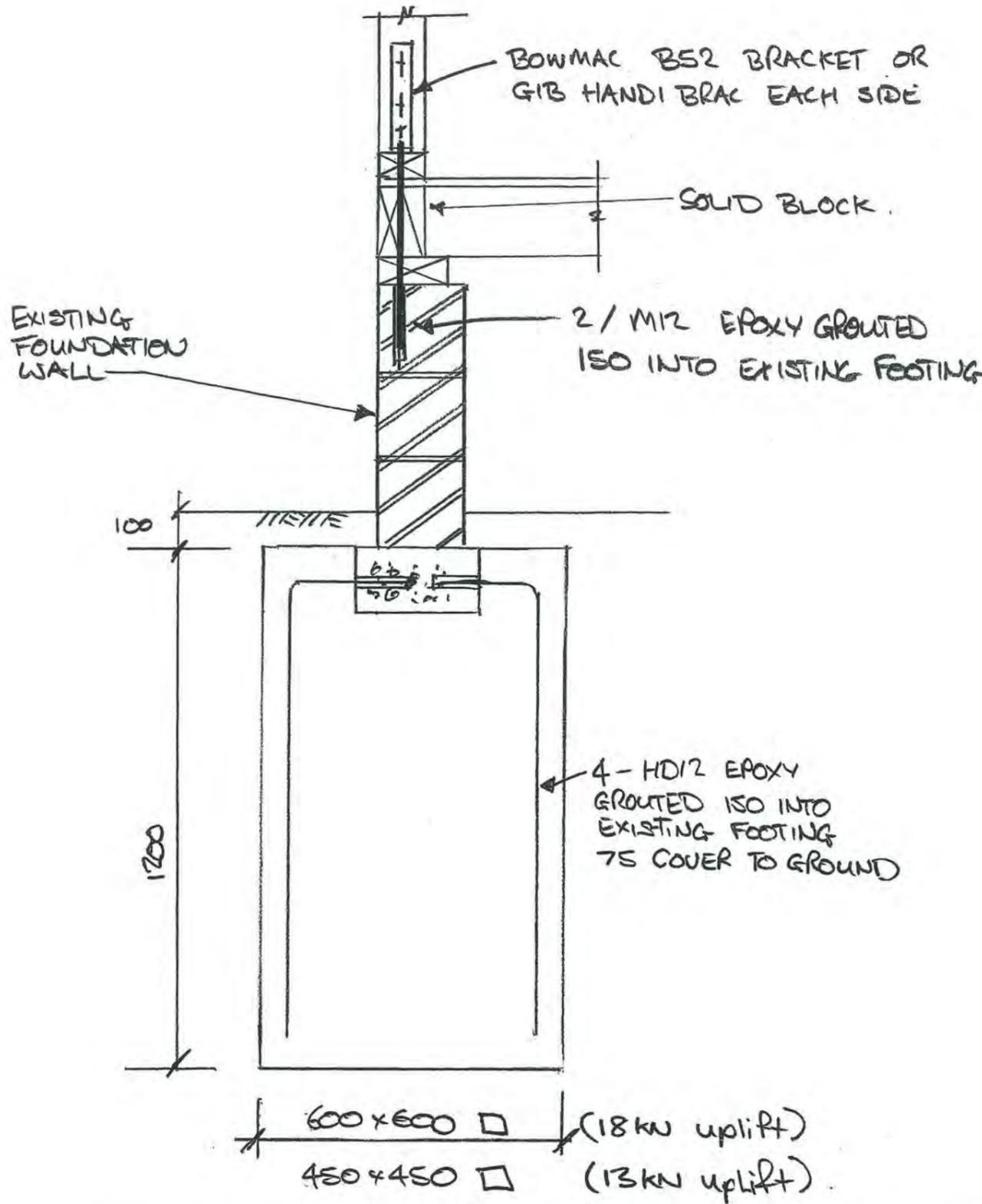


SECTION A  
(NTS) S4

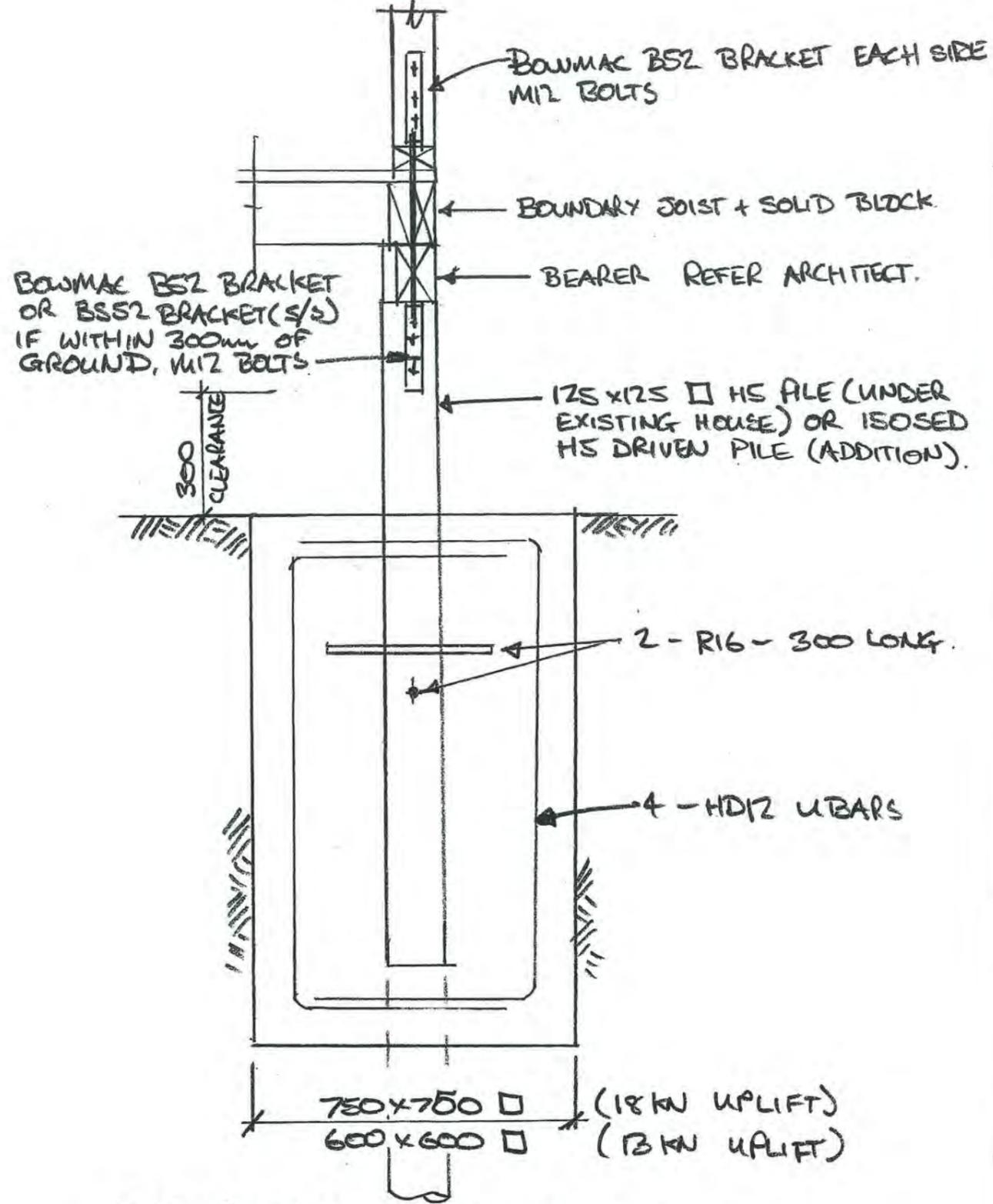


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CLIENT:	G & N HYNDMAN	DATE:	AUG 2017	DRAWN:	CJM
PROJECT:	65 KOHEKOHE ROAD WAIKANAЕ	JOB No:	17050		
TITLE:	HOUSE ALTERATIONS DETAILS 2	SHEET No:	S6	REV:	0



GIRDER TRUSS - UNDER PINNING FOUNDATION DETAIL



GIRDER TRUSS - NEW PILE DETAIL

NOTES:  
 1) CONFIRM GIRDER TRUSS SUPPORT POINTS x UPLIFT LOAD REQUIREMENTS WITH TRUSS MANUFACTURER PRIOR TO CONSTRUCTING FOUNDATIONS.

<b>Seajay</b> CONSULTING ENGINEERS CIVIL • STRUCTURAL • FIRE <small>42 Michael Road, PO Box 1713, Paraparaumu 5252          Phone: (04) 212 5150 • Cell: 021 121 4591          craig@seajay.co.nz</small>	CLIENT: G & N HYNDMAN	DATE: AUG 2017	DRAWN: CJM
	PROJECT: 65 KOHEKOHE ROAD WAIKANAЕ	JOB No: 17050	
	TITLE: HOUSE ALTERATIONS DETAILS 3	SHEET No: S7	REV: 0

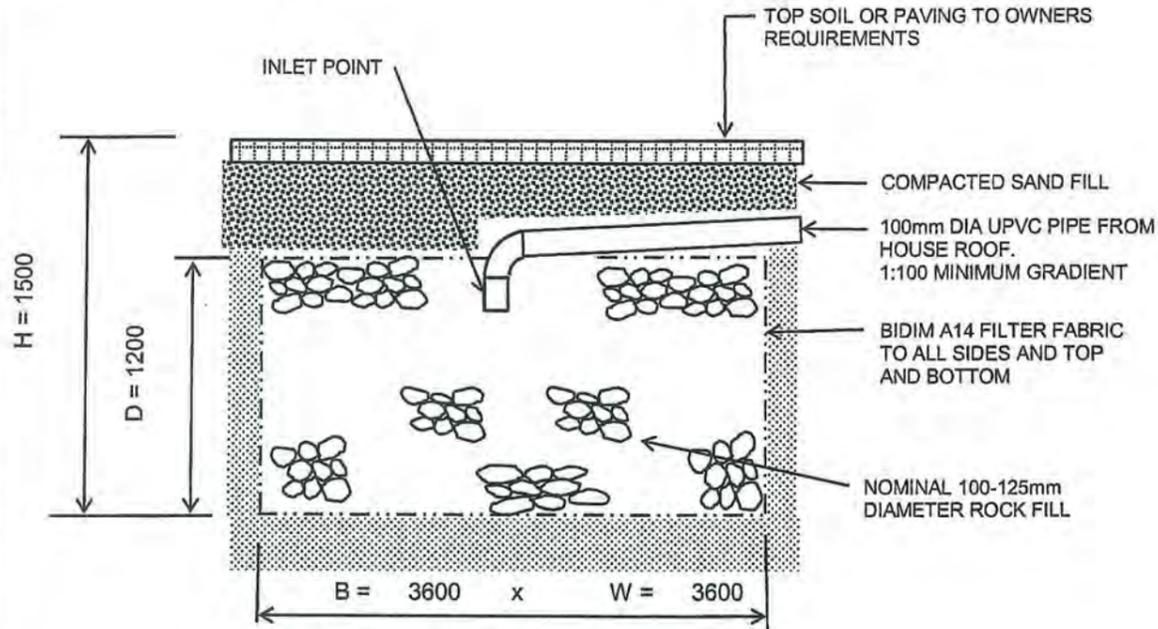
**SOAKAGE PIT DESIGN**

Job No.: 17050  
Project Title : 65 Kohkohe Road  
Description : Soak Pit

Page: SP01  
Date : 25/08/2017  
Engineer : CJM



**ROCK FILLED SOAKAGE PIT**



**SOAKAGE PIT - DETAIL**  
(NTS)

**NOTES:**

- 1) THE CONTRACTOR IS TO CHECK THE SOAKAGE RATE ON SITE ONCE THE LOCATION OF THE SOAK PIT HAS BEEN CONFIRMED PRIOR TO CONSTRUCTION.
- 2) BIDIM A14 FILTER FABRIC TO BE LAPPED AND JOINED AT ALL SIDES AND TOP AND BOTTOM IN ACCORDANCE WITH MANUFACTURER WRITTEN SPECIFICATION
- 3) ROCK FILL TO BE NO FINES CLEAN ROUNDED RIVER STONE BETWEEN 100mm AND 125mm DIAMETER. NO CUT, FRACTURED OR SHARP EDGES ARE PERMITTED. ROCKS BROKEN IN TRANSIT OR ON SITE SHALL NOT BE USED AND SHALL BE REMOVED AND REPLACE FROM SOAK PIT.
- 4) SOAK PIT TO BE INSTALLED AGAINST NATURAL GROUND. DO NOT BACK FILL AGAINST SIDES OF SOAK PIT.
- 5) BACKFILL OVER SOAK PIT WITH MINIMUM 100mm THICKNESS OF CLEAN SAND TO PROTECT FILTER FABRIC. EXCAVATED MATERIAL MAY BE USED OVER THE SAND LAYER. PLACE TOP SOIL AND LANDSCAPE TO OWNER REQUIREMENTS
- 6) PIPES TO BE UPVC SUPPLIED, INSTALLED AND TESTED IN ACCORDANCE WITH AS/NZS 1260, AS/NZS 1254 AND E1/AS1. JOINTS SHALL BE ELASTOMETIC OR SOLVENT WELDED. WORK SHALL BE CARRIED OUT BY A CERTIFIED DRAIN LAYER.
- 7) A CIRTEX RAINSMART MODULAR SYSTEM MAY BE USED IN LIEU OF THE ROCK FILL. THE SYSTEM SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN SPECIFICATION. DIMENSIONS SHALL BE:

B =	2600 mm
W =	2600 mm
D =	1200 mm
H =	1500 mm

300mm MINIMUM GROUND COVER



00028



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PROPOSED ADDITIONS & ALTERATIONS

For

Mr & Mrs Hyndman

At

65 Kohekohe Road  
Waikanae

Risk Matrix  
H1 Calculation  
Truss PS1  
Ventilation & Natural Light Calculations  
Hyspan Lintel

Dated: August 2017

# E2/AS1 : Building Envelope Risk Matrix.

## Project Details.

Name NAME Hyndman  
 Street/No. STREET 65 Kohekohe Road  
 Lot/DP/No. LOT  
 City/Town/District. CITY Waikanae

## Definition of Risk [table 1 from E2/AS1]

Factor	Risk	Detail
A Wind Zone	LOW	LOW wind zone as described by NZS 3604
	MEDIUM	MEDIUM wind zone as described by NZS 3604
	HIGH	HIGH wind zone as described by NZS 3604
	V.HIGH	VERY HIGH wind zone as described by NZS 3604
B No. of storeys	LOW	One storey
	MEDIUM	Two storey in part
	HIGH	Two storeys
	V.HIGH	More than two storeys
C Roof / Wall intersection Design.	LOW	Roof / wall intersection - Fully protected. [eg. hip / gable roof with eaves.]
	MEDIUM	Roof / wall intersection - Partly exposed. [eg. hip / gable roof with NO eaves.]
	HIGH	Roof / wall intersection - Fully exposed. [eg. Parapets or eaves greater than 90° vertical with soffit linings.]
	V.HIGH	Roof elements finished within the boundaries formed by exterior walls [eg. lower ends of aprons, chimney's etc.]
D Eaves width (1.)	LOW	Greater than 600mm at first floor level.
	MEDIUM	450 - 600mm at first floor level, or 600mm at second floor level
	HIGH	100-450mm at first floor level, or 450-600mm at second floor level
	V.HIGH	0 -100mm at first floor level, or 100-450mm at second floor level or 450 - 600mm at third floor level
E Envelope Complexity	LOW	Simple rectangular,L,T, or boomerang shape with single cladding type.
	MEDIUM	Complex angular or curved shape [eg. Y or arrow head] with single cladding type.
	HIGH	Moderately complex angular or curved shape [eg. Y or arrow head] with no more than 2 cladding types.
	V.HIGH	As for high risk, but with junctions not covered in C or F on this Table [eg. box windows, pergola's, multi storey re - entrant shapes etc.]
F Deck design.	LOW	None or timber slat deck or porch at ground level
	MEDIUM	Fully covered in plan by roof, or timber slat deck attached at first or second floor level.
	HIGH	Enclosed deck exposed in plan or cantilevered at first floor level
	V.HIGH	Enclosed deck exposed in plan or cantilevered at second floor level or above.

NOTES  
 1. Eaves width measured from external face of the wall cladding to outer edge of overhang including gutters and fascias  
 2. Balustrades and parapets count as 0 mm eaves.

## Risk Severity by Face

West Elevation									
RISK FACTOR	LOW	Score	MED	Score	HIGH	Score	V.HIGH	Score	Sub totals for each risk factor.
Wind Zone as NZS 3604	0		0		1	✓	2		1
No. of storey's	0	✓	1		2		4		0
Roof / Wall intersection	0	✓	1		3		5		0
Eaves width.	0	✓	1		2		5		0
Envelope Complexity	0	✓	1		3		6		0
Deck design.	0	✓	2		4		6		0
<b>Total Risk Score for this Elevation</b>									<b>1</b>

East Elevation									
RISK FACTOR	LOW	Score	MED	Score	HIGH	Score	V.HIGH	Score	Sub totals for each risk factor.
Wind Zone as NZS 3604	0		0		1	✓	2		1
No. of storey's	0	✓	1		2		4		0
Roof / Wall intersection	0	✓	1		3		5		0
Eaves width.	0	✓	1		2		5		0
Envelope Complexity	0	✓	1		3		6		0
Deck design.	0	✓	2		4		6		0
<b>Total Risk Score for this Elevation</b>									<b>1</b>

North Elevation									
RISK FACTOR	LOW	Score	MED	Score	HIGH	Score	V.HIGH	Score	Sub totals for each risk factor.
Wind Zone as NZS 3604	0		0		1	✓	2		1
No. of storey's	0	✓	1		2		4		0
Roof / Wall intersection	0	✓	1		3		5		0
Eaves width.	0	✓	1		2		5		0
Envelope Complexity	0	✓	1		3		6		0
Deck design.	0	✓	2		4		6		0
<b>Total Risk Score for this Elevation</b>									<b>1</b>

South Elevation									
RISK FACTOR	LOW	Score	MED	Score	HIGH	Score	V.HIGH	Score	Sub totals for each risk factor.
Wind Zone as NZS 3604	0		0		1	✓	2		1
No. of storey's	0	✓	1		2		4		0
Roof / Wall intersection	0	✓	1		3		5		0
Eaves width.	0	✓	1		2		5		0
Envelope Complexity	0	✓	1		3		6		0
Deck design.	0	✓	2		4		6		0
<b>Total Risk Score for this Elevation</b>									<b>1</b>

## Selected Cladding Resulting from Risk Assessment

	Risk score from tables above.	Cladding Selected from table 3 [ from tables on page 30 E2/AS1 ]	TICK SELECTED OPTION	
			DIRECT FIXED	DRAINED CAVITY
West Elevation	1	H3,1 Bevel back pine weatherboards		✓
North Elevation	1	H3,1 Bevel back pine weatherboards		✓
East Elevation	1	H3,1 Bevel back pine weatherboards		✓
South Elevation	1	H3,1 Bevel back pine weatherboards		✓



# Design Navigator H1 Compliance Report

## Project Summary

H1 Report created by:	kapiti architectural design limited
Project Name:	Hyndman
Client:	
Lot No:	65 Kohekohe Road
Comment:	
Project Id:	103424
Report Date:	21/08/2017

## Compliance Result

This report shows compliance of the design with Clause H1 Fourth edition Amendment 3 from January 2017 and the R-value targets of Clause E3 Second edition Amendment 6 from January 2017.

This building complies with H1 via the following methods:

- the Schedule Method in NZS4218:2009
- the Calculation Method in NZS4218:2009

## H1 Compliance Details

### NZS4218:2009 Schedule Method Compliance

The use of the Schedule Method is permitted .

In order to comply the R-values for all the construction elements must be the same or larger than the permitted minimum R-values. This design **complies** with the NZS4218:2009 Schedule Method.

<b>Non-Solid Construction</b>			
	Permitted Minimum	Proposed Minimum	
Floor:	1.3	2.97	✓
Non-solid Walls:	1.9	2.24	✓
Glazing in Non-solid Walls:	0.26	0.26	✓
Roof:	2.9	2.99	✓
Skylights:	0.26	0.53	✓

#### Notes:

If multiple solid wall types levels are used the table shows the requirements for the corresponding walls and windows in them. For solid timber and for other solid constructions two options are shown for each. But the components of these options can not be mixed, i.e. it is not permitted to use the solid timber wall R-value from option 1 and the solid timber window R-value from option 2.

### NZS4218:2009 Calculation Method Compliance

The use of the Calculation Method is permitted .

In order to comply the Actual Heat Loss must be the same or smaller than the Reference Heat Loss AND all component R-values must be the same or larger than 50% of the R-values in the '50% Rule' table below. This design **complies** with the NZS4218:2009 Calculation Method.

**HeatLoss:**

Reference building	Proposed building
591	372

**Minimum R-values ("50% rule"):**

	Permitted Minimum	Proposed Minimum	
Floor:	0.65	2.97	✓
Non-solid Walls:	0.95	2.24	✓
Roof:	1.45	2.99	✓

The Reference building has the following areas and R-values.

		Non-solid	Solid Timber	Other Solid
		100.0	0.0%	0.0%
Floor:	Area: 250 m <sup>2</sup> R-values:	1.3	1.3	1.5
Walls excl. glazing:	Area: 143.6 m <sup>2</sup> R-values:	1.9	1.2	1
Glazing (up to 30%):	Area: 61.5 m <sup>2</sup> R-values:	0.26	0.26	0.26
Glazing (surplus of 30%):	Area: 0 m <sup>2</sup> R-values:	0.4	0.34	0.31
Roof:	Area: 250.1 m <sup>2</sup> R-values:	2.9	3.5	3.5
<b>Heat Loss:</b>		591	620	618

For mixed constructions the heat loss of the reference building is calculated as the sum of the heat losses for each type of wall construction multiplied by the fraction of the wall area of each type. This approach is based on clause 4.2.6 of NZS4218:2009. There are no skylights in the reference building. The reference building roof area is the sum of the proposed building roof and skylight areas.

**Compliance with Clause E3**

This building complies with the R-value targets in NZBC Clause E3 .

Component	Minimum R-value	Project R-value
Framed wall constructions with cavities	1.5	2.24
Single skin masonry wall without a cavity	0.6	
Solid timber wall no less than 60 mm thick	0.6	
Roof or ceilings	1.5	2.99

## Design Details

### Building Dimensions

Floor Area	<input type="text" value="250"/> m <sup>2</sup>
Gross Wall Area	<input type="text" value="205.2"/> m <sup>2</sup>
Net Wall Area	<input type="text" value="173"/> m <sup>2</sup>
Wall (North) Area	<input type="text" value="33.4"/> m <sup>2</sup>
Wall (East, South and West) Area	<input type="text" value="139.6"/> m <sup>2</sup>
Gross Roof Area	<input type="text" value="250.1"/> m <sup>2</sup>
Net Roof Area	<input type="text" value="248"/> m <sup>2</sup>
Glazing Area	<input type="text" value="34.2"/> m <sup>2</sup>
Window (North) Area	<input type="text" value="10.6"/> m <sup>2</sup>
Window (East, South and West) Area	<input type="text" value="21.6"/> m <sup>2</sup>
Skylight Area	<input type="text" value="2.1"/> m <sup>2</sup>

### Glazing Areas

Total Vertical Glazing Percentage	<input type="text" value="15.7"/> %
East, South and West Window Percentage	<input type="text" value="13.4"/> %
Total over 30%	<input type="text" value="no"/>
East, South and West over 30%	<input type="text" value="no"/>
Total over 50%	<input type="text" value="no"/>
max. Skylight Area for Schedule Method	<input type="text" value="3.75"/> m <sup>2</sup>
Skylights over Schedule Method Limit	<input type="text" value="no"/>
Decorative Glazing	<input type="text" value="0"/> m <sup>2</sup>
Decorative Glazing over 3m <sup>2</sup>	<input type="text" value="no"/>

### Information required for BPI calculation

Living Floor Area	<input type="text" value="0"/> m <sup>2</sup> Note: This includes also internal floors.
Average Room Height	<input type="text" value="0"/> m

### Thermal Mass Level

Suspended timber floor with timber framed walls or a heavily carpeted slab floor with timber framed walls.

### Climate

Location	<input type="text" value="Paraparaumu"/>
Climate Zone	<input type="text" value="2"/>

## Heat Loss Details

	ID	Orient.	Width	Height	Gross Area	Net Area	R-value*	Heat Loss	Shad. Coeff.**	Solid Wall***
<i>Floors</i>										
Floor 1	1				250.0	250.0	2.97	84.2		
<i>Walls</i>										
Wall 1	1	E	9.2	2.4	22.3	18.6	2.24	8.3		C
Window 1-1	W13		0.5	1.4		0.7	0.26	2.7	0.00	
Window 1-2	W14		0.5	1.4		0.7	0.26	2.7	0.00	
Window 1-3	W15		0.5	1.4		0.7	0.26	2.7	0.00	
Window 1-4	W16		0.6	1.4		0.8	0.26	3.2	0.00	
Window 1-5	W17		0.5	1.4		0.7	0.26	2.7	0.00	
Wall 2	2	N	4.0	2.4	9.7	9.7	2.24	4.3		C
Wall 3	3	E	4.0	2.4	9.8	9.8	2.24	4.4		C
Wall 4	4	S	4.0	2.4	9.7	7.9	2.24	3.5		C
Window 4-1	W18		0.9	2.1		1.8	0.26	7.0	0.00	
Wall 5	5	E	7.8	2.4	18.8	18.3	2.24	8.2		C
Window 5-1	W19		0.5	1.0		0.5	0.26	1.9	0.00	
Wall 6	6	N	9.0	2.4	21.7	13.6	2.24	6.1		C
Window 6-1	W20		2.4	1.1		2.6	0.26	10.2	0.00	
Window 6-2	W21		2.6	2.1		5.5	0.26	21.0	0.00	
Wall 7	7	E	2.6	2.4	6.3	5.6	2.24	2.5		C
Window 7-1	W22		0.5	1.4		0.7	0.26	2.7	0.00	
Wall 8	8	N	0.9	2.4	2.2	0.9	2.24	0.4		C
Window 8-1	W23		0.6	2.1		1.3	0.26	4.8	0.00	
Wall 9	9	E	0.6	2.4	1.4	1.4	2.24	0.6		C
Wall 10	10	N	3.1	2.4	7.4	7.4	2.24	3.3		C
Wall 11	11	W	0.6	2.4	1.4	1.4	2.24	0.6		C
Wall 12	12	N	0.9	2.4	2.2	0.9	2.24	0.4		C
Window 12-1	W24		0.6	2.1		1.3	0.26	4.8	0.00	
Wall 13	13	W	12.7	2.4	30.7	24.7	2.24	11.0		C
Window 13-1	W25		0.6	2.1		1.3	0.26	4.8	0.00	
Window 13-2	W26		0.6	2.1		1.3	0.26	4.8	0.00	
Window 13-3	W27		0.6	2.1		1.3	0.26	4.8	0.00	
Window 13-4	W28		0.6	2.1		1.3	0.26	4.8	0.00	
Window 13-5	W30		1.8	0.5		0.9	0.26	3.5	0.00	
Wall 14	14	S	3.7	2.4	8.9	7.8	2.24	3.5		C
Window 14-1	W29		1.0	1.1		1.1	0.26	4.2	0.00	
Wall 15	15	W	4.8	2.4	11.5	8.7	2.24	3.9		C
Window 15-1	W1		1.0	2.1		2.1	0.26	8.2	0.00	

	ID	Orient.	Width	Height	Gross Area	Net Area	R-value*	Heat Loss	Shad. Coeff.**	Solid Wall***
Window 15-2	W2		0.6	1.1		0.7	0.26	2.5	0.00	
Wall 16	16	N	0.4	2.4	0.9	0.9	2.24	0.4		C
Wall 17	17	W	2.2	2.4	5.2	3.9	2.24	1.7		C
Window 17-1	W3		1.2	1.1		1.3	0.26	5.1	0.00	
Wall 18	18	S	0.4	2.4	0.9	0.9	2.24	0.4		C
Wall 19	19	W	4.1	2.4	9.9	7.4	2.24	3.3		C
Window 19-1	W4		0.6	2.1		1.3	0.26	4.8	0.00	
Window 19-2	W5		0.6	2.1		1.3	0.26	4.8	0.00	
Wall 20	20	S	4.1	2.4	9.8	8.6	2.24	3.9		C
Window 20-1	W6		0.5	1.2		0.6	0.26	2.3	0.00	
Window 20-2	W7		0.5	1.2		0.6	0.26	2.3	0.00	
Wall 21	21	S	6.1	2.4	14.7	14.7	2.24	6.6		C

#### Roofs

Roof 1	1				250.0	248.0	2.99	82.9		
Skylight 1-1	1		1.0	0.6		0.5	0.53	1.0	0.00	
Skylight 1-2	2		1.0	0.6		0.5	0.53	1.0	0.00	
Skylight 1-3	3		1.0	0.6		0.5	0.53	1.0	0.00	
Skylight 1-4	4		0.8	0.6		0.4	0.53	0.8	0.00	

#### Total Heat Loss

372

\* Any concrete slab-on-ground floor regardless of its dimensions can be assumed to have an R-value of at least R-1.3 (H1/AS1 2.1.5).

\*\* The Shading Coefficient is only required for BPI calculations.

\*\*\* C: Cavity Construction (any construction that is not solid), T: Solid Timber, S: Other Solid Construction (Note that the use of solid timber and other solid construction types is discretionary, i.e. solid timber walls and other solid walls can be treated as if they are non-solid (NZS4218:2009 section 4.1.3.).)

## Floor Construction Details

<b>Name:</b>	Floortype 1	2.97 m <sup>2</sup> K/W
	Type: Floor: Suspended Floor (no lining)	
internal surface 0.09		
Flooring : 20mm Particle Board ▼		
R-value: 0.17		
Timber Frame & Cavity : 140mm joists @ 400mm ▼		
Floor Frame Area: 11.3%		Cavity Area: 88.7%
Framing : R-value: 1.16	Expol Underfloor R-2.8 Wooden Floor (Dbl Layer) 2.8	
Insulation value of the subfloor space		
Suspended floor area [m <sup>2</sup> ]: 250		
Perimeter length [m]: 85		
Perimeter height [m]: 0.5		
Perimeter type: Continuous perimeter wall (sheltered) ▼		

## Wall Construction Details

<b>Name:</b>	Walltype 1	2.24 m <sup>2</sup> K/W
	Type: Wall: Timber frame (direct fixed cladding)	
external surface 0.03		
Cladding : Bevelled weatherboard with building paper ▼		
R-value: 0.28		
Air Barrier : none ▼		
R-value: 0.00		
Timber Frame & Cavity : 90mm, studs @ 400mm, dwangs @ 800mm ▼		
Wall Frame Area: 17.9%		Cavity Area: 82.1%
Framing : R-value: 0.75	Pink®Batts® Ultra R2.6 Wall 2.6	
	still Airgap: none ▼	
	R-value: 0.00	
Wall Lining : Gypsum plasterboard 10mm ▼		
R-value: 0.04		
internal surface 0.09		

<b>Name:</b>	Walltype 2	2.06 m <sup>2</sup> K/W
	Type: Wall: Timber frame (direct fixed cladding)	
external surface 0.03		
Cladding : Gypsum plasterboard 10mm into still air (garage, etc.) ▼		
R-value: 0.10		
Air Barrier : none ▼		
R-value: 0.00		
Timber Frame & Cavity : 90mm, studs @ 400mm, dwangs @ 800mm ▼		
Wall Frame Area: 17.9%		Cavity Area: 82.1%
Framing : R-value: 0.75	Pink®Batts® Ultra Steel R2.6 Wall 2.6	
	still Airgap: none ▼	
	R-value: 0.00	
Wall Lining : Gypsum plasterboard 10mm ▼		
R-value: 0.04		
internal surface 0.09		

## Roof Construction Details

<b>Name:</b>	Rooftype 1	2.99 m <sup>2</sup> K/W
Type: Roof: Timber framed roof, direct fixed or battened flat ceiling		
external surface 0.03		
Roofing : Corrugate iron with building paper ▼		
R-value: 0.01		
Insulation :		
Timber Frame & Cavity : 90mm rafters or joists @ 900mm, blocking @ 900mm ▼		
Roof Frame Area: 9.8%		Cavity Area: 90.2%
Roof space (still air) 0.11	Roof space (still air) 0.11	
Framing : R-value: 0.75	Pink®Batts® R3.6 Ceiling 3.6	
Roof Lining : Gypsum plasterboard 13mm ▼		
R-value: 0.06		
internal surface 0.09		
Recessed downlights		
Ceiling Area [m <sup>2</sup> ]: _ Number of downlights: _ Clearance from lamp holder side [m]: _		



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

CHRISTCHURCH  
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PO Box 8387, Riccarton 8440  
Phone: 03 348 8691  
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MiTek 20/20 Engineering 4.7.184.0

www.mitek.nz.co.nz

Printed: 10:18:57 26 Oct 2017

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

ISSUED BY: MiTek New Zealand Limited  
TO: Pre-Nail Systems LTD  
IN RESPECT OF: MiTek<sup>®</sup> Truss Designs

This producer statement covers the MiTek 20/20<sup>®</sup> truss design and the structural performance of the GANG-NAIL<sup>®</sup> connector plate for the job reference **Q93082** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20<sup>®</sup> truss design program has been developed by MiTek New Zealand Limited for the design of MiTek<sup>®</sup> timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20<sup>®</sup> are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution, to satisfy the requirements of Clauses B1 and B2 of the New Zealand Building Code.

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

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

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

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

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

**Date: Thursday, 26 October 2017**

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

Job: Q93082

Client: Mitre 10 MEGA Kapiti  
Phone:

Site: Hyndman  
65 Kohekohe Road  
Waikanae

Description:  
Building Consent No.:  
MiTek 20/20 Engineering 4.7.184.0

MiTek New Zealand Limited

Phone:

Printed: 10.10.2017 26 Oct 2017

**MITEK FABRICATOR DESIGN STATEMENT**

This statement is issued by MiTek accredited fabricator Pre-Nail Systems LTD, being licensed to use the MiTek 20/20\* software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

**MiTek 20/20\* TRUSS DESIGN DATA**

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

<b>Job Details</b>		Importance Level :	2	Design Working Life :	50 years
<b>Roof Truss</b>		Pitch:	20.000 deg	Nominal Overhang:	600 mm
Timber Group:	PNS MSG H1.2	Celling		Wind Area:	High (44.0 m/s)
Roof		Material:	Standard	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Material:	Galv Iron .5mm	Dead Load:	0.200 kPa		
Dead Load:	0.210 kPa	Restraints:	400 mm centres		
Restraints:	900 mm centres	Live Load:	Qc = 1.400 kN		
Live Load:	Qur = 0.250 kPa				
	Qc = 1.100 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, Fx = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required  
GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
*HB01	2	5123	14.433	900	*T05	1	913	20.000	900	*R01B	1	935	20.000	900
*HB02	1	4149	14.433	900	T06	5	6090	20.000	900	*R01C	1	935	20.000	900
*HB03	3	7951	14.433	900	T07	2	6035	20.000	833	*R03A	4	913	20.000	900
*HB04	2	4246	14.433	900	V01	1	4325	20.000	900	*R04A	1	1658	20.000	900
J03	1	1222	20.000	900	V02	1	2525	20.000	900	*R05A	1	1668	20.000	900
J04	1	3860	20.000	900	V04	1	4415	20.000	900	TG02	1D	10090	20.000	900
J06	1	2060	20.000	900	V05	1	2795	20.000	900	TG05	1D	10090	20.000	900
J07	1	1945	20.000	900	V06	1	1175	20.000	900	J02A	1	2122	20.000	900
J08	1	3755	20.000	900	V07	1	4470	20.000	900	J02B	1	2122	20.000	900
J10	1	1955	20.000	900	V08	1	2850	20.000	900	J02C	1	2122	20.000	900
*R01	1	935	20.000	900	V09	1	1230	20.000	900	J05	1	2960	20.000	900
*R02	1	1773	20.000	900	J02	1	2122	20.000	900	J09	1	2855	20.000	900
*R03	5	913	20.000	900	J03A	1	1222	20.000	900	T08	1D	6035	20.000	833
*R04	1	1658	20.000	900	J04A	1	3860	20.000	900	TG03	1	4850	20.000	900
*R05	1	1668	20.000	900	J04B	1	3860	20.000	900	J01	1	3022	20.000	900
R06	4	3351	20.000	900	J04D	1	3860	20.000	900	J05A	1	2960	20.000	900
*R07	4	2700	20.000	900	J06A	1	2080	20.000	900	J09A	1	2855	20.000	900
*R08	4	2503	20.000	900	J07A	1	1945	20.000	900	J09B	1	2855	20.000	900
*R09	4	2520	20.000	900	J07B	1	1945	20.000	900	J09C	1	2855	20.000	900
S01	1	4215	20.001	900	J07C	1	1945	20.000	900	J01A	1	3022	20.000	900
S02	1	4215	20.000	900	J07D	1	1945	20.000	900	J01B	1	3022	20.000	900
S03	1	4215	20.000	900	J08A	1	3755	20.000	900	J04C	1	3860	20.000	900
S04	1	4215	20.000	900	J08B	1	3755	20.000	900	J08C	1	3755	20.000	900
S05	1	4215	20.000	900	J08E	1	3755	20.000	900	J08D	1	3755	20.000	900
S06	1	4215	20.000	900	J10A	1	1955	20.000	900	T01	1	6090	20.000	900
S07	1	4215	0.000	900	J10B	1	1955	20.000	900	TG01	1D	10090	20.000	900
T02	1	3860	20.000	900	J10C	1	1955	20.000	900	TG04	1	10090	20.000	900
T03	3	3860	20.000	900	*R01A	1	935	20.000	900	T04	1D	4850	20.000	900

Total quantity : 114

The computer design input has been carried out by:

Signed: *[Signature]*  
Name of Detailer: *[Signature]*

On behalf of: Pre-Nail Systems LTD

Date: ...Thursday, 26 October 2017...

Qualifications and Title: Estimator/Detailer





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  
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MiTek 20/20 Engineering 4.7.184.0

www.mitek.nz.co.nz

Printed: 10:18:57 26 Oct 2017

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

ISSUED BY: MiTek New Zealand Limited  
TO: Pre-Nail Systems LTD  
IN RESPECT OF: MiTek<sup>®</sup> Truss Designs

This producer statement covers the MiTek 20/20<sup>®</sup> truss design and the structural performance of the GANG-NAIL<sup>®</sup> connector plate for the job reference **Q93082** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20<sup>®</sup> truss design program has been developed by MiTek New Zealand Limited for the design of MiTek<sup>®</sup> timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20<sup>®</sup> are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution, to satisfy the requirements of Clauses B1 and B2 of the New Zealand Building Code.

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

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

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

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

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

**Date: Thursday, 26 October 2017**

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

Job: Q93082

Client: Milre 10 MEGA Kapiti  
Phone:

Site: Hyndman  
65 Kohokohe Road  
Waikanae

Description:  
Building Consent No.:  
MiTek 20/20 Engineering 4.7.194.0

MiTek New Zealand Limited

Phone:

Printed: 10:18:57 26 Oct 2017

### MITEK FABRICATOR DESIGN STATEMENT

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

#### MiTek 20/20® TRUSS DESIGN DATA

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

<b>Job Details</b>		Importance Level :	2	Design Working Life :	50 years
<b>Roof Truss</b>		Pitch:	20.000 deg	Nominal Overhang:	800 mm
Timber Group:	PNS MSG H1.2	Material:	Standard	Area:	High (44.0 m/s )
Roof		Dead Load:	0.200 kPa	Pressure Coeff:	C <sub>pe</sub> = varies; C <sub>pi</sub> = -0.30, 0.20
Material:	Galv Iron .5mm	Restraints:	400 mm centres		
Dead Load:	0.210 kPa	Live Load:	Q <sub>c</sub> = 1.400 kN		
Restraints:	900 mm centres				
Live Load:	Q <sub>ur</sub> = 0.250 kPa				
	Q <sub>c</sub> = 1.100 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, ~~xxx~~ = failed design, ∅ = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required  
GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
*HB01	2	5123	14.433	900	*T05	1	913	20.000	900	*R01B	1	935	20.000	900
*HB02	1	4149	14.433	900	T06	5	6090	20.000	900	*R01C	1	935	20.000	900
*HB03	3	7951	14.433	900	T07	2	6035	20.000	833	*R03A	4	813	20.000	900
*HB04	2	4246	14.433	900	V01	1	4325	20.000	900	*R04A	1	1658	20.000	900
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J06	1	2060	20.000	900	V05	1	2795	20.000	900	TG05	1D	10090	20.000	900
J07	1	1945	20.000	900	V06	1	1175	20.000	900	J02A	1	2122	20.000	900
J08	1	3755	20.000	900	V07	1	4470	20.000	900	J02B	1	2122	20.000	900
J10	1	1955	20.000	900	V08	1	2850	20.000	900	J02C	1	2122	20.000	900
*R01	1	935	20.000	900	V09	1	1230	20.000	800	J05	1	2960	20.000	900
*R02	1	1773	20.000	900	J02	1	2122	20.000	900	J09	1	2855	20.000	900
*R03	5	913	20.000	900	J03A	1	1222	20.000	900	T08	1D	6035	20.000	833
*R04	1	1658	20.000	900	J04A	1	3860	20.000	900	TG03	1	4850	20.000	900
*R05	1	1668	20.000	900	J04B	1	3860	20.000	900	J01	1	3022	20.000	900
R06	4	3351	20.000	900	J04D	1	3860	20.000	900	J05A	1	2960	20.000	900
*R07	4	2700	20.000	900	J06A	1	2060	20.000	900	J09A	1	2855	20.000	900
*R08	4	2503	20.000	900	J07A	1	1945	20.000	900	J09B	1	2855	20.000	900
*R09	4	2520	20.000	900	J07B	1	1945	20.000	900	J09C	1	2855	20.000	900
S01	1	4215	20.001	900	J07C	1	1945	20.000	900	J01A	1	3022	20.000	900
S02	1	4215	20.000	900	J07D	1	1945	20.000	900	J01B	1	3022	20.000	900
S03	1	4215	20.000	900	J08A	1	3755	20.000	900	J04C	1	3860	20.000	900
S04	1	4215	20.000	900	J08B	1	3755	20.000	900	J08C	1	3755	20.000	900
S05	1	4215	20.000	900	J08E	1	3755	20.000	900	J08D	1	3755	20.000	900
S06	1	4215	20.000	900	J10A	1	1955	20.000	900	T01	1	6090	20.000	900
S07	1	4215	0.000	900	J10B	1	1955	20.000	900	TG01	1D	10090	20.000	900
T02	1	3860	20.000	900	J10C	1	1955	20.000	900	TG04	1	10090	20.000	900
T03	3	3860	20.000	900	*R01A	1	935	20.000	900	T04	1D	4850	20.000	900

Total quantity : 114

The computer design input has been carried out by:

Signed:   
Name of Detailer: 

On behalf of: Pre-Nail Systems LTD

Date: ...Thursday, 26 October 2017....

Qualifications and Title: Estimator/Detailer





# KAPITI ARCHITECTURAL DESIGN LTD

DESIGNED FOR LIVING www.kapitidesign.co.nz

P: 04 905 7380 M: 0275 114 744 E: rochelle@kapitidesign.co.nz PO Box 296, Waikanae

## VENTILATION & NATURAL LIGHT CALCULATIONS

**Project:** Additions & Alterations  
**Address:** 65 Kohekohe Road, Waikanae

Room	Room Area	Ventilation Light		Window Number	Actual Ventilation	Actual Light
		Req'd 5%	Req'd 10%			
Living				W1	0	0
Kitchen				W20	2.64	2.64
Dining	125	6.25	12.5	W21	0	5.46
Library				W22	0.7	0.7
				W23	0.84	1.26
				W24	0.84	1.26
				W25	0.84	1.26
				W26	0.84	1.26
				W27	0.84	1.26
				W30	0.9	0.9
				<b>Total</b>	<b>8.44</b>	<b>16</b>
Study	11.1	0.555	1.11	W28	0.84	1.25
				W29	1.1	1.1
				<b>Total</b>	<b>1.94</b>	<b>2.35</b>
Bedroom 1	16	0.8	1.6	W4	0.84	1.26
				W5	0.84	1.26
				W6	0.6	0.6
				W7	0.6	0.6
				<b>Total</b>	<b>2.88</b>	<b>3.72</b>
Bedroom 2	12.8	0.64	1.28	W13	0.7	0.7
				W14	0.7	0.7
				<b>Total</b>	<b>1.4</b>	<b>1.4</b>
Bedroom 3	13	0.65	1.3	W16	0.7	0.7
				W17	0.7	0.7
				<b>Total</b>	<b>1.4</b>	<b>1.4</b>

## DESIGN CERTIFICATE

Technical basis for structural design methodology contained in designIT for houses - New Zealand.

designIT for houses, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of structural laminated veneer lumber products manufactured by Carter Holt Harvey (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope of NZS 3604.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170 and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/VM1, 6.1).

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code (NZBC), provided the installation is in accordance with the installation requirements provided by designIT and/or in product literature and/or NZS 3604, or specific engineering design, as appropriate.

Futurebuild LVL and Laserframe components, when used and treated to the required treatment levels prescribed in NZS 3602 and NZS 3604, as modified by Acceptable Solution B2/AS1, will comply with the requirements of the NZBC (Acceptable Solution B2/AS1, 3.2).

#### References:

NZS 3603:1993 Timber Structures Standard.

AS/NZS 1170:2002 Structural design actions, Parts 0 and 1.

NZS 3604:2011 Timber-framed buildings.

AS/NZS 1170:2011 Structural design actions, Part 2: Wind actions.

AS 1720.1:2010 Timber structures. Part 1: Design methods.

AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.

AS 1720.3:2016 Timber structures. Part 3: Design criteria for timber-framed residential buildings

This Design Certificate, and any associated warranty/certification, is void where there has been substitution of alternate products not detailed within the Member Specification.

Version date: 3 May 2017

#### For further information or advice contact:

Carter Holt Harvey Woodproducts New Zealand,  
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Web: <http://www.chhwoodproducts.co.nz>

#### Specifier details:

<b>Specifier:</b>	ITadmin
<b>Business name:</b>	Hewlett-Packard Company
<b>Email:</b>	rochelle@kapitidesign.co.nz

#### Project & site details:

<b>Project:</b>	Untitled project 1
<b>At (address):</b>	
<b>Design wind zone</b>	High
<b>Snow loading</b>	Design snow zone: N0

## MEMBER DESIGN DETAILS

### Member 1

- |                                |   |
|--------------------------------|---|
| 1) Member code and description | L1 - Lintels - In single or upper storey load bearing walls |
| 2) Date prepared               | 02 November 2017  |
| 3) Serviceability criteria     | AS 1720.1: 2010 and AS 1720.3: 2016                         |

#### 4) Design inputs

Span	4.8 m
Roof load width 'RLW'	3.0 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

#### 5) Member specification

Size, stress grade/product	Use 2/300 x 45 hySPAN
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi$ LQ*	10.0 mm	6.7 mm (long term)	1.5
Live load - $\Psi$ sQ	15.0 mm	1.8 mm	8.2
Wind load - Ws	24.0 mm	5.5 mm	4.3

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

#### 7) Reactions

Load case	$k_1$ <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-4.7
1.2G + 1.5Q	0.80	-7.0
1.2G + W <sub>u</sub> + $\Psi$ cQ	1.00	-9.8
0.9G + W <sub>u</sub>	1.00	5.8

#### 8) Installation requirements

- Provide at least 30 mm bearing at end supports
- Vertical lamination in accordance with Detail H1.

#### Notes for interpretation of serviceability data

- 'average deflection' is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS 1170 and AS 1720. Deflections calculated using this methodology cannot therefore be usefully compared with deflections calculated using other methods, eg GLTAA design methodology.
- Deflection is the flexural response to load 'out-of-level' measurements of installations are not necessarily deflections and can incorporate 'initial out-of-straightness', whether intended or not. Furthermore, loads can be higher/lower than the notional estimate and in any comparison with measured levels, material variability needs to also be considered. AS 1720 gives the following basis for estimation of upper bound deflections for various materials.

No 1 Framing – visually graded to NZS 3631	Average + 100%
SG grades - mechanically graded to AS/NZS 1748	Average + 43%
GL grades for glulam to AS 1328	Average + 33%
LVL to AS/NZS 4357 (includes hySPAN and hyJOIST)	Average +18%

As can be seen, comparison of the 'average deflection' for different materials, even if calculated on the same basis, does not give the whole picture!

- The limits referred are those specified in AS 1720.3 for the stated load case.
- 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements of AS 1720.3

#### Notes for interpretation of reaction data

- Duration of load factor ' $k_1$ ' for strength as per NZ 3603:1993
- Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support

3. Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
4. End reaction includes allowance for overhang/cantilever where one has been designed

Kapiti Architectural Design Ltd



00029

## SPECIFICATION

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

## Additions & Alterations

### Project Specification

65 Kohekohe Road, Waikanae, New Zealand

Project Ref: 473

Printed: 01 November 2017



**masterspec**

Specification built using Masterspec software  
Masterspec ID: 142172 - 76940

### Concrete Floor

100mm thick 25MPa concrete floor with footings to comply with NZS 3604:2011. SE62 Mesh on Thermakraft Black DPM and sand blinding. Compacted Hardfill as necessary.

### Wall Framing:

Exterior Wall Framing: Up to 2.8m – 90x45 SG8 H1.2 at 400 crs

Interior Wall Framing: Up to 2.7m – 90x45 SG8 H1.2 at 600 crs

### Roof Framing:

Trusses at 900 crs. Prenailler to provide PS1 (producer statement)

### Beams and Posts:

Verandah Beam: Refer to Engineering

### Wall and Roof Underlays:

Wall: Texton building wrap - refer BRANZ Appraisal 548(2013)

Window: Texton One Piece Sill Tape flexible flashing – refer BRANZ Appraisal 591 (2014)

Roof: Thermakraft 215 Underlay – refer to Thermakraft Data Sheet

### Wall Claddings:

150mm Bevel backed H3.1 pine rebated weatherboards with weathergrooves. Boards to be lapped minimum 25mm to comply with NZBC E2/AS1 9.4.4.1. Fix with 70x3.15 JH nails with a minimum penetration into framing of 35mm. Fixing to be located 10mm above top of lower board. Ex100mm H3.1 pine facings with weathergrooves to external corners and openings. False sill to windows. As a guide NZ Wood recommend using paint with a LRV (light reflectance value) greater than 50%. Painted Dulux Weathershield Half St Clair (white)

### Soffits:

James Hardie 7.5mm HardieGroove soffit lining fixed with daubs of adhesive at 300mm centres. Double screws 50mm apart down centre of sheet. Do not place screws within 100mm of the adhesive daubs. Fix with screws at ends of sheets and along ribbon board at 300 crs. Use Villadrive screws – finish 1-2mm below surface of sheet and stop before painting.

### Roofing:

Colorsteel Endura Corrugated Roofing – Windsor Grey

Fascia: Pre primed dressed timber fascia painted Windsor Grey

### Windows, Exterior Doors, Interior Doors, Garage Doors, Skylights:

Front Door: Timber T&G frameless – door handle to be supplied by owners. Door to be stained Porters Palm Black

Windows: Fairview Residential Architectural Flat Profile, double glazed, Matt Charcoal. Hardware Stella single window fasteners plus bi-fold handles in Matt Charcoal

*Internal Doors:*

*Manhattan Pre-primed. Door hinges to be Windsor matt black (WB5904)*

*Internal door hardware to be supplied by owners*

*Door stops to be supplied by owners*

*Bathroom door from Bedroom 3 – CS cavity slider T&G, sound stop acoustic door with brush seal and seal bar to back of door*

*Barn Door – Estrada classic pendant kit for top mount pendant roller in black. Suits door 32-45mm thick. Door stained black with wire brushed texture. Joiner supply*

*Garage Doors: to be insulated*

*Dog Door: Dog mate medium dog door – owner supplied to be installed in laundry*

*Skylights:*

*WC – Velux GGU CK02 roof window 550 x 780*

*Kitchen – Velux FSC04 550 x 980*

*Bedroom 2 – Velux FSC04 550 x 980 with blackout blind*

*Bedroom 3 – Velux FSC04 550 x 980 with blackout blind*

Scotia, Skirting and Architraves:

Scotia:

Skirting: 60mm single bevel pine

Architraves: 60mm single bevel pine

Insulation:

Floor: 2 layers R1.8 Expol Black

Walls: R2.6 Pink Batts

Ceiling: R3.6 Pink Batts

Interior Linings:

Walls: Generally - 10mm standard gib board  
Bathroom – 7.5mm Hardigroove, installed horizontally  
Laundry & Kitchen - 10mm Gib Aqualine

Ceilings: Generally - 13mm Standard Gib Board  
Dining Pitched Ceiling – 7.5mm Hardiegroove  
Bathroom, Laundry - 13mm Gib Aqualine Board  
Back block sheet joints and allow for control joints as required by manufacturer

Painting and Decorating:

*Refer to owners for painting schedule*

Water Tank and Water Supply:

*Turfrey 2.040 ltr slimline Aqua tank, overflow to soakpit*

Stormwater:

Rainwater Spouting: *Colorsteel Endura Quarter Round continuous spouting with internal brackets – Windsor Grey*  
*Downpipes – Windsor Grey - rectangular*

Drainage:  
*100mm uPVC – connect to main sewer system*

Sanitary Fittings:

Shower: *Wet area showers – waterproofed with Flexiseal. Fall minimum 1 in 50 to Allproof Vision channel powercoated matt black. Niche recessed into walls – refer to plans. A Grade safety glass screens full height with 18mm black frame to side and base, powdercoated matt black*

Bath: *to be selected by owners*

Vanity: *Caroma cube basin on joinery unit*

WC: *Caroma wall faced WC*

Tapware: *all tapware, shower roses etc to be selected by owners*

Kitchen: *Icon medium sink station IK8650 flush mount 700mm x 480mm (cabinet size) 700mm*

Laundry Tub: *Alape bucket sink*

Joinery:

*Refer to owners drawings for details, office, library, lounge, dining, kitchen, laundry, bathrooms*

Gas:

*Relocate existing Rinnai Infinity*

Heating:

*Escea DL1100 gas fire – flued thru roof*

*Masport Akaroa Radiant woodburner installed on 900x930mm black parallel 4mm steel hearth*

*Heat Pump – semi-recessed floor console Mitsubishi*

Electrical:

*New meter board and distribution board to be installed. Consult with owners to confirm positions of all light fittings and power outlets.*

*Smoke detectors to comply with NZBC F4 to be installed*

Items selected:

*Heated Towel rails – 850 wide x 900mm high*

*Kitchen – Schweigen extractor fan UM1170-9S undermount model 900mm wide x 295mm deep with isodrive motore. Roof mounted – expel to eaves*

*Ilve Electric oven, gas hobs & induction top 600mm deep x 900mm wide*

*Fridge/Freezer – Mitsubishi CX designer 402l 600w x 660d x 1820 h MX402EJ stainless steel*

Landscaping:

*To be completed by owners*

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# 1220 GENERAL REQUIREMENTS

## 1 GENERAL

### 1.1 THE WORKS

The works are as described in this specification and shown on the drawings.

### 1.2 PERSONNEL

Owner: The person defined as "owner" in the New Zealand Building Code.

Contractor: The person contracted by the owner to carry out the contract.

### 1.3 THE SITE

The site of the works, the site address and the legal description are listed under the sections 1210 PROJECT. Confine access and work to the area of site indicated on the drawings.

### 1.4 SPECIFICATION SECTIONS

Sections are for reference and convenience only and do not constitute individual trade sections or work elements. Read all sections together and read this section with all other sections.

### 1.5 INTERPRETATIONS

Required:	Required by the documents, or by a statutory authority.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Approval:	Approval in writing.
Direction:	Direction in writing.
Notified:	Notified in writing.

### 1.6 ABBREVIATIONS

The following abbreviations are commonly used throughout the specification:

AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
BCA	Building Consent Authority
BRANZ	Building Research Association of New Zealand
LBP	Licensed Building Practitioner
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NUO	Network Utility Operator
OSH	Occupational Safety and Health
RBW	Restricted Building Work
TA	Territorial Authority

### 1.7 INCONSISTENCIES

If there are any inconsistencies, errors or omissions in or between documents, the contractor must seek direction in resolving it. Figured dimensions take precedence over scaled dimensions; drawings to a larger scale take precedence over drawings to a smaller scale and drawings take precedence over specification.

### 1.8 SUBSTITUTIONS

A substitution may be proposed where specified products are not available, or if substitute products are brought to the attention of and are considered by the owner as equivalent or superior to those specified. Except where a specified product is not available, the owner is not bound to accept any substitutions.

Notify proposed substitution of specified products. Include sufficient information to allow the owner to confirm that the substitution is equivalent or superior to that specified. Advise the owner whether an amendment will or may be required to the Building Consent and the expected costs of such amendment.

### 1.9 THE WORDS "PROVIDE" OR "FIX"

The words "provide" (or "supply") or "fix" if used separately mean "provide and fix" unless explicitly stated otherwise.

## 1.10 MANUFACTURERS AND SUPPLIERS

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

## 1.11 REFERENCED DOCUMENTS

Reference is made to various New Zealand Building Code (NZBC) acceptable solutions (AS) and verification methods (VM) for criteria and/or methods used to establish compliance with the Building Act 2004. Reference is also made to various Standards produced by Standards New Zealand (NZS, AS/NZS) and to listed Acts, Regulations and various industry codes of practice and practice guides.

The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise. Documents cited both directly and within other cited publications are part of this specification.

## 1.12 PRECEDENCE OF REFERENCED DOCUMENTS

This specification takes precedence in the event of it being at variance with and requiring a higher standard than, the cited documents. Resolution of any variance must be confirmed in writing and where Building Consent is affected, the change notified to the BCA for advice as to whether an amendment is required to the Building Consent Authority.

## 1.13 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004 to carry out any work not in accordance with the Building Consent. Refer the resolution of matters concerning compliance to the owner for a direction. Where Building Consent is affected refer any change to the BCA for advice as to whether an amendment is required to the Building Consent.

## 1.14 STATUTORY OBLIGATIONS

Comply with all statutory obligations and regulations of regulatory bodies controlling execution of the works.

## 1.15 BUILDING CONSENT

Obtain the original or copies of the Building Consent form and documents from the owner and keep on site. Liaise with the BCA and/or the building certifier for all required notices and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

## 1.16 INSPECTIONS

Do not proceed with work noted on the Building Consent for inspection until it has been inspected and passed by the BCA inspector.

## 1.17 KEY PERSONNEL

Provide names and contact detail of LBP's/ key personnel. Prior to Restricted Building Work being carried out, provide names, registrations numbers (where appropriate) and contact detail of LBP's that are required for RBW by the Building Consent Authority as part of the Building Consent.

Include the following as applicable:

- Person with the appropriate site license
- Carpenter
- Registered drainlayer
- Registered plumber
- Registered gasfitter
- Registered electrician
- Roofer
- External window manufacturer
- Waterproof membrane applicator

## 1.18 PRODUCER STATEMENTS AND LBP DOCUMENTATION

When Records of Work or producer statements verifying construction are required, for the application for the Code Compliance Certificate, provide copies to both the BCA and the owner. Provide LBP documents and producer statements in the form required by the BCA.

## 1.19 CERTIFICATE OF COMPLIANCE

Provide Certificates of Compliance for electrical and gas work carried out.

## 1.20 CODE COMPLIANCE CERTIFICATE

Provide documentation that the Owner requires in order to obtain a Code Compliance Certificate for the consented work.

#### 1.21 TRADE GUARANTEES AND WARRANTIES

Where specific trade guarantees/warranties are offered covering materials and/or execution of proprietary products or complete installations, or are required as a condition of Building Consent, provide guarantees/warranties to the owner.

#### 1.22 SITE ACCOMMODATION

Provide, erect and maintain scaffolding, sheds, toilets, water, power and hoardings. Allow for cartage, craneage, plant hire and storage. Arrange for temporary works and services necessary for the completion of the works.

#### 1.23 HEALTH AND SAFETY

Make the works safe and provide and maintain a safe working environment, to the requirements of the Health and Safety at Work Act 2015. Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards and risks.

#### 1.24 PROTECT THE WORKS

Protect parts of the work liable to damage until completion of the works. Take all precautions necessary to protect the works from damage by unauthorised entry or inclement weather. Brace and support all parts of the works against damage during construction.

#### 1.25 STORAGE AND PROTECTION

Provide temporary storage areas and protective covers and screens. Fillet stack and protect all framing and structural members from moisture and contamination. Completely protect finishing materials from the weather and damage and store in accordance with the manufacturer's requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers requirements.

#### 1.26 ANTIQUITIES AND ITEMS OF VALUE AND INTEREST

Report immediately the finding of any fossils, antiquities, pre-1900 items, or objects of value. Ensure they remain undisturbed until approval is given for their removal.

#### 1.27 MEANS OF COMMUNICATION

All directions and approvals in writing.

#### 1.28 WORKING HOURS

Work on site is restricted to between 0800 to 1800, Monday to Friday, excluding statutory holidays. Work outside these hours may be permitted, with prior approval in writing by the owner.

#### 1.29 RESTRICTIONS

Do not:

- smoke on site
- light rubbish fires on the site
- bring dogs on to or near the site
- bring radios/audio players on to the site.

#### 1.30 QUALITY ASSURANCE

Carry out and record regular checks of material quality and accuracy. Provide all necessary materials, equipment, plant, attendances, supervision, inspections and programming to ensure required standards are met.

#### 1.31 DAMAGE AND NUISANCE

Prevent damage and nuisance from water, fire, smoke, vehicles, dust, rubbish, noise and other causes resulting from the contract works. Comply with the requirements of the TA and relevant Acts and Standards.

#### 1.32 SET-OUT AND DATUM

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

#### 1.33 EXECUTION OF THE WORK

Conform to the requirements of this specification. Ensure work is level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

1.34 MATERIALS AND PRODUCTS

Use only new materials and products, unless stated otherwise, of the specified quality and complying with cited documents.

1.35 COMPATIBILITY

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

1.36 COMPLETE ALL SERVICES

Ensure completed building services are operational, with temporary labelling removed, required labelling fixed and service instructions provided.

1.37 CLEAR AWAY

Regularly clear away trade debris, unused materials and elements from the site. On completion of the work leave the building clean and ready for occupancy, with all services operating and mechanical parts in good working order. Remove temporary markings, coverings and protective wrappings.

1.38 CLEAN

Clean and wash down external surfaces to remove dirt, debris and marking. Clean interior surfaces including floors, glass, cabinetwork, joinery, sanitary and hardware items.

## 2310 PILE FOUNDATIONS

### 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

#### 1.1 QUALIFICATIONS

Carry out work using persons competent and experienced in the trade. Work to be carried out by or supervised by the appropriate LBP.

### 2 PRODUCTS

#### 2.1 TIMBER PILES

Radiata pine H5 CCA (preservative code 01 or 02) treated, to NZS 3602, table 1 **Requirements for wood-based building components**, and to NZS 3604, 6.4 **Piles**, for types and footings.

#### 2.2 ACCESSORIES

Nails:	Steel, stainless steel and galvanized steel of pattern to NZS 3604, table 6.6 <b>Nailing schedule for hand-driven and power driven-nails</b> , and NZS 3604, 4, <b>Durability</b> .
Bolts and screws:	Steel, stainless steel and galvanized steel to NZS 3604, 6 <b>Foundation and subfloor framing</b> , and NZS 3604, 4 <b>Durability</b> .
Nail plates:	Stainless steel and galvanized steel toothed or nailed steel plates to the plate manufacturer's design for the particular locations shown on the drawings and to NZS 3604, 4 <b>Durability</b> .
Concrete:	For piles, prescribed grade 17.5 MPa to NZS 3104, table 3.1 <b>Prescribed mixes (P)</b> .
Corrosion risk	If timber treatments other than CCA (preservative code 01 or 02) are used, stainless steel fixings/connectors must be used in wet/damp areas in all zones.

### 3 EXECUTION

#### 3.1 EXECUTION GENERALLY

Comply with NZS 3602, NZBC B2/AS1 and NZS 3604 except as varied by this specification.

Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

In the Canterbury Earthquake Region comply with the changes to NZS 3604 in NZBC B1/AS1.

#### 3.2 INSTALL SQUARE TIMBER PILES

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

## 3110 CONCRETE WORK

### 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

#### 1.1 QUALIFICATIONS

Carry out work using persons competent and experienced in the trade. Structural and foundation work to be carried out by or supervised by the appropriate LBP.

### 2 PRODUCTS

#### 2.1 REINFORCEMENT

Bars to AS/NZS 4671, grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh to AS/NZS 4671 Class E. Mild drawn steel tying wire not less than 1.2mm diameter.

#### 2.2 MESH FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground, welded reinforcing mesh to AS/NZS 4671, minimum to NZBC B1/AS1 - Grade 500E, 2.27kg/m<sup>2</sup> (1.14kg/m<sup>2</sup> in each direction).

#### 2.3 SPACERS AND CHAIRS

Precast concrete or purpose made moulded PVC. Use concrete spacer blocks only where the concrete surface is not exposed in the finished work.

#### 2.4 CONCRETE

Strength as selected. Ready-mix normal grade, maximum aggregate size 19mm to NZS 3104. Site mixed prescribed grade, using either separate batching of sand and coarse aggregate, or builder's mix, to NZS 3104.

### 3 EXECUTION

#### 3.1 HANDLE AND STORE REINFORCING

Handle and store reinforcing steel and accessories without damage or contamination. Ensure reinforcement is clean and remains clean and free of contamination that may reduce bonding capacity.

#### 3.2 FALSEWORK AND FORMWORK

Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality.

#### 3.3 CUT AND BEND

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109. Do not rebend bars without written approval. Bend main reinforcing bars, stirrups and ties to the former pin diameters as given in NZS 3109, figure 3.1, **Standard bend, hook and stirrup**.

#### 3.4 SECURE REINFORCEMENT

Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums laid down in NZS 3109, 3.3. **Hooks and bends**.

#### 3.5 LAPPED SPLICES

Set length of laps, where not dimensioned on the drawings, in accordance with NZS 3109: 3.7, **Splices in reinforcement**. Plain bars lapped splices must be hooked.

#### 3.6 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground, mesh to be lapped and tied, so the outermost wires overlap by the greater of:- the spacing of the cross wires plus 50mm or, 150mm or, manufacturer's requirements. Do not count bar extensions beyond the outermost cross wire.

#### 3.7 REINFORCEMENT COVER TO NZS 3604

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to NZS 3604 requirements.

### 3.8 CONCRETE PLACEMENT

To comply with NZS 3109.

### 3.9 SURFACE FINISHES

To comply with NZS 3114, section 105 **Specification of finishes**, or as denoted on the drawings. Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Surface tolerances to comply with NZS 3114, section 104 **Surface tolerances** and 105.3.2.

### 3.10 DAMP-PROOF MEMBRANE

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

### 3.11 CASTING IN

Build in grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required. Form pockets, chases and flashing grooves as required. No grounds exceeding 100mm in length. Minimum cover on conduits 40mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar. Wrap all pipes embedded in concrete with tape to break the bond and to allow for expansion.

### 3.12 FLOOR SLABS TO NZS 3604

Slabs on ground to NZS 3604 as modified by NZBC B1/AS1 and NZBC E2/AS3. Construct to NZS 3604, 4.5 **Concrete and concrete masonry** and NZS 3604, 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by NZBC B1/AS1, 3.0 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to NZS 3114, 304, **Surface tolerances**. Allow for free joints maximum 24m centres to NZBC B1/AS1, 3.1.13 **NZS 3604 New clause**. In the Canterbury Earthquake Region comply with the changes to NZS 3604 in NZBC B1/AS1.

### 3.13 SAW CUTS TO NZS 3604

Cut slabs where indicated on the drawings as required to control shrinkage cracking. Form by saw cutting the slab (blade width approximately 5 mm) to a quarter of the depth of the slab after it has hardened (saw cutting shall take place no later than 24 hours after initial set for average ambient temperatures above 20 °C, and 48 hours for average ambient temperatures below 20 °C). If saw cuts are not indicated on the drawings, then provide saw cuts as per the requirements for shrinkage control joints in NZS 3604.

For saw cuts filled with sealant, increase width of cut to suit sealant.

### 3.14 SURFACE REPAIRS

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

### 3.15 CURING OF CONCRETE

Keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.

### 3.16 STRIKE FORMWORK

Strike formwork without damaging or overloading structure.

### 3.17 CLEAN OUT

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

## 3800 TIMBER FRAMING

### 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

Use experienced competent carpenter familiar with the materials and techniques specified. Work to be carried out by or supervised by the appropriate LBP.

### 2 PRODUCTS

#### 2.1 TIMBER FRAMING GENERALLY

Species, grade and level of treatment to NZBC B2/AS1, NZS 3602, tables 1 to 3 **Requirements for wood-based building components** ..., and moisture content to NZS 3602, table 4 **Allowable moisture content** ..... Structural Grade (SG) to NZS 3604, NZS 3622 with properties to NZS 3603.

#### 2.2 TIMBER TRUSSES

To FTMA Code of Practice. Moisture content 16% at supply.

#### 2.3 ACCESSORIES

Damp-proof course:	High impact embossed polyethylene
Stud straps	Polypropylene tape run horizontal at 300mm centres over flexible wall underlay, for drained cavities with stud spacings greater than 450mm.
Nails, bolts and screws:	Steel, stainless steel, galvanized steel of pattern to suit the location and to BRANZ BU 519: Fasteners selection. To NZS 3604, 4 <b>Durability</b> and NZBC E2/AS1.
Nail plates connectors:	Stainless steel and/or galvanized steel toothed or nailed plates to the plate manufacturer's design for the particular locations as shown on the drawings and to NZS 3604, 4 <b>Durability</b> . Galvanized steel and stainless steel connectors and brackets to the connector manufacturer's design for locations shown on drawings and to NZS 3604, 4 <b>Durability</b> and NZBC E2/AS1
Corrosion risk	For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).  For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

### 3 EXECUTION

#### 3.1 ATTENDANCE

Provide and fix blocks, noggs, openings and other items as required by others.

#### 3.2 MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602, table 4 **Allowable moisture content**..., for framing supporting interior linings:

Framing at erection	24%
Framing at enclosure	20%
Framing at lining	16%

#### 3.3 EXECUTION GENERALLY

To NZS 3604 except as varied in this specification. To include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs). Set out framing in accordance with the requirements of NZS 3604 and as required to support sheet linings and claddings.

3.4 INSTALL SUB-FLOOR FRAMING

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

3.5 INSTALL FLOOR, WALL AND ROOF FRAMING

Floors and bottom plates framed and fastened to NZS 3604, 7 **Floors.** Frame walls to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, 8 **Walls.** Frame roof to required loading and bracing complete with valley boards, ridge boards and purlins to NZS 3604, 10 **Roof framing.** Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, 9 **Posts,** and NZS 3604, 10 **Roof framing.**

3.6 BATTENS

For direct fix cladding window and door openings nominal 20mm H3.1 jamb battens to NZBC E2/AS1, Fig. 72A.

## 4220 WALL CLADDING

### 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

#### 1.1 QUALIFICATIONS

Carry out work using persons competent and experienced in the trade.

### 2 PRODUCTS

#### 2.1 TIMBER WEATHERBOARD

As selected, or radiata pine to NZS 3631 for grading and to NZS 3602, table 2 **Requirements for wood-based building components...**, for selection and treatment.

#### 2.2 FIBRE CEMENT SOFFIT LINING

Cellulose cement autoclaved sheets.

#### 2.3 TIMBER FASCIAS AND BARGE BOARDS

As selected, or radiata pine to NZS 3631 for grading and to NZS 3602, table 2 **Requirements for wood-based building components...**, for selection and treatment.

#### 2.4 ACCESSORIES

Wall underlay:	Breather type, waterproof.
Rigid Air Barriers:	Proprietary rigid sheet pre-cladding systems.
Jointers:	To suit cladding type and thickness.
Nails, screws, fastenings:	Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4: <b>Durability</b> and E2/AS1.

### 3 EXECUTION

#### 3.1 MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602, table 4 **Allowable moisture content....**

#### 3.2 EXECUTION GENERALLY

To NZBC E2/AS1 except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

#### 3.3 INSTALL WALL UNDERLAY

Fix to the manufacturer's requirements.

#### 3.4 JAMB BATTENS

As specified in the section 3800 TIMBER FRAMING, to suit the selected wall cladding and construction type.

#### 3.5 PRIME OR SEAL TIMBER WEATHERBOARDS

Prime (for opaque finish) or seal (for clear finish) front and back faces, edges and end grain (minimum 2 coats) before fixing weatherboards and exterior trim.

#### 3.6 INSTALL TIMBER WEATHERBOARDS

Install level, true to line and face, to NZBC E2/AS1, 9.4 **Timber weatherboards.**

#### 3.7 INSTALL FIBRE CEMENT SOFFITS

Cut sheets dry and scribe fit to fully support all edges and joints. Nail and drill for and insert fasteners to the sheet manufacturer's requirements. Fit complete with jointers and capping moulds. Refer to the cladding manufacturer's literature for fixing details and fixings durability requirements to NZS 3604, section 4 **Durability.**

#### 3.8 INSTALL EXTERIOR TIMBER FINISHINGS

Install timber fascias, barge boards, facings, beads, trim and enclosures level, true to line and face, with all end grain sealed and joints mitred.

3.9 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1, 4.0 **Flashings.**

3.10 USE OF SEALANTS

Selection and use of sealants to follow BRANZ BU 601: Sealants for cladding joints.

3.11 COMPLETE

Complete all flashings, finishings and trim so the cladding system is completely weathertight.

# 4310 ROOFING

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

Use experienced competent roofers familiar with the materials and techniques specified. Work to be carried out by or supervised by the appropriate LBP.

### 1.2 WIND AND EARTHQUAKE LOADINGS

Use fixings and methods capable of sustaining the loads appropriate to the area as set out in NZS 3604, section 5 **Bracing design**, and confirmed under 1212 COMPLIANCE.

## 2 PRODUCTS

### 2.1 PROFILED METAL

Profile, metal and finish as selected. Accessories, cappings, flashings and fixings to match and to the roofing manufacturer's requirements.

### 2.2 ACCESSORIES

Tile battens:	Douglas fir or radiata pine, SG6, treated H1.2, size, spacing and fixing to NZS 3604, table 10.12, <b>Tile battens for all wind zones.</b>
Roof underlays:	As selected.
Nails, screws, fastenings:	Metal, size and pattern, to roofing manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4 <b>Durability</b> and NZBC E2/AS1.
Flashings:	As required.

## 3 EXECUTION

### 3.1 STORAGE

Stack roofing and accessories on clean, level areas of the site. Cover and protect from damage and from weather until ready to fix in place.

### 3.2 SET-OUT

Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features. Overlaps to face away from prevailing wind direction.

### 3.3 LAY ROOF UNDERLAY

Lay and fix to NZBC E2/AS1, 8.1.5 **Roof Underlays.**

### 3.4 TAKE CARE

Take care to avoid damaging pre-finished roofing both during and after fixing. Mark only with chalk or spirit-based pen. Wear only soft-soled shoes on the finished surface. Remove metal filings daily.

### 3.5 INSTALL PROFILED METAL

Use cutting tools recommended by the roofing manufacturer. Fold ends and seal cut edges to the roofing manufacturer's requirements. Fix complete with matching accessories, flashed to roof features and penetrations; all in accordance with NZ metal roof and wall cladding code of practice and NZBC E2/AS1: 8.4 **Profiled metal roof cladding.**

### 3.6 INSTALL ROOF WINDOWS/ROOFLIGHTS/SKYLIGHTS

Check that the trimmed openings are formed and constructed to suit. Install and fix roof windows/lights/skylights in accordance with the manufacturer's installation instructions. Install flashings and overflashings as detailed and as required to make the installation completely weatherproof. Install selected accessories and hardware. Install and complete operating systems.

### 3.7 FIXINGS AND SEALANTS

Refer to the roofing manufacturer's literature for fixing details and to NZS 3604 for fixings durability requirements. Select and use sealants only as recommended by the roofing manufacturer.

### 3.8 INSTALL COVERS AND FLASHINGS

Provide apron, verge and ridge flashings. Install and fix as detailed and to the roofing manufacturer's details and to comply with NZBC E2/AS1, 4.0 **Flashings**, NZBC E2/AS1: 5.0 **Roof/wall junctions**, and NZBC E2/AS1: 6.0 **Parapets**.

3.9 PENETRATIONS

Flash and overflash penetrations through the roof. Fit proprietary boots to pipework penetrations.

3.10 COMPLETE

Ensure the work is complete with flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.

3.11 CLEAR

Clear trade debris and unused materials from the roof and surrounds regularly during the work and at completion. Sweep down the completed roof and flush out spoutings, gutters and rainwater pipes.

# 4520 ALUMINIUM WINDOWS & DOORS

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

Fabricators/Installers to be experienced, competent trades people familiar with the materials and techniques specified.

### 1.2 CERTIFICATION

Provide documentation that the windows and doors comply with NZS 4211 and safety glass complies with NZS 4223.3.

### 1.3 WIND LOADINGS

Refer to section 1212 COMPLIANCE for wind zone.

## 2 PRODUCTS

### 2.1 WINDOW AND DOOR REVEALS

As selected, manufactured to comply with NZS 4211. Timber jamb liners to NZS 3602.

### 2.2 FLASHINGS

To NZBC E2/AS1, 9.1.10 **Windows and Doors** and as required.

### 2.3 POWDER COATING FINISH

To WANZPQAS: Powder Coating Quality Assurance System. All finished surfaces to show uniformity of gloss and colour (to match sample) free of all coating defects.

### 2.4 SEALANT, GLAZING TAPE AND GASKETS

To the window manufacturer's requirements.

### 2.5 FIXINGS

Ensure fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.

## 3 EXECUTION

### 3.1 OPENING PREPARATION

Confirm framing openings (including jamb battens for direct fix cladding) on site for dimension, plumb and straightness prior to fabrication or ordering of aluminium joinery. Prepare and trim to WANZ Window Installation Guide requirements. For openings over 600mm wide on cavity construction provide sill support bars.

### 3.2 EXECUTION GENERALLY

To NZBC E2/VM1 and NZBC E2/AS1. Install to WANZ Window installation Guide requirements.

### 3.3 HANDLING

Avoid distortion of elements during transit, handling and storage. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement. Do not deliver to site any elements which cannot be immediately unloaded into suitable conditions of storage.

### 3.4 CORROSION PROTECTION

Seal or suitably coat cut ends and holes drilled in aluminium before the frames are installed. Before fixing, apply bituminous coatings, slips or underlays between dissimilar metals in contact, or aluminium in contact with concrete.

### 3.5 FIX FRAMES

Fix frames rigidly in place without distortion, to the window manufacturer's requirements and to NZBC E2/AS1, 9.1.10.8, **Attachments for windows and doors**, plumb, true to line and face, weathertight and with all openings operating freely.

### 3.6 DRAINAGE

Anti-condensation channels to sills. All sills to sashes and fixed lights to incorporate positive drainage to the exterior.

3.7 GLAZING INSTALLATION

All glass held in aluminium beads and black PVC gaskets.

3.8 SAFETY GLASS INSTALLATION

Use in doors, sidelight panels, low level windows and all other locations to comply with NZS 4223.3.

3.9 INSTALL FLASHINGS

Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish on head flashings to match window finish.

3.10 SEAL FRAMES ON SITE

Seal frames to each other and to adjoining structure and finishes, all as required by the window manufacturer and to make the installation weathertight. Provide a continuous internal air seal between reveals and framing, using sealant over a backing rod.

3.11 SAFETY

Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Permanent manifestations, if required, to NZS 4223.3, 2.2 Manifestation (making glass visible).

3.12 CLEAN GLASS AND FRAMES

Clean off or remove glass indicators at completion of the building. Clean glass inside and out to a shining finish. Clean down both sides of window and door frames using the methods required by the window and door manufacturer.

# 4554VS VELUX OPENING & FIXED SKYLIGHTS

## 1 GENERAL

This section relates to the manufacture, supply, and installation of VELUX opening and fixed skylights and roof windows:

It includes;

- operating systems
- accessories
- proprietary flashings

### Documents

#### 1.1 DOCUMENTS

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

NZBC E2/AS1	External moisture
AS/NZS 2208	Safety glazing materials in buildings
NZS 3604	Timber-framed buildings
NZS 4223.4	Code of practice for glazing in buildings - Wind, dead, snow and live actions

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

Current Sales Brochure  
 Installation instructions for GGU/GGL Roof Window and Flashing  
 Installation instructions for VS/VSE/VSS Skylight  
 Installation instructions for FS Skylight  
 Installation instructions for VCM/VCS curb mounted Skylight  
 Installation instructions for FCM curb mounted Skylight  
 Installation instructions for EDW flashing  
 Installation instructions for EDL flashing  
 BRANZ Appraisal 968 - Velux Skylights  
 BRANZ Appraisal 969 - Velux Roof Windows

Manufacturer/supplier contact details

Company: VELUX New Zealand Limited  
 Web: [www.velux.co.nz](http://www.velux.co.nz)  
 Email: [info@velux.co.nz](mailto:info@velux.co.nz)  
 Telephone: 0800 650 445

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:  
 10 years: For VELUX Skylights

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### 1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:  
 ~ years: For installation of VELUX Skylights

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

**1.5 QUALIFICATIONS**

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

**1.6 NO SUBSTITUTIONS**

Substitutions are not permitted to any of the specified VELUX systems, components and associated products listed in this section.

**Performance****1.7 PERFORMANCE, WIND, DEAD, SNOW, AND LIVE ACTIONS**

The design wind pressures and snow loads to NZS 3604. Live loads and glazing design, for glass or equivalent plastics, to NZS 4223.4.

**2 PRODUCTS****2.1 SKYLIGHTS**

VELUX Skylights, either top hinged with INTEGRA (electric or solar) or manual opening, or fixed skylight, for roof pitches between 15° to 90°. Manufactured from high quality treated timber, prefinished frame and sash in white, semi-gloss paint. External cappings in umber grey manufactured from polyester coated aluminium. Refer to SELECTIONS for type, finish and accessories.

**2.2 ROOF WINDOWS - EVERFINISH - WHITE**

VELUX opening Roof Windows, pivot hinged at centre with vent flap for roof pitches between 15° to 90°. Manufactured from high quality treated timber, encapsulated in a white, virtually maintenance free, 3mm thick polyurethane. External cappings in umber grey manufactured from polyester coated aluminium. Refer to SELECTIONS for type, finish and accessories.

**Components****2.3 FIXINGS**

VELUX proprietary fixings and brackets compatible with the skylight/roof window.

**2.4 GLAZING - FIXED SKYLIGHTS**

VELUX proprietary toughened double glazing with Argon gas fill and low E<sup>3</sup> coating.

**2.5 GLAZING - ROOF WINDOWS**

VELUX proprietary laminated double glazing with Argon gas fill and low E<sup>2</sup> coating.

**2.6 HARDWARE**

Fasteners, stays, locks, vents and other hardware as supplied with the unit.

**2.7 FLASHINGS FOR FS/VS/VSE/VSS/GGL/GGU**

VELUX proprietary flashing solutions to VELUX instructions. Refer to SELECTIONS for type.

**2.8 FLASHINGS FOR FCM/VCM/VCS**

Custom flashings are required in accordance with NZBC E2/AS1. Refer to section 4821 FLASHINGS for details.

**Accessories****2.9 MANUAL OPENING DEVICES FOR VS/VCM/GGL/GGU**

Proprietary rod for manual opening.

**2.10 MOTORISED OPENING DEVICES FOR GGL/GGU**

Motorised control unit including remote, electric motor, keypad and transformer.  
Rain sensor for automatic control of opening.

**2.11 INTERNAL BLINDS/SCREENS**

Blind/s to suit the type of Skylight. Refer to SELECTIONS for type.

**2.12 INSTALLATION ACCESSORIES**

VELUX installation accessories as supplied with the unit. Refer to SELECTIONS for type.

**Finishes**

- 2.13 FINISH  
VELUX proprietary finishes.

**3 EXECUTION****Conditions**

## 3.1 DELIVERY, STORAGE AND HANDLING

Avoid distortion of elements during transit, handling and storage. Deliver in original containers, dry, undamaged with seals and labels intact. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement. Do not deliver to site any elements which cannot be immediately unloaded into suitable conditions of storage.

## 3.2 PRE-INSTALLATION REQUIREMENTS

Site measure during roof framing stage to ensure the VELUX proprietary Skylight / Roof Window and flashings can be installed correctly and in accordance with the installation instructions. Where a unit is installed adjacent to another unit confirm the set out distance between units in accordance with the installation instructions.

Refer to VELUX at [www.velux.co.nz](http://www.velux.co.nz) for installation details.

## 3.3 EXECUTION GENERALLY

Check that the preparation of the opening is to NZBC E2/AS1, 8.4.17, Roof penetrations.

## 3.4 HARDWARE GENERALLY

Factory fit all required and scheduled hardware.

## 3.5 RETAIN PROTECTIVE COVERINGS

Retain protective coverings and coatings in place during fixing wherever possible. Provide additional protection to prevent marking of surfaces visible in the completed work. Remove protection on completion.

**Installation**

## 3.6 GENERALLY

Check that the trimmed openings are formed and constructed to suit the required units. Do not proceed until roof and structural openings are properly formed.

## 3.7 INSTALL UNITS

Install and fix the units strictly in accordance with manufacturer's requirements and installation instructions. Repack any thermal insulation around rough openings where disturbed by the installation to maintain continuity of thermal barriers. When using VELUX flashings (EDW, EDL, EKW) with VELUX Skylights and Roof Windows, install as detailed by VELUX to make the installation completely weatherproof. Refer to VELUX at [www.velux.co.nz](http://www.velux.co.nz) for installation instructions. If using custom flashings, ensure upstand height and flashing meet NZBC E2/AS1 upstand height and flashing requirements.

## 3.8 ACCESSORIES AND OPERATING SYSTEMS

Install selected VELUX accessories and hardware and complete all operating systems.

**Completion**

## 3.9 CLEAN FRAMES AND GLAZING

On completion clean down both sides of unit frames, using the methods required by the manufacturer. Remove any manufacturer's stickers and clean glass. Ensure all installed units are adequately protected from damage and adverse weather during construction.

## 3.10 CONFIRM

Confirm the proper operation of hardware and operating systems on completion of the installation and again at completion of the contract works.

**4 SELECTIONS**

For further details on selections go to [www.velux.co.nz](http://www.velux.co.nz)  
Substitutions are not permitted to the following, unless stated otherwise.

### Skylights

#### 4.1 VELUX - FS - FIXED SKYLIGHT

Brand:	VELUX
Model:	FS Fixed
Type/size:	refer to plan
Glazing:	Pre installed. VELUX proprietary toughened double glazing with Argon gas fill and low E <sup>3</sup> coating.
Colour:	White, semi gloss finish
Roof type/pitch:	20degrees corrugated colorsteel
Flashing:	Proprietary Velux flashing

### Roof windows

#### 4.2 VELUX - GGU - ROOF WINDOW - EVERFINISH - WHITE

Brand:	VELUX
Model:	GGU Everfinish
Type/size:	refer to plan
Glazing:	Pre installed. VELUX proprietary laminated double glazing with Argon gas fill and low E <sup>2</sup> coating.
Colour:	White Everfinish encapsulated in a white, virtually maintenance free, 3mm thick polyurethane.
Roof type/pitch:	20 degrees, corrugated colorsteel
Flashing:	Proprietary velux flashing
Vent Controls:	ZCT 200 control rod

### Components

#### 4.3 VELUX HARDWARE/OPENING DEVICE FOR VS/VCM/GGU/GGL

Manual Control:	VELUX control rod/handles
Motorised Control:	For GGU/GGL INTEGRA Window Operator KMG 100K, INTEGRA Control Unit KLC 500 and INTEGRA Control Pad KLR 200, complete with rain sensor transformer.

#### 4.4 VELUX FLASHING SYSTEM

Brand:	VELUX
Roofing type:	Corrugated colorsteel
Roof pitch:	20 degrees
Flashing type:	EDW, to match unit/roof type
Colour:	Greyfriars

#### 4.5 CUSTOM FLASHINGS

Type:	Custom flashings to meet the requirements of NZBC AS/E2. Refer to Section 4821 FLASHINGS for details
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### Accessories

#### 4.6 VELUX INTERNAL BLINDS/SCREENS

Brand:	VELUX
Type:	refer to owners
Colour/pattern:	refer to owners

# 4610 GLAZING

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

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

### 1.2 CERTIFICATION

If not supplied with windows, provide documentation that the safety glass complies with NZS 4223.3.

## 2 PRODUCTS

### 2.1 GLAZING TAPE

Pressure sensitive, self-adhesive vinyl foam tapes, selected to suit the glazing detail.

### 2.2 GLASS THICKNESS

As selected and to NZS 4223.1, NZS 4223.3, NZS 4223.4.

### 2.3 FLOAT GLASS

Clear ordinary annealed glass for general window glazing. Thickness as required by NZS 4223.1.

### 2.4 LAMINATED GLASS

To NZS 4223.3.

### 2.5 TOUGHENED GLASS

To NZS 4223.3.

Heat soaked toughened glass to NZS 4223.1, Appendix E required for critical areas (balustrades etc) to reduce inclusion failure.

### 2.6 INSULATED GLASS UNITS

As selected and to AS/NZS 4666. and NZS 4223.2

### 2.7 SETTING BLOCKS

Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, at the base of glass panes.

## 3 EXECUTION

### 3.1 EXECUTION GENERALLY

To NZS 4223.1, and for human impact safety glazing to NZS 4223.3. Insulating glass units to AS/NZS 4666 and NZS 4223.2.

### 3.2 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS4223.1.

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

### 3.3 SAFETY GLASS INSTALLATION

Use in doors, sidelight panels, low level windows, bathrooms and all other locations to comply with NZS 4223.3.

### 3.4 SAFETY

Indicate the presence of transparent glasses, with whitening, tape or signs compatible with the glass type. Do not apply indicators other than whitening to the glass surface. Permanent manifestations if required, to comply with NZS 4223.3, 2.2 Manifestation (making glass visible).

### 3.5 CLEAN

Clean off or remove indicators at completion of the building. Clean glass inside and out to a shining finish.

# 4710 THERMAL INSULATION

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

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

## 2 PRODUCTS

### 2.1 THERMAL INSULATING PADS

Rectangular insulating pads manufactured from fibreglass, polyester, wool or similar.

### 2.2 CELLULAR PLASTIC RIGID BOARD

Polystyrene foam board manufactured from fire retardant grade resin.

## 3 EXECUTION

### 3.1 INSTALL INSULATION - GENERAL

Lay, install, fit and fix to NZBC H1/AS1: Energy efficiency, 2.0 Building thermal envelope, and to the insulation manufacturer's requirements. Install in housing to NZS 4218 and NZS 4246.

### 3.2 FIT THERMAL INSULATING PADS

Friction fit insulating pads in place to completely fill the whole of the cavities. Carefully scribe cut insulating pads slightly oversize to maintain friction fit to each other, to smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating pads over the whole of the installation. Do not cover vents.

### 3.3 FIT CELLULAR PLASTIC RIGID BOARD

Friction fit board after roof and wall claddings have been installed. Cut oversize lengthways for a tight compression fit between framing. Leave no gaps between, and maintain full thickness of the insulating segments over the whole of the installation. Fit board between floor joists and timber framing using proprietary fixing clips. Ensure separation from electric cabling. Do not cover vents. Leave a 200mm clear gap around recessed light fittings and metal flues. In windy locations secure floor insulation with proprietary support brackets.

### 3.4 GAPS AROUND RECESSED LIGHTS AND FLUES

New recessed light fittings to AS/NZS 3000, must be types IC-F, IC, CA-80 or CA-135 and do not require clearance from most, fibre glass, polyester or wool insulation. For all other insulation types and lighting types, or existing undefined types, allow clearance from the insulation of 100mm clear gap to incandescent or halogen lights, or as recommended by the lighting manufacturer. Around metal flues allow 200mm minimum clear gap or as recommended by the fireplace/flue manufacturer.

# 5110 INTERIOR LININGS AND TRIM

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 FRAMING MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602, table 4 **Allowable moisture content...**

### 1.2 PROTECT

Protect joinery, fittings and finishes already in place from water staining or damage from lining installation. Ensure building is weatherproof before lining work commences.

## 2 PRODUCTS

### 2.1 PLASTERBOARD

Gypsum plaster core encased in a durable face and backing paper formed for standard use, bracing use, fire rated use and water resistance use.

### 2.2 PLASTERBOARD ACCESSORIES

External angles:	Slim type 0.5mm galvanized steel.
Casing bead:	Slim type 0.5mm galvanized steel or PVC.
Cornice:	Plasterboard scotia type.
Nails:	Galvanized clouts 40mm x 2.5mm.
Screws:	40mm x 6 gauge zinc electro-plated bugle head gypsum drywall screws
Jointing compound & paper tape:	To the board manufacturer's requirements.
Adhesive:	Multi-purpose water based wallboard adhesive.

### 2.3 FIBRE CEMENT SHEET

Cellulose cement autoclaved sheets.

### 2.4 NAILS

Zinc-plated steel, stainless steel and galvanized steel of pattern to suit location and to BRANZ BU 519: **Fasteners selection.**

### 2.5 INTERIOR FINISHING TRIM

Timber selection to NZS 3602, table 3 **Requirements for wood-based building components....** Profile as selected or to match existing. Jointer profiles to suit location.

## 3 EXECUTION

### 3.1 SUBSTRATE

To NZS 3604, section 8 **Walls**, section 10 **Roof framing**, section 12 **Interior linings**, section 13 **Ceilings**, and the standard required by the lining manufacturer's requirements. Ensure moisture content of timber framing is at or below specified levels.

### 3.2 CONFIRM LEVELS OF PLASTERBOARD FINISH

Before commencing work, confirm the surface finish assessment procedures necessary to ensure the specified levels of finish will be obtained. Provide levels of finish as laid down in AS/NZS 2589.

### 3.3 LINE PLASTERBOARD CEILINGS AND WALLS

Line walls and ceilings with plasterboard sheets, fastened to the plasterboard manufacturer's requirements.

### 3.4 SPECIAL PLASTERBOARD LININGS

Line wet area walls with water resistant plasterboard sheets using adhesive and nail fixing to studs at centres to suit the surface finish. Form bracing panels using high density plasterboard sheets fixed with clout-washers and clouts and to conform to NZS 3604, 5.4 **Wall bracing design**, and 13.5 **Structural ceiling diaphragms**. Form sound rated panels following the sheet manufacturer's specifications and details for the required sound rating. Form fire rated panels following the sheet manufacturer's specifications and details for the required fire rating.

### 3.5 FIX PLASTERBOARD EXTERNAL ANGLES

Fix full length to external corners, with clouts at 100mm each side staggered.

### 3.6 FIX PLASTERBOARD CORNICE

Fix with adhesive and with joints scribe-fitted to the plasterboard manufacturer's requirements.

### 3.7 PLASTERBOARD JOINTING AND STOPPING

Fill joint recess with bedding compound, centre the paper tape, apply second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. Fill nail holes and flush up external angles with two successive coats of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. All to the plasterboard manufacturer's requirements.

### 3.8 LEVELS OF FINISH

Provide levels of finish to standards laid down by AS/NZS 2589 as follows:

Level 4: For thin coating finishes (paint) and surfaces receiving light texture or wall covering finishes

Level 5: Where specifically detailed for surfaces receiving thin coating finishes (paint).

### 3.9 INSTALL FIBRE CEMENT SHEET LININGS

Fix to timber framing with jointing as detailed and to the panel manufacturer's requirements.

### 3.10 INSTALL TRIM

Scribe and fit reveal linings to exterior timber joinery, architraves to interior joinery, skirtings to walls and timber beads to wall/ceiling junctions, and other trim as detailed.

# 5410 FLOORS

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

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

## 2 PRODUCTS

### 2.1 PARTICLEBOARD FLOORING

Flooring grade high density resin bonded.

### 2.2 SCREW FIXING PARTICLEBOARD OR PLYWOOD

Sure-fast type countersunk 50mm x 10 gauge screws, with one-component polyurethane based construction adhesive or elastomeric construction adhesive. Increase screw lengths for flooring over 21mm thick.

## 3 EXECUTION

### 3.1 LAY PARTICLEBOARD FLOORING

Fasten to the flooring manufacturer's requirements and NZS 3604, 7.2.3 **Wood-based sheet flooring**. Punch nails, fill holes, then sand with one coarse and one fine paper, hand sanding into corners.

# 5510 JOINERY FIXTURES AND FITTINGS

## 1 GENERAL

Refer to owners drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

To include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

## 2 PRODUCTS

### 2.1 TIMBER BOARDS AND FRAMES

Carefully sawn to minimise the inherent warping, twisting and bowing of the selected species and to give a finish suitable for clear finishing.

### 2.2 MEDIUM DENSITY FIBRE BOARD

Resin bonded wood fibre sheet with selected finish.

## 3 EXECUTION

### 3.1 TRANSIT AND DELIVERY

Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather. Do not deliver fittings until floor, wall and ceiling surfaces are in place and the fittings can be placed in their final location.

### 3.2 FABRICATION QUALITY

Check site dimensions. Carry out machining within the practices required for the particular timber or wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's requirements. Work accurate, square and true to line and face.

### 3.3 FABRICATE JOINERY FITTINGS

Carry out jointing, dowelling and other operations necessary for the proper assembly of the fittings as detailed, with fixings concealed unless otherwise detailed. Use glue joints where provision for shrinkage is not required, with contact surfaces, glueing and pressure all applied to the glue manufacturer's requirements. Locate and drive connectors and fasteners to the bolt manufacturer's requirements. Scribe fit adjustable shelves with 4 shelf pins and locate force fit pin holes at 50mm maximum centres in solid cheeks. Hang doors on concealed hinges.

### 3.4 INSTALL FITTINGS

Scribe fit on site and install level, square, plumb and true to line and face.

## 6200 TILING

### 1 GENERAL

Refer to owners drawings for specific product, material, accessories and finish selections.

#### 1.1 QUALIFICATIONS

Use tilers experienced with the materials and techniques specified.

#### 1.2 SLIP RESISTANCE

Accessible routes slip resistance to NZBC D1/AS1, 2.1 Slip resistance.

### 2 PRODUCTS

#### 2.1 ADHESIVES COMPATIBILITY

On proprietary substrates or waterproof membranes use only adhesives with documented compatibility approval from the respective manufacturers.

#### 2.2 ACCESSORIES

Waterproofing membranes:	As selected.
Cement-based screed:	Mix of 3:1 Portland cement, wash-mix sand, gauged with liquid polymer additive to the tile manufacturer's requirements.
Tile adhesive:	To the tile manufacturer's requirements.
Grout:	Cement based, compressible and to suit the particular location and use.
Control joint sealant:	To BRANZ Good practice guide: Tiling, section 5.0.

### 3 EXECUTION

#### 3.1 HANDLING AND STORAGE

Handle tiles with care to avoid chipping, soiling and damage. Store on hard, level standings in non-traffic, non-work areas that are enclosed, clean and dry. Reject all damaged tiles.

#### 3.2 SUBSTRATE

Ensure all services and accessories are in place, located to suit the tile layout, with the substrate required for tiling work.

#### 3.3 TEMPERATURE

Do not carry out tiling where the ambient temperature is below 5°C, or onto a substrate with a temperature higher than 40°C.

#### 3.4 LAYOUT

Obtain confirmation of the proposed layout of tiles, expansion joints and other visual considerations.

#### 3.5 EXECUTION GENERALLY

Prepare surfaces and carry out the tiling work in accordance with BRANZ Good practice guide: Tiling.

#### 3.6 SURFACE PREPARATION

To BRANZ Good practice guide: Tiling, section 4.0.

#### 3.7 LAY PROPRIETARY SCREED

Apply a proprietary cement slurry bond coat over the whole of the floor. Mix and place a 40mm thick mortar bed over the bond coat and firmly tamp, screed and compact to the required level. In waterproofed areas where the cement screed has been laid over the waterproofing membrane, prepare the screed surface by applying a further waterproof coating before laying tiles.

#### 3.8 APPLY LIQUID WATERPROOFING MEMBRANE

Apply the selected liquid waterproof membrane system to the membrane manufacturer's requirements. Flood test shower cubicle floors.

#### 3.9 INSTALL UNDER TILE ELECTRIC HEATING

Install to the membrane manufacturer's requirements. Arrange for electrician to connect power supply.

3.10 TILE FIXING, RIGID SHEET

Prime the surface after the curing of any waterproof membrane. Spread adhesive to a uniform minimum thickness of 3mm and rib it with a notched trowel to the tile manufacturer's requirements. Press the tile and beat it into place to obtain the required coverage by adhesive on the back of each tile.

3.11 TILE FIXING, INTERIOR TIMBER FLOORS

Install underlay to the tile manufacturer's requirements. After the curing of any waterproof membrane, prime the surface, spread adhesive to a uniform minimum thickness of 3mm and rib it with a notched trowel to the tile manufacturer's requirements. Press the tile and beat it into place to obtain the required coverage by adhesive on the back of each tile.

3.12 GROUTING

Remove spacers. Prepare joints, mix and apply proprietary grout and finish off the grout uniform in colour, smooth and without voids, pinholes or low spots.

3.13 MOVEMENT CONTROL JOINTS

Minimum width of 6mm, carried through tile and bedding. Where substantial movement is anticipated, carry through the rigid sheet to the structure. Ensure joints are clean, formed, filled, and the sealant inserted to the sealant manufacturer's requirements.

3.14 CLEAN

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave clean and free of blemish. Finally polish tiles with a clean, dry cloth.

# 6300 FLOOR COVERING

## 1 GENERAL

Refer to owners drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

Use flooring trades people appropriately experienced with the materials and techniques specified.

## 2 PRODUCTS

### 2.1 ADHESIVES COMPATIBILITY

Use only compatible adhesives approved by the respective manufacturers.

### 2.2 CARPET

Textile floor coverings to, AS/NZS 2455.1 for broadloom or AS/NZS 2455.2 for tiles.

### 2.3 ACCESSORIES - CARPET

Rigid sheet underlay:	Wood based sheet overlays for uneven timber floors
Underlay:	To AS/NZS 2455.1 Soft underlay and underlays manufacturer's requirements.
Adhesives:	To the manufacturer's requirements.
Edge grippers:	To the manufacturer's requirements.
Tape:	To the manufacturer's requirements.
Trims and edging:	Binder bars, divider strips and nosings to complete the work.

### 2.4 TIMBER OVERLAY FLOORING

Laminated timber overlay flooring strips/planks for floating floor installation.

### 2.5 ACCESSORIES - TIMBER OVERLAY FLOORING

Rigid sheet underlay:	Wood based sheet overlays for uneven timber floors
Primer and sealers:	To the adhesive manufacturer's requirements for the particular substrate.
Adhesive:	To the manufacturer's requirements.
Foam underlay	2mm thick, closed cell foam underlay to provide a moisture membrane.
Trims and edging:	As supplied by the manufacturer to complete the work.

## 3 EXECUTION

### 3.1 HANDLING AND STORAGE

Maintain materials and accessories undamaged and dry. Store any rolls and other material to manufacturers requirements, on level surfaces, in non-work areas that are enclosed, clean and dry. Avoid distortion, marking and damage to edges while shifting and handling materials and accessories. Do not use faulty or damaged material.

### 3.2 SUBSTRATE

Ensure the building is enclosed, wet work complete, finishes and trim complete, and good lighting available. Inspect the substrate to ensure it is of the standard required for work in this section.

### 3.3 TEMPERATURE

Acclimatise flooring to a room temperature above 16°C to manufacturer's requirements. In air-conditioned buildings run air-conditioning to flooring manufacturer's requirements. Turn off floor heating for at least 48 hours before and after laying.

### 3.4 LAYOUT

Before beginning the installation confirm the proposed layout of material, location of joins and other visual considerations of the finished work.

### 3.5 SURFACE PREPARATION - CARPET

To AS/NZS 2455.1, section 2. including necessary repairs and sealing. Check for moisture content to AS/NZS 2455.1, Appendix B, and do not commence laying until readings for the whole area show a maximum moisture content of, 75% RH for concrete, 14% for timber or 12% for timber with air conditioning. Clean surface.

### 3.6 SURFACE PREPARATION - TIMBER OVERLAY FLOORING

To manufacturer's requirements. Clear substrate of debris, repair and sand/grind as necessary. Check moisture content and do not commence final sanding or laying until readings for the whole area show a maximum moisture content of, 60/70% RH for concrete, 14% for timber or 12% for timber with air conditioning. For concrete apply sealer if necessary. Clean surface.

### 3.7 INSTALLING RIGID SHEET UNDERLAY

Over rough or uneven timber floors, lay sheet overlay with joints staggered, with a 1mm gap between sheets and 2mm at perimeters. Use 18mm divergent staples at 100mm centres throughout the whole sheet and 30mm apart, 18mm in from the edges of the sheets. Punch staples below the surface and sand joints level.

### 3.8 CARPET INSTALLATION, CONVENTIONAL SYSTEM

Install underlay to manufacturer's requirements, and lay at right angles to the carpet direction. Tape carpet joints, fix grippers to floor and install underlay and carpet to AS/NZS 2455.1, section 3. Stretch carpet tight in both width and length evenly without bowing, square with walls. Fix trim.

### 3.9 TIMBER OVERLAY FLOORING, INSTALLATION, FLOATING

Install 2mm foam underlay to the total floor area, in long, continuous runs, allowing to cove up walls 50mm. Tape joints using moisture resistant tape, to create an impervious membrane. Install the timber floor strictly in accordance with the flooring manufacturer's requirements. Ensure the required expansion gap is left at perimeters and around fixed obstacles. Adhesive fix flooring to stair treads, risers and landings, to manufacturer's requirements.

### 3.10 CLEAN

Upon completion clean to manufacturer's requirements.

# 7120 WATER SYSTEM

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a certifying person under the Plumbers, Gasfitters and Drainlayers Act 2006.

## 2 PRODUCTS

### 2.1 CROSS LINKED POLYETHYLENE WATER PIPE

Proprietary high-density cross-linked polyethylene composite pipe and fittings to AS/NZS 4130.

### 2.2 INSULATION FOR HOT WATER PIPES

Preformed closed cell foam.

### 2.3 WATER METER

Meter, gate valve and back flow prevention to the requirements of the network utility operator. Minimum 25mm OD Polyethylene cold water main. Allow to excavate, install and back fill for the water main.

### 2.4 VALVES AND FITTINGS

All valves and fittings required for the system, to NZBC G12/AS1.

## 3 EXECUTION

### 3.1 EXECUTION GENERALLY

Carry out work and tests as applicable to NZBC G12/AS1.

### 3.2 INSTALL POLYBUTYLENE/POLYETHYLENE/POLYPROPYLENE WATER SUPPLY

Type as selected. Size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Run pipes complete with all fittings, support and fixing, and jointed to the pipe manufacturer's specifications, all to NZBC G12/AS1, 5.0 **Water supply**. Conceal pipework and pressure test before wall linings are fixed.

### 3.3 OUTLET LOCATIONS

Ensure wall outlets for exposed pipes are level and centred on the fixture to ensure the neat installation of exposed pipework.

### 3.4 BACKFLOW PREVENTION

Fit back flow prevention devices to all outlets where it is possible for water or contaminants to backflow in to the potable water supply system.

### 3.5 INSTALL HOT WATER PIPE INSULATION

Insulate hot water pipes in accordance with the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs. Where hair felt is used, wrap around pipes in two layers in opposite directions and secure with galvanized steel wire ties.

### 3.6 INSTALL WATER HEATER

Install where shown complete with all the necessary fittings to the water heater manufacturer's requirements and NZBC G12/AS1, 6.11 **Water heater installation**. Gas water heaters also to AS/NZS 5601.1 and NZBC C/AS1-AS7, 7.2 **Gas-burning appliances**.

### 3.7 PENETRATIONS

Provide and fit collars and escutcheon plates to match pipework at penetrations through constructions.

### 3.8 COMPLETION

Pressure test to ensure no leakage and leave in proper working order. Clean tapware and fittings.

# 7150 SANITARYWARE, TAPWARE & ACCESSORIES

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a certifying person under the Plumbers, Gasfitters and Drainlayers Act 2006.

## 2 PRODUCTS

### 2.1 SANITARY FIXTURES, TAPWARE, APPLIANCES AND ACCESSORIES

Refer to owners and drawings for product selections.

## 3 EXECUTION

### 3.1 EXECUTION GENERALLY

Carry out installation work and tests to AS/NZS 3500.2, as applicable.

### 3.2 INSTALL SANITARYWARE

Fit and install sanitaryware and associated screens, elements and hardware, plumb, true to line and rigid, to the fixture manufacturer's requirements. Supply standard chrome plated brass wastes and plastic plugs on chrome plated chains with all basins, tubs and baths.

### 3.3 INSTALL TAPWARE

Install tapware in accordance with the tap manufacturer's requirements. Flush out on completion. Check that washers or ceramic discs are operating correctly.

### 3.4 TEST

Test soil and waste disposal systems to ensure no leakage exists and leave in working order.

### 3.5 ENSURE

Ensure all sanitary plumbing fittings and pipework are complete and operational.

# 7210 GAS SYSTEM

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 REGULATIONS

Comply with the Gas (safety and Measurement) Regulations, Electricity (Safety) Regulations and other NUO requirements. Give notices for inspections and carry out tests as required.

### 1.2 QUALIFICATIONS

Gasfitters to be experienced competent craftsman gasfitters, or registered gasfitters working under the direction of a craftsman gasfitter, familiar with the materials and techniques specified.

### 1.3 GAS CERTIFICATE OF COMPLIANCE

Provide a Certificate of Compliance (CoC) before connection.

### 1.4 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) at completion of work.

### 1.5 APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) for appliances.

### 1.6 PRESSURE TEST

Pressure test the system for leakage to AS/NZS 5601.1 before pipework is concealed by linings.

### 1.7 FINAL INSPECTION AND TEST

Carry out final inspections and testing, pressure test the system for leakage to AS/NZS 5601.1. Submit the work for inspection and test and prove to the satisfaction of the gas retailer that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.

## 2 PRODUCTS

### 2.1 DESIGN LPG CYLINDER SUPPLY

Design and install the 45kg LPG twin cylinder system to AS/NZS 5601.1 and the requirements of the LPG Association. Include, pipes, valves, change over valves and a cylinder anchor system.

## 3 EXECUTION

### 3.1 EXECUTION GENERALLY

Carry out the whole of this work to the requirements of NZBC G10/AS1, NZBC G11/AS1 and AS/NZS 5601.1.

### 3.2 INSTALL PIPING

Run the system, completely concealed, in the most suitable type of pipe for each part of the installation, bent, supported, jointed and complete with all fittings to AS/NZS 5601.1. Confirm the type of pipe to be used and its location.

### 3.3 INSTALL GAS APPLIANCES

Fit and connect the gas appliances to AS/NZS 5601.1, complete with flues where required and to the appliance manufacturer's requirements.

### 3.4 COMPLETION

Leave the installation including appliances clean and in full working order.

# 7410 RAINWATER SPOUTING SYSTEM

## 1 GENERAL

Refer to selections and drawings for specific product, material, accessories and finish selections.

### 1.1 LIAISON

Ensure liaison with associated installations to ensure material selections are compatible and required flashing work is completed.

### 1.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

## 2 PRODUCTS

### 2.1 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING

Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.

### 2.2 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL DOWNPIPES

Seam jointed and complete with stand-off brackets, galvanized screw fixed.

## 3 EXECUTION

### 3.1

#### INSTALL ALUMINIUM/ZINC ALLOY COATED STEEL PRE-PAINTED SPOUTING AND DOWNPIPES

Screw fix brackets, set to falls to outlets, with spouting joints silicone sealed and pop-riveted to the spouting manufacturer's requirements. Screw fix stand off brackets, set pipes plumb and clear of the wall, with joints silicone sealed. Discharge into stormwater bends.

### 3.2 ENSURE

Ensure rainwater services are operational, flashings complete and the building weathertight.

## 7420 SANITARY WASTE SYSTEM

### 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

#### 1.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a certifying person under the Plumbers, Gasfitters and Drainlayers Act 2006.

### 2 PRODUCTS

#### 2.1 PVC-U WASTE, SOIL AND VENT PIPES

PVC-U pipe, complete with fittings brand-matched to the pipe manufacturer's requirements.

#### 2.2 EXPOSED PIPES AND TRAPS

As selected and to the following details:

- chrome plate on copper pipes and associated copper and brass fittings
- white polybutylene or PVC, including all associated fittings.

### 3 EXECUTION

#### 3.1 EXECUTION GENERALLY

Carry out sanitary plumbing work and tests as applicable to:

- NZBC G13/AS1

#### 3.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

#### 3.3 INSTALL TRAPS, WASTE AND VENT PIPES

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to NZBC G13/AS1. Discharge wastes into floor waste gully, drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to roof vents and vermin proof mesh to untrapped waste pipes.

#### 3.4 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework. Exterior roof and wall penetrations to NZBC E2/AS1.

#### 3.5 TEST

Test soil and waste disposal systems to ensure no leakage exists and leave in working order.

#### 3.6 ENSURE

Ensure all sanitary plumbing fittings and pipework are complete and operational.

# 7430 DRAINAGE SYSTEMS

## 1 GENERAL

Refer to drawings for specific product, material, accessories and finish selections.

### 1.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 2006.

### 1.2 AS BUILT DOCUMENTS

Supply a 1:100 as-built drawing to the BCA and the owner on completion.

## 2 PRODUCTS

### 2.1 MATERIALS

Concrete:	17.5 MPa prescribed grade.
Reinforcement:	Grade 300 deformed bars.
PVC-U pipes:	PVC-U pipes bends, junctions, fittings and joints.
Field drains:	Plastic pipes for field drains perforated and coiled with filter fabric over.
Drainage/filling materials	
Granular fill:	Clean gravel or crushed stone or a blend of these. Particle size from minimum 7mm to maximum 20mm.
Selected fill:	Fine grain soil or granular material suitable for bedding, excluding topsoil.
Ordinary fill:	Top soil or other excavated materials.

### 2.2 FITTINGS

Gully traps:	To NZBC G13/AS2, 3.3 <b>Gully traps</b> , complete with grating.
Strip drain channel:	Proprietary, modular, variable invert, PVC-U or precast concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings.

## 3 EXECUTION

### 3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.

### 3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

### 3.3 EXECUTION GENERALLY

Carry out drainage work as applicable to:

- NZBC G13/AS2 and NZBC E1/AS1.

### 3.4 LAY WASTEWATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the NUO's sewer. Set inspection fittings on a concrete base.

### 3.5 INSTALL GULLY TRAPS

Set on concrete 50mm above surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.

### 3.6 CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

### 3.7 FIELD TEST

Field test drains for watertightness to the satisfaction of the BCA inspector.

3.8 BACKFILL

Backfill drain lines in 150mm layers, well tamped but without disturbing the drains. Finish off garden areas with 150mm of topsoil, slightly mounded above the finished ground line. Public roads and footpaths to be made good to the controlling authority requirements.

# 7700 ELECTRICAL

## 1 GENERAL

Refer to owners and drawings for specific product, material, accessories and finish selections.

### 1.1 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000 for listed and prescribed work and with the NUO's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

### 1.2 QUALIFICATIONS

Carry out work by or under the direct supervision of an electrical licensed supervisor under the Electricity (safety) Regulations 2010.

### 1.3 ELECTRICAL CERTIFICATE OF COMPLIANCE

Provide, prior to connection, a Certificate of Compliance (CoC) as required by the Electricity (Safety) Regulations 2010, to the owner and if required to the NUO. Allow the NUO to view before the meter installation, listed work inspection, polarity check and livening of supply.

### 1.4 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

### 1.5 SAFETY OF INSTALLATION

When required by the Electrical (Safety) Regulations 2010, before installation work commences, provide a Certified Design to Electrical (Safety) Regulations 2010, regulations 58. This will may not be required for domestic installations or Low Risk Work.

## 2 PRODUCTS

### 2.1 METER BOARD / DISTRIBUTION BOARD / SUB BOARD

Proprietary manufactured meter board complete with flashing kit. Proprietary manufactured distribution board, zinc plated powder coated, or heavy duty plastic, fire resistant enclosed construction, complete with neutral and earth busbars, MCB's, RCD's and main switch. All protective devices: 6kA MCB's of the appropriate rating. Fit to board manufacturer's requirements where detailed. Recess into wall and ensure fire containment properties of the enclosure is maintained.

### 2.2 CABLES

Tough plastic sheathed copper conductors. Minimum sizes are indicated below. Increase these as necessary due to method of installation, cable length or load.

Lighting circuits: 1.5mm<sup>2</sup> on 10 amp MCBs for domestic construction

Power circuits: 2.5mm<sup>2</sup> on 16 amp MCBs for domestic construction

### 2.3 ELECTRICAL ACCESSORIES

As selected and to the following details:

Switch units	Minimum 16 amp, 230 volt flush polycarbonate units. For number of switches per unit, dimmer units, neon (indicator or toggle) units, locator units and 2-way units refer to the electrical drawings.
Switched socket units:	10 amp, 230 volt flush polycarbonate 3 pin combined switch units.
Hot water system switch:	One way 20 amp switch complete with clamp for flexible PVC conduit.
Stove/range socket outlet and switch:	32 amp, 230 volt flush polycarbonate 3 pin combined switch unit, with remote isolating switch.

## 3 EXECUTION

### 3.1 CABLING

Install with a maximum of 10 light outlet units or 6 switched socket units on any circuit. Separate circuits for all electric heating appliances. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Provide earth bonding and main earth.

### 3.2 INSTALL SWITCH AND SOCKET UNITS

Fit single and double switch units and socket units level and plumb where shown on the drawings. Install at the following heights (to the centre of the unit) unless shown otherwise on the drawings or to match existing.

Switch Units:	1000mm above floor
Socket Units:	400mm above floor
	150mm above work benches

Mount switches vertically and socket units horizontally. Label switch units which control electrical equipment by engraving on the rocker switch.

### 3.3 INSTALL LIGHT FITTINGS

Install selected light fittings in the locations and heights shown on the drawings and in accordance with the fitting manufacturer's requirements. Recessed fittings to AS/NZS 3000, types IC-F, IC, CA-80 or CA-135 only (no clearance to insulation required for these types).

### 3.4 GAS HOT WATER SYSTEM

Wire for control system to continuous flow gas hot water system.

### 3.5 UNDERFLOOR HEATING SYSTEMS

Connect under floor heating systems complete with thermostats to manufacturer's requirements.

### 3.6 WIRE FOR PLUMBING FITTINGS

Wire for fittings to the Electricity (Safety) Regulations 2010 and to the fitting manufacturer's requirements.

### 3.7 INSTALL DOMESTIC SMOKE ALARMS

Install alarms to NZBC F7/AS1, 3.3 Location of smoke alarms, and to manufacturer's requirements, fitted neatly and without damage to the surrounding finish.

### 3.8 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire selected fittings and equipment to the Electricity (Safety) Regulations 2010 and the individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment.

### 3.9 COMPLETION

Leave all fittings, lamps and tubes operational, with equipment and diffusers clean.

## **\*\* APPENDIX**

- 1 Flexiseal Branz Appraisal
- 2 Super Stick Branz Appraisal
- 3 Texton Wall Wrap Branz Appraisal
- 4 Thermakraft 215 data sheet
- 5 All Proof channel drain
- 6 Escea Fire
- 7 Masport Fire



## **BRANZ Appraised**

Appraisal No.474 [2010]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

## **BRANZ APPRAISAL No. 474 (2010)**

This Appraisal replaces Appraisal No.  
474 (2005), issued 20 June 2005.

Amended 31 January 2012.

## **FLEXI-SEAL® INTERIOR WATERPROOFING SYSTEMS**

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## Product

1.1 Flexi-Seal® Interior Waterproofing Systems are of two types, one a two-part cementitious, acrylic modified, the other (Flexi-Seal® PUD) a single part water based polyurethane modified. Both are liquid applied, waterproof membrane systems designed for use in internal wet areas under ceramic and stone tiles.



## Scope

2.1 Flexi-Seal® Interior Waterproofing Membranes have been appraised for use as waterproofing membrane for internal wet areas of buildings, within the following scope:

- on floor substrates of concrete, flooring grade particleboard, plywood, fibre cement compressed sheet and fibre cement sheet tile underlay, and on wall substrates of wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
- when protected from physical damage by ceramic tiles or stone finishes; and,
- where floors are designed and constructed such that deflections do not exceed 1/360<sup>th</sup> of the span.

2.2 The use of Flexi-Seal® Interior Waterproofing Systems on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.

2.3 Movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.

2.4 Ceramic tile or other stone finishes are outside the scope of this Appraisal.

2.5 The membranes must be installed by Flexco (NZ) Ltd approved and trained applicators.

## Building Materials

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Flexi-Seal® Interior Waterproofing Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

**Clause B2 DURABILITY:** Performance B2.3.1 (b) 15 years. Flexi-Seal® Interior Waterproofing Systems meet this requirement. See Paragraph 9.1.

**Clause E3 INTERNAL MOISTURE:** Performance E3.3.6. Interior wet area floors and walls incorporating Flexi-Seal® Interior Waterproofing Systems will meet this requirement and also Functional Requirement E3.2 (b) and (c). See Paragraphs 11.1 – 11.7.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Flexi-Seal® Interior Waterproofing Systems meet this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** to meet the NZBC performance requirements.

## Technical Specification

### Flexi-Seal® Waterproofing Systems

4.1 Materials supplied by Flexco (NZ) Ltd are as follows:

#### Flexi-Seal®

- Flexi-Seal® is a two-part, flexible, acrylic, cementitious liquid waterproofing membrane. Once mixed it is coloured grey and supplied in kits of 12 litre container and a 20 kg bag. (Note: Flexi-Seal® is a Class I as per AS/NZS 4858.)

#### Flexi-Seal® PUD

- Flexi-Seal® PUD is a single part; water based polyurethane modified, flexible waterproofing membrane. It is coloured blue and supplied in 4 and 15 litre pails. (Note: Flexi-Seal® PUD is a Class III as per AS/NZS 4858.)

#### Orgo'Clean®

- Orgo'Clean® is an organic cleaning concentrate for the removal of moss, mould and lichen if present on existing substrates.

#### Nail'n Screw Patch

- Nail'n Screw Patch is a fast setting cementitious compound used to fill nail and screw holes on plywood and particle board substrates, as well as repair chips and imperfections on concrete floors.

#### Primer Sealer

- Primer Sealer is a white liquid penetrative primer for concrete and wet area plasterboard substrates.

#### Mega Prime

- Mega Prime is a two part epoxy primer used to spot prime galvanised nails and screw heads, as well as PVC and Steel Waste traps, and to prime plywood and particle board substrates prior to the application of the Flexi-Seal®.

#### Reinforcing Bandage

- Reinforcing Bandage is polyester, woven bandage used in conjunction with Flexi-Seal® Primers or Flexi-Seal® 2 Part Liquid Membrane, as a bond breaking mechanism to reinforce wall/wall and wall/floor junctions in non wet and semi wet areas. For all other applications use Butylseal Tape.

### Flexi-Seal® Deck Reinforcing Tape

- Flexi-Seal® Deck Reinforcing Tape is a bituminous tape to accommodate joint movement.

The tape is a self-adhering, modified SBS rubberised asphalt tape with a white polyester upper face and is 1mm thick.

### Butylseal Tape

- Butylseal Tape is a Butyl Rubber Tape used to detail/reinforce wall/wall and wall/floor joints and all internal and external joints and it is available in a roll of 80 or 150 mm wide and 15 m long.

### Sikasil C

- Sikasil C is a siliconised compound used as a bond breaker medium at wall/wall and wall/floor junctions.

### Sikaflex 11FC

- Sikaflex 11FC is a siliconised compound designed to fill control joints such as in concrete floors.

### Micron Mat

- Micron Mat is a continuous filament polypropylene yarn used to ensure guaranteed micron thickness.

## Handling and Storage

5.1 All of the materials must be stored indoors, away from direct sunlight, heat and flame, in a dry space, at temperatures between 10°C and 32°C. Materials must not be removed from their containers until ready to use. The products have a shelf life of one year.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ Website for details of the current Technical Literature for Flexi-Seal® Interior Waterproofing Systems. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the scope of this Appraisal and the Technical Literature must be followed.

## Design Information

### General

7.1 Flexi-Seal® Waterproofing Systems are for use in buildings where impervious waterproof membranes are required to floors and walls to prevent damage to building elements and adjoining areas.

7.2 The membranes must be protected from physical damage by the application of ceramic tiles or other stone finishes.

7.3 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ Tiling Good Practice Guide.

7.4 For a Class I Membrane, the bond breaker consists of a 10 mm scallop bead of neutral cure silicone, followed by installation of the reinforcing bandage or Butylseal Tape to all wall/wall and wall/floor joints. For the Class III Membrane, the bond breaker consists of the same as above, but with the Butylseal Tape only; or an alternative method is to apply a 25 mm scallop of neutral cure silicone followed by a coat of the Flexi-Seal® PUD prior to the application of two full coats of the Flexi-Seal® PUD.

7.5 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

## Substrates

### Plywood

8.1 Plywood must be a minimum of 17mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3 (CCA treated). **LOSP treated plywood must not be used.** The plywood must be supported with dwangs or framing with a maximum span of 400mm in each direction, fixed with 10g x 50mm stainless steel countersunk head screws at 150mm centres on the edges and 200mm through the body of the sheets.

### Fibre Cement Compressed Sheet/ Fibre Cement Sheet Tile Underlay

8.2 Fibre cement compressed sheet must be manufactured to comply with the requirements of AS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Fibre cement sheet tile underlay must be covered by a valid BRANZ Appraisal Certificate for use in internal wet areas. Installation must be in accordance with the manufacturer's instructions.

### Particleboard

8.3 Particleboard must be specified for the end use in accordance with NZS 3602.

### Concrete and Concrete Masonry

8.4 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101 and NZS 3604 Concrete Slab-On-Ground Floors and Concrete masonry to NZS 4229 and NZS 4230.

### Wet Area Wall Linings

8.5 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588, and be covered by a valid BRANZ Appraisal for use in internal wet areas.

8.6 Fibre Cement Sheet must be manufactured to comply with the requirements of AS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area wall lining.

## Durability

### Service Life

9.1 Flexi-Seal® Interior Waterproofing Systems when subjected to normal conditions of environment and use are expected to retain their integrity for a period of at least 15 years and be compatible with tiling finishes with a designed service life of 15 – 25 years.

## Maintenance

10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tiling finish remains intact. Regular checks must be made of tiled areas to ensure they are sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grout and sealants.

10.2 In the event of damage to the waterproofing membrane the tiling must be removed. Repair can then be carried out by applying a patch of suitable membrane.

10.3 Drainage outlets must be maintained to operate effectively, and tiling finishes must be kept clean.

## Internal Moisture

11.1 Flexi-Seal® Interior Waterproofing Systems are impervious to water and when appropriately designed and installed will avoid the likelihood of water penetrating behind linings or entering concealed spaces.

11.2 Flexi-Seal® Interior Waterproofing Systems are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of Code Compliance for overflow is given in NZBC Acceptable Solution E3/AS1 Paragraph 2.

11.3 Surfaces must be finished with ceramic or stone tile finishes. A means of Code Compliance to NZBC Clause E3.3.3 is given in NZBC Acceptable Solution E3/AS1 Paragraph 3.1.1 (b) and 3.1.2 (b).

11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1500 mm out from the shower rose. Floor wastes must be provided and the floor must fall to the outlet.

11.5 The waterproofing membranes must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions can be obtained from AS 3740, the BRANZ Tiling Good Practice Guide, and flooring and wallboard manufacturers.

11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30mm.

11.7 BRANZ recommends the entire floor be covered by a waterproof membrane for bath, shower and spa rooms where timber, plywood or particleboard floors are used. This is also a requirement of particleboard manufacturers.

## Installation Information

### Installation Skill Level Requirement

12.1 Installation of the membranes must be completed by approved and trained applicators that have completed the Flexco (NZ) Ltd training programme.

12.2 Installation of substrates must be completed by tradespersons with an understanding of internal wet area construction, in accordance with instructions given within the Flexi-Seal® Interior Waterproofing Systems Technical Literature and this Appraisal.

### Preparation of substrates

13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.

13.2 Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 424. The relative humidity of the concrete must be 75% or less before membrane application.

13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor or wall/wall junctions and control joints must use installed as set out in the Technical Literature.

13.4 Cement sheet substrates must be primed with Flexi-Seal® Primer Sealer and allowed to cure before the membrane is installed.

13.5 Use Flexi-Seal® Mega Prime to prime all plastic waste traps, plywood substrates and nail heads.

## Membrane Installation

14.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.

14.2 Flexi-Seal® 2 Part Liquid Membrane and Flexi-Seal® 2 Part Liquid Membrane Powder must be mixed and left to stand for 5 minutes before re-mixing, then applying. Flexi-Seal® PUD must be thoroughly stirred before application.

14.3 The membranes must be applied in a minimum of two coats at the rates set out in the Technical Literature.

For both membrane types, the second coat should be applied in the opposite direction to the first.

14.4 Application can be made by roller (medium/long nap), brush (long bristle), or on floors with a rubber grouting blade.

14.5 Reinforcement bandage is bedded into the wet layer of the two-part system at wall/wall and wall/floor junctions. Butylseal Tape is used for this purpose when using the single pack PUD system. For joints in flooring systems and crack suppression on concrete floors the Butylseal Tape is used.

14.6 Clean up may be undertaken with water.

## Tiling

15.1 The membranes must be cured for at least 24 hours in summer and 48 hours in winter before tiling. The cured membranes must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.

15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Tiling Practice Guide. The compatibility of the tile adhesive must be confirmed with Flexco (NZ) Ltd.

## Inspections

16.1 Critical areas of inspection are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membranes to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
- Membranes curing and integrity prior to the installation of tiles including protection from mechanical damage during curing and prior to tile installation.

## Health and Safety

17.1 Safe use and handling procedures for the membrane are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

## Basis of Approval

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

## Tests

18.1 Testing has been carried out by BRANZ. This testing covered durability, water absorption, thermal stability, shear, adhesion, static water head resistance, water vapour transmission and suitability over particle board. The test results were reviewed by BRANZ experts and found to be satisfactory.

18.2 Testing has carried out by CSIRO to AS/NZS 4858, results of this testing has been reviewed by BRANZ technical experts and is found to be satisfactory.

## Other Investigations

19.1 An assessment was made of the durability of the Flexi-Seal® Waterproofing Systems by BRANZ technical experts.

19.2 Site inspections were carried out by BRANZ to examine the practicability of installation.

19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

## Quality

20.1 The manufacture of the Flexi-Seal® Waterproofing Membranes has been examined by BRANZ and found to be satisfactory.

20.2 The quality of manufacture of the Flexi-Seal® Interior Waterproofing Membranes are the responsibility of RLA Polymers (NZ) Ltd and RLA Polymers Pty Ltd.

20.3 The quality of supply to the market is the responsibility of Flexco (NZ) Ltd.

20.4 The quality of installation on site is the responsibility of the Flexco NZ Ltd approved and trained applicator.

## Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2269: 2008 Plywood – structural.
- AS 2358: 1990 Adhesive for fixing ceramic tiles.
- AS 3740: 2010 Waterproofing of wet areas within residential buildings.
- AS 3958.1: 1991 Guide to the installation of ceramic tiles.
- Good Tiling Practice, BRANZ, June 2002.
- NZS 3101: 2006 Concrete structures.
- NZS 3109: 1997 Concrete construction.
- NZS 3602: 2003 Timber and wood-based products for use in buildings.
- NZS 3603: 1994 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition (Amendment 12, 10 October 2011).
- The Building Regulations 1992.



**BRANZ**

**In the opinion of BRANZ, Flexi-Seal Interior Waterproofing Systems are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.**

**The Appraisal is issued only to Flexco (NZ) Ltd, and is valid until further notice, subject to the Conditions of Appraisal.**

**Conditions of Appraisal**

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

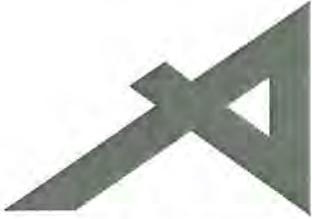
For BRANZ

P Burghout  
Chief Executive

**Amendment No. 1, dated 31 January 2012.**

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011.

Date of issue: 6 August 2010



**BRANZ Appraised**  
Appraisal No. 846 [2013]

## SUPER-STICK FLEXIBLE FLASHING TAPE

Appraisal No. 846 [2013]

Amended 29 January 2016



### BRANZ Appraisals

Technical Assessments of products for building and construction.



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## Product

- 1.1 SUPER-STICK is a flexible flashing tape used around framed joinery openings as a secondary weather resistant barrier.
- 1.2 SUPER-STICK is installed into and around the framed joinery opening over the building wrap and exposed frame to cover both the face and edge of the opening framing. SUPER-STICK is also used at joinery heads to seal flashing upstands to the building wrap.

## Scope

- 2.1 SUPER-STICK has been appraised as a flexible flashing system for use around window and door joinery openings for buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
  - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
  - with wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a flexible flashing tape system; and,
  - with wall underlays compatible with the flexible flashing tape; and,
  - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 SUPER-STICK has also been appraised as a flexible flashing system for use around window and door joinery openings for steel framed buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, with regards to building height and floor plan area; and,
  - constructed with steel framing complying with the NZBC; and,
  - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
  - with wall cladding systems covered by a valid BRANZ Appraisal that specifies a flexible flashing system; and,
  - with wall underlays compatible with the flashing tape and steel frame; and,
  - situated in NZS 3604 Wind Zones up to, and including, Extra High.

*Note: Marshall Innovations Ltd offer SUPER-STICK as a jointing and flashing tape for use with rigid air barrier systems that do not require a flexible wall underlay, but this aspect is outside the scope of this Appraisal. Contact the rigid air barrier system proprietor for system details including recommended jointing and flashing tapes.*

## Building Regulations

### New Zealand Building Code [NZBC]

- 3.1 **In the opinion of BRANZ, SUPER-STICK, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:**
- Clause B2 DURABILITY:** Performance B2.3.1 (b), 15 years and B2.3.2. SUPER-STICK meets these requirements. See Paragraphs 8.1 and 8.2.
- Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. SUPER-STICK contributes to meeting this requirement. See Paragraphs 7.1 – 7.4 and 11.1.
- Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. SUPER-STICK meets this requirement and will not present a health hazard to people.
- 3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance. See Paragraph 7.1.

## Technical Specification

- 4.1 SUPER-STICK is a multi-layered silver polyester faced, copolymer, self-adhesive tape. The tape is supplied in rolls of 75 mm X 22.86 m, 150 mm X 22.86 m and 200 mm X 22.86 m.

## Handling and Storage

- 5.1 Handling and storage of all materials supplied by Marshall Innovations Ltd, whether on or off site, is under the control of the installer. Rolls must be stored under cover, in clean, dry conditions away from direct exposure to sunlight.

## Technical Literature

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

## Design Information

### General

- 7.1 SUPER-STICK meets the requirements of AC148: 2001 which is an alternative solution to the version of AC148 referenced by NZBC Acceptable Solution E2/AS1, Paragraph 9.1.5 (b). The installation method for SUPER-STICK is an alternative solution to the installation method shown within NZBC Acceptable Solution E2/AS1, Figure 72A and 72B.
- 7.2 The use of flexible flashing tape systems around window and door joinery openings is critical to assist the overall weathertightness performance of window and door joinery installations.
- 7.3 SUPER-STICK is suitable for use over flexible wall underlays compatible with the flashing tape in NZS 3604 Wind Zones up to and including Extra High. In the Extra High Wind Zone, the flexible underlay must be installed over a rigid underlay complying with NZBC Acceptable Solution E2/AS1, Table 23.
- 7.4 SUPER-STICK is designed to prevent air leakage and water penetration around window and door openings at framing junctions [e.g. at the sill trimmer and opening stud junction], and to keep any water that gets past the cladding, or through the joinery, from direct contact with the framing timber.
- 7.5 SUPER-STICK is not designed to overcome poor detailing and workmanship of the window or door joinery installation. The system must not be considered in isolation, but be considered as part of the wall cladding system. SUPER-STICK flashing tape is designed to be used in conjunction with air seals and joinery flashing systems, not as a substitute.

- 7.6 When SUPER-STICK is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of the system.

### Durability

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

### Serviceable Life

- 8.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, SUPER-STICK is expected to have a serviceable life equal to that of the cladding. The maximum exposure period may however be limited by the requirements of the substrate supplier.

### Maintenance

- 9.1 No maintenance is required for SUPER-STICK. Regular checks, at least annually, must be made of the junctions between the joinery and wall cladding to ensure that they are maintained weathertight and that the primary means of weather resistance for the junction e.g. flashing, sealant, etc continues to perform its function, to ensure that water will not penetrate the cladding.

### Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to SUPER-STICK from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### External Moisture

- 11.1 Where a cladding manufacturer specifies the use of generic flashing tapes around window and door joinery openings at framing junctions as part of their system, or they specify the use of flexible flashing tapes that comply with NZBC E2/AS1, Paragraph 9.1.5 (b), SUPER-STICK may be used.

## Installation Information

### Installation Skill Level Requirements

- 12.1 Installation of SUPER-STICK must be completed by tradespersons with an understanding of flexible flashing systems, in accordance with instructions given within SUPER-STICK Technical Literature and this Appraisal.

### General

- 13.1 The selected building wrap must be installed in accordance with the manufacturer's instructions, and must completely cover the joinery opening. The wrap is then cut on a 45° angle away from each corner of the opening so the flaps can be folded into the opening and secured to the interior face of the timber framing.
- 13.2 Before SUPER-STICK is applied, the substrate surfaces must be clean, dry and free from any surface contaminants such as dust and grease that may cause loss of adhesion.
- 13.3 A 75 mm wide x 150 mm long sealing tape 'butterfly' must be installed at 45° across the corner of the jamb/sill junction overlapping the corner by 3 mm to create a seal at the corner junction. A length of SUPER-STICK is then cut to the length of the sill plus 300 mm. The tape is installed flush with the interior face of the opening and is applied along the entire length of the sill and 150 mm up each jamb. The overhanging tape is cut at the corner of the opening to allow the tape to be folded onto the face of the building wrap and "butterfly" installed across the corner. Cut another length of SUPER-STICK the exact length of the sill and overlay onto the already installed Tape to ensure nail sealability requirements are met.

- 13.4 A 300 mm length of SUPER-STICK must be installed 150 mm down the jamb and 150 mm along the lintel at each of the top corners of the window or door joinery opening. A 75 mm wide x 150 mm long sealing tape 'butterfly' must be installed at 45° across the corner of the head/jamb junction overlapping the corner by 3 mm to create a seal at the corner junction.
- 13.5 SUPER-STICK must not be stretched. When joining two sections of tape, the overlap must be 100 mm minimum.
- 13.6 If SUPER-STICK is exposed to the weather or UV light for more than 90 days, it must be replaced with new material.

#### **Installation Temperature**

- 13.7 SUPER-STICK must not be installed where temperatures are less than -5°C [Note: Marshall Innovations Ltd approve the installation of SUPER-STICK down to -20°C. This has not been addressed by this Appraisal and is outside its scope.]

#### **Inspections**

- 13.8 The Technical Literature must be referred to during the inspection of SUPER-STICK installations.

## **Basis of Appraisal**

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

#### **Tests**

- 14.1 Testing of SUPER-STICK has been completed by BRANZ to the requirements of ICC Evaluation Service Acceptance Criteria for Flashing Materials AC148. The adhesion of SUPER-STICK to black bituminous Kraft building paper complying with the requirements of NZBC Acceptable Solution E2/AS1, Table 23 and selected other synthetic wall underlays have been tested and found to be satisfactory.

#### **Other Investigations**

- 15.1 An assessment was made of the durability of SUPER-STICK by BRANZ technical experts.
- 15.2 Site inspections were carried out by BRANZ to examine the practicability of installation.
- 15.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

#### **Quality**

- 16.1 The manufacture of SUPER-STICK has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ undertakes an ongoing review of product quality on an inwards goods basis.
- 16.2 The quality of supply to the market is the responsibility of Marshall Innovations Ltd.
- 16.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and building wraps in accordance with the instructions of the designer.
- 16.4 The quality of installation, handling and storage on site is the responsibility of the installer in accordance with the instructions of Marshall Innovations Ltd.

#### **Sources of Information**

- ICC Evaluation Service, Inc, AC148 Acceptable Criteria for Flexible Flashing Materials, July 2001.
- NZS 3604: 2011 Timber-framed buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 [Amendment 6, 14 February 2014].
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

## Amendments

### Amendment No. 1, dated 13 March 2014.

This Appraisal has been amended to increase maximum exposure days and to reduce the minimum application temperature.

### Amendment No. 2, dated 29 January 2016.

This Appraisal has been amended to update the roll sizes of SUPER-STICK.



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

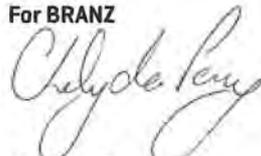
The Appraisal is issued only to Marshall Innovations Limited, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

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

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**For BRANZ**



**Chelydra Percy**

Chief Executive

Date of Issue:

23 December 2013



**BRANZ Appraised**  
Appraisal No. 548 [2013]

## TEKTON® BUILDING WRAP

**Appraisal No. 548 [2013]**

This Appraisal replaces BRANZ Appraisal No. 548 [2007], issued 27 July 2007.  
Amended 17 December 2013.



### BRANZ Appraisals

Technical Assessments of products for building and construction.



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## Product

- 1.1 Tekton® Building Wrap is a synthetic breather-type flexible wall underlay and air barrier for use under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is manufactured of a coated spun-bonded polypropylene.

## Scope

- 2.1 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on timber framed buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
  - with absorbent wall claddings directly fixed to framing; and,
  - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
  - situated in NZS 3604 Wind Zones up to, and including Very High.
- 2.2 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on steel framed buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
  - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
  - with masonry veneer subject to specific design; and,
  - situated in NZS 3604 Wind Zones up to, and including Very High.
- 2.3 Tekton® Building Wrap has been appraised for use as a flexible wall underlay over rigid wall underlays on timber and steel framed buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
  - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or specific design for steel framed buildings; and,
  - situated in NZS 3604 Wind Zones up to and including Extra High.
- 2.4 Tekton® Building Wrap has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Tekton® Building Wrap into their design in accordance with the declared properties and the instructions of Marshall Innovations Limited.

## Building Regulations

### New Zealand Building Code (NZBC)

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

**Clause B2 DURABILITY:** Performance B2.3.1 [a], not less than 50 years, B2.3.1 [b], 15 years and B2.3.2. Tekton® Building Wrap meets these requirements. See Paragraphs 9.1 and 9.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the cladding system, Tekton® Building Wrap will contribute to meeting this requirement. See Paragraphs 12.1 – 12.3.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Tekton® Building Wrap meets this requirement and will not present a health hazard to people.

- 3.2 This is an Appraisal of an **Alternative Solution** in terms of the New Zealand Building Code compliance.

## Technical Specification

- 4.1 Tekton® Building Wrap is a 100 g/m<sup>2</sup> light grey sheet polypropylene membrane material approximately 0.6 mm thick.
- 4.2 The product is supplied in rolls 1.370 m x 74 m and 2.743 m x 37 m. The product is printed with the Tekton® logo repeated along the length of the roll. The rolls are wrapped with an instruction sticker.

### Accessories

- 4.3 Accessories used with Tekton® Building Wrap which are supplied by the installer are:
- Fixings – staples, clouts, screws or proprietary wrap fixings, or other temporary fixings to attach the wall wrap to the framing.
  - Wall underlay support – polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall wrap in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

## Handling and Storage

- 5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

## Technical Literature

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

## Design Information

### Timber and Steel Framing

- 7.1 Studs must be provided at maximum 600 mm centres. Dwargs must be fitted flush between the studs at maximum 1200 mm centres.

### General

- 7.2 Tekton® Building Wrap is intended for use as an alternative to conventional building papers which are fixed over timber and steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.

- 7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.
- 7.4 Tekton® Building Wrap must not be exposed to the weather or ultra violet light for a total of more than 60 days before being covered by the wall cladding.
- 7.5 Tekton® Building Wrap is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23, except that it must not be used with non-absorbent wall claddings such as vinyl or metal based sidings or weatherboards in direct fixed installations. Tekton® is suitable for use under cavity based wall claddings as a non-absorbent synthetic wall underlay as called up in NZS 2295, Table 2.4 on steel framed buildings. Refer to Table 1.
- 7.6 Tekton® Building Wrap is also suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, as called up in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 (c). Refer to Table 1.

**Table 1: NZBC E2/AS1 Table 23 Requirements**

NZBC E2/AS1 Table 23 Wall Wrap Properties	Property Performance Requirement	Actual Property Performance
Absorbency	$\geq 100 \text{ g/m}^2$	Classified as non-absorbent [see paragraph 7.4]
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 20 \text{ mm}$	Pass
pH of Extract	$\geq 5.5$ and $\leq 8$	9.78 [Note 1]
Shrinkage	$\leq 0.5\%$	Pass
Mechanical	Edge tear and tensile strength	<b>Edge tear:</b> Machine direction = 228 N Cross direction = 186 N <b>Tensile strength:</b> Machine direction = 4.4 kN/m Cross direction = 3.9 kN/m
Air Barrier	Air resistance: $\geq 0.1 \text{ MN s/m}^2$	Pass

*Note 1: Further testing of Tekton® Building Wrap was completed to determine the effect of the high pH level on the wall underlay and materials it is likely to come into contact with during its serviceable life. The testing confirmed that the high pH had no adverse effects on the wall underlay performance, or the performance of other materials.*

- 7.7 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

### Stucco Plaster

- 7.8 Tekton® Building Wrap is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1. The wall underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.2.
- 7.9 Tekton® Building Wrap may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3 [b].

### Structure

- 8.1 Tekton® Building Wrap is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a flexible building underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid building underlays.

### Durability

- 9.1 Tekton® Building Wrap meets code compliance with NZBC Clause B2.3.1 [a], not less than 50 years for building wraps used where the cladding durability requirement or expected serviceable life is not less than 50 years, and code compliance with NZBC Clause B2.3.1 [b], 15 years for building wraps used where the cladding durability requirement is 15 years.

### Serviceable Life

- 9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Tekton® Building Wrap is expected to have a serviceable life equal to that of the cladding.

### Control of Internal Fire and Smoke Spread

- 10.1 Tekton® Building Wrap has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Tekton® Building Wrap from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### External Moisture

- 12.1 Tekton® Building Wrap must be used behind claddings that meet the requirements of the NZBC, e.g. such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.
- 12.2 Tekton® Building Wrap, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding systems compliance with NZBC Clause E2.
- 12.3 When used as an air barrier, particular care must be taken to ensure an air tight barrier is achieved, and weather sealing at all openings and penetrations through the cladding meets the requirements of the NZBC.

## Installation Information

### Installation Skill Level Requirements

- 13.1 Installation must always be carried out in accordance with the Technical Literature and this Appraisal, by competent tradespersons with an understanding of wall wrap installation.

### Wrap Installation

- 14.1 Tekton® Building Wrap must be fixed to all framing members at maximum 300 mm centres with hot-dip galvanised, large-head clouts 20 mm long, zinc plated 6-8 mm staples, self-drilling screws, or proprietary wrap fixings. The membrane must be pulled taut over the framing before fixing.
- 14.2 Tekton® Building Wrap must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.
- 14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess wall underlay may be cut off flush with the internal face of the wall frame.
- 14.4 Tekton® Building Wrap can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3.
- 14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.
- 14.6 Any damaged areas of Tekton® Building Wrap, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

### Inspections

- 14.7 The Technical Literature must be referred to during the inspection of Tekton® Building Wrap installations.

## Basis of Appraisal

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

### Tests

- 15.1 The following tests have been carried out on Tekton® Building Wrap by Scion: Folding strength of paper in accordance with AS/NZS 1301.423; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1 and air resistance in accordance with BS 6538-3.
- 15.2 The following tests have been carried out on Tekton® Building Wrap by BRANZ: Absorbency in accordance with AS/NZS 4201.6, Vapour transmission in accordance with ASTM E 96B, Shrinkage in accordance with AS/NZS 4201.3, Water barrier in accordance with AS/NZS 4201.4 and pH of extract in accordance with AS/NZS 1301.421. A range of these tests were completed before and after Tekton® Building Wrap was exposed to ultra-violet light.
- 15.3 The Flammability Index of Tekton® Building Wrap has been evaluated in accordance with AS 1530.2.

### Other Investigations

- 16.1 A durability opinion was given by BRANZ technical experts.
- 16.2 Site inspections were carried out by BRANZ to assess methods used for the installation of Tekton® Building Wrap, and to examine completed installations.
- 16.3 The marketer's Technical Literature, including installation instructions, have been examined by BRANZ and found to be satisfactory.