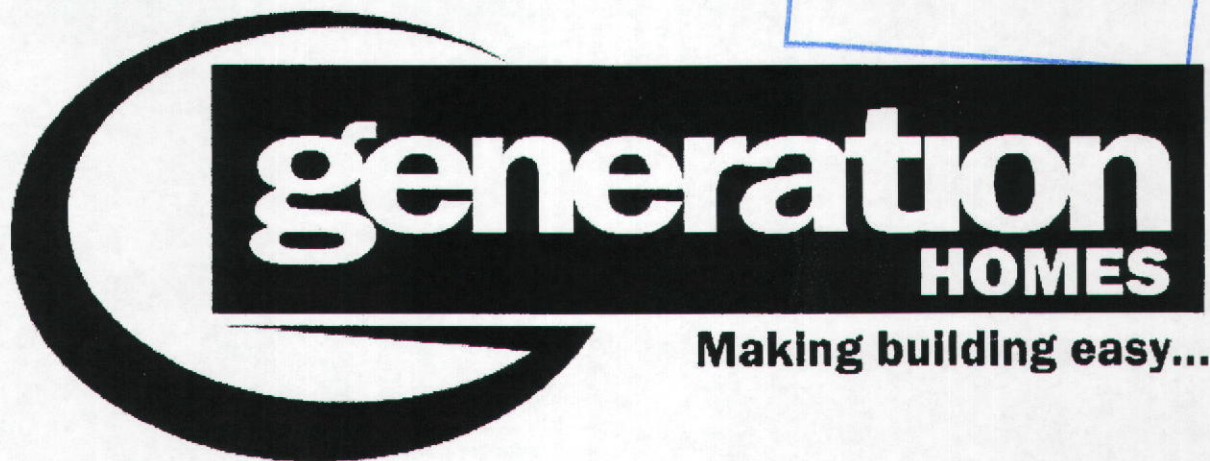
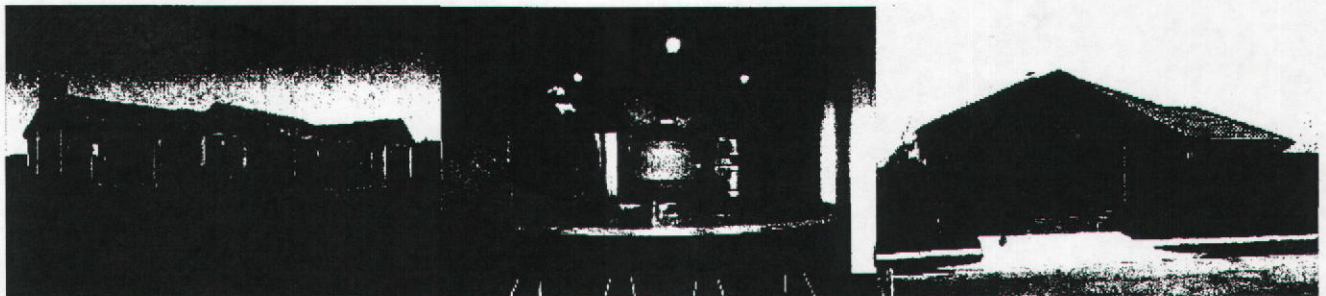


PIM/BC
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Making building easy...

**Legal Agreement for the sale and purchase of
Parkwood house & land package at Lot – 49
30 Hamon Place, Hamon Park, Rotorua**



David Wocke & Fiona Wocke

19 October 2012



RRD001UTLU

Document Number: **RDC-367579**

Date Registered: **6/6/2013**

AGREEMENT FOR SALE AND PURCHASE OF LAND AND BUILDINGS

Date of Agreement:

Vendor:

G H (Rotorua/Taupo) Limited

Purchaser:

David Richard Wocke and Fiona Merle Wocke

Address of Property:

30 Hamon Place, Hamon Park, Rotorua

Legal Description:

An estate in fee simple in all the land containing 700m2 shown as Lot 49 on Deposited Plan 399109 being the land comprised in Certificate of Title 395508 (South Auckland Registry) attached hereto and being subject to any interests or encumbrances shown thereon (excepting any mortgage thereon)

Purchase Price:

\$471,500.00 inclusive of GST made up as follows:

Land : \$150,000.00

Building: \$321,500.00

Initial Deposit:

\$500.00 payable upon signing of this Agreement which shall be a non refundable deposit for the preparation of plans. If the conditions in clause 21 herein are satisfied by the due date for satisfaction then the initial deposit shall be deducted from the purchase price. Such sum to be applied towards to the building portions of the Purchase Price.

Further Deposit:

\$46,650.00 payable upon the conditions in clause 21 herein being satisfied to the trust account of Cooney Lees Morgan as stakeholder. Any interest earned on the deposit (net of withholding tax) shall be credited to the Vendor should this Agreement become unconditional. In the event that this Agreement does not become unconditional the net interest shall be credited to the Purchaser upon refund of the deposit and neither party shall have any further claim against the other. Such Further Deposit to be applied as to \$15,000.00 towards the land and \$31,650.00 towards the building portions of the Purchase Price.

Balance:

By payment in cleared funds at the vendors solicitors office in accordance with clause ~~24~~²³ herein.

Possession date:

In accordance with clause ~~43~~⁴².

Interest rate for late settlement:

16% per annum

Tenancies:

Vacant possession

Chattels:

See attached Features list

Signature of Vendor:
GH (Rotorua/Taupo) Limited

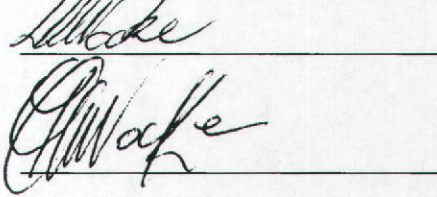


Contact Details:
Generation Homes
P O Box 774
Taupo 3351
Phone: 07 349 3964
Mobile: 021 494 497
Email: lyndonm@generation.co.nz

VENDOR'S SOLICITORS:

Firm: Cooney Lees Morgan
Individual Acting: Kelly Bek
Contact Details:
PO Box 143
TAURANGA 3140
Ph: 07 578 2099 Fax 07 578 1433
Email: kbek@clmlaw.co.nz

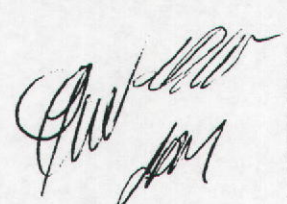
Signature of Purchaser:
David Richard Wocke and Fiona Merle Wocke



Contact Details:
15 Harris Street
Ngongotaha
Rotorua 3010
Phone: 07 357 3443
Mobile: 027 703 3231
Email: davwocke@hotmail.co.nz

PURCHASER'S SOLICITORS:

Firm: The Law Shop
Individual Acting: Paula Lines
Contact Details:
PO Box 2173
Rotorua
Phone: 07 349 2924
Email: paula@thelawshop.co.nz





**COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952**

Search Copy



R. W. Muir
Registrar-General
of Land

Identifier 395509
Land Registration District South Auckland
Date Issued 27 February 2008

Prior References
SA38D/72

Estate Fee Simple
Area 700 square metres more or less
Legal Description Lot 49 Deposited Plan 399109

Proprietors
Pinnacle Hill Subdivisions Limited

Interests

Subject to Section 11 Crown Minerals Act 1991
Subject to Part IV A Conservation Act 1987
7730864.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 27.2.2008 at 12:51 pm
Land Covenant in Easement Instrument 7730864.9 - 27.2.2008 at 12:51 pm

Transaction Id 35086901
Client Reference 219405.52

Search Copy Dated 19/10/12 9:01 am, Page 1 of 1
Register Only

PIM/BC

. . 70518

Habitable Building Vetting Checklist

For initial completion by the applicant

Ref: CV 01

Ver:10

Issued 06 July 2012

RDC-66524

Page 1 of 3

Copies Rqd	ADMINISTRATION CHECKLIST <i>To be completed by Customer Service Centre</i>					Complete ✓	
2	Geyserview printout (contour plan) checked with Applicant for Correctness					✓	
1	Green PIM/BC Master cover has been completed					✓	
1	Site Inspection Card completed					✓	
1	Applicant Inspection card complete					✓	
1	Form 6 (Application for Code Compliance Certificate) attached to Applicant Inspection Card					✓	
	Form 2 administratively complete and front cover signed appropriately					✓	
Document	Description	Applicant to Complete		Plan/Spec No.	RDC USE ONLY		
Address	30 HAMON PLACE, ROTORUA.	S	N/A	N/A	P	F	N/A
	Building Consent Application Form 2 completed and signed	S	N/A	N/A	P	F	N/A
	If this project involves "restricted building work" has the design been carried out by a Licensed Designer?	Y	N		P	F	N/A
	If this project is "restricted building work" has Form 2A (Certificate of Design Work) been provided?	Y	N		P	F	N/A
	Have all Licensed Building Practitioner's been identified AND name, address and phone nos. also been supplied?	Y	N		P	F	N/A
Documents							
Please refer to RDC website " How do I apply for a building Consent " if you are not sure how to complete this document or don't know what to provide.							
	Two sets of plans specifications, reports, calculations, producer statements etc	S	N/A		P	F	N/A
	All plans drawn to clearly to recognize metric scale (no pencil or red ink)	S	N/A		P	F	N/A
	Separate A3 (minimum size) floor plan for works >10k	S	N/A		P	F	N/A
	Current certificate of title no more than 6 months old	S	N/A		P	F	N/A
	Has site assessment of soil conditions been provided to 3604:2011?	S	N/A		P	F	N/A
	To what standard has this building been designed?	S	N/A	2011/10	P	F	N/A
	Show how wind zone was determined	S	N/A	101	P	F	N/A
	Bracing calculations	S	N/A	106	P	F	N/A
	E2 Risk Matrix for each elevation	S	N/A	301	P	F	N/A
	H1 Assessment (calculation method)	S	N/A	406	P	F	N/A
	Buildable truss layout	S	N/A	Attached	P	F	N/A
	Bracing fixings	S	N/A	107	P	F	N/A
	Specific design calculations and producer statement	S	N/A	Spec.	P	F	N/A
	Tanking specifications and appraisal certificates (e.g. wet area showers, membrane roofing, basements)	S	N/A	Spec.	P	F	N/A
	Exterior cladding specification	S	N/A	Spec.	P	F	N/A
	Job specific specifications (non generic)	S	N/A		P	F	N/A
Site Plan (Recommended Scale 1:100 1:200 1:500 1:1000)							
	Distances to boundaries indicated for proposed work	S	N/A	101	P	F	N/A
	Accurate site plan showing street name, boundary dimensions and north point	S	N/A	101	P	F	N/A
	Locations of all existing / proposed buildings, distances between them and any existing services	S	N/A	101	P	F	N/A
	Alterations to land contours (cut and fill) <i>At site</i>	S	N/A	101	P	F	N/A
	Easements and public drains	S	N/A		P	F	N/A

see back of form II.
as this property is recently purchased.

New SS and stormwater drainage (inc gradients, inspection points, vents and drain sizes)	S	N/A	108	P	F	N/A
Invert levels for drainage lateral	S	N/A	108	P	F	N/A
Finished floor level (datum)	S	N/A	101	P	F	N/A
Contours provided - SPOT LEVELS	S	N/A	101	P	F	N/A
Vehicle Crossing	S	N/A	101	P	F	N/A
Overhead power lines in relation to building		N/A				N/A
Floor Plans (Recommended Scale 1:20 1:50 1:100)						
Dimensions of proposed building work	S	N/A	102	P	F	N/A
Contain all walls, doors and fixtures for each room	S	N/A	102	P	F	N/A
Bracing layout with unique identifier	S	N/A	106	P	F	N/A
Indication of use of rooms	S	N/A	102	P	F	N/A
Dimensions of windows and doors	S	N/A	102	P	F	N/A
Lintel sizes and grade (MSG)	S	N/A	105	P	F	N/A
Plumbing fixtures	S	N/A	102/108	P	F	N/A
Ventilation to enclosed spaces (e.g. laundry in cupboard, enclosed toilet etc)	S	N/A	109	P	F	N/A
Surface finishes to wet areas (walls and floor to laundry, kitchen and bathroom)	S	N/A	102	P	F	N/A
Smoke alarm(s) location	S	N/A	109	P	F	N/A
Elevations (Recommended Scale 1:20 1:50 1:100)						
Cladding types clearly indicated and their locations	S	N/A	301	P	F	N/A
Windows (safety windows where appropriate)	S	N/A	301	P	F	N/A
Roof (roofing material)	S	N/A	301	P	F	N/A
Day lighting angles indicated	S	N/A	301	P	F	N/A
Ground levels at building and boundary	S	N/A	301	P	F	N/A
Roof pitch and material	S	N/A	301	P	F	N/A
Pile Plan (Recommended Scale 1:20 1:50 1:100)						
Location and type of piles	S	N/A		P	F	N/A
Subfloor bracing calculations	S	N/A		P	F	N/A
Foundation sizes and concrete strength	S	N/A		P	F	N/A
Connection details, types and centers	S	N/A		P	F	N/A
Anchor or brace piles (sub floor bracing for decks at more than 2m from the building)	S	N/A		P	F	N/A
Treatments (including MSG where appropriate)	S	N/A		P	F	N/A
Timber Floor (Recommended Scale 1:20 1:50 1:100)						
Joists and bearers including connections and spacing	S	N/A		P	F	N/A
Size, treatments and grading (e.g. MSG 8)	S	N/A		P	F	N/A
Flooring material and thickness	S	N/A		P	F	N/A
Insulation and enclosing of perimeter	S	N/A		P	F	N/A
Ventilation of subfloor space	S	N/A		P	F	N/A
Access to subfloor space	S	N/A		P	F	N/A
Slab Foundation (Recommended Scale 1:20 1:50 1:100)						
Size and depth of foundations	S	N/A	103/401	P	F	N/A
Reinforcing and concrete strength	S	N/A	103	P	F	N/A
Floor thickness and any thickenings	S	N/A	103	P	F	N/A
Construction joints/ saw cuts	S	N/A	103	P	F	N/A
DPM and fill	S	N/A	401	P	F	N/A
Blockwork (Recommended Scale 1:20 1:50 1:100)						

SED/ NZS 3604 or 4229	S	N/A		P	F	N/A
Reinforcing and concrete strength	S	N/A	103	P	F	N/A
Control joints	S	N/A	103	P	F	N/A
Cross Section Walls (Recommended Scale 1:20 1:50 1:100)						
Stud sizes, centers and height	S	N/A	201	P	F	N/A
Timber treatment and grading (e.g. MSG 8) <i>SG8 H1</i>	S	N/A	201	P	F	N/A
Bottom plate fixings	S	N/A	705	P	F	N/A
Top plate to stud fixings relevant to wind zone	S	N/A	105	P	F	N/A
Cavity construction details	S	N/A	404	P	F	N/A
Roof (Recommended Scale 1:20 1:50 1:100)						
Roof material and underlay	S	N/A	402	P	F	N/A
Truss fixings and centers	S	N/A	201	P	F	N/A
Formed roof construction details including sizes, centers	S	N/A		P	F	N/A
Purlin fixings (relevant to wind zone) and centers	S	N/A	108	P	F	N/A
Space or plane bracing	S	N/A	108	P	F	N/A
Ceiling batten sizing and spacing	S	N/A	201	P	F	N/A
Timber treatment and grading (e.g. MSG 8)	S	N/A	<i>Truss 2m</i>	P	F	N/A
Stormwater (Recommended Scale 1:20 1:50 1:100)						
On-site disposal (soak hole size & depth)	S	N/A		P	F	N/A
Internal/ external gutter sizing and details	S	N/A	402	P	F	N/A
Down pipe sizing and spacing (calculation?)	S	N/A	104	P	F	N/A
Flashings/ wrap/ envelope penetrations (Recommended Scale 1:20 1:50 1:100)						
Barge, ridge, hip and valley	S	N/A	402	P	F	N/A
External and internal corners	S	N/A	404	P	F	N/A
Junctions between differing claddings detailed	S	N/A	404	P	F	N/A
Wrap details and restraints	S	N/A	406	P	F	N/A
Window and door wrap/ flashing details (head, sill, jamb)	S	N/A	404	P	F	N/A
Plumbing and Drainage (Recommended Scale 1:20 1:50 1:100)						
Drain gradients sizing and venting	S	N/A	108	P	F	N/A
Inspection bends, junctions etc	S	N/A	108	P	F	N/A
Waste gradients sizing and venting	S	N/A	108	P	F	N/A
Overflow relief gully	S	N/A	108	P	F	N/A
Specifications for hot water heating system	S	N/A	108	P	F	N/A
Fire Walls (within 1m of boundary)						
Design for fire wall	S	N/A		P	F	N/A
On Site Effluent						
EBOP discharge approval granted or using an EBOP approved effluent disposal system	S	N/A		P	F	N/A
Environment Waikato TP58 form completed or an advanced effluent disposal system specified	S	N/A		P	F	N/A
Other Vetting Checklists Completed						
<i>SEH - not checked for completeness</i>	S	N/A		P	F	N/A

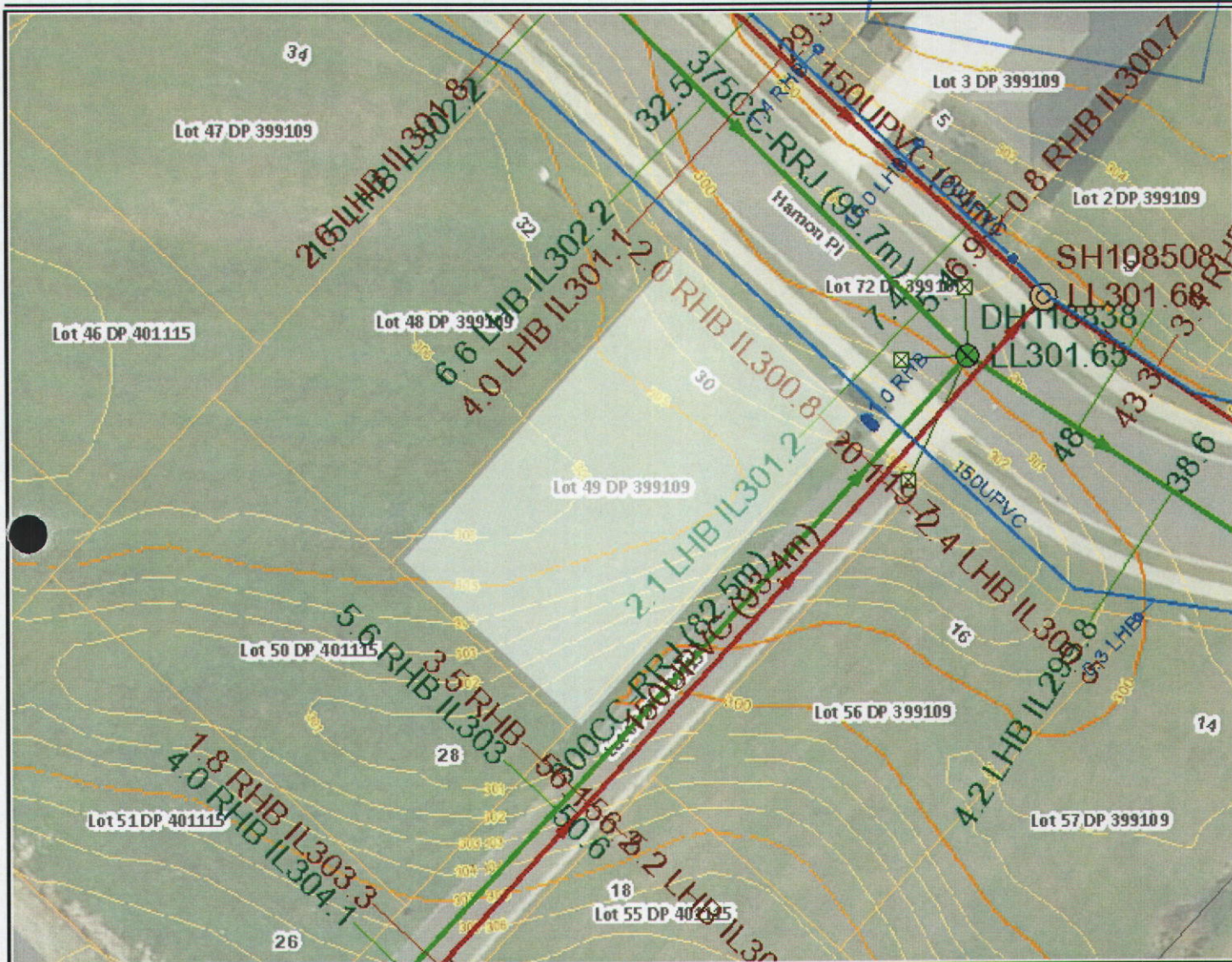
RDC
S = Supplied (2 copies) **P** = Pass
N/A = Not Applicable **F** = Not supplied – further information required **N/A** = Not Applicable

GeyserView IV Parcel Report

Legal desc: Lot 49 DP 399109

PIM/BC

399109 · 70518

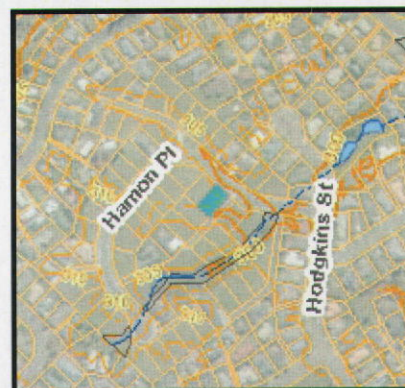


Parcel Information

Parcel is 'ghosted'

(s):

Owners:



This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

GeyserView IV Parcel Report

Legal desc: Lot 49 DP 399109

Oz Parcel Id	PFile	Full Address	Parcel Name
8859/49	P32783	30 HAMON PLACE, PUKEHANGI	LOT 49 DP 399109

Valuation	Address	Legal Description
06554*570*49*	30 HAMON PLACE	LOT 49 DP 399109
Capital Value	\$153,000.00	Connections:
Land Value	\$153,000.00	Sewer 0
Improvements		Water 0
Area (ha)	0.0700	Refuse Charges: 0

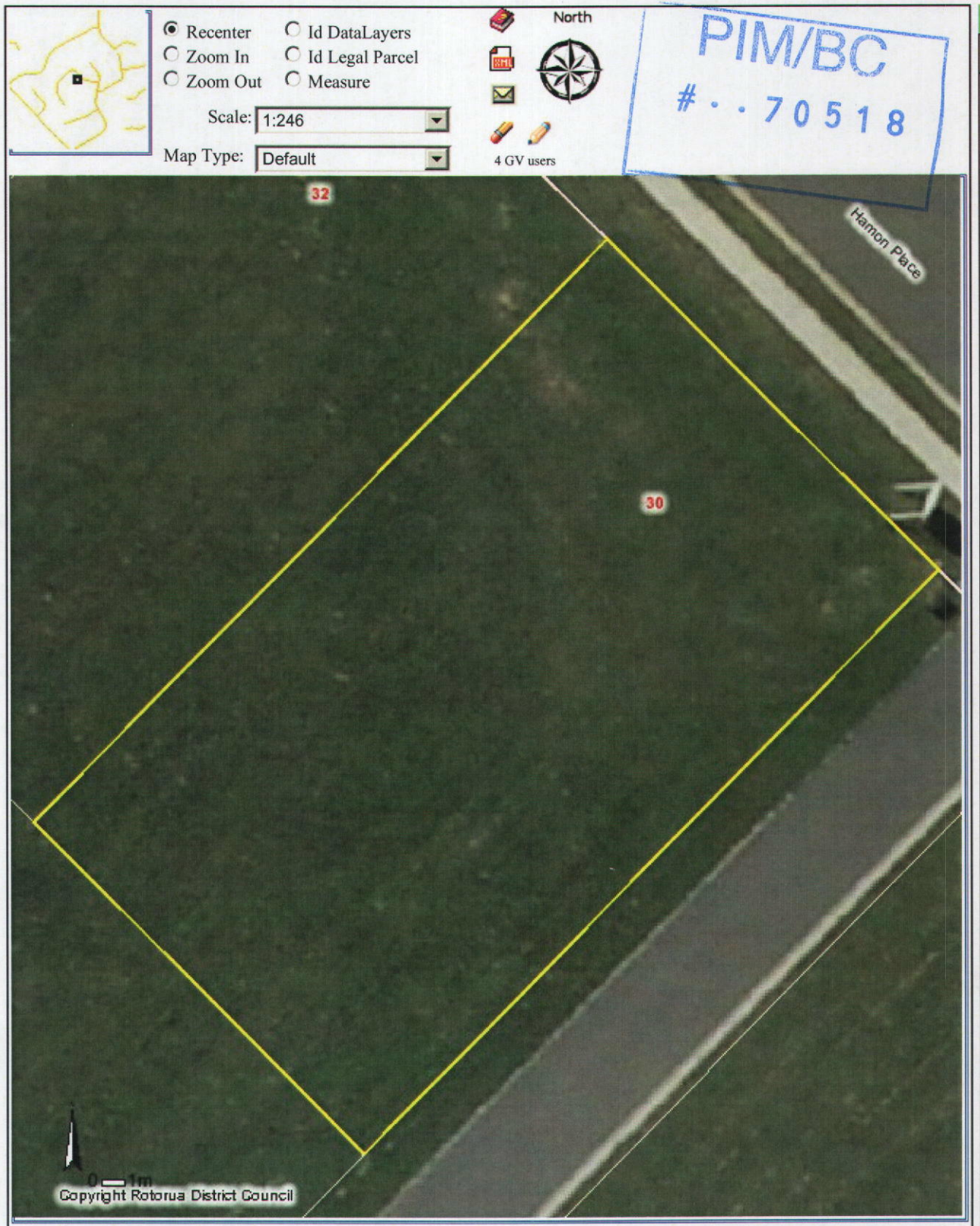
Rates struck on: 06554*570*49*

1120	Residential - General Urban Rate	153000.0000	0.002623150	\$401.34
2500	Uniform Annual General Charge	1.0000	603.750000000	\$603.75
3620	Lakes Enhancement Rate	1.0000	18.975000000	\$18.98
3720	Urban Sewerage Development Rate	1.0000	3.105000000	\$3.11
7541	Sewerage Service Availability	1.0000	188.600000000	\$188.60
5521	Urban Water Non-connected	1.0000	106.950000000	\$106.95
9100	B O P REGIONAL COUNCIL GEN RATE	153000.0000	0.000296610	\$45.38
9210	BOP UNIFORM ANNUAL GEN CHARGE	1.0000	74.876500000	\$74.88
9310	BOP PASSENGER TRANSPORT RATE	1.0000	35.443000000	\$35.44
9410	LAKES RESTORATION RATE <2HA	1.0000	68.735500000	\$68.74
9470	BOP AIR ACTION PLAN	1.0000	29.911500000	\$29.91
9660	KAITUNA CATCHMENT SCHEME RO3 S	0.0300	818.420500000	\$24.55
9690	KAITUNA CATCHMENT SCHEME RO3 A	0.0400	29.451500000	\$1.17

0



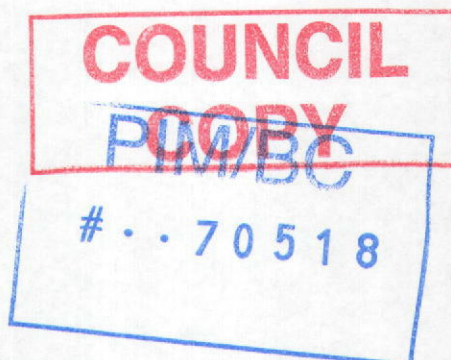
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Handwritten signature

3 January 2013

Generation Homes
PO Box 1606
Rotorua 3040



Civil
Civil

**STATEMENT OF PROFESSIONAL OPINION AS TO THE GEOTECHNICAL
SUITABILITY OF LAND FOR BUILDING.**

*APPENDIX A; Code of Practice for Earth Fill for Residential
Development NZS 4431:1989*

30 Hamon Place, Lot 49, Rotorua

I hereby confirm that;

- 1) I am a professional person, appropriately qualified with experience in geotechnical engineering to ascertain the suitability of the land for building development and was retained as the Soils Engineer to the above development.
- 2) An appropriate level of site investigation ~~and construction supervision~~ has been carried out under my direction.
- 3) In my professional opinion, not to be construed as a guarantee, I consider that;
 - a) N/A.
 - b) N/A.
 - c) The completed works give due regard to all land slope and foundation stability considerations.
 - d) The filled ground is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604:2011 and related documents.
 - e) The original ground not affected by filling is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604:2011 and related documents.
- 4) This professional opinion is furnished to the Council and the owner for their purpose alone, on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection for any dwelling.

Yours faithfully

Bruce Cameron
Civil Engineer, CPEng, MIPENZ, BE Civil, NZCE
13012496/001

CIVIL LIMITED
PO Box 9408
Tauranga

Phone: 07 577 6699
Fax: 07 577 6693

InsertSeries



**COUNCIL
COPY**



METRO

SMART INSERT

Finished in metallic black high temperature paint, matt black, matt brown, dark charcoal vitreous enamel or silver.



Model



150m²



15kW



Wetback

PIM/BC

. . 7 0 5 1 8



Model

ECO Model - Suitable for any size property. Can be installed into Clean Air Zones.



150m²

m² - The floor area the Metro wood fire is capable of heating. (Estimated on 2.4m stud height in an average NZ climate/insulation)



15kW

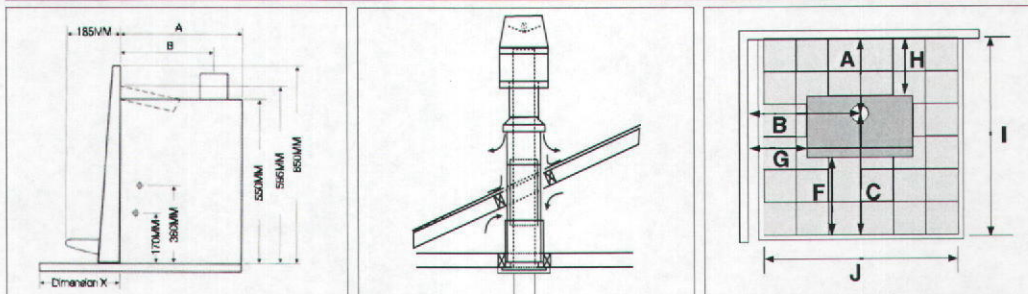
Kilowatt Output - The heat output with a Metro ECO Flue System fitted. (A Metro ECO Flue System will increase the overall heat efficiency in your home)



Wetback

Wetback - Can be fitted with an energy saving wetback.

Model Dimensions (mm)	Width	Depth	Height
ECO Insert Smart Fascia	890	30	672
ECO Insert Firebox	560	495	550



metrofires

Wood Fire Specifications 2012

National Environmental Standards	2
Insert Installation Specifications	3
Converting a Metro Insert Appliance into a Built-In Appliance	4
ECO Mega Smart Built-In Installation Specifications	5
Upgrade to the Metro ECO Flue System	6 & 7
Freestanding Installation Clearances & Specifications	8



PO Box 11, Inglewood 4347, New Zealand
info@metrofires.co.nz • www.metrofires.co.nz

National Environmental Standards

National Environmental Standards (NES) came into effect throughout New Zealand in 2005, imposing a minimum 65% efficiency and maximum 1.5 grams emission requirement on all wood fires installed on properties with a land area of less than two hectares. This means:

65% Heat Efficiency Requirement

100% of the heat produced by a wood fire does not end up inside the home; some of the heat is lost up the fluepipe, so a minimum 65% of the heat must be produced inside the home to obtain NES compliance. This can be hard to achieve especially if a wetback is fitted. Wetbacks utilise heat within the firebox to produce hot water, this heat that is used to make hot water is not allowed to be calculated within the 65% requirement, making the requirement extremely hard to achieve, which is why the majority of NES approved wood fires on the market are not wetback approved, however, the majority of Metro wood fires are.

1.5 Gram Emission

1.5grams is the maximum amount of particulate (PM10) that is allowed to be emitted from the wood fire per 1kg of fuel burnt. Some areas throughout New Zealand have more stringent by-laws in place, Central Otago Air Shed 1 has adopted a 0.7 gram emission limit, Canterbury have adopted a 1 gram emission limit to name a few.

Metro Fires take pride in achieving many industry first's, which has come from the huge resource it invests in research and development. Metro Fires offer the largest range of NES and ECan approved wood fires, the majority with water heating options. In addition, Metro still offer a large range of LTD models for rural home owners wanting longer burn times.

ECO, ECO DV & Ambience Models

Specifically designed for properties less than two hectares, these models surpass the requirements of the NES. Utilising advanced combustion technology these Metro's have a more complex firebox design which operates at higher combustion temperatures.

LTD Models

Designed for properties two hectares or more, LTD Metro's retain over night burn capabilities while still meeting internationally accepted efficiency and emission standards.

Please note

Some regional councils have imposed emission requirements which take precedence over the NES, while some councils in New Zealand have imposed or are considering adopting by-laws relating to environmental issues. If in doubt, consult your local council or Metro retailer.

Some councils require a "Test Certificate" detailing the wood fire approval details. All Metro's Test Certificates are listed on www.metrofires.co.nz

ECO & Ambie Models	Tested Emission & Efficiency		ECan Authorisation Number		Complies with National Environmental Standards
	Without Wetback	With Wetback	Without Wetback	With Wetback	
Ambie One	0.96gms/71%	Not Tested	120834	Not Tested	Without Wetback only
Ambie Plus	0.42gms/68%	0.49gms/67%	120835	120836	With & Without Wetback
ECO Tiny Rad	0.94gms/75%	0.85gms/67%	072605	072607	With & Without Wetback
ECO Tiny Ped	0.72gms/78%	1.0gms/66%	073897	080009	With & Without Wetback
ECO Wee Rad	0.88gms/70.4%	0.96gms/65.2%	092977	102678	With & Without Wetback
ECO Wee Ped	0.88gms/70.4%	0.96gms/65.2%	092976	102679	With & Without Wetback
ECO Wee Curve (DV)	0.65gms/68%	Not tested	093460	Not Tested	Without Wetback only
ECO Xtreme Rad (DV)	0.89gms/68.2 %	0.94gms/68.8%	112026	102676	With & Without Wetback
ECO Xtreme Ped (DV)	0.86gms/69.4%	1.04gms/67.4%	112024	102677	With & Without Wetback
ECO Euro Rad (DV)	0.72gms/72%	Not tested	072608	Not Tested	Without Wetback only
ECO Euro Ped (DV)	0.65gms/70.4%	1.08gms/70.2%	110221	N/A in Canterbury	With & Without Wetback
ECO Smart Insert	0.49gms/68%	0.82gms/67%	120411	102426	With & Without Wetback
ECO Insert	0.91gms/65%	Not tested	101157	Not Tested	Without Wetback only
ECO Mega Smart Built-In	0.65gms/69%	0.56gms/66%	110719	111058	With & Without Wetback

LTD Models	Tested Emission & Efficiency	Can be installed on property sizes two hectares and greater Complies with AS/NZS2918:2001
LTD Wee Rad	2.3gms/71%	Yes - With & Without Wetback
LTD Wee Ped	2.3gms/71%	Yes - With & Without Wetback
LTD Xtreme Rad	3.3gms/63%	Yes - With & Without Wetback
LTD Xtreme Ped	3.3gms/63%	Yes - With & Without Wetback
LTD Euro Ped	3.3gms/63%	Yes - With & Without Wetback
LTD Mega Rad	2.0gms/65.6%	Yes - With & Without Wetback
LTD Mega Ped	2.0gms/65.6%	Yes - With & Without Wetback
LTD Insert	2.3gms/58%	Yes - With & Without Wetback

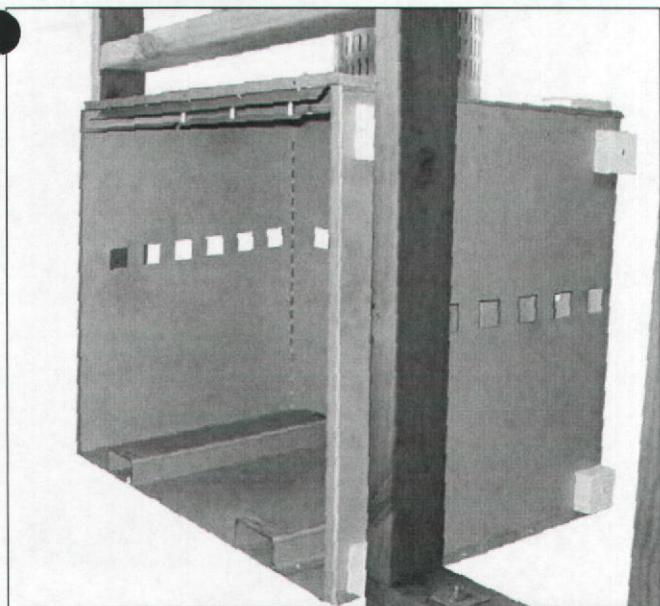
Converting a Metro Insert Appliance into a Built-In Appliance

Metro's Insert appliances have the ability to be converted into a Built-In appliance, by using Pioneer's Vented Zero Clearance Cabinet (VZCC) in conjunction with the Metro Insert. The difference between an Insert and a Built-In appliance is:

- Insert - A Fireplace Insert is designed to be installed into a masonry chimney cavity.
- Built-In - A Built-In appliance is designed to be installed into a timber framed cavity, which is commonly used in new and renovated homes.

Vented Zero Clearance Cabinet

The function of the (VZCC) as shown below, is to enable the Metro LTD Insert, ECO Insert and ECO Smart Insert to be installed into a timber framed wall. The VZCC therefore replaces the more traditional masonry chimney at a fraction of the cost. Detailed instructions for the VZCC are available from your Metro retailer or www.metrofires.co.nz



ECO Built-In Flue System

Metro's ECO Built-In Flue System must be used with the installation of the Metro appliance. The ECO Built-In Flue System incorporates Metro's unique vertical discharge cowl which improves flue draft and performance of the Metro Built-In wood fire.

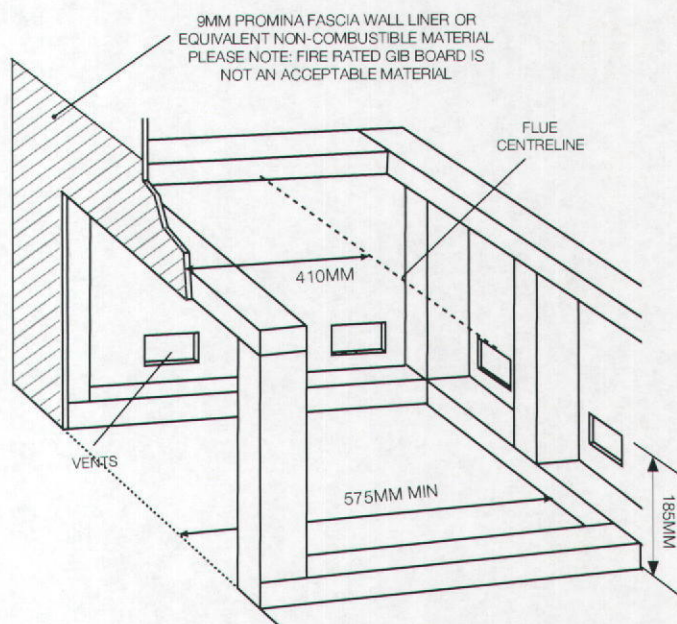
A minimum length of 4m of 150mm diameter flue pipe is required. The total length of the 150mm flue pipe must be fully encased from top to bottom with a 200mm diameter inner casing and a 250mm diameter outer casing.

Fascia Wall Liner

A non combustible fascia wall liner is required to sit behind the fascia as illustrated below. Metro offer a pre-cut 9mm Promina fascia wall liner for the Metro Built-In appliances.

Preparing the Wall Opening/Cavity

- Width of opening
 - 700mm suggested
 - 800mm maximum
 - 690mm minimum
- Height of opening
 - 695mm suggested
 - 700mm maximum
 - 690mm minimum



Metro's come complete with fully detailed installation instructions, including the owners operation and warranty manual, these manuals are also available on www.metrofires.co.nz

ECO Mega Smart Built-In Installation Specifications

Metro's ECO Mega Smart Built-In is specifically designed for timber framed cavities.

Mantelshelf

If a timber or combustible mantelshelf exists above the ECO Mega Smart Built-In, it must be a minimum distance above the top of the ECO Mega Smart Built-In fascia. The minimum distance is:

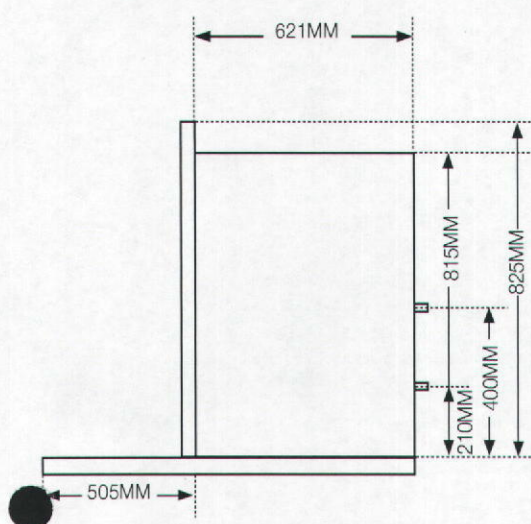
- 500mm

If less than the minimum specified, a deflector or heat shield will be required to be fitted under the mantelshef. (REF AS/NZS 2918/2001)

Floor Protector Requirements

The Metro ECO Mega Smart Built-In requires an insulating floor protector, minimum requirement is 18mm thick Promina board or equivalent, finished with a non combustible tile or similar.

The floor protector must be a minimum width of 1057mm and a minimum overall depth of 505mm. Minimum overall depth is the distance from the front of the wall lining (behind the fascia) to the front non combustible point of the floor protector.



Fascia Model	Depth	Height	Width
ECO Mega Smart Built-In	30mm	825mm	1057mm

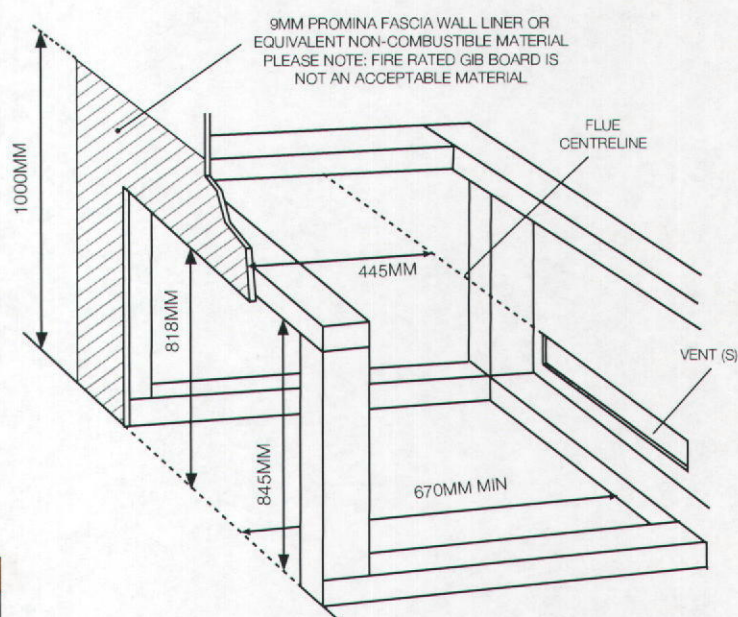
ECO Built-In Flue System

Metro's ECO Built-In Flue System must be used with the installation of the Metro appliance. The ECO Built-In Flue System incorporates Metro's unique vertical discharge cowl which improves flue draft and performance of the Metro ECO Mega Smart Built-In wood fire.

A minimum length of 4m of 150mm diameter flue pipe is required. The total length of the 150mm flue pipe must be fully encased from top to bottom with a 200mm diameter inner casing and a 250mm diameter outer casing.

Fascia Wall Liner

A non combustible fascia wall liner is required to sit behind the fascia as illustrated below. Metro offer a pre-cut 9mm Promina fascia wall liner for the Metro ECO Mega Smart Built-In appliances.



Metro's come complete with fully detailed installation instructions, including the owners operation and warranty manual, these manuals are also available on www.metrofires.co.nz

Upgrade to the Metro ECO Flue System

ECO Flue Systems are an innovation from Metro, based on many years of development and testing to achieve what Metro's engineers believe to be the optimum performance and efficiency possible from a flue system.

Metro ECO Flue Systems differ from conventional flue systems in that the cooling air for the system is not taken from inside the home but is drawn in from outside. The energy savings achieved by installing a Metro ECO Flue System are impressive.

Independent testing of a conventional flue system resulted in 450 litres per minute of the warmest air available in the room being drawn out of the home.

A conventional flue system draws air from the room to keep itself cool, resulting in the warmest air from your wood fire being drawn out of your home. This discarded warm air is then replaced with cold outside air drawn back into your home. On a cold winter's night this hugely inefficient system will empty an average sized room once every hour of

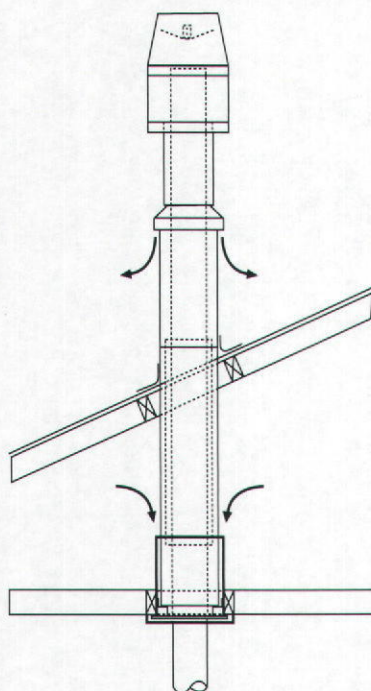
potentially 45°C air. It replaces it with the outside air which in some regions will be below zero.

Metro offers both the ECO Base Flue System, which is designed to be installed on its own and the ECO Option Kit which is designed to be installed in conjunction with the ECO Base Flue System.

Metro ECO Base Flue System

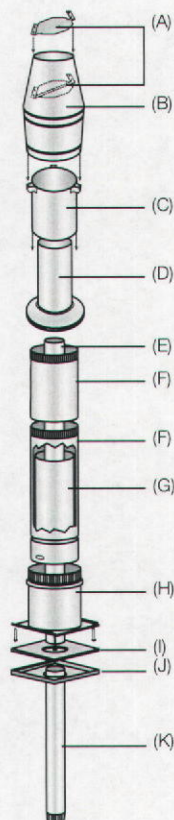
Metro ECO Base Flue System is designed for installation into a home that has a "ceiling cavity" with unrestricted air supply. A vented ceiling cavity is required as the ECO Base Flue System draws its cooling air from the ceiling cavity.

ECO BASE FLUE SYSTEM ASSEMBLED



ECO BASE FLUE SYSTEM COMPONENTS

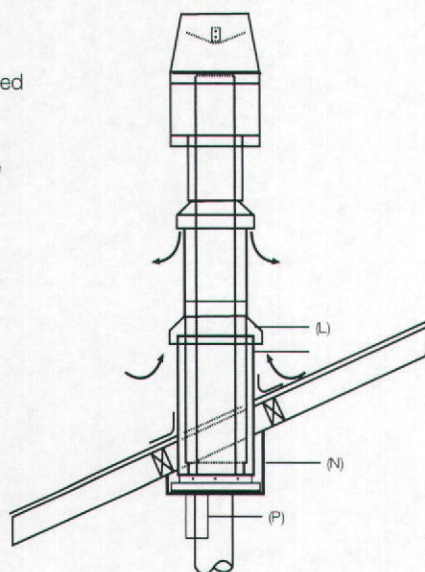
- (A) 1 x Stainless steel weather butterfly
- (B) 1 x Stainless steel ECO cowl housing
- (C) 1 x 225mm x 200mm diameter stainless steel outer casing extension
- (D) 1 x 480mm x 150mm long stainless steel flue pipe extension with flashing cone
- (E) 1 x 1200mm x 150mm diameter stainless steel flue pipe
- (F) 1 x 1200mm x 250mm diameter galvanised outer casing with 750mm long slip section
- (G) 1 x 800mm x 200mm diameter galvanised inner casing
- (H) 1 x Galvanised mounting plate with brackets and 300mm long x 300mm diameter casing attached
- (I) 1 x insulation gasket
- (J) 1 x clip-on ceiling plate
- (K) 2 x 1200mm lengths of 150mm diameter stainless steel flue pipe painted metallic black
- (+) - 1 x Plastic bag of assembly bolts



Metro ECO Option Kits

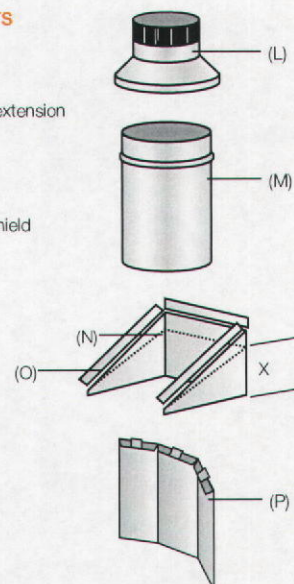
The Metro ECO Option Kit is designed to be "added to" the Metro ECO Base Flue System for installations that do not have a vented ceiling cavity and require the flue systems cooling air to be drawn in from above the roofline (outside the building).

ECO BASE FLUE SYSTEM & ECO OPTION KIT ASSEMBLED



ECO OPTION KIT COMPONENTS

- (L) External intake flashing cone
- (M) 300mm diameter outer liner extension
- (N) Drop box infill panel
- (O) Drop box edge covers
- (P) Ceiling plate mounted heat shield



METRO INSERT FLUE KIT

The Metro ECO Insert Flue Kit is suitable for all Insert Metro wood fires, installed into a masonry chimney cavity. Suitable for the following Metro Insert models:

- LTD Trend & Trad
- ECO Insert
- ECO Smart

METRO ECO BUILT-IN FLUE KIT

The Metro ECO Built-In Flue Kit is designed for Built-In installations, being installed into a timber framed chimney cavity.

Suitable for the following Metro Built-In models:

- LTD & ECO Inserts complete with the Metro Vented Clearance cabinet, which converts the Insert into a Built-In appliance

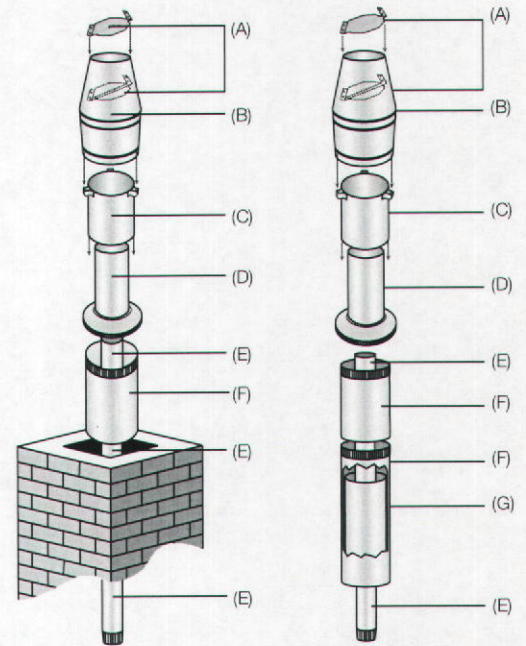
ECO Mega Smart Built-In

ECO INSERT FLUE KIT COMPONENTS

- (A) 1 x Stainless steel weather butterfly
- (B) 1 x Stainless steel ECO cowl housing
- (C) 1 x 225mm x 200mm diameter stainless steel outer casing extension
- (D) 1 x 480mm x 150mm long stainless steel flue pipe extension with flashing cone
- (E) 3 x 1200mm x 150mm diameter stainless steel flue pipe
- (F) 1 x 600mm x 250mm diameter galvanised outer casing

ECO BUILT IN FLUE KIT COMPONENTS

- (A) 1 x Stainless steel weather butterfly
- (B) 1 x Stainless steel ECO cowl housing
- (C) 1 x 225mm x 200mm diameter stainless steel outer casing extension
- (D) 1 x 480mm x 150mm long stainless steel flue pipe extension with flashing cone
- (E) 3 x 1200mm x 150mm diameter stainless steel flue pipe
- (F) 3 x 1200mm x 250mm diameter galvanised outer casing
- (G) 3 x 1200mm x 200mm diameter galvanised inner casing

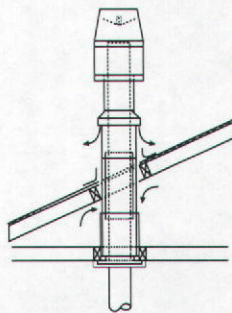


ECO INSERT FLUE KIT

ECO BUILT IN FLUE KIT

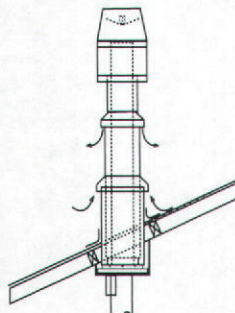
Shown below are the more common installation methods for installing Metro ECO Flue Systems. To ensure a safe and efficient installation, this flue system must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

Single Storey Installations



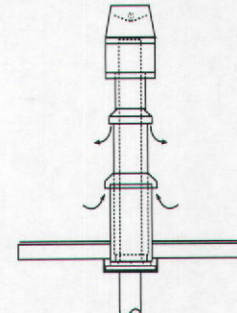
FLAT CAVITY CEILING

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



SLOPING CEILING

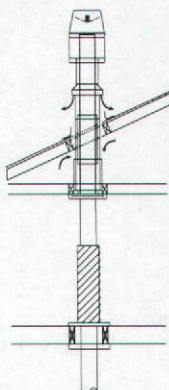
Both the ECO Base Flue System and ECO Option Kit are required to enable air to be drawn from outside the home.



FLAT CEILING/ROOF

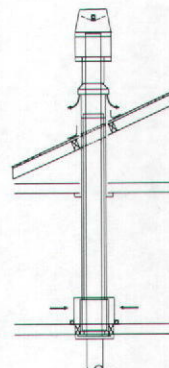
Requires both ECO Base Flue System and ECO Option Kit as per sloping ceiling unless a vented ceiling cavity exists.

Two Storey Installations



2ND FLOOR EXPOSED FLUE PIPE

Requires an ECO Base Flue System only with additional lengths of Flue pipe, a floor penetration kit, 1 x 1200mm long mesh/screen and one 250mm dia. x 300mm long black in accordance with AS/NZS2918:2001.



2ND FLOOR ENCLOSED FLUE PIPE

Requires an ECO Base Flue System only with additional lengths of Flue pipe, 200mm & 250mm inner/outer combination liners. A 2nd floor vent cover and an additional ceiling plate with a 250mm diameter hole in accordance with AS/NZS2918:2001.

Metro Stainless Steel Liners

Metro offer both the ECO Base Flue System and the ECO Option kit with optional stainless steel liners, for coastal installations, or for those wanting a superior look and finish.

Upgrade to the ECO Flue System

To get the best performance from your Metro wood fire, it is highly recommended that the Metro ECO Flue System is installed with your Metro. The ECO flue system is an optional extra, please ensure you request the ECO Flue System at the time of purchasing.

Freestanding Installation Clearances & Specifications

Model Clearances

Minimum clearances shown are in mm, with a Pioneer double flue mounted shield fitted. All Metro wood fires comply with AS/NZS2918:2001. Specifications were correct at the time of printing, but may alter and those detailed within should be used only as a guide. Refer to the installation and operation manual supplied with every Metro, or if in doubt, consult your Metro retailer.

Clearance Reductions

AS/NZS 2918:2001 allows for a reduction in minimum clearances as detailed in tables 3.1 and 3.2 of the standard which your Metro retailer will be able to advise you on. Pioneer has also tested certain model Metro's with "side extensions" fitted to the Pioneer double flue mounted shield, to achieve a reduction in clearances, details are:

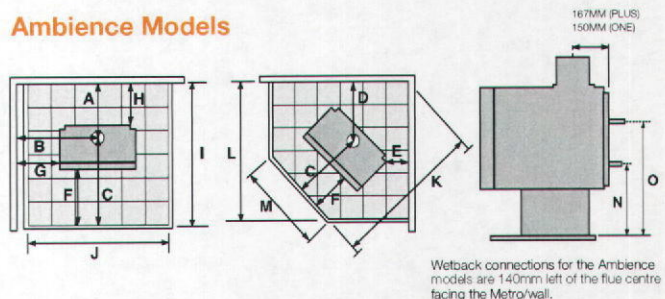
- The LTD Wee Ped installed with a Pioneer double flue mounted shield with side extensions fitted can have side clearances B and G reduced by 80mm if installed into an alcove which does not project forward of the Metro.
- The LTD Wee Rad and LTD Wee Ped rear clearance (H) and overall floor protector depth (I) can reduce by 50mm providing a wetback is not fitted and therefore maintenance access is not required.
- The ECO Euro Ped and ECO Xtreme Ped installed with a Pioneer double flue mounted shield with side extensions fitted reduces minimum corner clearance E from 170mm to 110mm. In this situation use the LTD Metro equivalent for measurements E, D, K & L. (i.e use LTD Euro Ped chart for ECO Euro Ped for E, D, K & L).

Freestanding Floor Protectors

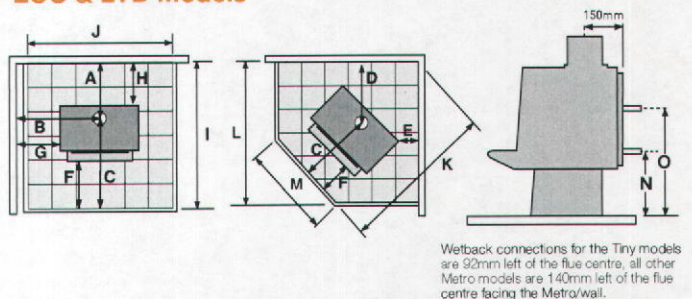
Metro freestanding wood fires do not require an insulating floor protector, and are tested and comply with the minimum floor protector requirements of AS/NZS 2918:2001. Note:

- Minimum floor protector sizes are specified below
- A floor protector can include ceramic tiles, a sheet of toughened glass, panel steel or any other non combustible material laid directly onto a wooden floor
- Metro manufacture a large range of floor protectors in a range of tiles and colours, in three different trim options.

Ambience Models



ECO & LTD Models



Clearances & Dimensions	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Width	Depth	Height
Ambie One	250	538	589	391	100	275	250	100	839	825	1142	960	427	350	540	577	464	717
Ambie Plus	267	685	658	462	125	275	350	100	925	905	1317	1110	506	360	550	671	550	761
ECO Tiny Ped	210	430	580	290	25	200	185	60	790	650	990	875	250	280	470	490	530	665
ECO Tiny Rad	225	552	580	420	150	200	300	75	805	650	1165	925	250	280	470	505	530	665
ECO Wee Rad	260	525	580	385	80	200	220	110	840	825	1125	950	425	295	485	607	530	665
ECO Wee Ped	260	595	580	385	85	200	300	110	840	825	1120	950	425	295	485	590	530	665
ECO Wee Curve (DV)	300	555	580	405	100	200	250	150	880	825	1150	975	425	280	470	607	530	665
ECO Xtreme Ped (DV)	230	585	625	495	170	200	250	80	855	905	1325	1120	505	325	515	670	575	715
ECO Xtreme Rad (DV)	250	575	625	435	80	200	200	100	875	905	1240	1065	505	338	528	750	575	745
ECO Euro Rad (DV)	250	625	625	435	80	200	250	100	875	905	1240	1065	505	338	528	750	575	745
ECO Euro Ped (DV)	230	585	625	495	170	200	250	80	855	905	1325	1120	505	325	515	670	575	715
ECO Euro Trad (DV)	230	585	625	495	170	200	250	80	855	905	1325	1120	505	325	515	670	575	715
LTD Wee Rad	250	555	580	400	80	200	250	100	830	825	1145	950	425	295	485	607	530	665
LTD Wee Ped	250	595	580	400	85	200	300	100	830	825	1145	950	425	295	485	590	530	665
LTD Xtreme Ped	250	575	625	455	110	200	240	100	875	905	1265	1065	505	340	530	670	575	715
LTD Xtreme Rad	250	575	625	455	80	200	200	100	875	905	1265	1065	505	353	543	750	575	745
LTD Euro Ped	250	575	625	455	110	200	240	100	875	905	1265	1065	505	340	530	670	575	715
LTD Mega Rad	270	675	725	500	125	200	300	120	995	905	1425	1175	505	353	543	750	675	745
LTD Mega Ped	270	610	725	465	130	200	275	120	995	905	1400	1140	505	340	530	670	675	715



MiTek New Zealand Limited

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PO Box 58-014, Botany 2163
Phone: 09 274 7109
Fax: 09 274 7100

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

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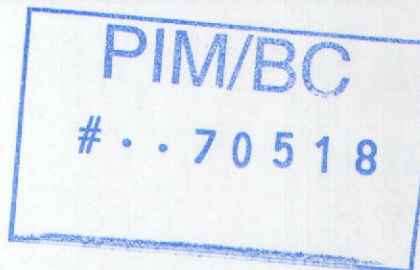
MiTek 20/20 Engineering 4.6.6.145

Printed: 11:28:24 17 Dec 2012

**COUNCIL
COPY**

PRODUCER STATEMENT for MiTek 20/20[®] TRUSS DESIGN - Version 4.6

ISSUED BY: MiTek New Zealand Limited
TO: PlaceMakers Taupo
IN RESPECT OF: MiTek[®] Truss Designs



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

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

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

- i) All proprietary products meeting their performance specification requirements
- ii) The provision of adequate roof bracing and overall building stability
- iii) Correct selection and placement of GANG-NAIL connector plates
- iv) Correct input of Truss Design Data as shown in the Fabricator Design Statement for this job
- v) The design being undertaken by the accredited fabricator under the terms of the software licence

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

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

On behalf of MiTek New Zealand Limited,

Date: Monday, 17 December 2012

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

Job: WOCKE

Client: PLACEMAKERS TAUPO
Phone:

Site:

WOCKE RESIDENCE
30 HAMON PLACE
ROTORUA

Phone:

Description:
Building Consent No.:
MITek 20/20 Engineering 4.6.6.145

MITek New Zealand Limited.

Printed: 11/26/24 17 Dec 2012

MITEK FABRICATOR DESIGN STATEMENT

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

MITek 20/20® TRUSS DESIGN DATA

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

Job Details		Importance Level :	2	Design Working Life :	50 years
Roof Truss					
Timber Group:	PT Truss x 45 1007	Pitch:	25.000 deg	Nominal Overhang:	590 mm
Roof		Ceiling		Wind	
Material:	Metal Tiles	Material:	Gib Board 12mm	Area:	Low (32.0 m/s)
Dead Load:	0.210 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	400 mm centres	Restraints:	1800 mm centres		
Live Load:	Q _{ur} = 0.250 kPa	Live Load:	Q _c = 1.400 kN		
	Q _c = 1.100 kN				

The timber for these MITek® trusses shall be treated to the requirements of NZS 3602:2003 and shall be graded to the requirements of NZS 3603:1993. Unless otherwise noted, this design assumes that the steel fixings and timber connectors proposed are located in a "closed environment", as defined by NZS3604:2011 Section 4.

MITek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
TG1	1	9600	25.000	900	J2D	1	2077	25.000	900	T8	1	3700	25.000	900
TG1A	1	9600	25.000	900	J3	1	1177	25.000	900	T9	1	2077	25.000	900
CT1	3	10060	25.000	900	J3A	1	1177	25.000	900	T9A	1	2077	25.000	900
EN1	1	3700	25.000	900	J4	1	1575	25.000	900	TR1	1	9600	25.000	900
ET1	1	6000	25.000	900	J4A	1	1575	25.000	900	TR1A	1	9600	25.000	900
ET2	1	4480	25.000	900	J5	1	1805	25.000	900	V2	1	1930	25.000	900
J1	1	2977	25.000	900	J5A	1	1805	25.000	900	V3	1	1030	25.000	900
J1A	1	2977	25.000	900	J5B	1	1805	25.000	900	V4	1	723	25.000	900
J1B	1	2977	25.000	900	J6	1	1383	25.000	900	*HB1	2	7546	18.249	900
J1C	1	2977	25.000	900	J6A	1	1383	25.000	900	*HB2	1	2643	18.249	900
J1D	1	2977	25.000	900	SG1	1	5678	25.000	900	*HB3	1	4095	18.249	900
J1E	1	2977	25.000	900	T1	2	9600	25.000	900	*HB4	1	1370	18.249	900
J1F	1	2977	25.000	900	T1A	2	9600	25.000	900	*HB5	1	5524	18.249	900
J1G	1	2977	25.000	900	T2	1	5678	25.000	900	*R1	3	903	25.000	900
J1H	1	2977	25.000	900	T3	6	6000	25.000	900	*R1A	3	903	25.000	900
J1I	1	2977	25.000	900	T3A	1	6000	25.000	900	*R2	1	1250	25.000	900
J2	1	2077	25.000	900	T4	1	3877	25.000	900	*R3	1	7180	25.000	900
J2A	1	2077	25.000	900	T5	2	3170	25.000	900	*R4	1	4880	25.000	900
J2B	1	2077	25.000	900	T6	1	3700	25.000	900	*V1	2	560	25.000	900
J2C	1	2077	25.000	900	T7	1	3610	25.000	900	*V5	1	786	25.000	900

Total quantity : 76

The computer design input has been carried out by:

Signed: _____

Date: ...Monday, 17 December 2012....

Name of Detailer: _____

Qualifications and Title:

On behalf of: PlaceMakers Taupo



Job: WOCKE

Client: PLACEMAKERS TAUPO
Phone:Site: WOCKE RESIDENCE
30 HAMON PLACE
ROTORUADescription:
Building Consent No.:
MITek 20/20 Engineering 4.6.6.145

Phone:

MITek New Zealand Limited.

Printed: 11:31:53 17 Dec 2012

**TRUSS FIXING SELECTION REPORT - Characteristic
Loads**

Fixings are selected from the LUMBERLOK Brochure 03/4 (Timber Connectors Characteristic Loadings Data)

MITek® Truss List

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

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	----- Fixing ----- Qty Selected
TG1	1	9600	B	5.539	1.789	Cross	1 Pair of Wire Dog Staples
			S	14.834	5.216	Cross	1 CT400
			G	2.077	0.086	Cross	1 Pair of Wire Dog Staples
TG1A	1	9600	B	1.772	0.000	Cross	1 Pair of Wire Dog Staples
			G	5.396	2.013	Butt	1 JH 47x90
			N	11.478	4.860	Cross	1 CT400
CT1	3	10060	H	4.139	1.058	Cross	3 Pair of Wire Dog Staples
			P	6.780	2.084	Cross	3 Pair of Wire Dog Staples
			E	0.533	0.051	Cross	3 Pair of Wire Dog Staples
EN1	1	3700	A			Wide	No fixing selected
ET1	1	6000	A			Wide	No fixing selected
ET2	1	4480	A			Wide	No fixing selected
J1	1	2977	B	2.655	0.242	Cross	1 Pair of Wire Dog Staples
			F	1.726	0.423	Butt	1 JH 47x90
			D	0.396	0.261	Butt	1 Pair of 3.15d Nails
J1A	1	2977	B	2.628	0.104	Cross	1 Pair of Wire Dog Staples
			E	0.200	0.184	Butt	1 Pair of 3.15d Nails
			D	2.167	1.000	Cross	1 Pair of Wire Dog Staples
	1	2977	B	2.655	0.242	Cross	1 Pair of Wire Dog Staples
			F	1.726	0.423	Butt	1 JH 47x90
			D	0.396	0.261	Butt	1 Pair of 3.15d Nails
J1C	1	2977	C	2.413	0.305	Cross	1 Pair of Wire Dog Staples
			F	0.199	0.210	Butt	1 Pair of 3.15d Nails
			E	2.107	0.725	Cross	1 Pair of Wire Dog Staples
			B	0.687	0.538	Cross	1 Pair of Wire Dog Staples
J1D	1	2977	B	2.952	0.631	Cross	1 Pair of Wire Dog Staples
			F	2.011	0.774	Butt	1 JH 47x90
J1E	1	2977	B	2.952	0.631	Cross	1 Pair of Wire Dog Staples
			F	2.011	0.774	Butt	1 JH 47x90
J1F	1	2977	A	1.627	0.280	Cross	1 Pair of Wire Dog Staples
			E	1.755	0.421	Butt	1 JH 47x90
			C	0.372	0.262	Butt	1 Pair of 3.15d Nails
J1G	1	2977	A	2.385	0.332	Cross	1 Pair of Wire Dog Staples
			D	0.265	0.195	Cross	1 Pair of Wire Dog Staples
			C	2.353	1.000	Cross	1 Pair of Wire Dog Staples
J1H	1	2977	B	2.828	0.511	Cross	1 Pair of Wire Dog Staples
			F	2.113	0.811	Butt	1 JH 47x90
J1I	1	2977	C	2.417	0.304	Cross	1 Pair of Wire Dog Staples
			H	0.257	0.179	Butt	1 Pair of 3.15d Nails
			F	1.939	0.692	Cross	1 Pair of Wire Dog Staples
			B	0.811	0.531	Cross	1 Pair of Wire Dog Staples
			G	0.668	0.495	Cross	1 Pair of Wire Dog Staples
J2	1	2077	B	2.477	0.307	Cross	1 Pair of Wire Dog Staples
			F	1.200	0.287	Butt	1 Pair of 3.15d Nails
J2A	1	2077	B	2.461	0.157	Cross	1 Pair of Wire Dog Staples
			F	1.431	0.279	Butt	1 JH 47x90
			D	0.318	0.200	Butt	1 Pair of 3.15d Nails
	1	2077	B	2.477	0.307	Cross	1 Pair of Wire Dog Staples
			F	1.200	0.287	Butt	1 Pair of 3.15d Nails
J2C	1	2077	A	1.546	0.386	Butt	1 JH 47x90
			E	1.714	0.803	Butt	1 JH 47x90
J2D	1	2077	B	2.461	0.157	Cross	1 Pair of Wire Dog Staples
			F	1.431	0.279	Butt	1 JH 47x90
			D	0.318	0.200	Butt	1 Pair of 3.15d Nails
J3	1	1177	B	2.373	0.071	Cross	1 Pair of Wire Dog Staples
			D	0.298	0.000	Butt	1 Pair of 3.15d Nails
			C	0.324	0.311	Butt	1 Pair of 3.15d Nails
J3A	1	1177	B	2.373	0.071	Cross	1 Pair of Wire Dog Staples
			D	0.298	0.000	Butt	1 Pair of 3.15d Nails
			C	0.324	0.311	Butt	1 Pair of 3.15d Nails
J4	1	1575	E	1.234	0.000	Butt	1 Pair of 3.15d Nails
			D	0.263	0.188	Cross	1 Pair of Wire Dog Staples
			C	1.592	1.090	Cross	1 Pair of Wire Dog Staples
J4A	1	1575	F	1.418	0.000	Butt	1 JH 47x90
			E	0.263	0.173	Butt	1 Pair of 3.15d Nails
			C	1.320	1.086	Cross	1 Pair of Wire Dog Staples
			D	0.643	0.529	Cross	1 Pair of Wire Dog Staples
J5	1	1805	D	0.940	0.266	Cross	1 Pair of Wire Dog Staples
			G	0.087	0.455	Butt	1 Pair of 3.15d Nails
			F	2.125	0.267	Cross	1 Pair of Wire Dog Staples
J5A	1	1805	D	1.295	0.307	Cross	1 Pair of Wire Dog Staples
			F	1.591	0.262	Butt	1 JH 47x90
			C	0.268	0.220	Butt	1 Pair of 3.15d Nails
J5B	1	1805	E	1.211	0.188	Cross	1 Pair of Wire Dog Staples
			D	0.140	0.280	Butt	1 Pair of 3.15d Nails
			C	2.251	0.786	Cross	1 Pair of Wire Dog Staples

PlaceMakers Taupo

Fixing Report : Page 2

Job: WOCKE

Client: PLACEMAKERS TAUPO
Phone:Site: WOCKE RESIDENCE
30 HAMON PLACE
ROTORUADescription:
Building Consent No.:
MITek 20/20 Engineering 4.6.6.145

Phone:

MITek New Zealand Limited.

Printed: 11/31/33 17 Dec 2012

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing
J6	1	1383	B	2.283	0.146	Cross	Qty Selected
			F	0.102	0.686	Butt	1 Pair of Wire Dog Staples
			E	1.234	0.000	Cross	1 Pair of 3.15d Nails
J6A	1	1383	B	2.396	0.019	Cross	1 Pair of Wire Dog Staples
			F	2.359	1.247	Butt	1 JH 47x90
			D	1.032	2.626	Butt	1 JH 47x90
			E	1.236	0.000	Cross	1 Pair of Wire Dog Staples
SG1	1	5678	P	1.057	0.472	Butt	1 Pair of 3.15d Nails
			B	2.666	0.438	Cross	1 Pair of Wire Dog Staples
			L	3.139	0.578	Cross	1 Pair of Wire Dog Staples
			O	1.670	0.153	Cross	1 Pair of Wire Dog Staples
T1	2	9600	B	4.197	1.088	Cross	2 Pair of Wire Dog Staples
			T	6.213	1.902	Cross	2 Pair of Wire Dog Staples
			L	2.118	0.253	Cross	2 Pair of Wire Dog Staples
T1A	2	9600	B	2.480	0.280	Cross	2 Pair of Wire Dog Staples
			P	5.793	1.803	Cross	2 Pair of Wire Dog Staples
			V	3.816	0.713	Cross	2 Pair of Wire Dog Staples
T2	1	5678	B	2.591	0.383	Cross	1 Pair of Wire Dog Staples
			P	1.001	0.000	Butt	1 Pair of 3.15d Nails
			K	4.428	0.673	Cross	1 Pair of Wire Dog Staples
T3	6	6000	B	3.624	0.933	Cross	6 Pair of Wire Dog Staples
			F	3.624	0.933	Cross	6 Pair of Wire Dog Staples
T3A	1	6000	B	3.641	0.932	Cross	1 Pair of Wire Dog Staples
			F	3.261	0.970	Cross	1 Pair of Wire Dog Staples
T4	1	3877	B	2.739	0.349	Cross	1 Pair of Wire Dog Staples
			K	0.561	0.300	Butt	1 Pair of 3.15d Nails
			I	3.008	0.568	Cross	1 Pair of Wire Dog Staples
T5	2	3170	B	2.690	0.467	Cross	2 Pair of Wire Dog Staples
			G	2.405	0.214	Butt	2 JH 47x90
T6	1	3700	B	2.820	0.561	Cross	1 Pair of Wire Dog Staples
			F	2.820	0.561	Cross	1 Pair of Wire Dog Staples
T7	1	3610	A	1.949	0.582	Butt	1 JH 47x90
			E	2.812	0.546	Cross	1 Pair of Wire Dog Staples
T8	1	3700	A	3.421	1.049	Cross	1 Pair of Wire Dog Staples
			E	6.630	2.235	Cross	1 Pair of Wire Dog Staples
T9	1	2077	B	2.461	0.211	Cross	1 Pair of Wire Dog Staples
			H	1.289	0.423	Butt	1 JH 47x90
T9A	1	2077	F	2.860	0.060	Cross	1 Pair of Wire Dog Staples
			I	1.023	0.404	Butt	1 Pair of 3.15d Nails
TR1	1	9600	B	2.511	0.305	Cross	1 Pair of Wire Dog Staples
			V	3.803	0.736	Cross	1 Pair of Wire Dog Staples
			O	5.629	1.803	Cross	1 Pair of Wire Dog Staples
TR1A	1	9600	B	3.381	0.861	Cross	1 Pair of Wire Dog Staples
			S	6.278	1.982	Cross	1 Pair of Wire Dog Staples
			J	2.384	0.236	Cross	1 Pair of Wire Dog Staples
V2	1	1930	A			Wide	No fixing selected
V3	1	1030	A			Wide	No fixing selected
V4	1	723	A			Wide	No fixing selected
*HB1	2	7546					Refer NZS3604:2011 Tables 10.1 & 10.14
*HB2	1	2643					Refer NZS3604:2011 Tables 10.1 & 10.14
*HB3	1	4095					Refer NZS3604:2011 Tables 10.1 & 10.14
*HB4	1	1370					Refer NZS3604:2011 Tables 10.1 & 10.14
*HB5	1	5524					Refer NZS3604:2011 Tables 10.1 & 10.14
*R1	3	903					Refer NZS3604:2011 Tables 10.1 & 10.14
*R1A	3	903					Refer NZS3604:2011 Tables 10.1 & 10.14
*R2	1	1250					Refer NZS3604:2011 Tables 10.1 & 10.14
*R3	1	7180					Refer NZS3604:2011 Tables 10.1 & 10.14
*R4	1	4880					Refer NZS3604:2011 Tables 10.1 & 10.14
*V1	2	560					Refer NZS3604:2011 Tables 10.1 & 10.14
*V5	1	786					Refer NZS3604:2011 Tables 10.1 & 10.14

Fixing List

Qty	Selected Fixing
37	Pair of Wire Dog Staples
2	CT400
19	JH 47x90
24	Pair of 3.15d Nails
6	No fixing selected

Note:

- 1) Fixings have been selected based on loading only. Please check that selected fixings are practical for each situation and that appropriate nailing can be applied on site.
- 2) Fixings are selected from the LUMBERLOK Brochure 03/4 (Timber Connectors Characteristic Loadings Data) with down and uplift characteristic loads of at least the values shown for each joint.

**COUNCIL
COPY**

PIM/BC
. . 7 0 5 1 8

SPECIFICATION

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

Wocke Residence

(project name)

30 Hamon Place, Rotorua

(project address)

Dave and Fiona Wocke

(owners name)

Job Number: 74474

Date: 11.12.12

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1210 PROJECT.

1. GENERAL

1.1 PROJECT

Street address:	30 Hamon Place, Rotorua
Legal description:	Lot49 , DPS399109
Site area:	700 m2
Project type:	New building
Intended use:	Single residential building
Intended life:	Indefinite but not less than 50 years / ~ years

1.2 PROJECT DESCRIPTION

Construct new dwelling

1.3 CATEGORY AND LBP REQUIREMENT

Category 1:

- Single household dwellings with low- or medium-risk envelope design

Any site license LBP's shall have a minimum:

Site license in area of practice 1

Bricklaying and Blocklaying 1 : Brick / masonry veneer

Carpentry

Foundations 1: Concrete foundation walls and concrete slab-on-ground

Roofing 3: Metal tile roof

1.4 OWNER

Name:	Dave and Fiona Wocke
Mailing address:	C/- Generation Homes Rotorua , 16 Hamon Place Rotorua
Telephone:	021474497-Lyndon
Email:	lyndonm@generation.co.nz

1.5 DESIGNER

Name:	Millennium Architecture Ltd
Mailing address:	2 Benn Rd, Lake Okareka
Telephone:	073628775
Email:	dylan@millarch.co.nz

1.6 ENGINEER

Name:	BSK Consulting Engineers
Mailing address:	1364 Hinemoa St, Rotorua
Telephone:	3485394
Email:	brett@bsk.co.nz

1.7 CONTRACTOR

Name:	Generation Homes Rotorua-Taupo
Mailing address:	~
Telephone:	~
Email:	~

1211 DOCUMENTATION

1. GENERAL

1.1

Layout ID	Layout Name
101	Site Plan
102	Floor Plan
103	Foundation Plan
104	Roof Plan
105	Fixings Plan
106	Bracing Plan
107	Brace Fixing Details
108	Floor Plumbing Plan
109	Electrical Plan
201	Section AA and BB
301	Elevations
302	Joinery Schedule
401	Foundation Details
402	Roof Details
403	Roof Details
404	Cladding Details
405	Typical Wet Area Details
406	Project Schedule, H1 Calculations

1212 COMPLIANCE

1. GENERAL

1.1 SITE DATA

Soil type:	~ (to NZS 3604, 3.2 Soil types)
Exposure zone:	Zone 2 (to NZS 3604, 4.2 Exposure zones or E2/AS1 Zone E severe marine)
Wind zone:	Low (to NZS 3604, table 5.4 Determination of Wind Zone)
Earthquake zone:	Zone B (to NZS 3604, figure 5.4 Earthquake zones)

1.2 BUILDING DATA

Building classification:	iv Importance Level (to NZS 3604, table 1.1 Classification of buildings)
Floor live load:	1.5 KPa (to NZS 3604, table 1.2 Imposed floor live load reference values)
Overall height:	5.3m metres (in accordance with NZS 3604, Fig 1.2 Buildings covered by this Standard)
Risk assessment:	3 Total Risk Score (to NZBC E2/AS1, 3.1 Establishing the risk)

1.3 PRODUCER STATEMENTS

Provide Producer Statements for the following

- Truss design
- Wet area interior waterproofing
- Aluminium joinery
- Glazing

Provide Producer Statements in the required form. We no form is specified provide in the industry/trade standard form. Provide all Producer Statements before the Building Consent Authority carries out the final inspection.

1.4 RECORDS OF WORK

Provide Records of Work for Restricted Building Work:

- Brick/masonry veneer
- Carpentry
- Proprietary Plaster Cladding Systems
- Roofing
- Foundations

Refer to the Building Consent for specific requirements. Provide Records of Work in the required form. Provide all Records of Work before the Building Consent Authority carries out the final inspection.

1213 SELECTIONS

1. GENERAL

The following selections are to be read in conjunction with the related work sections, where they are available, and the general sections.

2. SITE

<< 2200 GROUNDWORKS AND PREPARATION >>

2.1 FILL FOR GROUNDWORK

Type: gap 20

3. STRUCTURE

<< 3110 CONCRETE WORK >>

3.1 DAMP-PROOF MEMBRANE - UNDER SLAB

Type/thickness: 0.25 polythene

3.2 CONCRETE REINFORCEMENT

Type: 500e

3.3 CONCRETE

Location: ref plan
Strength: 20 MPa
Surface finish: u4

<< 3410 STRUCTURAL STEELWORK >>

There is no work section specification relating to the following selections

3.4 STEELWORK

Item: shs post
Finish: galv.

<< 3800 TIMBER FRAMING >>

3.5 EXTERIOR WALL TIMBER FRAMING

Type/treatment: Radiata pine, Grade SG8, Treated H1.2
Cavity battens: Radiata pine, Treated H3.1
Jamb battens: Radiata pine, Treated H3.1

3.6 ROOF TIMBER FRAMING

Type/treatment: Radiata pine, Grade SG8, Treated H1.2

3.7 ROOF TRUSSES

Type/treatment: Radiata pine, Grade SG8, Treated H1.2
Truss supplier: placemakers Taupo

3.8 INTERIOR WALL TIMBER FRAMING

Type/treatment: Radiata pine, Grade SG8, Treated H1.2

4. ENCLOSURE

<< 4160 DAMP-PROOFING, UNDERLAYS AND RIGID AIR BARRIERS >>

There is no work section specification relating to the following selections

4.1 DAMP-PROOF COURSE

Brand/Type: supercorse 500

4.2 WALL UNDERLAY/ROOF UNDERLAY
Brand/Type: tekton homewrap

4.3 WINDOW FLASHING TAPE
Brand/Type: 3m all weather tape

<< 4220 WALL CLADDING >>

4.4 CLADDING
Brand/Type: linea weatherboard
Finish: paint

4.5 SOFFIT
Brand/Type/thickness: 4.5mm hardie soffit
Jointers: upvc
Finish: paint

<< 4261 BRICK VENEER >>

4.6 BRICK VENEER
Brand/Type: 70 series austral
Bond: stretcher
Pointing: standard

<< 4310 ROOFING >>

4.7 ROOFING
Brand/Type: Metro metal tile
Flashings: to match
Colour: client selected

<< 4520 ALUMINIUM WINDOWS AND DOORS >>

4.8 ALUMINIUM WINDOWS AND DOORS
Finish/colour: client selected
Jamb liners: paint quality pine
Flashings: colorsteel
Hardware: client selected

<< 4555 GARAGE DOORS >>

There is no work section specification relating to the following selections

4.9 GARAGE DOOR CONTROLLER
Remotes quantity: 2

<< 4610 GLAZING >>

4.10 GLAZING - ORDINARY
Location: ref. plan

4.11 GLAZING - SAFETY
Location: ref. plan
Type: grade A

4.12 GLAZING - INSULATING GLASS UNITS
Location: ref plan
Type: d.glazed

<< 4710 THERMAL INSULATION >>

4.13 WALL INSULATION
Brand/Type: batts
R value/Thickness: R 2.2

- 4.14 CEILING/ROOF INSULATION
Brand/Type: batts
R value/Thickness: R 4

<< 4820 FLASHINGS >>

There is no work section specification relating to the following selections

- 4.15 FLASHINGS - GENERALLY
Type: colorsteel

- 4.16 FLASHINGS - CONCEALED
Type: upvc

5. INTERIOR

<< 5110 INTERIOR LININGS AND TRIM >>

- 5.1 WALL LININGS
Location: ref. plan
Brand/Type/thickness: 10mm gib(aqualine to wet areas)
Finish: l4

- 5.2 CEILING LININGS
Location: Ref plan
Brand/Type/thickness: 13mm gib(aqualine to wet areas)
Finish: l4

<< 5230 INTERIOR DOORS & FRAMES >>

- 5.3 INTERIOR DOORS
Leaf type/finish: paint
Frame type/finish: paint
Hardware: client selected

6. FINISH

<< 6200 TILING >>

- 6.1 TILES
Location: ref plan
Floor Tile/substrate: conc.
Wall Tile/substrate: gib
Grout/colour: client selected

- 6.2 WET AREA WATERPROOFING
Location: ref. plan/wet areas
Brand/type: construction chemicals Liquid Flash

<< 6511 CARPETING >>

There is no work section specification relating to the following selections

- 6.3 CARPET
Location: ref. plan
Brand/Type: client selected

<< 6700 PAINTING >>

- 6.4 EXTERIOR PAINTING
Walls 3 coat acrylic system

- 6.5 INTERIOR PAINTING
Walls 3 coat acrylic system
Ceiling: 3 coat acrylic system
Doors 3 coat acrylic system
Trim: 3 coat enamel system

<< 6750 PAPERHANGING >>

- 6.6 WALL PAPER
Location: ref. to client

7. SERVICES

<< 7120 WATER SYSTEM >>

- 7.1 WATER SYSTEM
Pipework concealed: wefatherm
Exposed internal pipe finish: chrome paint
Hot water cylinder: 180ltr electric

<< 7410 RAINWATER SPOUTING SYSTEM >>

- 7.2 SPOUTING
Brand/type/size: colorsteel continous system

- 7.3 DOWNPIPES
Brand/type/size: 80Ø upvc

<< 7700 ELECTRICAL >>

- 7.4 SMOKE ALARMS
Brand/type/reference: type 1 domestic

8. EXTERNAL

<< 8000 LANDSCAPE >>

There is no work section specification relating to the following selections

- 8.1 DRIVEWAY
Type/finish: u3
- 8.2 GARDEN RETAINING STRUCTURES
Retaining type: timber
Drainage coil: novaflo if required at all

1233 DOCUMENTS REFERENCED

1. GENERAL

Documents listed below are, when referred to in the text, part of this specification. However, this specification takes precedence in the event of it being at variance with and requiring a higher standard than any cited document.

1.1 ACTS AND REGULATIONS

Building Act 2004
Gas (Safety and Measurement) Regulations 2010
Health and Safety in Employment Act 1992
Electricity (Safety) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006
New Zealand Electrical Codes of Practice (ECP)

1.2 NEW ZEALAND BUILDING CODE VERIFICATION METHODS

NZBC E2/VM1 External moisture
NZBC G12/VM1 Water supplies

1.3 NEW ZEALAND BUILDING CODE ACCEPTABLE SOLUTIONS

NZBC B1/AS1 Structure - general
NZBC B2/AS1 Durability
NZBC D1/AS1 Access routes
NZBC E1/AS1 Surface water
NZBC E2/AS1 External moisture
NZBC E2/AS3 External moisture
NZBC F2/AS1 Hazardous building materials
NZBC F7/AS1 Domestic smoke alarms
NZBC G1/AS1 Personal hygiene
NZBC G10/AS1 Piped services - Gas
NZBC G11/AS1 Gas as an energy source
NZBC G12/AS1 Water supplies
NZBC G13/AS2 Foul water - Drainage

1.4 NEW ZEALAND STANDARDS

AS/NZS 1604.3 Specification for preservative treatment - Plywood
AS/NZS 2269.0 Plywood - Structural - Specifications
AS/NZS 2589 Gypsum linings - Application and finishing
AS/NZS 2642.2 Polybutylene pipe systems - Polybutylene pipe for hot and cold water applications
AS/NZS 2699.1 Built-in components for masonry construction Wall ties
AS/NZS 3000 Electrical installations (known as the Australian/NZ Wiring Rules)
NZS 3103 Sands for mortars and plasters
NZS 3104 Specification for concrete production
NZS 3109 Concrete construction
NZS 3114 Concrete surface finishes
AS/NZS 3500.2 Plumbing and drainage - Sanitary plumbing and drainage
AS/NZS 3500.3 Plumbing and drainage - Stormwater drainage
NZS 3501 Specification for copper tubes for water, gas and sanitation
NZS 3602 Timber and wood-based products for use in building
NZS 3603 Timber structures standard
NZS 3604 Timber-framed buildings
NZS 3622 Verification of timber properties
NZS 3631 New Zealand national timber grading rules
AS/NZS 4130 Polyethylene (PE) pipes for pressure applications
NZS 4210 Masonry construction materials and workmanship
NZS 4211 Specification for the performance of windows
NZS 4218 2004 Energy efficiency - Housing and small building envelope
NZS 4223.1 Glazing in buildings - Glass selection and glazing
NZS 4223.3 Glazing in buildings - Human impact safety requirements
NZS 4223.4 Glazing in buildings - Wind, dead, snow and live actions
NZS 4229 Concrete masonry buildings not requiring specific engineering design

NZS 4251.1	Solid plastering - Cement plasters for walls, ceilings and soffits
AS/NZS 4666	Insulating glass units
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
AS/NZS 5601.1	Gas installations - general installations
NZS 6803	Acoustics - Construction noise

1.5 BUILDING RESEARCH ASSOCIATION OF NEW ZEALAND (BRANZ)

Good practice guide: Stucco
 Good practice guide: Tiling
 Good practice guide: Membrane roofing
 Bulletin 441 - Sealed joints in external claddings - 2. Sealants
 Bulletin 519 - Fasteners selection

1.6 OTHER DOCUMENTS

Cement & Concrete Association of New Zealand
 - Code of practice for weathertight concrete and concrete masonry construction (CCANZ CP 01)

Department of Labour - Occupational Safety and Health (OSH)
 - Approved code of practice for safety in excavation and shafts for foundations
 - Repainting lead based paints

Membrane Group New Zealand Inc.
 - Code of practice for torch-on membrane systems for roofs and decks

New Zealand Demolition and Asbestos Association (NZDAA)
 - Best Practice Guideline for Demolition in New Zealand.
 - New Zealand Guidelines for the Management and Removal of Asbestos

New Zealand Metal Roofing Manufacturers Inc
 - NZ Metal roof and wall cladding: Code of practice 2008

Window Association of New Zealand Incorporated (WANZ)
 - Specification for powder coatings on architectural aluminium products
 - Window Installation System

2200 GROUNDWORKS AND PREPARATION

1. GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work using persons competent and experienced in the trade.

1.2 SITE SAFETY

Provide proper support for excavations. Cover holes and fence off open trenches and banks.

2. PRODUCTS

2.1 FILLING MATERIALS

Volcanic tuff:	Scoriaceous tuff of variable grading excluding silt or clay material, capable of being placed and compacted as specified.
Rock fill:	Hard material comprising rock, broken stone, hard brick, concrete, run of pit scoria, or other comparable inert material capable of being placed and compacted as specified.
Sand fill:	Clean sand of such grading in particle size as to allow for mechanical compaction to 90% maximum density.
Hardcore:	Scoria or crushed rock to GAP (General All Passing) 40 grading.
Granular base:	Screened crushed gravel or scoria graded in size from 20mm to 7mm, clean. When tested with a standard sieve of 4.75 opening no material is to pass.
Dressing course:	Scoria to GAP 20 grading, or "dirty footpath scoria", or equivalent "all in" graded crushed metal aggregate.
Free-draining aggregate:	Scoria or crushed gravel graded 50 to 14 clean.

3. EXECUTION

3.1 EXCAVATION GUIDELINES

Carry out excavation to the guidelines set in OSH Approved Code of Practice for Safety in Excavation and Shafts for Foundations.

3.2 PROTECT EXISTING

Protect from damage existing buildings, structures, roads, paving and services nominated on the drawings as being retained, throughout the course of the work.

3.3 SURFACE PREPARATION

To NZS 3604, 3.5 **Site preparation**, remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area being built on.

3.4 UNDERGROUND ELEMENTS AND SERVICES

Break out and remove underground elements and redundant services. Report for instructions when unexpected voids, made-up ground or services are encountered. Seal off the ends of drains or remove to NUO approval.

3.5 STOCKPILE TOPSOIL

Stockpile excavated topsoil on site where directed. Keep separate from other excavated materials. Spread and level where directed before completion of the works.

3.6 GENERAL EXCAVATION

Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.

3.7 EXCAVATION FOR FOUNDATIONS

Take foundation excavations to depths shown. Keep trenches plumb and straight, bottoms level and solid, stepped as detailed and clean and free of water.

3.8 INADEQUATE BEARING

If bearing is inadequate then excavate further and backfill with material as follows:

Slabs on grade:	Hardfill
Footings:	10 MPa concrete
Service trenches:	Hardfill

If excavation exceeds the required depths, backfill and compact to the correct level with listed material.

3.9 GRANULAR BASE FOR SLABS

To NZS 3604, 7.5.3 **Granular base**. Consolidate with a vibrating roller. Blind the surface with coarse sand or sand/cement and roll ready to receive a damp-proof membrane.

3.10 GENERAL BACKFILLING

Compact backfilling in 150mm layers, with the last 200mm in clean topsoil, lightly compacted and neatly finished off.

3110 CONCRETE WORK

1. GENERAL

Refer to 1213 SELECTIONS/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 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.

2.3 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**. Increase laps of plain round steel by 100%.

3.6 COVER

Minimum cover to reinforcing as shown on the drawings and to NZS 3109, 3.8 **Cover**. Fix chairs for top reinforcement in slabs at 1.0 metre centres. Cover tolerances to NZS 3109, 3.8. **Cover**.

3.7 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.

3.8 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.

3.9 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.

3.10 CONSTRUCT FLOOR SLABS

Construct in accordance with NZS 3604, 7.5 **Concrete slab-on-ground floors for 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 the requirements of NZS 3114, section 104 **Surface tolerances**.

In the Canterbury Earthquake Region comply with the changes to NZS 3604 in NZBC B1/AS1.

3.11 SAW CUTS

Pour floor slabs cast on the ground in areas no greater than 25 square metres, with a maximum ratio of length to breadth of 1:1.5. Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring. Where saw cuts are made, cut out 100mm of every second wire of the mesh for a length of 50mm each side of the saw cut position. Saw cuts: 1/3rd slab depth, or 30mm minimum.

3.12 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.

3.13 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.

3.14 STRIKE FORMWORK

Strike formwork without damaging or overloading structure.

3.15 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 1213 SELECTIONS/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 Bulletin 519: Fasteners selection. To NZS 3604, 4 Durability 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 Durability . Galvanized steel and stainless steel connectors and brackets to the connector manufacturer's design for locations shown on drawings and to NZS 3604, 4 Durability and NZBC E2/AS1

3. EXECUTION

3.1 ATTENDANCE

Provide and fix blocks, nogs, 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 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**.

BATTENS

4220 WALL CLADDING

1. GENERAL

Refer to 1213 SELECTIONS/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 FIBRE CEMENT WEATHERBOARD

Cellulose cement autoclaved boards.

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: Durability 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/RIGID AIR BARRIER

Fix to the manufacturer's requirements. Refer to 1213 SELECTIONS for type

3.4 CAVITY BATTENS OR JAMB BATTENS

As specified in the section 3800 TIMBER FRAMING, to suit the selected wall cladding and construction type.

3.5 INSTALL FIBRE CEMENT WEATHERBOARD

Install level, true to line and face, to the manufacturer's requirements and NZBC E2/AS1, 9.5 **Fibre cement weatherboards.**

3.6 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.**

3.7 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.

- 3.8 **INSTALL FLASHINGS**
Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1,
4.0 **Flashings.**
- 3.9 **USE OF SEALANTS**
Selection and use of sealants to follow BRANZ Bulletin 441: Sealed joints in external
claddings - 2. Sealants.
- 3.10 **COMPLETE**
Complete all flashings, finishings and trim so the cladding system is completely
weathertight.

4261 BRICK VENEER

1. GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out brickwork with persons competent and experienced in the trade. Work to be carried out by or supervised by the appropriate LBP.

2. PRODUCTS

2.1 ACCESSORIES

Lintels:	Fit angle lintels to openings, sized to NZBC E2/AS1, 9.2.9, Openings in masonry veneer Table 18E and placed to NZBC E2/AS1, 9.2.9, Openings in masonry veneer .
Vermin stop:	Galvanized steel wire netting strip with reinforced edges and galvanized staples for fixing.
Damp-proofing:	Heavy kraft strip laminates saturated and coated with bitumen, or bituminous brush-applied liquid membrane to suit location and detail.
Ties:	To AS/NZS 2699.1, Veneer ties screw fixed to framing.
Sand for mortar:	To NZS 3103. Chloride levels to not exceed 0.04% by dry weight of sand.

2.2 MORTAR

Composed of Portland cement, sand and water with an admixture to the provisions of NZS 4210, 2.2 **Mortar**. Obtain written approval if intending to use cement mortar as a damp-proof course and where or if intending to use hydrated lime in the mortar.

3. EXECUTION

3.1 STORAGE

Store bricks and other materials clear of the ground, under cover and well ventilated until placed in the work.

3.2 VENEER WORK GENERALLY

Comply with NZS 4229, SNZ HB 4236 and NZS 4210, section 2.9 **Veneer and cavity wall construction**.

3.3 LAYING GENERALLY

To NZS 4210. Ensure bricks are dry when laid. Use bricks equally off all pallets as work proceeds. Distribute facing bricks of varying colour randomly throughout so no patches or striping appears.

3.4 BOND

Stretcher bond, single width unless detailed or stated otherwise.

3.5 INSTALLING WALL TIES

Screw fix to face of studs without otherwise piercing or damaging the wall underlay. Ties placed, spaced and installed to NZS 4210, and NZBC E2/AS1, 9.2.7, **Wall ties**, Tables 18A, 18B and 18C, screw fixings to Table 18C.

3.6 MORTARING

To maximum practical density. Mortar fully laid, firmly placed, correctly cured and not re-tempered. Discard any mortar not used within 1 1/2 hours of mixing. Joint thickness 10mm plus or minus 2mm.

3.7 RAKE OUT

Rake out joints as work proceeds, for pointing as detailed. Maximum depth of rake 6mm.

- 3.8 POINTING
Joints tooled concave after initial stiffening.
- 3.9 WEEPHOLES
Rake out every third perpend where weep holes are required, and vent veneer to NZS 4210, 12.4 **Cavities** and NZBC E2/AS1, 9.2.6, **Cavities**.
- 3.10 CO-ORDINATE
Co-ordinate the building-in of exterior joinery and items required for fitting as the work proceeds. Rake out for or build in flashings as required.
- 3.11 KEEP CAVITY AND TIES CLEAR
Keep cavity and ties clear of mortar droppings and clean the brickwork face of any marking as the work proceeds. Repair damage to wall underlay immediately it occurs.
- 3.12 BASE OF CAVITY
Flaunch base of cavity to provide stepped rebates supporting brick veneer and damp-proof, to E2/AS1, 9.2.5, **Foundation support and damp-proofing**.
- 3.13 CLEAN DOWN
Clean down brickwork to remove stains. Remove efflorescence with a stiff bristle broom, blot with a damp sponge and wash walls with a plentiful supply of clean water during fine weather.

4310 ROOFING

1. GENERAL

Refer to 1213 SELECTIONS/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 METAL TILES

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, Tile battens for all wind zones .
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 Durability 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 TILE BATTENS

Install to the roofing manufacturer's requirements, with joints fully supported and staggered.

3.6 INSTALL METAL TILES

Cut with tools specified by the roofing manufacturer. Fold ends and seal cut edges of tiles and accessories without damaging their integrity or finish, all to the roofing manufacturer's requirements. Lap metal tiles and fix complete with matching accessories, flashed to roof features and penetrations; all to the roofing manufacturer's requirements.

- 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 AND DOORS

1. GENERAL

Refer to 1213 SELECTIONS/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 as modified by NZBC F2/AS1 and NZBC B1/AS1.

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 Wanz Specification for powder coatings on architectural aluminium products. 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 System 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 System 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, as modified by NZBC F2/AS1, 1.0 **Glazing** and NZBC B1/AS1, 7.0 **Glazing**.
- 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 to comply with NZS 4223.3, 303.1 **Manifestations** (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.

4610 GLAZING

1. GENERAL

Refer to 1213 SELECTIONS/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 as modified by NZBC F2/AS1 and NZBC B1/AS1.

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 and NZBC B1/AS1, 7.0 **Glazing**.

2.3 TOUGHENED GLASS

Grade A safety glazing material.

2.4 INSULATED GLASS UNITS

As selected and to AS/NZS 4666.

2.5 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, both modified by NZBC B1/AS1, 7.0 **Glazing**. Insulating glass units to AS/NZS4666.

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 and all other locations to comply with NZS 4223.3, as modified by NZBC F2/AS1, 1.0 **Glazing** and NZBC B1/AS1, 7.0 **Glazing**.

3.4 SAFETY

Indicate the presence of transparent glasses, with whiting, tape or signs compatible with the glass type. Do not apply indicators other than whiting to the glass surface.

Permanent manifestations to comply with NZS 4223.3, 303.1 **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 1213 SELECTIONS/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 THERMAL INSULATING BLANKET

Roll form insulation blanket manufactured from fibreglass or polyester.

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 THERMAL INSULATING BLANKET

Install in ceiling/roof cavity and mid-floor cavity where specified. Slightly oversize length for friction fit and tear by hand across pad and fill cavity. Tear to smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating segments over the whole of the installation. Do not cover vents.

3.4 GAPS AROUND RECESSED LIGHTS AND FLUES

New recessed light fittings to 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 1213 SELECTIONS/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 NAILS

Zinc-plated steel, stainless steel and galvanized steel of pattern to suit location and to BRANZ Bulletin 519: **Fasteners selection**.

2.4 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 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.

3.7 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).

3.8 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.

5230 INTERIOR DOORS & FRAMES

1. GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Trades people qualified or experienced in 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, and stairs).

2. PRODUCTS

2.1 DOORS GENERALLY

As selected.

2.2 INTERNAL JOINERY FRAMES

Fabricate as detailed.

2.3 DOOR HINGES

Type: loose-pin zinc-plated steel
Size: 89mm
Material: zinc-plated steel
Number: 3 hinges per door

2.4 DOOR HARDWARE

As selected.

2.5 NAILS

Zinc-plated steel, stainless steel and galvanized steel of pattern to suit location and to BRANZ Bulletin 519: **Fasteners selection**.

3. EXECUTION

3.1 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.

3.2 FIT INTERNAL JOINERY FRAMES

Wedge and rigidly fix in place without distortion, plumb, and true to line and face.

3.3 FIT HARDWARE

Fit hardware selected and provided, all in accordance with the hardware manufacturer's requirements.

3.4 CHECK

Check and adjust operation of doors sets, hardware and furniture.

6200 TILING

1. GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Use tilers experienced with the materials and techniques specified.

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 APPLY LIQUID WATERPROOFING MEMBRANE

Apply the selected liquid waterproof membrane system to the membrane manufacturer's requirements. Flood test shower cubicle floors.

3.8 TILE FIXING, CONCRETE, CEMENT-BASED ADHESIVE

Apply and float thin (thick) bed cement-based adhesive to a minimum 3mm (6mm) bed thickness to the tile manufacturer's requirements. Rib surface with a notched trowel, press the tile and beat it into place with 3mm joints, and to obtain required coverage of adhesive on the back of each tile.

- 3.9 **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.
- 3.10 **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.
- 3.11 **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.

6700 PAINTING

1. GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work using competent and experienced painters.

1.2 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety in Employment Act 1992 and if elimination or isolation is not possible, then minimise the hazards in this work. Refer to OSH publication, Repainting lead based paints, for the required procedures and precautions when treating or removing lead based paint, burning or sanding off paint, or using solvent based paint removers.

1.3 SELECTIONS

Confirm all selections, colours and finishes with the owner.

2. PRODUCTS

2.1 PAINT

As selected and to the paint manufacturer's standards for exterior and/or interior primers, undercoats, sealers, stains, clear coatings, solvent-borne and water-borne paints.

2.2 GAP FILLERS

Linseed oil, putty, plastic wood, wood filler or plastic filler, to suit and to match the surface being prepared.

3. EXECUTION

3.1 INSPECT SURFACES

Inspect surfaces being painted and report to the owner any that will not, after the preparatory work laid down by the paint manufacturer, allow work of the required standard. Confirm that all areas have adequate lighting and are sufficiently free of other construction activities to enable painting work to proceed.

3.2 PROTECT

Cover up adjoining surfaces and areas liable to damage or over-painting.

3.3 REMOVE HARDWARE

Remove hardware and door/window furniture and replace on completion. Do not paint over permanently attached hinges, or any hardware items which cannot be removed.

3.4 PRIMING AND SEALING

Ensure that priming and sealing work needed before or during construction is carried out when required.

3.5 ENVIRONMENTAL CONDITIONS

Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of the paint manufacturer.

3.6 SHARP EDGES, CRACKS AND HOLES

Repair as required by the paint manufacturer.

3.7 PREPARE SURFACES

Prepare surfaces as required by the paint manufacturer. Make good all damage and defects.

3.8 PAINT APPLICATION

Apply paint by brush and/or roller to suit the location of the coating and to the paint manufacturer's requirements. Do not spray on site without express permission.

- 3.9 **MANUFACTURER'S MANUALS**
Refer to the paint manufacturers' manuals and follow their preparation, sequence and application requirements applying to each system. Ensure all paint coats in any system are supplied by the same manufacturer.
- 3.10 **SCUFF BETWEEN COATS**
Scuff between all coats to remove any dust pick-up, protruding fibres and coarse particles.
- 3.11 **FINISHED PAINT SURFACES**
Finished paint surfaces to show uniformity of gloss and colour, with the correct thickness for each coat, and freedom from painting defects. Ensure finished work is clean and free of any disfigurement.
- 3.12 **CLEAN**
Clean adjoining surfaces, glass and fittings of any paint contamination.
- 3.13 **REFIT HARDWARE**
Refit hardware without damage to the hardware or the adjoining surfaces.

6750 PAPERHANGING

1. GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work using competent and experienced paperhangers.

1.2 INSPECT SURFACES

Inspect surfaces being papered and report to the owner any that will not, after the preparatory work, allow work of the required standard. Confirm that all areas have adequate lighting and are sufficiently free of other construction activities to enable paperhanging work to proceed.

2. PRODUCTS

2.1 SELECTIONS

Confirm all selections, colours and finishes for wallpaper with the owner.

2.2 CONFIRM WALLPAPER BATCH

Confirm that all rolls of each pattern are from the same batch.

3. EXECUTION

3.1 PREPARING NEW SURFACES

Clean down and seal to manufacturer's requirements.

3.2 WALLPAPER INSTALLATION

Seal or size walls. Drops full-length, completely glued, pattern matched and hung vertically without bubbles or visible butt joints. Scribe cut paper 2mm onto surrounding trim.

7120 WATER SYSTEM

1. GENERAL

Refer to 1213 SELECTIONS/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 POLYBUTYLENE WATER PIPE

Polybutylene tubing complete with fittings and accessories brand-matched to AS/NZS 2642.2.

2.2 EXPOSED PIPES

As selected, chrome or white polybutylene, pipework finish to include escutcheon plates, accessories, bends and elbows protruding from walls or fittings.

2.3 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 joined 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 CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and NZBC G12/AS1, 6.11 **Water heater installation**.

3.6 PENETRATIONS

Provide and fit collars and escutcheon plates to match pipework at penetrations through constructions.

3.7 COMPLETION

Pressure test to ensure no leakage and leave in proper working order. Clean tapware and fittings.

7410 RAINWATER SPOUTING SYSTEM

1. GENERAL

Refer to 1213 SELECTIONS/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 PVC-U DOWNPIPES

Tubes, stand-off brackets and fittings brand matched and complete to the manufacturers specifications.

2.2 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING

Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.

3. EXECUTION

3.1 INSTALL PVC-U SPOUTING AND DOWNPIPES

Fit and screw fix brackets, set to falls to outlets. Ensure solvent welded or rubber ring jointed spouting sections are complete with all fittings to the spouting manufacturer's requirements. Screw fix stand-off brackets, set pipes plumb and clear of the wall, solvent welded. Discharge into stormwater bends.

3.2 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.

3.3 ENSURE

Ensure rainwater services are operational, flashings complete and the building weathertight.

7430 DRAINAGE SYSTEMS

1. GENERAL

Refer to 1213 SELECTIONS/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 DRAWINGS

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 Gully traps , 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/AS1, G13/AS2 and G13/AS3
- AS/NZS 3500.2 and AS/NZS 3500.3

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 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the NUO's stormwater system.

- 3.7 **INSTALL STRIP DRAIN CHANNEL**
Excavate trench and form site concrete base to fall. Set interlocking channel sections, sumps and accessories in place, all in accordance with the channel manufacturer's requirements. Check falls and install gratings and covers.
- 3.8 **INSTALL SURFACE WATER SUMP**
To NZBC E1/AS1, 3.6 Surface water inlets to drains. Ceramic half-siphon pipe. Cast iron frame with a lift out grating.
- 3.9 **FIELD TEST**
Field test drains for watertightness to the satisfaction of the BCA inspector.
- 3.10 **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 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000 and the New Zealand Electrical Codes of Practice 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 CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance to the owner, as required by the Electricity (Safety) Regulations 2010. Allow the NUO to view before the meter installation, listed work inspection, polarity check and livening of supply.

1.4 SAFETY OF INSTALLATION

Before installation work commences, provide a declaration of conformity to Electrical (Safety) Regulations 2010, regulations 57 & 58

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: 1.5mm² on 10 amp MCBs for domestic construction

Power circuits: 2.5mm² 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 ELECTRIC HOT WATER SYSTEM

Wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end.

3.5 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.

3.6 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.

3.7 COMPLETION

Leave all fittings, lamps and tubes operational, with equipment and diffusers clean.