

EXCAVATOR

Levels

To be assessed & fixed on site inspection between Builder & Plumber whilst also in accordance with Napier City Council guidelines.

Building Excavation

Excavate for all foundations as indicated on the plans, or as required by NZS 3604:1999. No variations will be issued for unforeseen ground conditions or slope of site.

Hardfill

Under all concrete floors provide a minimum thickness of 100mm of peametal well compacted and blended with fine sand or other material to correct level.

APPROVED

CONCRETE AND REINFORCING

Materials

Concrete which shall be Raftmix – a 20MPa 80mm slump structural mix available in either a 13mm or more usually 19mm nominal aggregate size. Raftmix Pump is a 20MPa 100mm slump pump mix available in either 13mm or 19mm nominal aggregate size. All other concrete is of ordinary grade and reinforcing shall comply with the requirements of NZS 3109:1997, and amendments. Builders mix may be used providing the minimum crushing strength of 17.5mpa is unaffected. Cement shall comply with NZS 3122 and NZS 3123.

Foundations

Foundations, footings and reinforcing shall be to size shown on the drawings as with footing details & refer to details shown in NZS 3604:1999 and amendments. Reinforcing steel shall be lapped at least 40 rod diameters for plain rod and not less than 30 bar diameters for deformed bars conforming to the requirements prescribed.



Concrete Slab

Ribraft™ concrete floor as per Firth Ribraft™ floor system.

Or

PERIMETER WALL - shall be as detailed. MOISTURE BARRIER shall be laid to form as few joins as possible. Joints shall be lapped 150mm and sealed with polythene backed pressure sensitive tapes. Seal around any wastes or pipes that project through dampcourse, and care shall be taken that the DPM is not punctured by subsequent work. At perimeter form turn up of DPM specifically as detailed.

DAMP PROOF COURSE - All timber supported on or in contact with concrete shall be protected by an approved damp proof course. Slab reinforcing shall be 665 HRC mesh, sheet lapped 225mm and tied supported at the top third of the slab on chairs at 1m ctrs, both ways.

Built in Bolt

Provide in concrete for openings for waste pipes etc or as required by other trades and for holding down bolts in accordance with NZS 3604:1999

Power tool fixing: USE ONLY NZS 3604:1999

CARPENTER AND JOINER

Materials and Workmanship

All materials used shall be the best of their respective class and type specified. All work shall be carried out in a workmanlike manner in accordance with best trade practice and to comply with NZS 3604:1999 and amendments.

Timber

All timber used shall be the best of its kind conforming to NZSS requirements (Building Timbers). All Pinus Radiata to be MSG8 Grade treated to requirements of the Timber Preservation Authority Specification. (See Below)

Timber Treatment :-

Interior (above ground) – Low Risk “H1.1” ie: interior finishes timber
Interior (above ground) – Low Risk “H1.2” ie: wall framing
Exterior (above ground) – Moderate Risk “H3.1” ie: Cladding, fascia, weatherboards
Exterior (above ground) – Moderate Risk “H3.2” ie: Structural-decking, joists, bearers
Exterior (non-structural) – High Risk “H4” ie: fence posts, landscaping timbers.
Exterior (structural) – High Risk “H5” ie: house piles, poles & crib walling.

Damp Proofing

All timber to be protected from dampness with 3 ply bituminous felt or other approved damp proofing material when in contact with concrete or blockwork.

Construction

Requirements for general carpentry work (e.g. bracing studs and top plate requirements) are to be as itemised in relevant clauses of NZS 3604:1999 and amendments.

Priming

All exterior finishing timber, all timber in contact with blockwork and all external faces, rebate etc of all doors and frame shall be primed before fixing unless otherwise specified by PAINTER

Nails and Screws

All nails used in framing to be of sufficient length to penetrate the holding of second timber to at least half their length. All bolts, screws etc to be adequate for their respective purpose as scheduled in NZS 3604:1999.

Insulation

To be as directed on drawings and installed in accordance with manufacturer's specifications and comply with NZS 4214.

Wall Cladding

EFIS Polystyrene Cladding & Brick & James Hardie Linea Weatherboard manual.

Aluminium Joinery

Supply and fix aluminium joinery as shown. Finish to be selected color powder coat. Glass weight to suit window size unless specifically noted on schedule.

Doors and Jambs

Interior doors to be hollow core paint quality, hung on 1.5 prs f. b. loose pin hinges. Sliding doors to be approved tracks. Interior door frames to be out of 140x32mm f.j.p.r. grooved to take 10mm Gibraltar board with 40x12 f.j.p.r. glued and nailed planted stop.

Ceiling

Fix 13mm Ceiling Gibboard fixed to manufacturers specifications-stop for paint finish.

Wall Linings

Fix 10mm Gibraltar board to studs and dwangs with 30mm flat head galvanised clouts stopped and all joints flushed even to surface. Stop for paint finish.

Timber Lintel

HY90 lintels are to be used as shown on drawing in strict accordance with manufacturer's recommendation regarding fixing.

Wall Bracing

Wall bracing shall comply with NZS 3604:1999 and be fixed in accordance with Winstones Gib Board Wall Bracing System requirements.

Wardrobes

Line out with 10mm Gibraltar board and stop for wallpaper finish, proprietary wardrobe fitting system to be installed by contractor.

Kitchen/Bath/EnSuite

Refer to client for preferences.

Glazing

All Glazing to be in full compliance with NZS 4223 & NZBC F2/AS1 including Safety glass.

PLUMBER



General

The whole of the work shall be carried out and completed in the best trade manner by licensed plumbers only and shall conform to all requirements of the Building Act 2004 and Local Council requirements.

PVC pipework shall be used throughout with approved sealants or jointing systems.

Flashing

Flash wherever needed to keep watertight and weathertight, extreme care being taken to keep dissimilar metals from making contact. Also, as much as possible, use flashings of same metal and finishes in adjacent areas. Refer to NZBC E2/AS1 for compatibility tables.

Internal Gutters

N/A

Downpipes

80Ø PVC.

Coldwater

Allow to make connections to water mains at boundary and lead in piping to terminate with main wheel valve with plastic wheel within lidded Toby box, lead in 25mm piping concealed directly to hot water cylinder. All cold water outlets shall be serviced by 12mm supply.

NOTE: Bath to be supplied in 19mm piping.

Fittings

Refer fitting schedule for fittings. Plumber shall provide and fix all to complete the contract. Make complete connections, providing traps, vents etc, in accordance with NZ Building Code. Tapware to have ceramic seats where possible. Filters required to cold water. The following taps are to be included in quote:

Kitchen sink:	Mid-range Quality – refer to client
Vanities:	Mid-range Quality – refer to client
WC Basins:	Mid-range Quality – refer to client
Showers:	Mid-range Quality – refer to client
Laundry:	Mid-range Quality – refer to client

Roofing

Refer to Drawings.



DRAINLAYER

Extent of Work

Work in this section of the Contract comprises all surface and foul water drainage up to and above ground level to connect Plumber's work. Include all pipes and special fittings, construction of manholes, all gully traps and connections for terminal vents, soil and waste pipes.

Standard of Work

The whole of this work shall be carried out by experienced tradesmen to the satisfaction of the Local Drainage Inspectors. It shall conform to all requirements of the N.Z.B.C. 2004 Local Council Requirements.

Trenches and Drains

Excavate for and allow necessary drains from gully traps and WC's to connect into council sewer drain. All sewer pipes and fittings shall be 100mm first quality U.P.V.C. with socket joints and shall be laid to a true and even fall. All stormwater pipes and fittings to be 90mm first quality U.P.V.C. and shall be laid to a true and even fall.

Trenches shall be carefully filled after drains have been inspected and the whole shall be left in perfect working order. All sanitary arrangements shall comply with N.Z.B.C. and shall be completed to the satisfaction of the Sanitary Inspector.

ELECTRICIAN

Scope

Carry out the whole of the electrical installation in strict accordance with the latest Electrical Wiring Regulations.

Materials and Workmanship

All materials used under this contract shall be of approved British or New Zealand Standard Specification. All work shall be carried out by a registered Electrician in accordance with regulation and best trade practice. Do all cutting away, drilling etc for the entry of cables.

Completion and Connection of Power

Leave the work complete, obtain permits and arrange for all inspections and tests for the connections of power to the works.

Power Supply/Meter Board

Placement of switchboard to be confirmed with client & builder.

Main Switchboard

Provide and install recessed main switchboard complete with all necessary control and auxiliary equipment. Provide main cable with 25% spare capacity. On this board provide MCB'S for internal circuits associated with this contract.

Fittings

Owner to supply all light fittings. Allow to connect up all as supplied.

Power Points

All wall plugs shall be 230v, 10amp, 3 pin flush type with PDL plates. Generally install plugs 400mm above floor or 225mm above bench tops. Points to washer and refrigerator space 1200mm from floor. All power points to be doubles.

Telephone

The Owner shall make application for all telephones required and make arrangement for Telecom to install. All wires shall be concealed on completion.

Television

All to use coaxial cable suitable for color reception and wire as a multi-point installation strictly to Tisco recommendations. Allow to terminate wires at eaves where directed.

Light Switches

Light Switches generally shall be 5 amp all insulated PDL series type or equivalent. Fix switches generally 1200mm above floor or otherwise specified by client or designer.



DEFECT LIABILITY PERIOD

Any defects or other faults which appear within 90 days from the takeover of the building by the Owner, or materials and workmanship not in accordance with the drawing and specification shall be amended and made good by the Contractor at his own expense. A 6% retention shall be held by the Owner until such items have been dealt with to the Owner's satisfaction.



PRODUCER STATEMENT – DESIGN

Issued by: Firth Industries Limited
Relating to: Firth Ribraft Floor System
In Respect of: Lateral Resistance

Firth Industries developed, markets and supplies componentry for the Firth Ribraft Floor System. Opus International Consultants have carried out an appraisal of the system (Appraisal Certificate No. 1999/22), and developed a non-specific design guide (Firth Ribraft Floor System Manual: May 2000) which received B.I.A. Accreditation as a non-specific design guide.

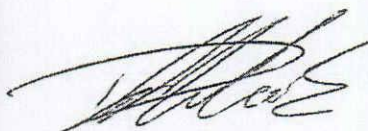
Further to the non-specific design guide, I have carried out specific design relating to the requirements for provision of lateral resistance. This work is separate to the Opus Appraisal and the Ribraft Floor System Manual and in no way changes the content of either.

As a design professional, I believe on reasonable grounds that subject to:

1. All conditions and requirements of the Firth Ribraft Floor System Manual: May 2000 being met except for those contained in Section 5 Lateral Resistance.
2. The building wind zone as determined in Section 5 of NZS 3604:1999 not exceeding VH.
3. The height H of the building not exceeding the plan dimension L, with H and L as shown in Figure 5.3 of NZS3604:1999.

Shear piles as described in Section 5 of the Firth Ribraft Floor Manual: May 2000 are not required for compliance with the relevant provisions of the building code.

Sufficient shear resistance is provided by base friction to satisfactorily resist seismic and wind loads.



Dene Cook
B.E (Hons), M.E, CPEng, FIPENZ
(2009)

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Structural Design

68 Northland Rd, Wellington. Ph (04) 976 7889 Fax (04) 976 7886. e-mail malcolm.thomson@clear.net.nz

PAD DESIGN

6

<Job No. >:	90710	Date:	13/7/09
<Job Title >:	Ribraft Slab to New Residence	Designer:	M Thomson
<Description >:	Internal Pads	Checker:	

Soil Bearing Capacity =	100 kPa
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Loading info.	FLOOR	Timber	with	N/A	Topping
	Dead Load	=	0.38	kPa	
	Live Loading	=	1.50	kPa	
	Super Imposed Dead	=		kPa	
	Tributary Area	=		m ²	
	Dead Load/m	=		kN	
	Live Load/m	=		kN	
	ROOF	Light	=	0.46	kPa
	Live Loading	=	0.50	kPa	
	Tributary Area	=	25.00	m ²	
	Dead Load/m	=	11.50	kN	
	Live Load/m	=	12.50	kN	
	MASONRY WALL ABOVE	15 Series	800 crs	Light	
	(North of Taupo = Light) (South of Taupo = Heavy)	=	170	kg/m ²	
	Height	=	1.67	m	
Tributary length	=		m		
Load	=		kN		
OTHER WALL ABOVE (Specify Wall Weight)	Weight	=	38	kg/m ²	
Height	=	0.37	m		
Tributary length	=	2.40	m		
Load	=		kN		
SELF WEIGHT OF COLUMN	=		kN		

Loadings Summary	Floors		kN	Dead
			kN	Live
	Roof	11.50	kN	Dead
		12.50	kN	Live
	Walls		kN	Dead
	Self Weight:		kN	Dead
	Extra Dead		kN	Dead
Extra Live		kN	Live	

Total Loads	Dead	11.50	kN
	Live	12.50	kN
Ultimate Loads (1.2G + 1.6Q)	Dead	13.80	kN
	Live	20.00	kN
Total Ultimate Load	w =	33.8	kN

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PAD DESIGN

6

Internal Pads

Job: 90710

Title: Ribraft Slab to New Residence

Footing Design

DIMENSIONS

Foundation Area Required = Load/Bearing Cap.
= 0.34 m²

Minimum Foundation Size Required = 581 x 581 mm

Adopted Foundation Size = 600 x 600 mm

Foundation Depth = 220 mm

NZS 3101: Part 1: 1995: 8.4.4

REINFORCEMENT STEEL

$$p_{min} = \frac{\sqrt{f_c'}}{4f_y}$$

$f_c' = 17.5$ MPa

$f_y = 500$ MPa ▼

$p_{min} = 0.00209$

$p_{min} \times csa \text{ concrete} = 268 \text{ mm}^2$

Use 3-HD12 in both directions

= 339 mm² OK

The prescribed footing design is:

Footing = 600 x 600 mm by 220 mm deep with 3-HD12 in both directions

Location on plan:

APPROVED

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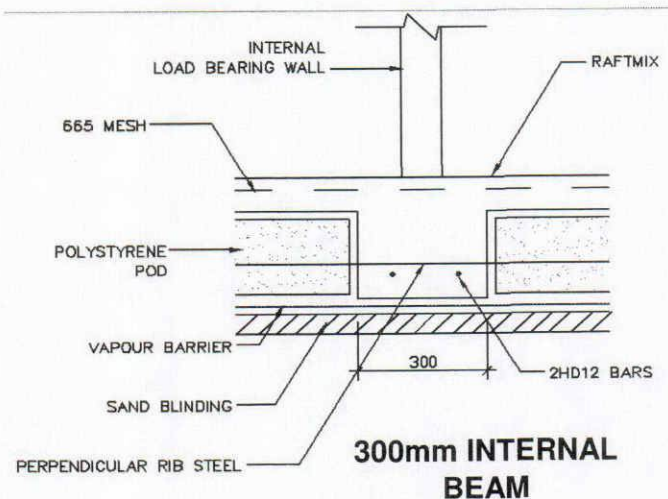
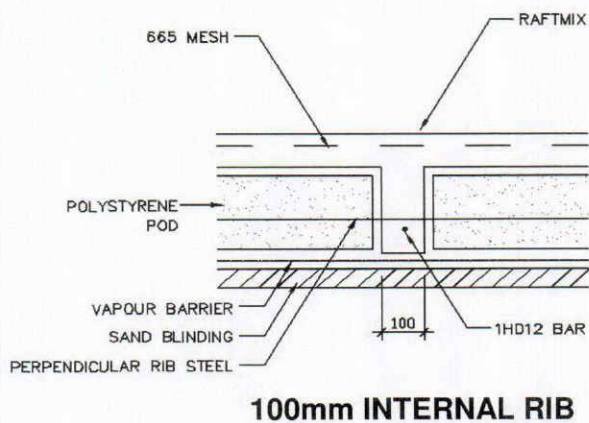
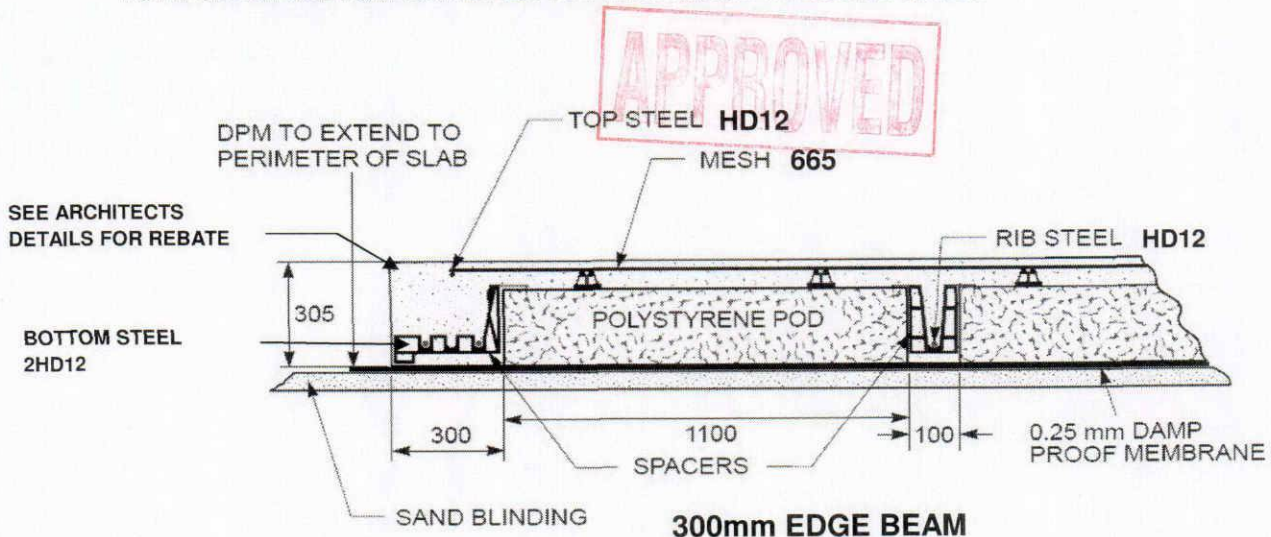
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Job Title:	Ribraft Slab to New Residence	Page:	9
Designer:	Signature Homes Ltd	Job #:	90710
Owner:	Patterson and Sakamoto	Date:	13/07/2009
Job Address:	475 Manawapu Rd, Hawera, Taranaki	By:	M Thomson
		Chkd:	

DETAILS

FOR FULL SPECIFICATION REFER TO FIRTH RIBRAFT FLOOR SYSTEM



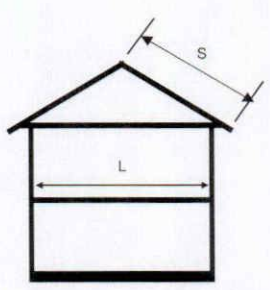
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RIBRAFT FLOOR SYSTEM

RIBRAFT DESIGN - EDGE BEAM		3	
<Job No.>:	90710	Date:	13/07/2009
<Job Title>:	Ribraft Slab to New Residence	Designer:	M Thomson
<Description>:	Edge Beam	Checker:	

<p>Loadings</p> <p>Upper Wall must be Timber</p>  <p>Tributary Roof and Floor Lengths</p>	<p>WALLS</p> <p>Lower: <input type="text" value="Timber"/> <input type="text" value=""/></p> <p>(North/South Taupo)</p> <p>= 50 kg/m²</p> <p>= 0.49 kPa</p> <p>Height = 2.50 m</p> <p>Load/m = 1.23 kN/m</p> <p>Upper: <input type="text" value="Timber"/> <input type="text" value=""/></p> <p>(North/South Taupo)</p> <p>= 50 kg/m²</p> <p>= 0.49 kPa</p> <p>Height = 2.50 m</p> <p>Load/m = 1.23 kN/m</p> <p>Other (Specify Wall Weight)</p> <p>Weight = kg/m²</p> <p>= kPa</p> <p>Height = m</p> <p>Load = kN/m</p>																																				
	<p>SUSPENDED MID-FLOOR Tributary Length L/2</p> <p>Unit/Floor = <input type="text" value="Timber"/></p> <p>Topping = <input type="text" value="N/A"/></p> <p>= 0.38 kPa</p> <p>Live Loading = 1.50 kPa</p> <p>Super Imposed Dead = kPa</p> <p>Tributary Span = 3.00 m</p> <p>Dead Load/m = 1.14 kN/m</p> <p>Live Load/m = 4.50 kN/m</p>																																				
	<p>ROOF Tributary Length = S</p> <p>Light <input type="text" value="Light"/> = 0.46 kPa</p> <p>Live Loading = 0.25 kPa</p> <p>Tributary Span = 5.00 m</p> <p>Dead Load/m = 2.30 kN/m</p> <p>Live Load/m = kN/m</p>																																				
	<p>Loadings Summary</p> <table border="1"> <tr> <td>Walls</td> <td>2.45</td> <td>kN/m</td> <td>Dead</td> </tr> <tr> <td>Mid Floors</td> <td>1.14</td> <td>kN/m</td> <td>Dead</td> </tr> <tr> <td></td> <td>4.50</td> <td>kN/m</td> <td>Live</td> </tr> <tr> <td>Slab*</td> <td>1.37</td> <td>kN/m</td> <td>Dead+SDL</td> </tr> <tr> <td></td> <td>1.20</td> <td>kN/m</td> <td>Live</td> </tr> <tr> <td>Roof</td> <td>2.30</td> <td>kN/m</td> <td>Dead</td> </tr> <tr> <td></td> <td></td> <td>kN/m</td> <td>Live^</td> </tr> <tr> <td>Extra Dead</td> <td></td> <td>kN/m</td> <td>Dead</td> </tr> <tr> <td>Extra Live</td> <td></td> <td>kN/m</td> <td>Live</td> </tr> </table> <p>* Includes Edge Beam Weight, SDL = 0.5 kPa LL = 1.5 kPa</p> <p>^ Roof LL not added if midfloor exists else LL = 0.25 kPa</p>		Walls	2.45	kN/m	Dead	Mid Floors	1.14	kN/m	Dead		4.50	kN/m	Live	Slab*	1.37	kN/m	Dead+SDL		1.20	kN/m	Live	Roof	2.30	kN/m	Dead			kN/m	Live^	Extra Dead		kN/m	Dead	Extra Live		kN/m
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RIBRAFT FLOOR SYSTEM

Job Details: Ribraft Slab to New Residence

90710

13/7/09

Working Loads	Dead	7.27	kN/m
	Live	5.70	kN/m
Ultimate Loads (1.2G + 1.6Q)	Dead	8.72	kN/m
	Live	9.12	kN/m
Total Ultimate Load on Edge	w =	17.84	kN/m

Wall Construction Type	Brick Veneer min beam width 300mm	
Edge Beam Details	Beam Width =	300 mm
	Pod Depth =	220 mm
	Top slab Depth =	85 mm
	Self Weight =	2.20 kN/m
	Construction Type =	Standard Raft

Standard Raft Construction	
APPROVED	Bearing Capacity Over Platform: 100 kPa
	Bearing Check = OK!
	Working Pressure = 32 kPa
	Steel Requirements - As Per Firth Std Drg's
Top Steel: 1HD12	
Btm Steel: 2HD12	

Continuous Piers	
<p>(N.B. All Edge Beam Load in to 'strip' footing) Assume 100 kPa Bearing Under Edge Beam, unless a Soil Report indicates otherwise.</p>	Bearing Capacity under Piers: kPa
	Bearing Check =
	Pressure = kPa
	Steel Requirements - As Per Firth Std Drg's
Top Steel:	
Btm Steel:	

The prescribed Edge Beam design is:	
Location (ie: which wall): Edge Beam	<p>Standard Raft Construction 300 mm wide edge beam with 1HD12 in top & 2HD12 in bottom</p>

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RIBRAFT FLOOR SYSTEM

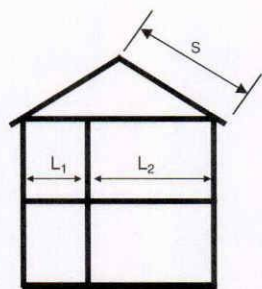
RIBRAFT DESIGN - INTERNAL LOADBEARING RIB

<Job No.>: 90710
<Job Title>: Ribraft Slab to New Residence
<Description>: Internal Load Bearing Rib

Date: 13/07/2009
Designer: M Thomson
Checker:

4

Loadings



Tributary Roof and Floor Lengths

APPROVED

WALLS

Lower:	HOTBloc	Solid	
	Light		(North/South Taupo)
		=	400 kg/m ²
		=	3.92 kPa
Height		=	m
Load/m		=	kN/m
Upper:	HOTBloc	Solid	
	Light		(North/South Taupo)
		=	400 kg/m ²
		=	3.92 kPa
Height		=	m
Load/m		=	kN/m

Other (Specify Wall Weight)

Weight	=	30 kg/m ²
	=	0.29 kPa
Height	=	5.00 m
Load	=	1 kN/m

SUSPENDED MID-FLOOR

Tributary Length = (L₁+L₂)/2

Unit/Floor	=	Timber
Topping	=	N/A
	=	0.38 kPa
Live Loading	=	1.50 kPa
Super Imposed Dead	=	kPa
Tributary Span	=	3.00 m
Dead Load/m	=	1.14 kN/m
Live Load/m	=	4.50 kN/m

ROOF

Tributary Length = S	(Check if Rafter or Truss)
Light	= 0.46 kPa
Live Loading	= 0.25 kPa
Tributary Span	= 4.00 m
Dead Load/m	= 1.84 kN/m
Live Load/m	= kN/m

Loadings Summary

Walls	1.47 kN/m	Dead
Mid Floors	1.14 kN/m	Dead
	4.50 kN/m	Live
Slab*	2.60 kN/m	Dead+SDL
	1.80 kN/m	Live
Roof	1.84 kN/m	Dead
	kN/m	Live^
Extra Dead	kN/m	Dead
Extra Live	kN/m	Live

* Includes Internal Rib Weight, SDL = 0.5 kPa LL = 1.5 kPa

^ Roof LL not added if midfloor exists else LL = 0.25 kPa

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RIBRAFT FLOOR SYSTEM

Job Details: Ribraft Slab to New Residence

Job Number: 90710

13/7/09

Working Loads	Dead	7.05	kN/m
	Live	6.30	kN/m
Ultimate Loads (1.2G + 1.6Q)	Dead	8.46	kN/m
	Live	10.08	kN/m
Total Ultimate Load on Internal	w =	18.54	kN/m

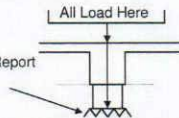
Internal Rib Details	Rib Width =	300	mm	
	Pod Depth =	220	mm	OK!
	Top slab Depth =	85	mm	
	Self Weight =	1.58	kN/m	
	Construction Type	Standard Raft <input type="button" value="v"/>		

Standard Raft Construction	Bearing Capacity:	100	kPa
	Bearing Check =	OK!	
	Working Pressure =	32	kPa
	Steel Requirements - As Per Firth Std Drg's		
	Btm Steel:	2HD12	

APPROVED

Continuous Piers (N.B. All Internal Load in to 'strip' footing) Assume 100 kPa Bearing Under Loadbearing Rib, unless a Soil Report indicates otherwise.	Bearing Capacity:	kPa
	Bearing Check =	
	Pressure =	kPa
	Steel Requirements - As Per Firth Std Drg's	
	Btm Steel:	

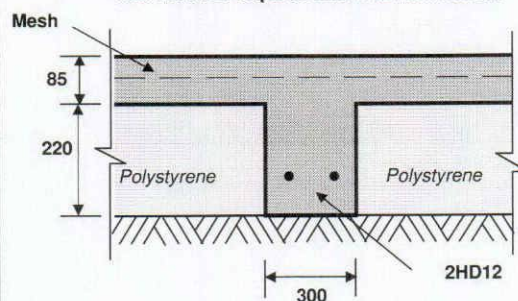
100 kPa min or as specified in Report
under loadbearing areas.



The prescribed internal rib design is:

Location (ie: which wall):
Internal Load Bearing Rib

Standard Raft Construction,
300 wide Rib required with 2HD12 in bottom



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RIBRAFT FLOOR SYSTEM

RIBRAFT DESIGN - INTERNAL LOADBEARING RIB

<Job No.>: 90710
<Job Title>: Ribraft Slab to New Residence
<Description>: Internal Load Bearing Rib

Date: 13/07/2009
Designer: M Thomson
Checker:

5

Loadings

WALLS

Lower:

HOTBloc

Solid

Light

(North/South Taupo)

= 400 kg/m²

= 3.92 kPa

Height = m

Load/m = kN/m

Upper:

HOTBloc

Solid

Light

(North/South Taupo)

= 400 kg/m²

= 3.92 kPa

Height = m

Load/m = kN/m

Other (Specify Wall Weight)

Weight = 30 kg/m²

= 0.29 kPa

Height = m

Load = kN/m

SUSPENDED MID-FLOOR

Tributary Length = (L₁+L₂)/2

Unit/Floor = Timber

Topping = N/A

= 0.38 kPa

Live Loading = 1.50 kPa

Super Imposed Dead = kPa

Tributary Span = m

Dead Load/m = kN/m

Live Load/m = kN/m

ROOF

Tributary Length = S (Check if Rafter or Truss)

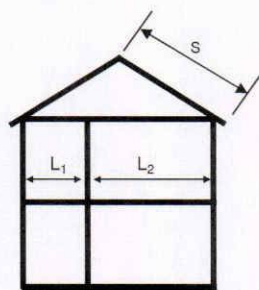
Light = 0.46 kPa

Live Loading = 0.25 kPa

Tributary Span = m

Dead Load/m = kN/m

Live Load/m = kN/m



Tributary Roof and Floor Lengths

Loadings Summary

Walls	kN/m	Dead
Mid Floors	kN/m	Dead
Slab*	kN/m	Live
	kN/m	Dead+SDL
	1.80 kN/m	Live
Roof	kN/m	Dead
	kN/m	Live^
Extra Dead	kN/m	Dead
Extra Live	kN/m	Live

* Includes Internal Rib Weight, SDL = 0.5 kPa LL = 1.5 kPa

^ Roof LL not added if midfloor exists else LL = 0.25 kPa

DEKE CONSULTING LTD

Residential Civil and
Structural Design

68 Northland Rd, Wellington. Ph (04) 976 7889 Fax (04) 976 7886. e-mail malcolm.thomson@clear.net.nz

RIBRAFT FLOOR SYSTEM

Job Details: Ribraft Slab to New Residence Job Number: 90710

13/7/09

Working Loads	Dead		kN/m
	Live	1.80	kN/m
Ultimate Loads (1.2G + 1.6Q)	Dead		kN/m
	Live	2.88	kN/m
Total Ultimate Load on Internal	w =	2.88	kN/m

Internal Rib Details	Rib Width =	100	mm	
	Pod Depth =	220	mm	OK!
	Top slab Depth =	85	mm	
	Self Weight =	0.53	kN/m	
	Construction Type	Standard Raft <input type="button" value="v"/>		

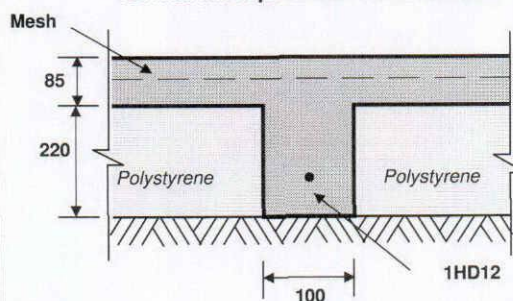
Standard Raft Construction	Bearing Capacity:	100	kPa
	Bearing Check =	OK!	
	Working Pressure =	7	kPa
	Steel Requirements - As Per Firth Std Drg's		
	Btm Steel:	1HD12	

Continuous Piers (N.B. All Internal Load in to 'strip' footing) Assume 100 kPa Bearing Under Loadbearing Rib, unless a Soil Report indicates otherwise.	Bearing Capacity:	kPa
	Bearing Check =	
	Pressure =	kPa
	Steel Requirements - As Per Firth Std Drg's	
	Btm Steel:	

The prescribed internal rib design is:

Location (ie: which wall):
Internal Load Bearing Rib

Standard Raft Construction,
100 wide Rib required with 1HD12 in bottom



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68 Northland Rd, Wellington. Ph (04) 976 7889 Fax (04) 976 7886. e-mail malcolm.thomson@clear.net.nz

Job Title:	Ribraft Slab to New Residence	Page:	1
Designer:	Signature Homes Ltd	Job #:	90710
Owner:	Patterson and Sakamoto	Date:	13/07/2009
Job Address:	475 Manawapu Rd, Hawera, Taranaki	By:	M Thomson
		Chkd:	

The design calls for a one and two storey light timber frame house (light cladding, light roof) supported on Firth Ribraft slab on grade.

Deke Consulting has been engaged to carry out the design of the Ribraft floor slab and the floor beams.

Ribraft Slab

This office has been advised that the site meets the definition of Good Ground as defined by NZS3604 and provides in excess of 100kPa allowable bearing capacity. This is to be confirmed by others.

Materials and construction is to be in accordance with Firth specification contained in Firth Technical Solutions Ribraft Floor Systems except as altered by attached design.

The roof truss supplier is to advise of any point loads in excess of 10kN landing internally. These are to be taken by full depth concrete pads. The attached 600mm sq pad is capable of supporting a ULS load of 17kN.



Malcolm Thomson
CPEng
DEKE Consulting Ltd

DEKE CONSULTING LTD

Residential Civil and
Structural Design

68 Northland Rd, Wellington. Ph (04) 976 7889 Fax (04) 976 7886. e-mail malcolm.thomson@clear.net.nz

Job Title:	Ribraft Slab to New Residence	Page:	2
Designer:	Signature Homes Ltd	Job #:	90710
Owner:	Patterson and Sakamoto	Date:	13/07/2009
Job Address:	475 Manawapu Rd, Hawera, Taranaki	By:	M Thomson
		Chkd:	

The design calls for new two storey house with light cladding. Attached is a calculation of shear key piles required for this house.

Calculation of Shear Pile Requirements

Use AS1170 design philosophy of preventing damaging movement up to an SLS event, and thereafter accepting increasing levels of damage as the event increases.

The site is most likely Class C soil.

Siesmic Loads

$C(t) = Ch(t) Z R N(T,D)$

Soil C	Ch(t)	2.36	Ru	1	Ductility	2	Timber Structure on Slab
	Z	0.18	Rs	0.25	ku	1.57	
	T	0.4	Sp	1	Ct	0.42	
			For base sliding Sp = 1.0		Cd	0.27	
Cd	ULS	0.27					
	SLS	0.11					

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Testing by Dr McManus University of Canterbury (Geotechnical Society Symposium, 2003) found the friction co-efficient of slab on polythene on sand had peak friction co-efficients of 0.42 for an unloaded slab and 0.53 for a loaded slab. Residual friction angles were 0.38 and 0.49 respectively.

These values are somewhat lower than that published by other sources, normally 0.7 peak and 0.5 residual.

Even using the lower values there will not be relative movement between the slab and the ground at SLS level event on Class C soil.

At ULS level event there may be relative movement between the slab and the ground when on Class C soil. Relative movement may break services to the house but will also serve to reduce the forces transferred to the structure of the house. This is acceptable within the intent of NZS 1170.5 2004.

Accordingly, as a design professional, I believe that shear key piles are not required for the above residence.



NEW ZEALAND INSTITUTE OF
ARCHITECTS
INCORPORATED



Building Code Clause(s) B1 ONLY

90710

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance notes on the use of this form are printed on the reverse side*)

ISSUED BY: DEKE CONSULTING LTD.

(Design Firm)

TO: PATTERSON AND SAKAMOTO

(Owner/Developer)

TO BE SUPPLIED TO: SOUTH TARANAKI DISTRICT COUNCIL

(Building Consent Authority)

IN RESPECT OF: NEW RESIDENCE

(Description of Building Work)

AT: 475 MANAWAPOU RD. HAWERA, SOUTH TARANAKI

(Address)

LOT 1

DP 399802

SO

We have been engaged by the owner/developer referred to above to provide CIVIL DESIGN OF RIBRAFT SLAB

(Extent of Engagement)

services in respect of the requirements of

Clause(s) B1 ONLY

of the Building Code for

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

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

☒ Compliance Documents issued by Department of Building & Housing NZBC VM4

(verification method / acceptable solution)

or

☐ Alternative solution as per the attached schedule

The proposed building work covered by this producer statement is described on the drawings titled RIBRAFT SLAB TO

NEW RESIDENCE and numbered 90710

together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

(i) Site verification of the following design assumptions GOOD GROUND TO NZS3604 (BY OTHERS)

(ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code.

I, MALCOLM THOMSON

(Name of Design Professional)

am: ☒ CP Eng 144906

#

☐ Reg Arch

#

I am a Member of: ☒ IPENZ ☐ NZIA and hold the following qualifications: BE Civil

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

The Design Firm is a member of ACENZ ☐ YES ☒ NO

SIGNED BY MALCOLM THOMSON

ON BEHALF OF DEKE CONSULTING LTD

(Design Firm)

Date 13/7/09

(signature)

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

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

Design Certificate – Technical basis for structural design methodology contained in designIT for houses - New Zealand.

designIT for houses, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of structural laminated veneer lumber products manufactured by Carter Holt Harvey (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope and limitations of NZS 3604.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170:2002 and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/VM1, 6.1).

The methodology for designIT uses the most up to date information available from joint Australian/New Zealand standards to ensure designIT solutions correspond with performance levels of design solutions given in NZS 3604:1999

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code, provided the installation is in accordance with the installation requirements provided by designIT and/or in product literature and/or NZS 3604, as appropriate.

References:

NZS 3603:1993 Timber Structures Standard.

NZS 3604:1999 Timber Framed Buildings.

AS 1720.1 – 1997 Timber structures. Part 1: Design methods.

AS/NZS 1170:2002 Structural design actions, Parts 0, 1 and 2.

AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.

AS 1684.1 – 1999 Residential timber framed construction. Part 1: Design criteria.

14 April 2009

For further information or advice please contact:

Carter Holt Harvey Woodproducts New Zealand
173 Captain Springs Road, Onehunga, Auckland

Telephone 0800 808 131

Facsimile 0800 808 132

Email: designIT@chh.co.nz



Specifier details:

Specifier:	Warren Clarke	
Business name:	Signature Homes Ltd	
Address:		
Phone:	Mobile: 0212348825	Facsimile:

Project & Site details:

Project:	Paterson & Sakamoto	Ref. no.:
At (address):	Manawapou Rd, Hawea, Taranaki	
For (owner/s):		
Wind Zone:		
Snow loading	Snow region: N0, snow loading not applicable	

H1 2007 Compliance Report

Project Details

Designer: Signature Homes HB Ltd
Project Name: Patterson/Sakamoto
Client: Patterson/Sakamoto
Lot No: 1
Comment: New Residence



Project Id: 7331
Report Date: 05/07/2009

Compliance Result

This building complies with H1 via the following methods:

- the Calculation Method in NZS4218:2004 (Sept 2008 R-values)
 - the BPI Method
-

NZS4218:2004 Calculation Method Compliance

The use of the Calculation Method is permitted.

In order to comply the Actual Heat Loss must be the same or smaller than the Reference Heat Loss AND all component R-values must be the same or larger than 60% of the R-values in the '60% Rule' table below. This design complies with the NZS4218:2004 Calculation Method.

<i>Reference Building Heat Loss</i>		
	Area	R-value
Floor	137	1.3
Wall	126.3	1.9
Roof	166	2.9
Glazing (30% of Total Wall)	54.1	0.28
Glazing (surplus of 30%)	0	0.31
Skylight	0	0.31



Heat Loss:

Reference	Actual
437	251

Minimum R-values ("60% rule"):

	Permitted minimum	Actual minimum
Floor R-value	0.8	1.16
Wall R-value	1.1	2.46
Roof R-value	1.7	2.84
Glazing R-value	0.15	1.94
Skylight R-value	0.15	0

Building Performance Index Compliance

The use of the Building Performance Index (BPI) method is permitted.

This design complies with the BPI.

In order to comply the design must have a BPI smaller or equal to 1.55 kWh/DegMonth.m². Your building has a BPI of 1.15 kWh/DegMonth.m².

Please refer to www.design-navigator.co.nz/BPICorrelation.pdf regarding the recognition of the BPI for NZBC compliance verification. An alternative BPI calculation tool is the **BRANZ** ALF software in conjunction with the guidelines provided in the **ALF Guide**.

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Design DetailsBuilding Dimensions

Floor Area	137
Gross Wall Area	180.5
Net Wall Area	139.6
Wall (North) Area	46.5
Wall (East, South and West) Area	93
Gross Roof Area	166
Net Roof Area	166
Glazing Area	40.9
Window (North) Area	17.3
Window (East, South and West) Area	23.6
Skylight Area	0

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Glazing Area Percentages

Total Glazing Percentage	22.7%
East, South and West Window Percentage	20.2%
Total over 30%	no
East, South and West over 30%	no
Total over 50%	no

Information required for BPI calculation

Living Floor Area	165.1	Note: This includes also internal floors.
Average Room Height	2.4	
Thermal Mass Level	Medium weight	Slab floor with some carpeting or direct glued timber, timber framed walls.

Wall Construction Type

Solid Construction	non-solid
--------------------	-----------

Climate

Location	New Plymouth
Climate Zone	2

Heat Loss Details

	ID	Orientation	Width	Height	Net Area	R-value	Heat Loss	Shading Coeff.
<u>Floors</u>								
Floor 1					137	1.16	118.1	
<u>Walls</u>								
Wall 1		North	26.6	2.4	46.5	2.46	18.9	
Window 1-1	7		1.8	2	3.6	1.94	1.9	.26
Window 1-2	9		1.8	1.2	2.2	2.46	0.9	.26
Window 1-3	10		.6	.8	0.5	2.46	0.2	.26
Window 1-4	11		1.8	1.2	2.2	2.46	0.9	.26
Window 1-5	12		.6	2.18	1.3	2.46	0.5	.26
Window 1-6	13		2.	2.	4	2.46	1.6	.26
Window 1-7	15		1.8	2	3.6	1.94	1.9	.26

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Wall 2		West	11	2.4	17.6	2.46	7.1	
Window 2-1	24		2.4	.9	2.2	2.46	0.9	.26
Window 2-2	14		1.4	.4	0.6	2.46	0.2	.26
Window 2-3	16		2.4	1.2	2.9	1.94	1.5	.26
Window 2-4	17		.81	2	1.6	1.94	0.8	.26
Window 2-5	23		1.2	.6	0.7	1.94	0.4	.26
Window 2-6	2		2.2	.4	0.9	1.94	0.5	.26
Wall 3		South	26.6	2.4	55.7	2.46	22.7	
Window 3-1	19		1.7	.6	1	2.46	0.4	.26
Window 3-2	20		1.7	.6	1	2.46	0.4	.26
Window 3-3	21		1.7	.5	0.9	2.46	0.3	.26
Window 3-4	22		1.7	.5	0.9	2.46	0.3	.26
Window 3-5	1		.3	2	0.6	1.94	0.3	.26
Window 3-6	27		2.1	.9	1.9	2.46	0.8	.26
Window 3-7	28		2.1	.9	1.9	2.46	0.8	.26
Wall 4			11	2.4	19.7	2.46	8	
Window 4-1	18		1.2	.6	0.7	1.94	0.4	.26
Window 4-2	4		1.8	1.2	2.2	1.94	1.1	.26
Window 4-3	5		.81	2	1.6	1.94	0.8	.26
Window 4-4	6		.4	1.2	0.5	1.94	0.2	.26
Window 4-5	8		1.2	1.4	1.7	2.46	0.7	.26
Roofs								
Roof 1			3.9	8	31.2	2.84	11	
Roof 2			9	6	54	3.08	17.5	
Roof 3			8.5	9.5	80.8	2.84	28.4	
Total Heat Loss							250.4	

Note that the Shading Coefficient is only required for BPI calculations.

Compliance with Clause E3

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

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

This report was created with the Design-Navigator (www.design-navigator.co.nz).

Print Report

**Construction R-value Calculator**

H1 compliance calculator,
now with BPI calculation.

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2002.

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

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

Choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Wall, roof and suspended floor construction:

Roof: Timber framed skillion roof

external surface R-value: 0.03	
Roofing Corrugate iron with building paper R-value: 0.01	
Timber Frame & Cavity 94mm rafters or joists @ 600mm, battens (covered with insulation)	
Frame Area: 7.5%	Cavity Area: 92.5%
Rafters R-value: 0.78	Air gap (min 25mm) R-value: 0.08
	Insulation R-value: 3.2
Lining Gypsum plasterboard 15mm R-value: 0.07	
internal surface R-value: 0.09	

Resulting R-value:

2.84

m²K/W.

[Print Page](#)

Current NZS4281 Schedule minimum R-value Targets (non-solid construction):

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

**Construction R-value Calculator**

H1 compliance calculator,
now with BPI calculation.

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

Choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Wall, roof and suspended floor construction:

Roof: Timber framed roof, flat ceiling

external surface R-value: 0.03	
Roofing Corrugate iron with building paper R-value: 0.01	
Roof space (still air) R-value: 0.11	
Optional additional insulation layer covering all framing and any insulation between the framing R-value: 0	
Timber Frame & Cavity 94mm rafters or joists @ 900mm, battens (covered with insulation)	
Frame Area: 5%	Cavity Area: 95%
Trusses and dwangs R-value: 0.78	Insulation R-value: 3.2
Lining Gypsum plasterboard 15mm R-value: 0.07	
internal surface R-value: 0.09	

Resulting R-value:

3.08

m²K/W.

Print Page

Current NZS4281 Schedule minimum R-value Targets (non-solid construction):

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

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**Construction R-value Calculator**H1 compliance calculator,
now with BPI calculation.

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2002.

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

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

Choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Wall, roof and suspended floor construction:

Wall: Timber frame with vented cavity

external surface R-value: 0.03	
Cladding 40mm EPS (R1.1) with plaster finish R-value: 1.1	
15-90mm vented cavity (all R-values on ext. side of cavity will be halved) R-value: 0.08	
Timber Frame & Cavity 90mm, studs @ 600mm, dwangs @ 800mm	
Frame Area: 16% Timber Frame R-value: 0.75	Cavity Area: 84% Insulation R-value: 2.2
Lining Gypsum plasterboard 10mm R-value: 0.04	
internal surface R-value: 0.09	

Resulting R-value:

2.46

m²K/W.

[Print Page](#)

Current NZS4281 Schedule minimum R-value Targets (non-solid construction):

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

APPROVED



Construction R-value Calculator

H1 compliance calculator,
now with BPI calculation.

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2002.

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

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

Choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

Wall, roof and suspended floor construction:

Wall: Timber frame (direct fixed cladding)

external surface R-value: 0.03	
Cladding Fibre cement planking with building paper R-value: 0.1	
Timber Frame & Cavity 90mm, studs @ 600mm, dwangs @ 800mm Frame Area: 16% Cavity Area: 84%	
Timber Frame R-value: 0.75	Insulation R-value: 2.2
Lining Gypsum plasterboard 10mm R-value: 0.04	
internal surface R-value: 0.09	

Resulting R-value:

1.94

m²K/W.

Print Page

Current NZS4281 Schedule minimum R-value Targets (non-solid construction):

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



ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part

2 Part Undertile Waterproofing Membrane
BRANZ Appraised

ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part 2 Part Undertile Waterproofing Membrane



BRANZ APPRAISED

BRANZ Appraisal Certificates No 472 (2005) and No 473 (2005) have been issued. Separate copies available on request.



PRODUCT DESCRIPTION

Ardex WPM 002 (Superflex 2 Part) is a tough, ready to use waterproofing membrane specifically designed for use under tiles. Ardex WPM 002 (Superflex 2 Part) is a fast drying two component waterproofing membrane specifically designed for use under tiles. The products have been uniquely formulated with synthetic microfibres to increase its strength and eliminate the need for a separate reinforcement mat. Ardex WPM 002 (Superflex 2 Part) are based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification. Ardex WPM 002 (Superflex 2 Part) is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives.

Ardex WPM 002 (Superflex 2 Part) is one of the fastest drying one part acrylic membranes on the market - normally ready to tile in 48 hours @ 23°C.

FEATURES/BENEFITS

Fast drying Ardex WPM 002 (Superflex 2 Part) can be tiled over in 48 hours. Ardex WPM 002 (Superflex 2 Part) can be tiled over in 4 hours @ 23°C, 50% RH in non critical areas*.

Features Benefits

- Liquid reinforced: Excellent strength, eliminates need for reinforcing mat.
- Flexible: Accommodates normal building movement.
- Advanced acrylic: Will not re-emulsify polymers.
- Designed for tiling - Fully compatible with ABA tile systems adhesives.
- Water based, safe to use, low odour & easy cleaning. BRANZ/CSIRO Appraisals Approved for undertile waterproofing in shower recesses by independent testing authority.

CSIRO Appraisal #208

*Critical areas include areas where the membrane is applied at greater than 0.5mm or over impermeable substances such as over bond breakers or incorporating other reinforcement. Longer drying times are necessary in these areas.

APPLICATION RANGE

Performance

Levels Commercial and residential.

Location

Internal wet areas, balconies, decks, and other areas

that will be tiled or otherwise protected from regular foot traffic.

Surfaces

Walls & floors.

Substrates

Concrete

Cured for min. 28 days or sealed when set with one coat. Ardex Ardex HydrEpoxy 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet concrete should be allowed to dry thoroughly or sealed with one coat of Ardex Ardex HydrEpoxy 300 as above.

Renders and Screeds

Cured for min. 7 days or sealed when set with one coat Ardex HydrEpoxy 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet render should be allowed to dry thoroughly or sealed with one coat of Ardex Ardex HydrEpoxy 300 as above.

Fibre cement

Suitable for wet area grade fibre cement.

Plasterboard

Wet area grade only.

Plywood

Structural plywood (PAA branded) or marine grade (Internal use only).

Particleboard

Wet area grade, internal use only (special preparation is required - contact Ardex).

Permanent immersion

Ardex WPM 002 (Superflex 2 Part) is suitable.

In conditions of permanent immersion when used as an undertile membrane.

Contact Ardex for use over existing membranes, covering materials, and any other substrates not listed.

SPECIFICATION CLAUSE

Ardex WPM 002 (Superflex 2 Part).

The waterproofing membrane shall be Ardex Superflex Two Part Bathroom & Balcony: a two component cementitious acrylic modified fibre reinforced membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Two component: 20kg liquid pail/2 x 10kg bags powder

SHELF LIFE

12 months when stored in the original unopened packaging, in a dry place at 23°C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining



contents from part used containers within 3 months.

COVERAGE

Two coats are recommended for an effective waterproof membrane.

Coverage will vary depending on the porosity of the surface.

One 40kg unit will cover approximately 18-20m² (based on two coats) depending on area requirements between wall and floor surfaces to be treated.

DRYING TIMES

Recoat time

1-2 hours (23°C, 50% RH) at between first and second coats. Alternatively, if a polyester mat is used between coats then the second coat can be applied whilst the first coat is still wet.

Dry through

The slowest drying areas are those where the membrane has been applied over a silicone bond breaker, eg. wall and floor junctions. The membrane cannot be tiled over until these critical areas are completely dry.

Ardex WPM 002 (Superflex 2 Part) membrane is totally dry in 24 hours at 23°C, 50% RH but can take up to 48 hours at 10°C / 50% RH in corners or for thick films..

In areas where bond breakers or additional reinforcement are not used the Ardex WPM 002 (Superflex 2 Part) can be tiled over after 4 hours at 23°C, 50% RH.

Fully cured

The shower should not be used until the membrane has reached its full strength. The Ardex WPM 002 (Superflex 2 Part) membranes are fully cured after 3 days at 23°C, or after 5 days at 10°C.

Drying times will vary depending on humidity, surface temperature and surface porosity.

Do not apply on substrates where the surface temperature is below 10°C or above 35°C.

CLEANING

Wash hands, brushes, rollers, etc, with water while the membrane is still fresh. Remove cured material with mineral turpentine.

PRECAUTIONS

Do not use the product in the following situations:

- Areas subject to negative hydrostatic pressure or rising damp
- Where the substrate is wet - wet surfaces can be sealed with one coat Abaseal at a coverage rate

of 3.0 square metres per litre and allowed to cure overnight.

- Where rain is imminent
- Where the membrane will be left exposed and subjected to regular foot traffic
- On glazed, glass or other totally impervious surfaces (eg. areas pre-treated with water repellants)
- Where the surface temperature is below 10°C or greater than 35°C
- All floor areas must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to application of the Ardex WPM 002 (Superflex 2 Part).

For substrates or situations other than those listed contact Ardex.

SAFETY DATA

Ardex WPM 002 (Superflex 2 Part) is non-toxic. However, the contents should not be swallowed or inhaled. In case of eye contamination, rinse thoroughly with clean water. If irritation continues seek medical advice.

Material Safety Data sheets are available from Ardex upon request.

QUALITY PRODUCT

Ardex WPM 002 (Superflex 2 Part) is manufactured and tested to Ardex procedures which are maintained in accordance with Quality System Standard ISO 9001.

USER NOTES

The technical details and recommendations contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is the responsibility of the user to ensure that the product is used in accordance with Ardex instructions and in applications for which they are intended.

APPLICATION

Apply Ardex WPM 002 (Superflex 2 Part) by brush or roller. A medium nap (8-12mm pile) paint roller is recommended. New rollers should be dampened with water before being used for the first time.

For best results with a paint brush use a good quality, 50mm long bristle variety.

To achieve the required dry film thickness per coat application must consist of laying the product onto the surface and light finish the surface. Do not try to apply in the same manner as a building paint. A conventional building paint is normally applied at 25-40 microns for wet film thickness while Ardex WPM 002 (Superflex 2 Part) needs to be applied at between 0.8 and 1.2mm per coat depending on product and application.

ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part 2 Part Undertile Waterproofing Membrane



CRITICAL AREAS

Internal wet areas (Refer Fig.1)

1. Construction should be in accordance with Australian/New Zealand Standard 3740-2004.
2. All render and tile bed requirements should be completed before application of the membrane and tiles or other floor coverings should be direct bonded to the membrane.
3. Ensure wall & floor sheets are installed as per sheet manufacturer's recommendations.
4. Ensure suitable brick/concrete hobs are used (do not use timber), and that the top of the hob does not slope outwards.
5. Ensure that falls to the waste are min 1:60 (ie. approx. 30mm in 2m) before waterproofing. Ensure outlet pipes are fixed securely and that the waste or drainage flanges are recessed into the floor.
6. Avoid sheet joints in shower recess floor. Ensure that sheets are securely fixed to the wall at the bottom edge, and sheet joints are sealed with a neutral cured silicone sealant spread approximately 5mm on either side of the joint.
7. Treat nail and screw holes with neutral cure silicone sealant.
8. Seal the perimeters of taps, shower outlets and waste outlets with neutral cure silicone sealant.
9. Apply a bead of neutral cure silicone sealant to all horizontal and vertical corners.
10. Apply a bead of neutral cure silicone sealant to the junction of the hob or angle and walls.
11. Apply the membrane to the entire shower recess floor and down into waste or drainage flange. Apply the membrane over the hob and at least 100mm beyond the outside edge of the hob (ideally to entire wet area floor).
12. Apply the membrane 1800mm up the walls or to

the height of the shower rose within the shower recess.

13. Install the shower screen to inside edge of the hob.

Balconies and decks (Refer Fig.2)

1. Ensure that the deck is constructed with falls to edge/drains of min 1:100 (ie. 20mm in 2m) or else achieve the fall with a sand/cement screed.
2. Ensure a min set down (step down) of 150mm to the finished floor level (ie. top of tiles).
3. Ensure suitable flashing is installed, ideally prior to the installation of the balcony screen/sliding door.
4. Treat any sheet joints with a neutral cure silicone prior to waterproofing.
5. Prepare and seal all wall/floor junctions with a bead of neutral cure silicone.
6. Apply the membrane up the step down and as far up underneath the screen door flashing as possible (ideally waterproof prior to installing door).
7. Where possible, apply the membrane prior to building divisional walls.
8. Apply the membrane to the entire balcony floor and at least 50mm up the wall above the top surface of the finished tiles and finished below the wall drainage vents.
9. Apply the membrane to the top of the parapets and divisional walls and install suitable metal capping.
10. Apply the membrane down over the front edge of the balcony onto the drip rail.
11. Carefully seal any gaps around balcony penetrations prior to applying the membrane.
12. Apply the membrane down into outlets and drains, ensuring excess material is removed.
13. Ensure all weep holes are above the membrane application area.

Fig.1 - Shower Recess - Critical Areas

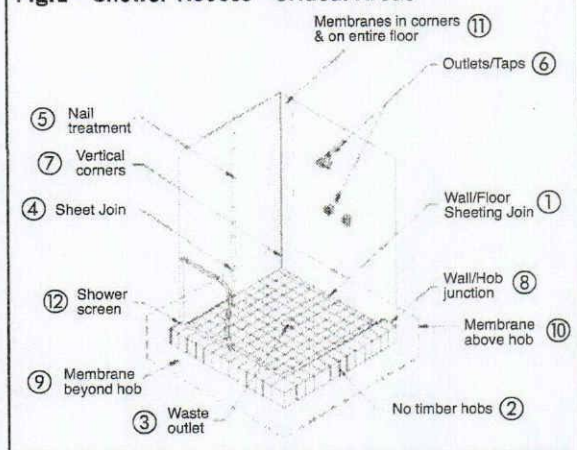
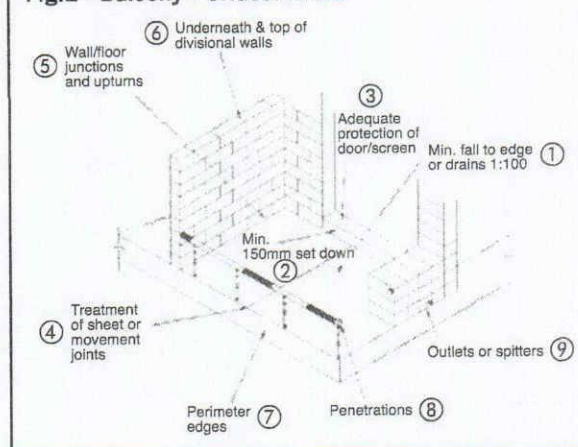


Fig.2 - Balcony - Critical Areas



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APPLICATION NOTES

Surface preparation

- Ensure all surfaces are structurally sound and totally dry. The pores of concrete surfaces should be open (absorbent surface). All sheet substrates must be securely fixed in accordance with the manufacturers instructions.
- Falls to outlets of at least 1:60 or approx. 30mm in 2m (wet areas) or 1:100 externally, must be achieved prior to tiling.
- The surface to be coated should be free from dust, oil, paint, curing compounds and any other contaminating materials.
- Damaged concrete should be repaired (leveled) and surface defects including all cracks and sharp protrusions should be treated prior to the application of the membrane.
- Remove laitance on concrete or screeds by mechanical means.
- Highly dense (>40MPa) or steel trowelled concrete should be roughened by suitable mechanical means (shot blasting, grinding, etc).

Priming

The primer is a critical part of the waterproofing system. Apply one coat of Ardex Superflex Primer by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to be completely dry prior to the application of the Ardex WPM 002 (Superflex 2 Part) membrane. This will take around 20-30 minutes depending upon weather conditions and porosity of the substrate. Coverage is approximately 6m² per litre. Plastic (eg. PVC) pipes should be primed with a solvent based plumbers pink primer. Prime metal surfaces with a suitable metal primer such as epoxy polyamide primer.

GENERAL APPLICATION

Crack preparation

Cracks <2mm:

Clean and remove any loose particles in the crack. Prime the crack and adjacent area carefully with Ardex Superflex Primer and allow to dry before applying two coats of Ardex WPM 002 (Superflex 2 Part) membrane, in a band at least 200mm wide equidistantly across the crack, along the length of the crack.

Cracks 2-6mm: (Refer Fig.3)

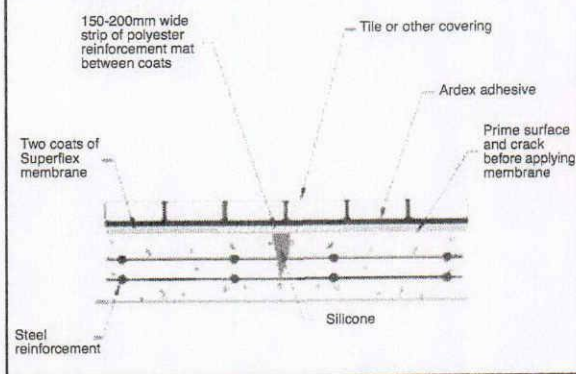
Prepare and prime the crack as opposite. Apply a bead of neutral cure silicone into the crack and extend it 5mm either side. Apply a 300mm wide band of Ardex WPM 002 (Superflex 2 Part) equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of Ardex "Deckweb" polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases

in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Cracks>6mm:

Contact your local Ardex representative.

Fig.3 Crack Treatment



Movement/construction joints (Refer Fig.4)

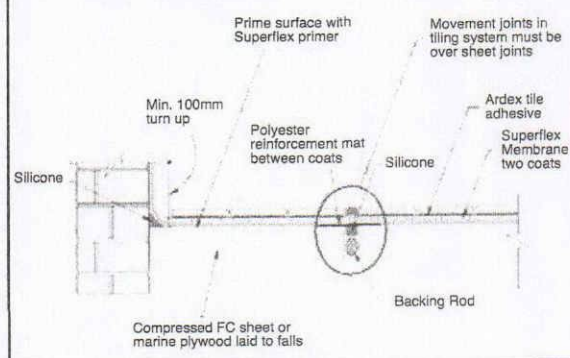
Movement joints (<6mm)

Clean and prime the joint before filling it with a bead of neutral cure silicone and extending it 5mm each side of joint. Apply a 300mm wide band of Ardex WPM 002 (Superflex 2 Part) equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of Ardex "Deckweb" polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Construction joints (>6mm)

Use the same procedure as above, but replace the reinforcing mat with the Ardex Joint Bridging Band. Note: if tiling, movement joints should be taken to the surface of the tiles. Fill the joints between the tiles immediately above the movement joints with an appropriate joint sealant.

Fig.4 Movement Joints



ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part 2 Part Undertile Waterproofing Membrane



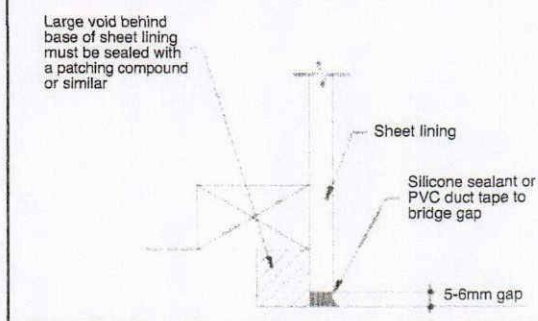
Corners & covering areas (Refer Fig.5)

After priming with Ardex Superflex Primer and allowing to dry, apply a generous bead (10mm) of neutral cured silicone sealant in coving areas and corners. Smooth over the silicone so that it extends 5mm up the wall and 5mm over the floor and allow to touch dry.

Apply a first coat of Ardex WPM 002 (Superflex 2 Part) to the area and allow the membrane to dry.

Apply a second coat ensuring that excess product is removed from the junction (the final dry film thickness should be around 1.2mm) Alternatively, if a polyester reinforcement mat is used between coats then the second coat can be applied as soon as the mat is fully bedded into the first coat.

Fig.5 Wall/Floor Junction



WALL/FLOOR JUNCTION

After priming with Ardex Superflex Primer and allowing to dry, apply a 300mm wide band of Ardex WPM 002 (Superflex 2 Part) equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of Ardex "Deckweb" polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. The Ardex WPM 002 (Superflex 2 Part) should be applied to at least 100mm up the wall surfaces as per the recommendations for the application of Ardex WPM 002 (Superflex 2 Part) to floors.

Walls

Two coats of Ardex WPM 002 (Superflex 2 Part) are required to achieve a minimum total dry film thickness of 0.5mm.

After priming with Ardex Superflex Primer and allowing to dry, apply two coats of Ardex Superflex 2 Part Bathroom & Balcony (to achieve a minimum dry film thickness of 0.5mm) in two opposite directions. Wall sheets joints should be treated with a neutral cure silicone, PVC duct tape or base jointing compound. In balcony situations take the membrane up underneath any existing cover flashing or install appropriate

flashing. Allow the first coat to dry before applying the second coat.

Floors

Two coats of Ardex WPM 002 (Superflex 2 Part) are required to achieve a minimum total dry film thickness of 1.2mm. The flooring recommendations should be extended at least 100mm up all perimeter walls.

Prime the surface with Ardex Superflex Primer and allow to dry.

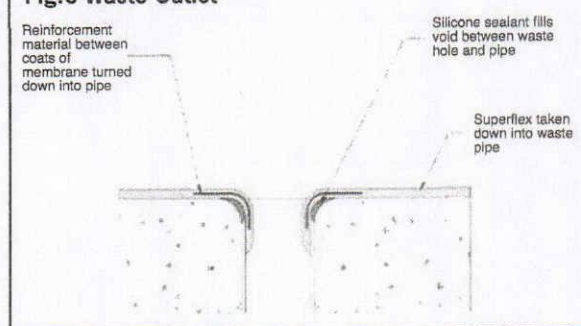
Apply the first coat over the primed surface and allow it to dry (1-2 hours at 23°C, 50% RH) before applying a second coat in an opposite direction. In shower recesses a drainage flange must be installed on all timber/sheeted floors, and are strongly recommended on all other substrates. Where possible rebate the flange into the floor. Seal the perimeter of the flange with neutral cure silicone treatment. If a flange is not installed the membrane must be applied down into the pipe. (Refer Fig.6) Allow the membrane to dry completely before tiling. Refer drying times above.

Waste outlet (Refer Fig.6)

Prime the surface with Ardex Superflex Primer and allow to dry.

Apply Ardex WPM 002 (Superflex 2 Part) over the adjacent floor surface extending down into the waste outlet pipe overlapping the pipe surfaces by at least 30mm. Place Ardex "Deckweb" polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Fig.6 Waste Outlet



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Balcony penetrations (Refer Fig.7)

Place a suitable flanged metal upstand around the penetration.

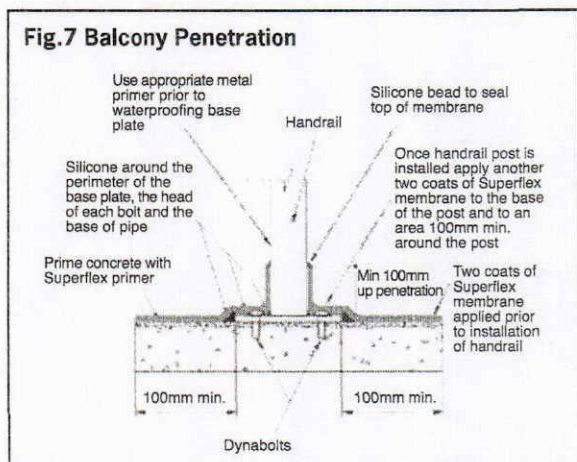
Prime the metal with an appropriate metal primer such as an epoxy polyamide primer and allow to dry. Apply a 10mm bead of neutral cure silicone around the perimeter of the penetration. Apply the first coat of Ardex WPM 002 (Superflex 2 Part) on the substrate and the flanged metal.

Allow first coat to dry before applying a second coat ensuring a finished dry film thickness of no less than 1.0mm is achieved. Place a suitable flashing collar around the penetration sealing it with a suitable sealant.

Tiling systems

It is advisable to conduct a flood test of the shower once the membrane has cured (normally after 48 hours), and before the tiling commences. A broad range of Ardex tile adhesives can be used over Ardex Superflex membranes. Contact Ardex or your nearest ABA merchant for advice on the most suitable system.

Fig.7 Balcony Penetration



TECHNICAL DATA

Ardex Superflex 2 Part

Characteristics of components

Form & Colour	Liquid: white, medium viscosity Powder: off white
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Characteristics of mixed product

Mixing Ratio	1:1 by weight
SG of mixed product	1.44kg/litre
Non Volatile Matter	77±1%
Colour	light grey/green

Characteristics of cured membrane

Shore A hardness ASTM D2240	
- dry film	85 - 90
- wet film	75 - 80
Water Absorption	
AS A121 App K	4.3%
Tensile Strength	
28 days dry AS1145	1.8 MPa
Elongation at Break	
28 days dry AS1145	>200%

NOTE: Most of the tests have been carried out in the Ardex laboratory under standard conditions (23±2°C, 50±5% RH)

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GIB® EzyBrace™ FP for GIB® EzyBrace™ Systems, 2009



GIB® Wall Bracing Calculation Sheet B

Single or Upper Walls Along

V01/09

Along		Bracing Elements provided						Wind	Earthq.
Bracing Line								9W	10EQ
1	2	3	4	6	5	7	8		
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Available Wall Length L (m)	Angle to Bracing line (degrees)	Element Height H (m)	Bracing Type	Supplier	BUs Achieved	BUs Achieved
A	100	1	1		2.4	BL1(10)	GIB®	120	109
	OK	2	1		2.4	BL1(10)	GIB®	120	109
line totals		3							
W	240	4							
EQ	217	5							
B	100	1	1.5		2.4	GS1(10)	GIB®	104	83
	not enough	2	0.6						
line totals		3							
W	104	4							
EQ	83	5							
C	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
D	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
E	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
F	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
G	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
H	enter	1							
		2							
line totals		3							
W		4							
EQ		5							

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Wind	Earthq.
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Totals Achieved	Achieved/Demand	W	181%	EQ	207%	344	300	
Timber Floor, design limit of 120 BU/m						accepted	OK	OK
Totals Required (from Demand)							190	145

Wall Bracing Systems

For full construction details see technical literature

Single or Upper Walls Along

Supplier	System	Minimum Length (m)	BU's W/m	BU's EQ/m
	none		 BRANZ Appraised Appraisal No.294 (2009)	
GIB®	GS1(10)	0.4		
GIB®	GS2(10)	0.6		
GIB®	BL1(10)	0.4		
GIB®	BLP	0.4		
GIB®	BLG	0.6		
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			

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Timber Floor

Based on BRANZ research we recommend a limit of 120 BU/m for NZS3604 timber floors. If this limit is declined specific engineering must ensure that uplift forces generated by elements rated higher than 120 BU/m can be resisted by the floor framing.

In case the limit is accepted please ensure not to enter custom elements with ratings higher than 120 BU/m

accept limit of 120 BU/m for timber floors

Distribution (NZS3604:1999 minimum values)

Internal wall bracing lines	70	BU
External wall bracing lines	10 x L(m)	BU
Lines supporting diaphragms	100	BU

Recommended distribution check (75% x D/n)

No bracing line less than	71	BU
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APPROVED

GIB® EzyBrace™ FP for GIB® EzyBrace™ Systems, 2009



GIB® Wall Bracing Calculation Sheet B

Single or Upper Walls Across

V01/09

Across		Bracing Elements provided						Wind	Earthq.
1	2	3	4	6	5	7	8	9W	10EQ
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Available Wall Length L (m)	Angle to Bracing line (degrees)	Element Height H (m)	Bracing Type	Supplier	BUs Achieved	BUs Achieved
M	100	1	0.6		2.4	BL1(10)	GIB®	72	68
	OK	2	2		2.4	GS2(10)	GIB®	180	160
line totals		3							
W	252	4							
EQ	228	5							
N	100	1	3.8		2.4	GS1(10)	GIB®	262	209
	OK	2							
line totals		3							
W	262	4							
EQ	209	5							
O	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
P	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
Q	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
R	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
S	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
T	enter	1							
		2							
line totals		3							
W		4							
EQ		5							

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Wind Earthq.

Totals Achieved	Achieved/Demand	W	157%	EQ	302%	544	437
Timber Floor, design limit of 120 BU/m						OK	OK
Totals Required (from Demand)						327	145

27-11-09

APPROVED


334

Wall Bracing Systems

For full construction details see technical literature

APPROVED

Single or Upper Walls Across

Supplier	System	Minimum Length (m)	BU's W/m	BU's EQ/m
	none		 BRANZ Appraised Appraisal No.294 (2009)	
GIB®	GS1(10)	0.4		
GIB®	GS2(10)	0.6		
GIB®	BL1(10)	0.4		
GIB®	BLP	0.4		
GIB®	BLG	0.6		
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			

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Timber Floor

Based on BRANZ research we recommend a limit of 120 BU/m for NZS3604 timber floors. If this limit is declined specific engineering must ensure that uplift forces generated by elements rated higher than 120 BU/m can be resisted by the floor framing.

In case the limit is accepted please ensure not to enter custom elements with ratings higher than 120 BU/m

accept limit of 120 BU/m for timber floors



Distribution (NZS3604:1999 minimum values)

Internal wall bracing lines	70	BU
External wall bracing lines	10 x L(m)	BU
Lines supporting diaphragms	100	BU

Recommended distribution check (75% x D/n)

No bracing line less than	123	BU
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GIB® EzyBrace™ FP for GIB® EzyBrace™ Systems, 2009



GIB® Wall Bracing Calculation Sheet B Lower Walls Across V01/09

Across		Bracing Elements provided						Wind	Earthq.
1	2	3	4	6	5	7	8	9W	10EQ
Bracing Line	Minimum	Bracing	Available	Angle to	Element	Bracing Type	Supplier	BU's	BU's
Line Label	BU's Req/Ach	Element No.	Wall Length L (m)	Bracing line (degrees)	Height H (m)			Achieved	Achieved
M	100	1	1		2.4	BL1(10)	GIB®	130	109
	OK	2	0.8		2.4	BL1(10)	GIB®	102	89
line totals		3							
W	232	4							
EQ	197	5							
N	100	1	0.6		2.4	BL1(10)	GIB®	75	68
	OK	2	1.5		2.4	GS1(10)	GIB®	104	83
line totals		3							
W	179	4							
EQ	150	5							
O	70	1	2.6		2.4	GS1(10)	GIB®	179	143
	OK	2							
line totals		3							
W	179	4							
EQ	143	5							
P	100	1	2		2.4	GS1(10)	GIB®	138	110
	OK	2	0.7		2.4	BL1(10)	GIB®	89	78
line totals		3							
W	227	4							
EQ	188	5							
Q	100	1	2.2		2.4	GS1(10)	GIB®	152	121
	OK	2	1.2		2.4	BL1(10)	GIB®	159	128
line totals		3	1.2		2.4	BL1(10)	GIB®	159	128
W	469	4							
EQ	376	5							
R	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
S	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
T	enter	1							
		2							
line totals		3							
W		4							
EQ		5							

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Wind Earthq.

Totals Achieved Achieved/Demand W EQ 117% 1285 1055

Concrete Slab

not enough OK


Totals Required (from Demand)

1641 902

Wall Bracing Systems

For full construction details see technical literature

Lower Walls Across

Supplier	System	Minimum Length (m)	BU's W/m	BU's EQ/m
	none			
GIB®	GS1(10)	0.4	 BRANZ Appraised Appraisal No.294 (2009)	
GIB®	GS2(10)	0.6		
GIB®	BL1(10)	0.4		
GIB®	BLP	0.4		
GIB®	BLG	0.6		
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			

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Concrete Slab



A limit of 150 BU/m applies to solid concrete slabs

Ensure not to enter custom elements with ratings higher than 150 BU/m

Distribution (NZS3604:1999 minimum values)

Internal wall bracing lines	70	BU
External wall bracing lines	10 x L(m)	BU
Lines supporting diaphragms	100	BU

Recommended distribution check (75% x D/n)

No bracing line less than	246	BU
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GIB® EzyBrace™ FP for GIB® EzyBrace™ Systems, 2009



GIB® Wall Bracing Calculation Sheet B Lower Walls Along

V01/09

Along		Bracing Elements provided						Wind	Earthq.
1	2	3	4	6	5	7	8	9W	10EQ
Bracing Line	Minimum BUs Req/Ach	Bracing Element No.	Available Wall Length L (m)	Angle to Bracing line (degrees)	Element Height H (m)	Bracing Type	Supplier	BUs Achieved	BUs Achieved
Line Label									
A	118	1	0.9		2.4	BL1(10)	GIB®	116	99
	OK	2	0.9		2.4	BL1(10)	GIB®	116	99
line totals		3	0.9		2.4	BL1(10)	GIB®	116	99
W	348	4							
EQ	296	5							
B	70	1	0.7		2.4	BL1(10)	GIB®	89	78
	OK	2	0.7		2.4	BL1(10)	GIB®	89	78
line totals		3	0.7		2.4	BL1(10)	GIB®	89	78
W	266	4							
EQ	235	5							
C	100	1	0.7		2.4	BL1(10)	GIB®	89	78
	OK	2	3		2.4	GS1(10)	GIB®	207	165
line totals		3							
W	296	4							
EQ	243	5							
D	100	1	3.3		2.4	GS1(10)	GIB®	228	182
	OK	2							
line totals		3							
W	228	4							
EQ	182	5							
E	100	1	0.6		2.4	BL1(10)	GIB®	75	68
	OK	2	0.6		2.4	BL1(10)	GIB®	75	68
line totals		3							
W	150	4							
EQ	135	5							
F	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
G	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
H	enter	1							
		2							
line totals		3							
W		4							
EQ		5							

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Wind Earthq.

Totals Achieved	Achieved/Demand	W	143%	EQ	121%	1287	1091
-----------------	-----------------	---	------	----	------	------	------

Concrete Slab

OK OK

Totals Required (from Demand)


902 902

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Wall Bracing Systems

For full construction details see technical literature

Lower Walls Along

Supplier	System	Minimum Length (m)	BU's W/m	BU's EQ/m
	none		 BRANZ Appraised <small>Appraisal No.294 [2009]</small>	
GIB®	GS1(10)	0.4		
GIB®	GS2(10)	0.6		
GIB®	BL1(10)	0.4		
GIB®	BLP	0.4		
GIB®	BLG	0.6		
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			

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Concrete Slab

A limit of 150 BU/m applies to solid concrete slabs

Ensure not to enter custom elements with ratings higher than 150 BU/m

Distribution (NZS3604:1999 minimum values)

Internal wall bracing lines	70	BU
External wall bracing lines	10 x L(m)	BU
Lines supporting diaphragms	100	BU

Recommended distribution check (75% x D/n)

No bracing line less than	135	BU
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GIB® EzyBrace™ FP for GIB® EzyBrace™ Systems, 2009

GIB® Subfloor Bracing Calculation Sheet B					Subfloor Along		V01/09
Along							
Bracing Line	Bracing Elements provided				Wind	Earthq.	
1	2	3	4	5	6	8W	9EQ
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Number or Length L (m)	BUs Achieved	BUs Achieved
a	line totals	1					
W		2					
EQ		3					
b	line totals	1					
W		2					
EQ		3					
c	line totals	1					
W		2					
EQ		3					
d	line totals	1					
W		2					
EQ		3					
e	line totals	1					
W		2					
EQ		3					
f	line totals	1					
W		2					
EQ		3					
g	line totals	1					
W		2					
EQ		3					
h	line totals	1					
W		2					
EQ		3					
i	line totals	1					
W		2					
EQ		3					
j	line totals	1					
W		2					
EQ		3					
						Wind	Earthq.
Totals Achieved							
						not enough	not enough
Totals Required (from Sheet A)						slab	slab

Subfloor Bracing Systems*For details see NZS3604:1999**and appropriate manufacturer's literature*

Supplier	System	Min. No. or Length (m)	BU's W/m	BU's EQ/m
	none			
NZS3604	masonry 0.75	1.5	42	42
NZS3604	masonry 1.5	1.5	100	100
NZS3604	masonry 3.0	1.5	200	200
NZS3604	masonry 4.5	1.5	300	300
NZS3604	braced piles	1	160	120
NZS3604	cantilever pile	1	70	30
NZS3604	anchor pile	1	160	120
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			

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GIB® EzyBrace™ FP for GIB® EzyBrace™ Systems, 2009

GIB® Subfloor Bracing Calculation Sheet B					Subfloor Across		V01/09
Across							
Bracing Line		Bracing Elements provided				Wind	Earthq.
1	2	3	4	5	6	8W	9EQ
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Number or Length L (m)	BUs Achieved	BUs Achieved
m	line totals	1					
W		2					
EQ		3					
n	line totals	1					
W		2					
EQ		3					
o	line totals	1					
W		2					
EQ		3					
p	line totals	1					
W		2					
EQ		3					
q	line totals	1					
W		2					
EQ		3					
r	line totals	1					
W		2					
EQ		3					
s	line totals	1					
W		2					
EQ		3					
t	line totals	1					
W		2					
EQ		3					
u	line totals	1					
W		2					
EQ		3					
v	line totals	1					
W		2					
EQ		3					
						Wind	Earthq.
Totals Achieved							
						not enough	not enough
Totals Required (from Sheet A)						slab	slab

Subfloor Bracing Systems

*For details see NZS3604:1999
and appropriate manufacturer's literature*

Supplier	System	Min. No. or Length (m)	BUs W/m	BUs EQ/m
	none			
NZS3604	masonry 0.75	1.5	42	42
NZS3604	masonry 1.5	1.5	100	100
NZS3604	masonry 3.0	1.5	200	200
NZS3604	masonry 4.5	1.5	300	300
NZS3604	braced piles	1	160	120
NZS3604	cantilever pile	1	70	30
NZS3604	anchor pile	1	160	120
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			

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SHEET NO 1/3

FILE NO 3973-035

CALCS BY
Paul StanleyJOB NAME Signature Homes,
Patterson & Sakamoto
Residence,
475 Manawapou Rd,
Hawera.

DATE July 09.

Tse

TSE TARANAKI & ASSOCIATES LIMITED

STRUCTURAL & CIVIL ENGINEERS
PROJECT MANAGERS

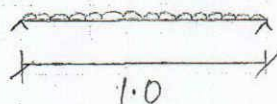
Graphix Explosion - 17322

① Description - 2 storey residential dwelling with lightweight roof and cladding.

Fifth concrete block feature walls to entry area.

② Beam supporting concrete block feature wall across hallway/corridor.

- max span 1.0 m.



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Loadings; Roof DL = 0.45 kPa (inc ceiling).

Roof LL = 0.25 kPa.

Wall DL = $(1.0 \times 0.090) 22 = 2.0 \text{ kN/m}$

Beam DL = 0.2 kN/m

Load on beam; $W_G = \left(0.45 \times \frac{3}{2}\right) + 2.0 + 0.2$
= 3 kN/m. $W_Q = \left(0.25 \times \frac{3}{2}\right) = 0.4 \text{ kN/m}$ $W(1.2G + 1.5Q) = 4.2 \text{ kN/m}$ $W(1.35G) = 4.1 \text{ kN/m}$ $W(G + 0.7Q) = 3.3 \text{ kN/m}$

$$M^* = \frac{4.2 \times 10^2}{8} = 0.53 \text{ kN/m}$$

$$I > \frac{5 \times 3.3 \times 1^3 \times 500}{384 \times 200} = 0.11 \times 10^6 \text{ mm}^4$$

SHEET NO

2/3

FILE NO

3973-035

CALCS BY

Paul Stanley

JOB NAME

Signature homes,
Patterson & Salcamoto
residence,
475 Manawapou Rd,
Hawera.

DATE

July 09

Tse

TSE TARANAKI & ASSOCIATES LIMITED

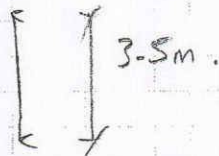
STRUCTURAL & CIVIL ENGINEERS

PROJECT MANAGERS

Graphix Explosion - 17322

Try $90 \times 90 \times 6$ EA ; $I = 0.55 > 0.11$ ok ✓ $\phi M_{sx} > 0.53$ ok ✓ \Rightarrow Use $90 \times 90 \times 6$ EA for beam over hallway

Wall Framing - Max height 3.5m.



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Using seismic coefficient of 0.3;

Lateral load on framing = $(0.090 \times 22) \times 0.3 \times 0.4 = 0.23 \text{ kN/m}$
(stone size 0.08545)

$$M^* = \frac{0.23 \times 3.5^2}{8} = 0.4 \text{ kNm}$$

Try 90×45 @ 400 cns; $\phi M_N = 0.8 \times 1.0 \times 1.0 \times 14 \times 45 \times 90^2 / 6$
 $= 0.7 > 0.4$ ok ✓

$$I > \frac{5 \times 0.08 \times 3.5^3 \times 300}{384 \times 6.7} = 2 \times 10^6 \text{ mm}^4$$

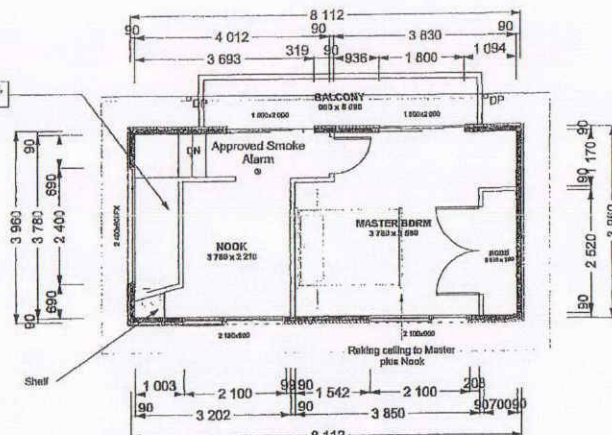
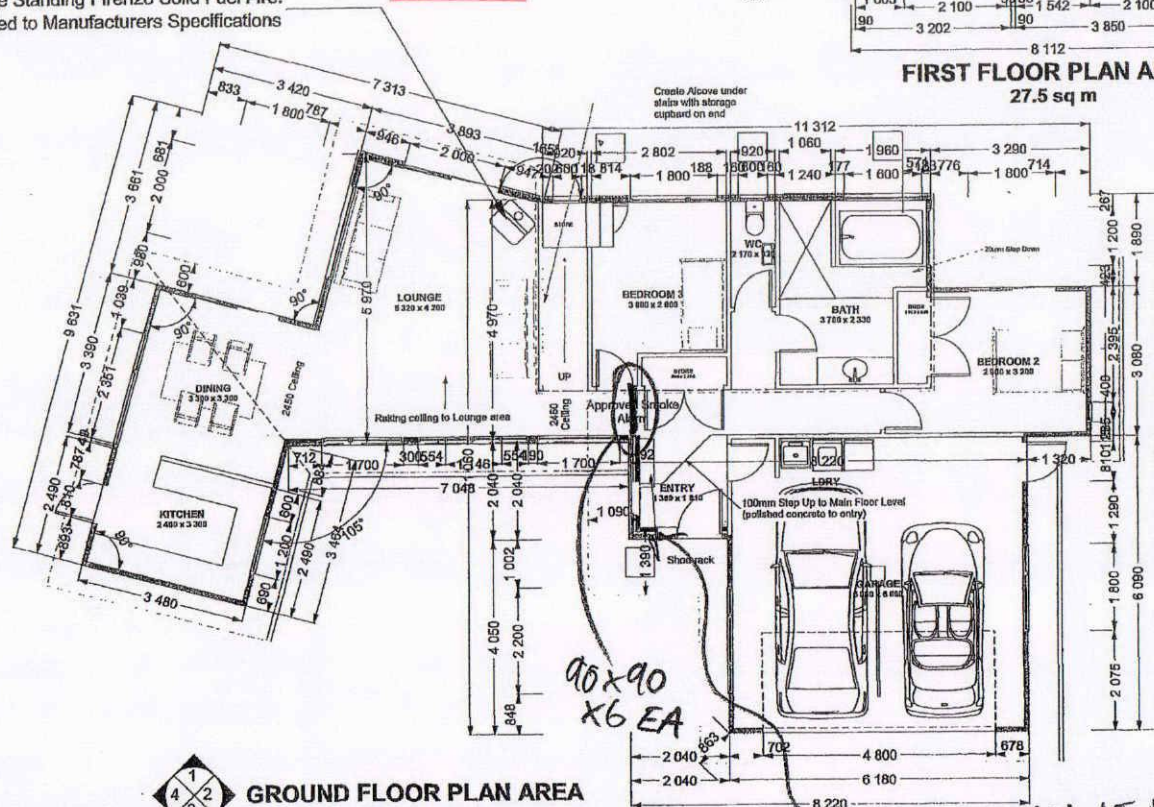
$$I = 45 \times 90^3 / 12 = 2.7 > 2 \therefore \text{ok} \checkmark$$

 \Rightarrow Provide 90×45 framing @ 400 max cns where block wall is located

Stone work to be tied to framing with Lumberlock 90 Series brick ties at 400 c/c both ways
 \Rightarrow Use 35mm x 12g Type 17 hex head screws - hot dip galv

Stairs shall conform to NZBC D1, Treads 280mm (min), Risers 100mm (max), Stringer Angle 37deg (max)

Free Standing Firenz Solid Fuel Fire.
Installed to Manufacturers Specifications



Job Title:
Patterson & Sakamoto

Drawing Title:
Floor Plan

Site Address:
475 Manawapou Road
Hawke

Job	
Drawn	Warren Clarke
Checked	
Scale	1:100
Date	21 June 2009
Page	A2
Sheet Rev No.	

These drawings have been prepared on the understanding that the Building Contractor has a sound knowledge of the NZ Building Code and NZS 3604:1999. The main Contractor, Sub Contractor or Authorised Agent of the owner or Builder shall ensure that all works comply with these Codes in addition to any requirements of the Territorial Authority. Any work undertaken outside these requirements without the prior written approval of the Designer, Engineer and/or the Territorial Authority hereby indemnifies the Designer or his Agent against any claim, or claims, in respect of the said work.

- Notes:
- All Works to Comply with NZS3604:1999 and the NZ Building Code and Best Trade Practices.
 - All Drawings to be Read Inconjunction with Engineers Drawings/Reports
 - The Contractor shall Supply and Fix all Necessary Flashing and Sealants to Provide a Completely Weather Tight Building.
 - Refer to All Written Notifications - Do Not Scale off Drawings
 - Check All Diam. and Verify All Levels on Site Prior Proceeding with Works or Ordering of Materials and Commencing Construction.
 - IF IN DOUBT - ASK
- Signature Homes New Plymouth Ltd
201 Daven St East
New Plymouth
Ph: 06 769 8026
Fax: 06 769 8025
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SHEET NO 3/3

FILE NO 3973-035

Tse**TSE TARANAKI & ASSOCIATES LIMITED**CALCS BY
Paul StanleyJOB NAME Signature Homes,
Patterson & Sakamoto
residence,
475 Manawapou Rd,
Hawera.

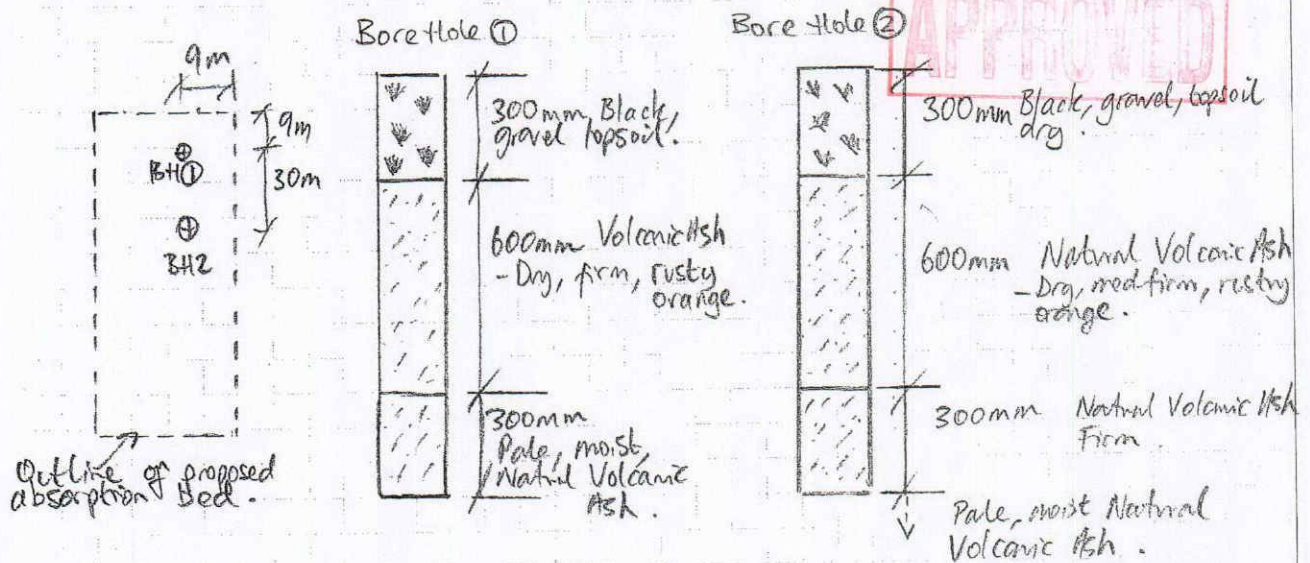
DATE July 09

STRUCTURAL & CIVIL ENGINEERS
PROJECT MANAGERS

Graphix Explosion - 17322

Description - On site waste management system for a new 3 bedroom dwelling to AS/NZS 1547.

The site consists of relatively flat agricultural land. During the site visit, two test pits were dug beneath the proposed absorption bed. There was no indication of high ground water levels during site visit.



In accordance with table 4.2A1, the volcanic ash would be classified as soil category 2, sandy loam.

In accordance with table 4.3A1, provide a septic tank capacity of 3000L with an approved filter at outlet end.

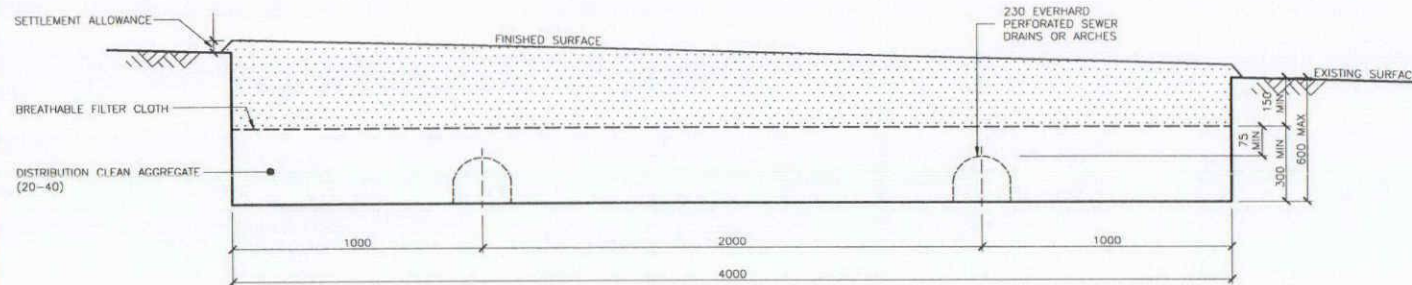
From Appendix 4.2D, wastewater flow allowance = 180 L/p/d.

Total Flow $Q = 180 \times 5 = 900$ L/day.

Assuming an absorption bed of 4m wide; $L = \frac{900}{(20 \times 4)} = 11.25$

⇒ Provide a 4m wide by 12m long effluent bed

⇒ Provide MIN CAPACITY 3000L Septic tank with approved filter @ outlet



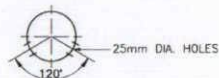
SECTION A-A
SCALE 1:20

TANK SIZES:

- CASE 1: BEDROOMS 1 - 3 (5 PERSONS)
SEPTIC TANK SIZE IS 3300L LITRES MINIMUM
UNLESS NOTED OTHERWISE
- CASE 2: BEDROOMS 4 - 5 (7 PERSONS)
SEPTIC TANK SIZE IS 4500 LITRES MINIMUM

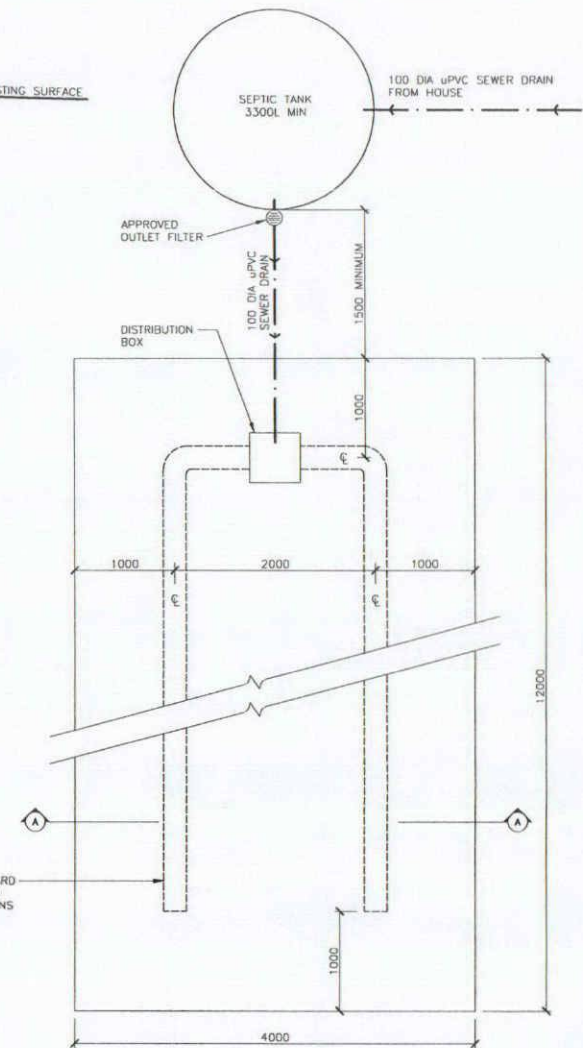
NOTE:

- CONSTRUCTION SHALL BE IN ACCORDANCE WITH "ON-SITE DOMESTIC WASTEWATER MANAGEMENT" CODE AS/NZS 1547:2000.
- SMEARED SOIL SURFACES SHALL BE RAKED TO REINSTATE NATURAL SOIL SURFACE.
- VEHICLE TRAFFIC MUST BE KEPT OFF BEDS AT ALL TIMES.
- MULTIPLE BEDS REQUIRE A MINIMUM 1.0m BETWEEN ADJACENT SIDEWALLS.
- BEDS SHALL NOT EXCEED 20m IN LENGTH.
- GARBAGE SINK GRINDERS ARE NOT RECOMMENDED AS THEY CAN CAUSE BLOCKAGE OF PIPED BEDS. AS A MINIMUM PRECAUTION, FOR GARBAGE SINK GRINDERS INCREASE THE SEPTIC TANK SIZE TO 4500 AND 6000 LITRES RESPECTIVELY FOR CASE 1 AND 2 ABOVE. PROVIDE BAFFLE TO SEPTIC TANK TO OBTAIN 2/3, 1/3 COMPARTMENT SIZE.
- THE BED SIZE MAY ONLY BE VARIED WITH PRIOR APPROVAL BY TSE TARANAKI & ASSOCIATES LTD.
- ALL BED OPTIONS SHALL FOLLOW ALONG THE GROUND CONTOURS AND SHALL BE LOCATED 3m AWAY FROM THE HOUSE, 10m AWAY FROM SOAKHOLES, AND 1.5m FROM ADJACENT PROPERTY BOUNDARIES.
- THE BEDS SHALL BE LAID OUT IN AN AREA SET ASIDE FOR LAWN OR PASTURE AND NOT GARDENS. PROVIDE A DISTRIBUTION BOX AT THE SEPTIC TANK OUTLET TO ALLOW ALTERNATE BEDS TO BE 'RESTED' WHERE APPLICABLE.
- ALL BEDS SHALL BE LOCATED AT LEAST 25m AWAY FROM ANY WATERCOURSE, WETLAND AREAS OR CLIFF TOP AND AT LEAST 50m FROM ANY WELL OR BORE.
- BEDS ARE TO BE LAID LEVEL.
- 100% RESERVE AREA MUST BE MAINTAINED ON THE SITE IN CASE THE BEDS FAIL.
- WATER TABLE SHALL BE A MINIMUM OF 600mm BELOW BOTTOM OF BEDS.
- AN ACCEPTABLE ALTERNATIVE IS CLAY FIELDTILE PIPES, OR PERFORATED PIPE TO BE uPVC SEWER DRAIN WITH 2/25mm DIAMETER HOLES AT 150mm CENTRES AT 120° APART.



15. NO AMMONIA BASED CLEANING PRODUCTS ARE TO BE DISCHARGED INTO SEPTIC TANK.

APPROVED



PLAN
SCALE 1:50

DO NOT SCALE

IF IN DOUBT ASK

CHECK ALL DIMENSIONS

ORIGINAL SIZE = A3

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Job: NP2164

Client: Mizak Homes Ltd
Phone:Site: Patterson & Sakamoto
475 Manawapou Road
HaweaDescription:
Building Consent No.:
MiTek 20/20 Engineering 4.5.147Phone:
Printed: 10:53:58 28 Jul 2009

MiTek New Zealand Ltd.

PRODUCER STATEMENT for MiTek 20/20™ TRUSS DESIGN

The MiTek 20/20™ truss design program has been developed by MiTek New Zealand Ltd for the design of GANG-NAIL® 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 Building Code.

This producer statement covers the MiTek 20/20™ truss design and the structural performance of the GANG-NAIL plate.

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

- All proprietary products meeting their performance specification requirements
- The provision of adequate roof bracing and overall building stability
- Correct selection and placement of fixings
- Correct input of Truss Design Data below
- The design being undertaken by suitably trained personnel
- The truss design being carried out in accordance with MiTek 20/20 User Terms and Conditions,

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 Building Code.

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

On behalf of MiTek New Zealand Ltd,

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

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 GANG-NAIL Fabricator shall ensure that these details are current and relevant to the project for the design of the trusses.

Job Details		Importance Level :	2	Design Working Life :	50 years
Roof Truss					
Timber Group:	MSG45H31	Pitch:	5.000 deg	Std Overhang:	600 mm
Roof		Ceiling		Wind	
Material:	Galv Iron .5mm	Material:	Standard	Area:	High (44.0 m/s)
Dead Load:	0.210 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	400 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 trusses shall be standard gauged and treated to the requirements of NZS 3602:2003. Unless otherwise noted, this design assumes that the steel fixings and timber connectors proposed are located in a "closed environment", as defined by NZS3604:1999 Section 4.

Truss List

Legend: * = detail only, ? = input only, Fxx = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing 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)
BEAM	1	1010	0.000	900	T04	1	1193	5.000	900	T11A	1	5018	5.000	900
EN01	1	3480	5.000	900	T05	1	775	5.000	900					
EN02	1	6180	5.000	900	T06	1	1707	5.000	900					
EN05	1	2130	5.000	900	T07	1	2580	5.000	900					
T01	3	3480	5.000	900	T08	4	6180	5.000	900					
T01A	1	3480	5.000	900	T09	3	8220	5.000	900					
T02	1	4352	-3.970	900	T10	2	3290	5.000	900					
T03	1	2366	5.000	900	T11	1	4477	5.000	900					

Total quantity : 25

APPROVED

The computer design input has been carried out by:

Name of Computer Operator: April Fletcher

Qualifications and Title: Truss Detailer

Signed:

CARTERS

A Division of Carter Holt Harvey

Dated: Tuesday, 28 July 2009

Att Graeme

+64 6 7591870 2009



LOGAIRE

specifications

Hestia

Rural / Clean Air

Floor Protector Construction (Hearth)

For minimum floor protector dimensions refer to following data. The floor protector must extend at least 300mm beyond the door opening of the heater and 200mm to each side of the door opening. Floor protector specs (AS/NZS 2918:2001) minimum ash hearth only eg. Ceramic tile glued to a heat sensitive floor. A provision has been made at the rear of the pedestal for seismic restraint by bolting through the two holes through the Floor Protector and floor.

Clearance Requirements

The Hestia Rural / Clean Air has been tested to the Australian/New Zealand Standard AS/NZS 2918:2001 and all installations must be in accordance with the minimum clearances to combustibles indicated in these instructions. The minimum clearances to combustibles may be reduced if the combustible walls are shielded with an approved non-combustible material. Details of suitable shielding materials and appropriate clearance reduction factors are present in Section 3 of AS/NZS 2918:2001.

Minimum clearances to combustibles in millimetres AS/NZS 2918:2001

	A	B	C	D	E	F	G	H	J	K	L	M	N
NEW ZEALAND													
Without flue shield	320	340	233	130	180	484	680	502	900	1076	1302	1086	592
* With Logaire Double flue shield	50	340	233	130	25	214	660	367	900	806	1111	951	592

* Note : Only a vented Logaire double flue shield has been approved for use with the Hestia.
All specifications are subject to change or variation without notification.

