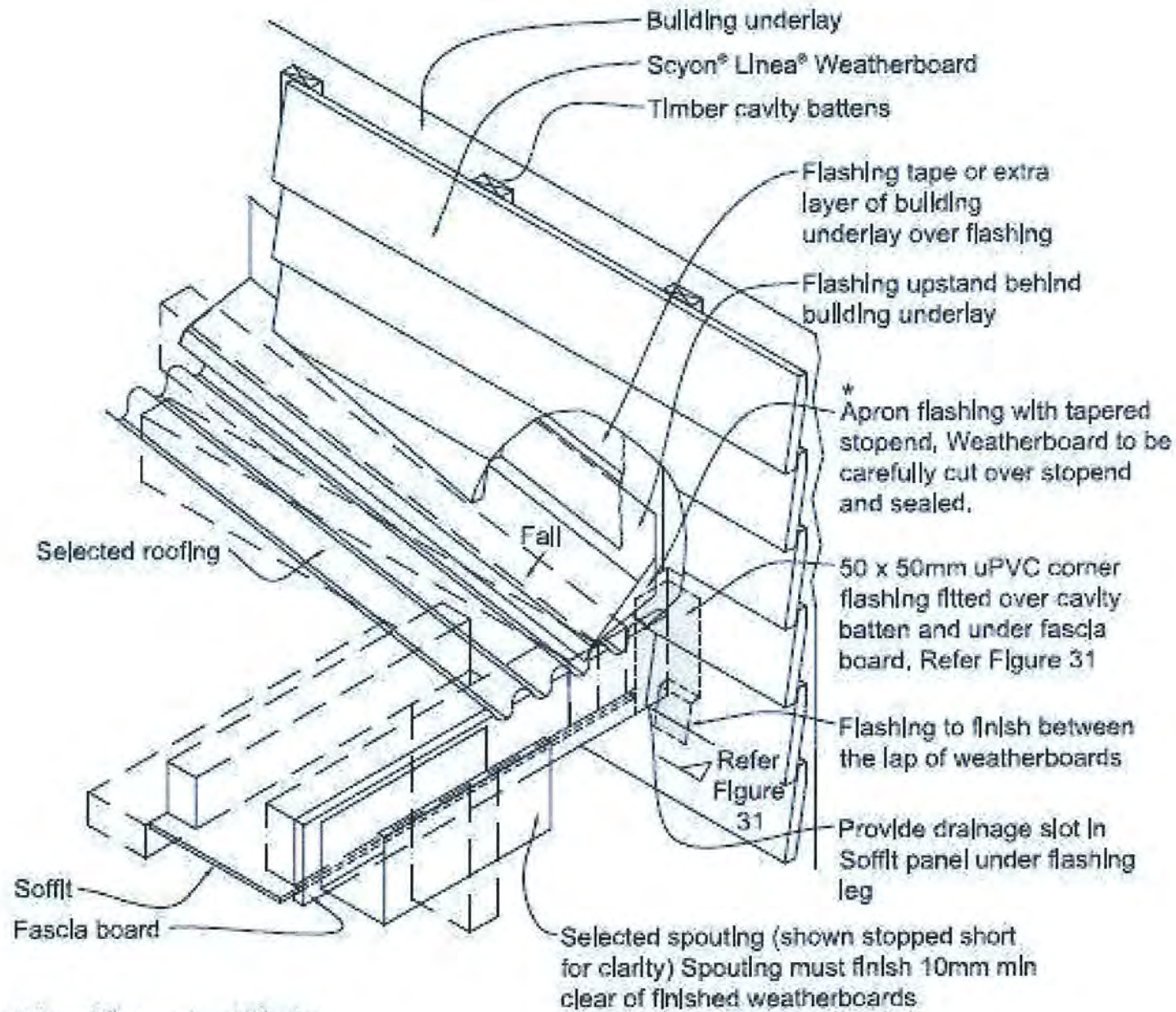
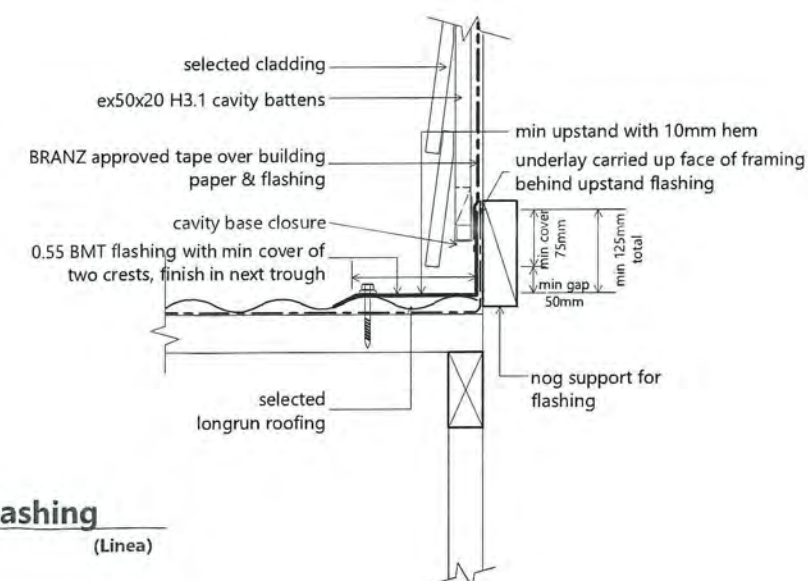
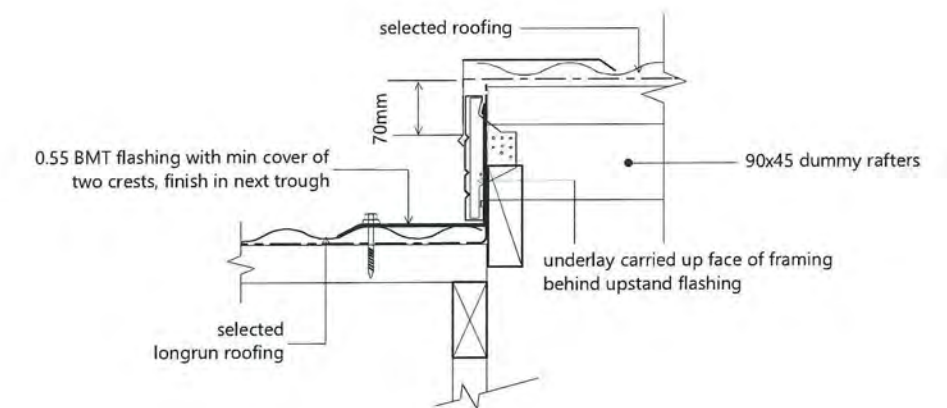
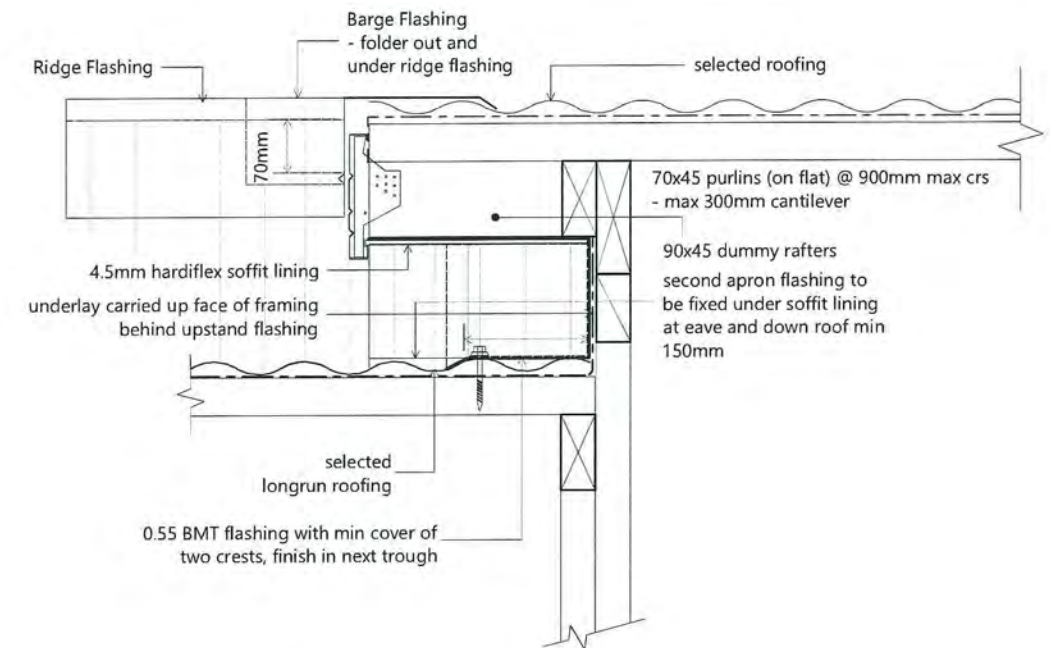




* When 50 year durability for flashing is required refer Table 20 NZBC E2/AS1 document,



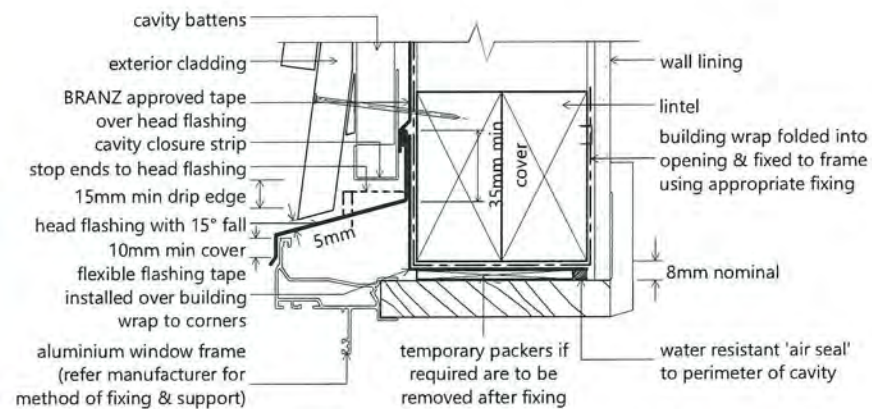
D7
13 **Apron Flashing**
(Linea)

Client Details :				UBAW461
Mr Dent & Ms Lott				
Address:				
11 Matuhi Street				
Waikanae				
				EH174
Roof Details		Scale: 1:10	Date: 8/10/2015	Sheet no: 28
Drawn: PM	Check: N.Davis	Call 0800 A1homes 2 1 4 6 6 3		
Wind: High	Earthq: 3	Exposure: C	Snow: N1	www.A1homes.co.nz
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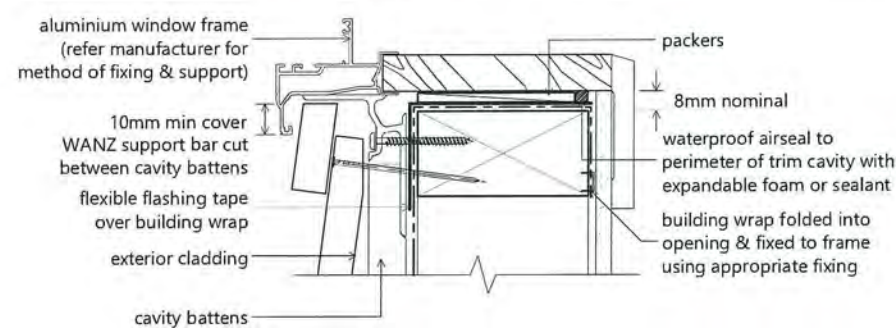
Figure 72B: General window and door opening with drainage cavity
Paragraphs 9.1.5, 9.1.9.3, 9.1.10.2, Figures 73C, 76, 85, 86, 91, 99, 116 and 128

NOTE:

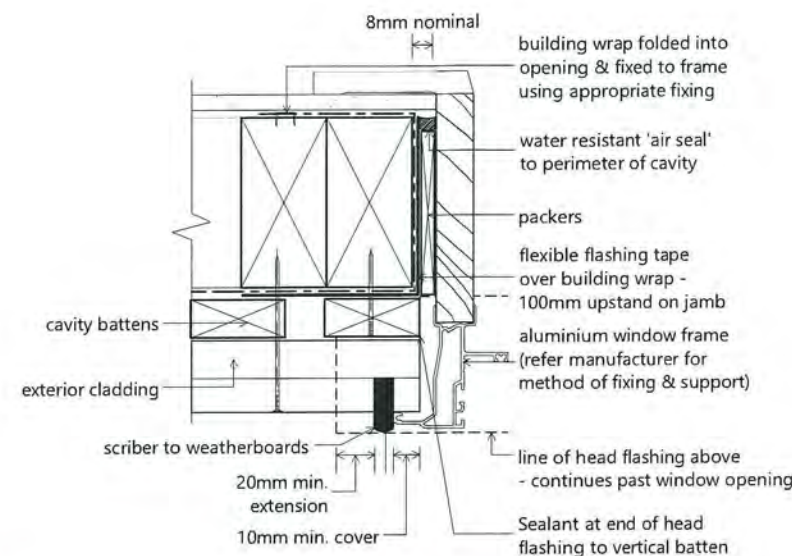
- (1) Detailed cladding omitted for clarity, refer to specific claddings.
- (2) Head to be treated similarly with continuous wall underlay and flexible tape at corners.
- (3) Refer individual cladding details for jamb flashings.



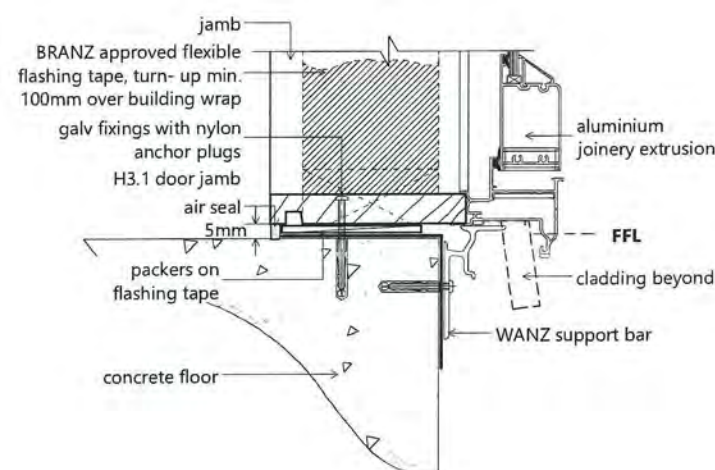
Window Head



Window Sill



Window Jamb



Door Sill

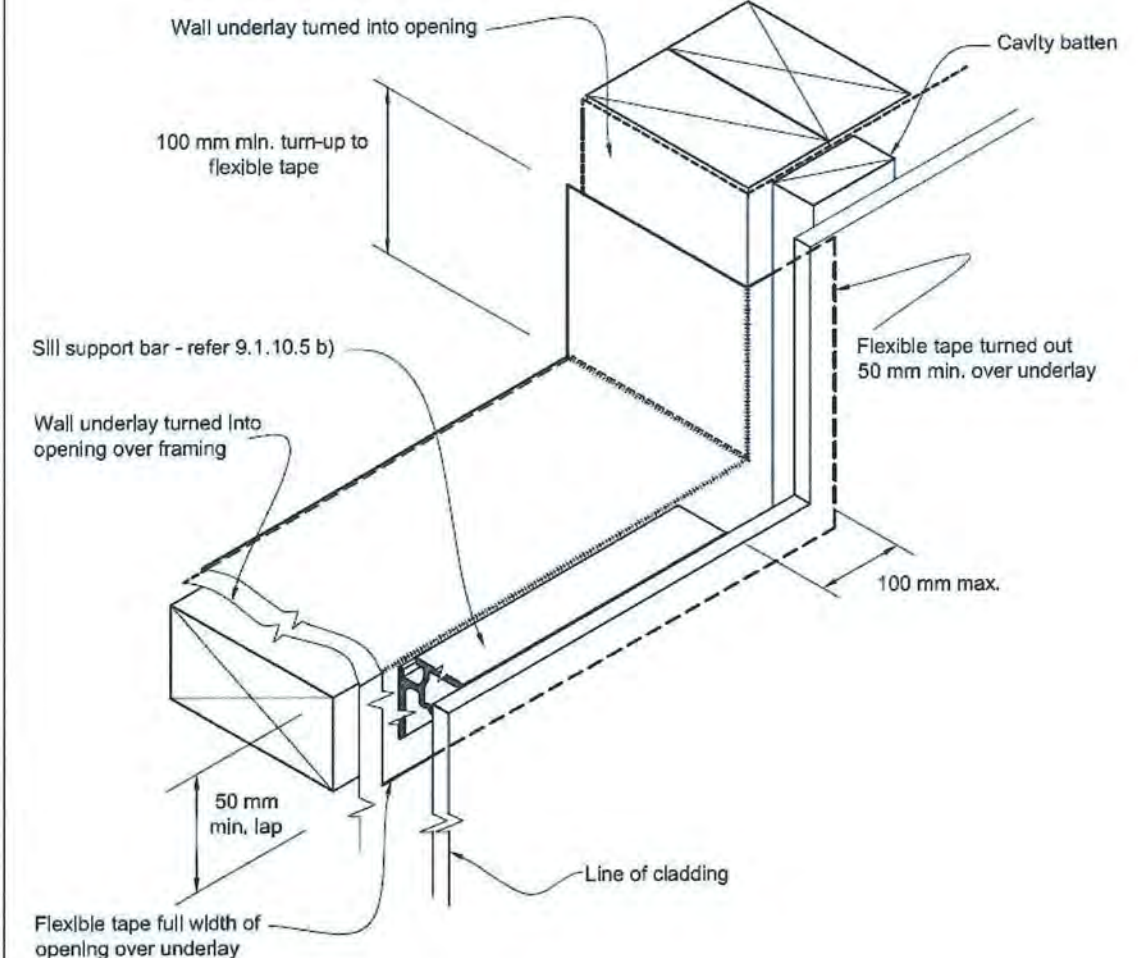
Flexible air seals:

The air seal shall be installed over a closed cell polyethylene foam (PEF) backing rod, or similar and made of self-expanding polyurethane foam

Backing rods are used for self-expanding polyurethane foam as there is a danger foam will expand to the outside of the wall and form a moisture bridge to the interior.

9.1.10.8 Attachments for windows and doors
Install windows and doors using pairs of minimum 75 x 3.15 galvanised jolt head nails or 8 gauge x 65 mm stainless steel screws, through reveals into surrounding framing at:

- a) Maximum 450 mm centres along sills, jambs and heads, and
 - b) Maximum 150 mm from reveal ends.
- Install packers between reveals and framing at all fixing points, except between head reveals and lintels.



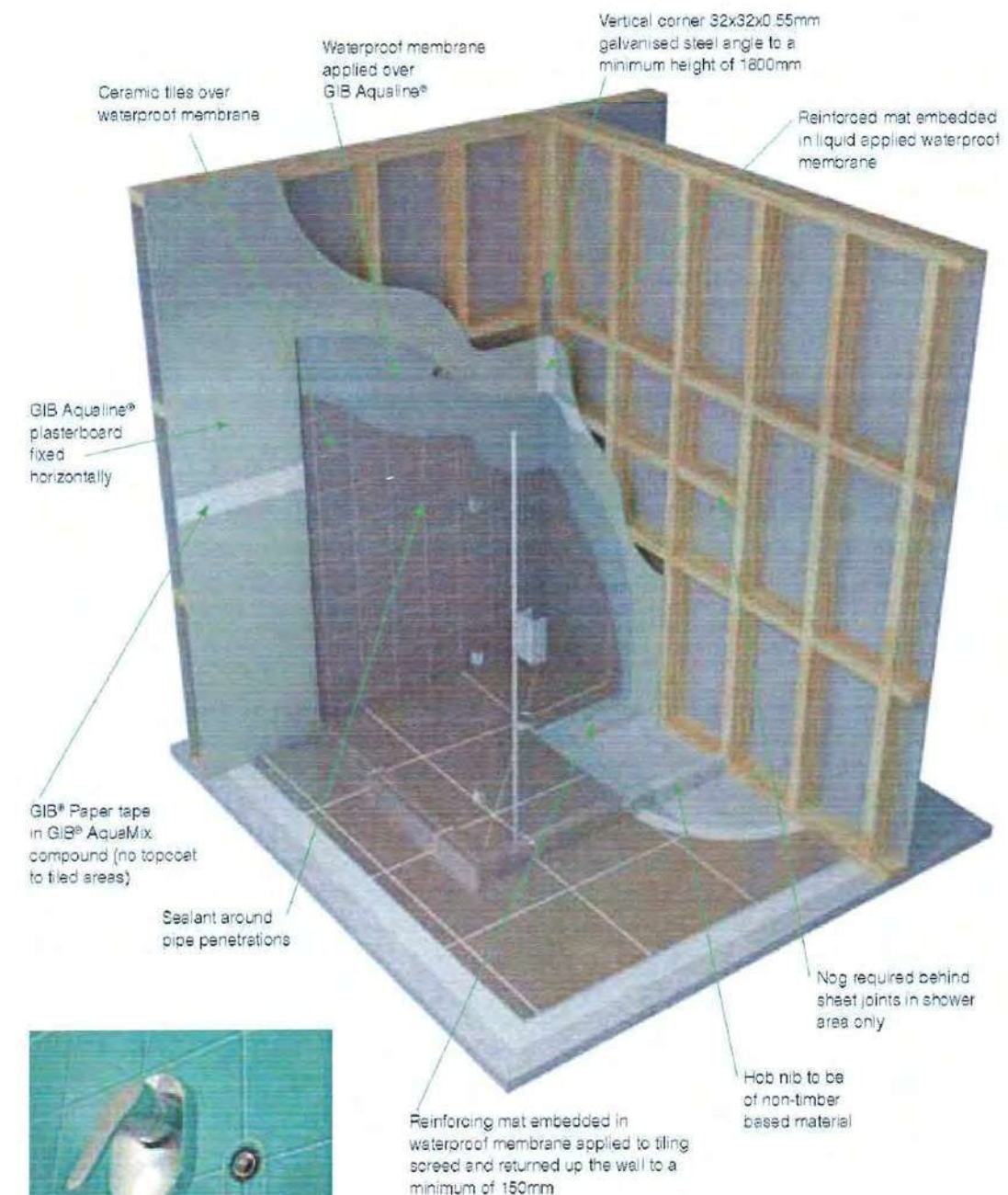
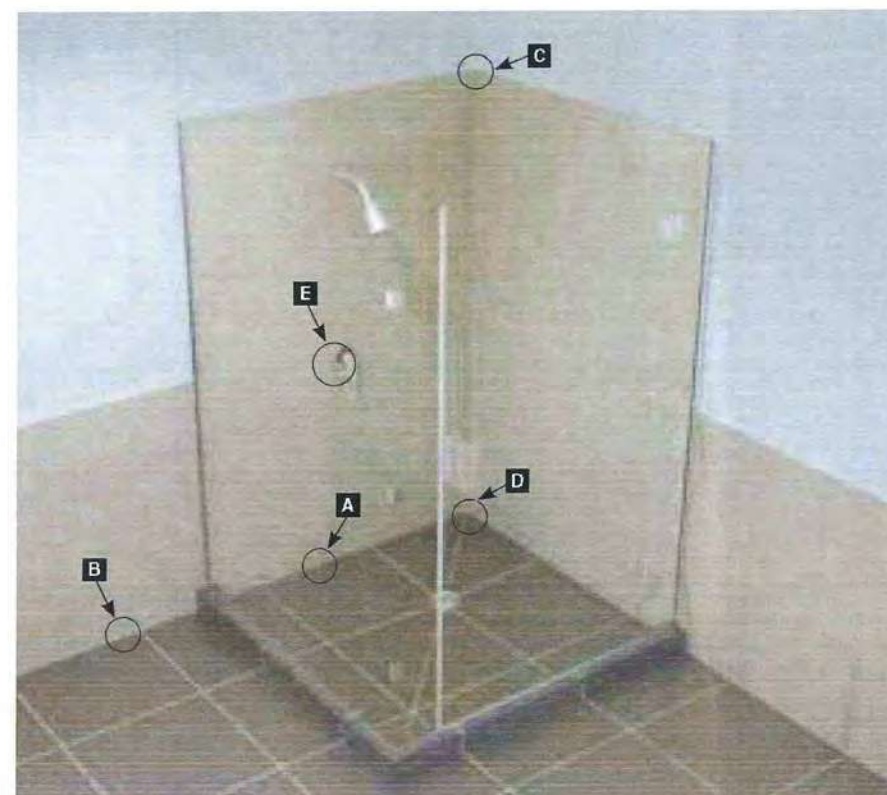
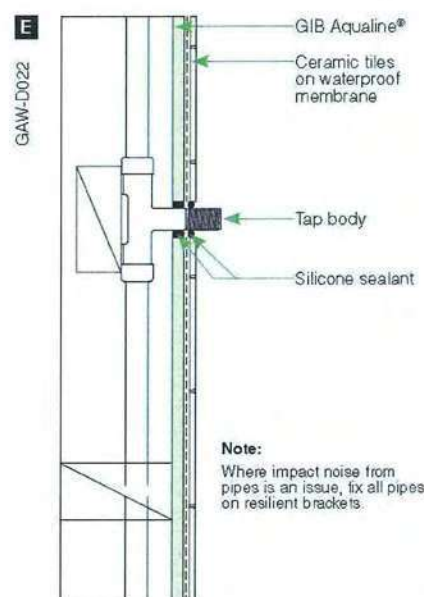
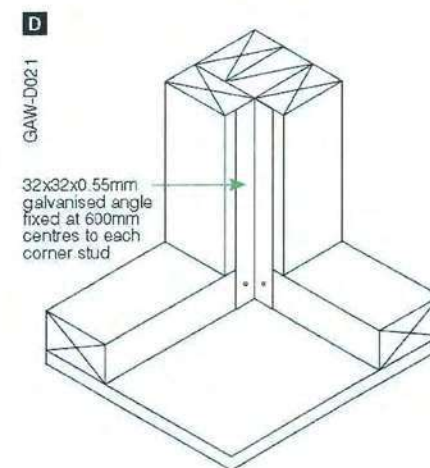
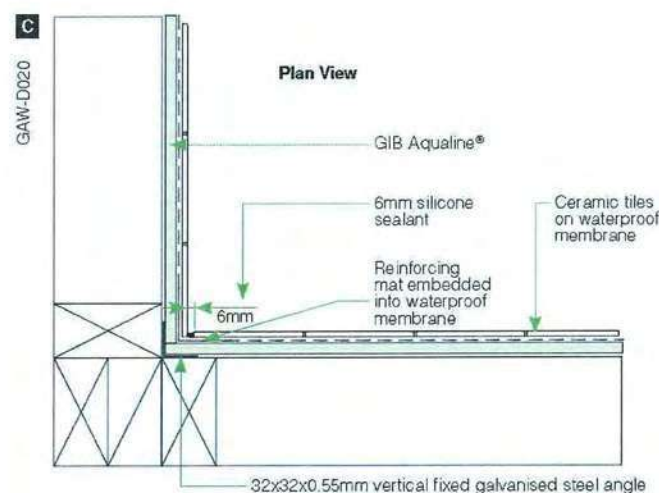
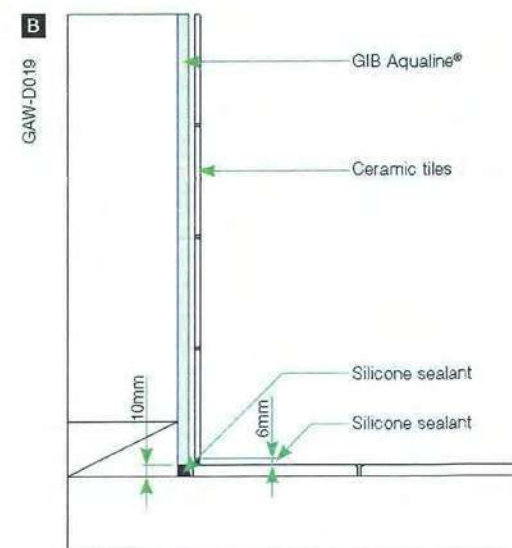
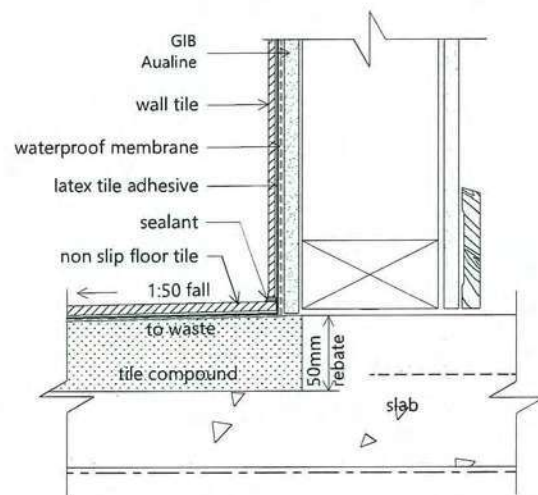
Flashing tape must be proven compatibility with selected building underlay and other building materials with which it comes into contact as per table 21 of 'E2/AS1'

Client Details : UBAW461
Mr Dent & Ms Lott
Address:
11 Matuhi Street
Waikanae

Joinery Details
Scale: 1:5
Date: 8/10/2015
Sheet no: 29

Drawn: PM
Wind: High
Earthq: 3
Check: N.Davis
Exposure: C
Snow: N1
Call 0800 A1homes
2 1 4 6 6 3
www.A1homes.co.nz

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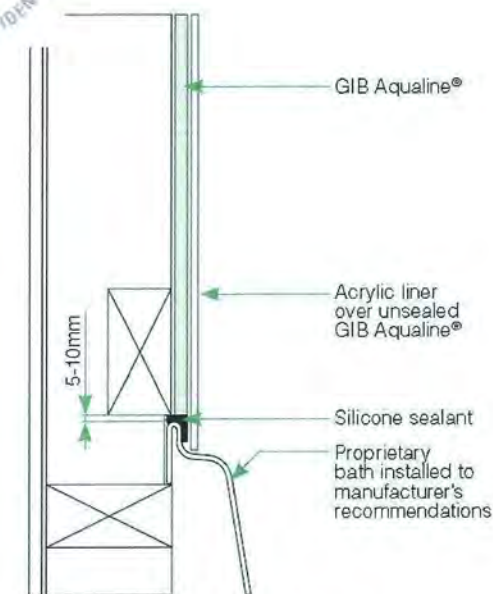
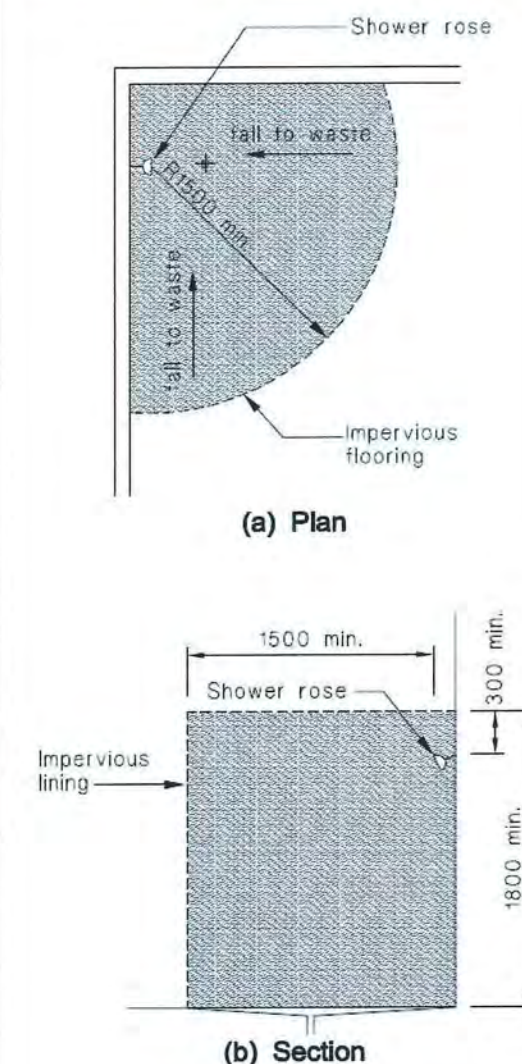


Run a bead of silicone sealant around the mixer unit on the tiles extending below the bottom of the pipe aperture

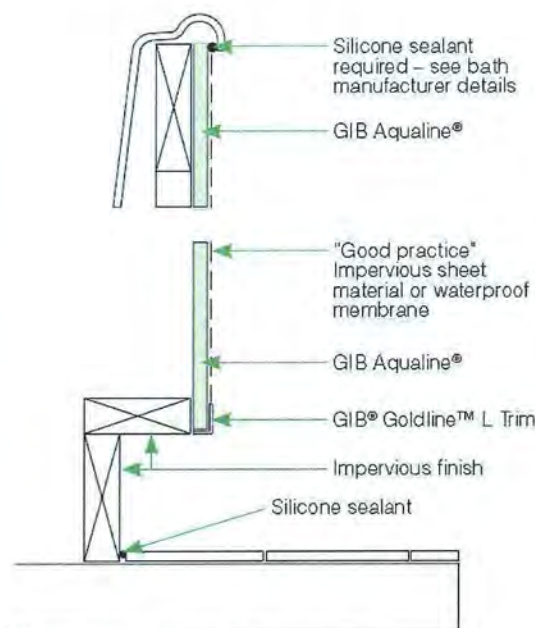
For typical details, see the following pages.

Client Details : Mr Dent & Ms Lott				UBAW461		
Address: 11 Matuhi Street Waikanae				EH174		
Wet Area Details				Scale:	Date: 8/10/2015	Sheet no : 30
				N.T.S	Rev:	
Drawn:	PM	Check:	N.Davis	Call 0800 A1homes 2 1 4 6 6 3 www.A1homes.co.nz		
Wind:	Earthq:	Exposure:	Snow:			
High	3	C	N1			
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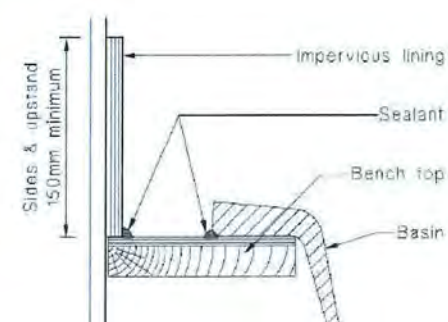
Figure 5: Wall and Floor Coverings to Unenclosed Showers
Paragraphs 3.3.1 and 3.3.5



Bath to Wall Junction



Bath to Floor Junction



Tub, Sink and Basin Junction

Important: See page 6 and 7 for waterproof membrane requirements.

Wall Framing

Framing dimensions and spacing must comply with the requirements of NZS 3604:1999 or relevant NZ Standard.

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum 32 x 32 x 0.55mm galvanised metal angle. Each side of the angle shall be fastened to the framing with 30mm galvanised clouts at 300mm centres
- Steel stud systems do not generally require nogs except as below:
 - Adjacent to each pipe penetration and behind sink and tub flashings
 - Between all studs above bath flanges and preformed shower bases
- For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require either vertical fixing of the GIB Aqualine® or the installation of some additional nogs.

Fasteners

- For 10mm GIB Aqualine® use minimum 25mm x 6g GIB® Grabber® Drywall Screws
- For 13mm GIB Aqualine® use minimum 32mm x 6g GIB® Grabber® Drywall Screws

Fastener Centres

- GIB® Grabber® Drywall Screws at 100mm centres to perimeter of wall and to all intermediate studs
- Adhesive is not to be used in place of mechanical fastenings.

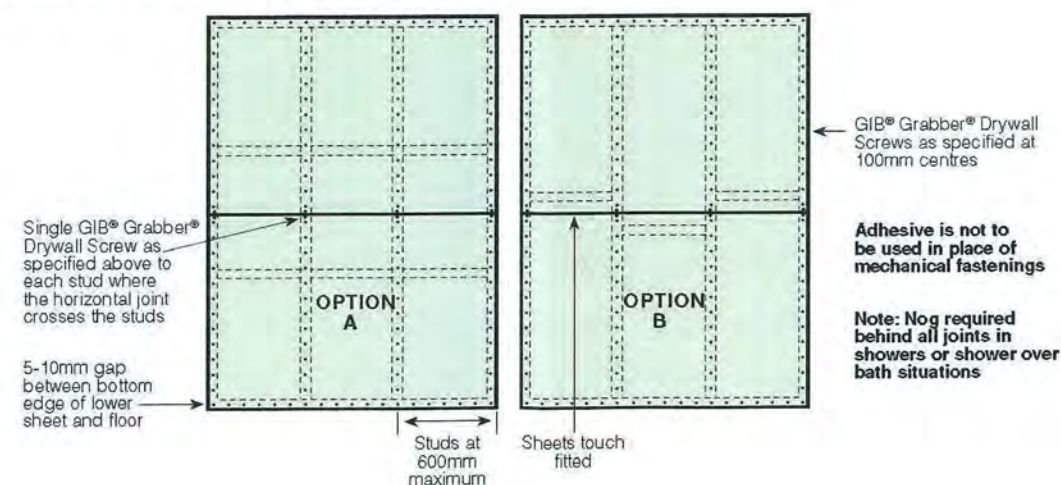
Lining

- 10mm or 13mm GIB Aqualine® is suitable for use on timber framing and for tile weights up to 20kg/m²
- 13mm GIB Aqualine® must be used for tile weights between 20 and 32kg/m² and when light steel framing has been used
- GIB Aqualine® may be fixed vertically or horizontally
- Provide a 5-10mm gap at the wall/floor junction
- Provide a 5-10mm gap between the bottom edge of the GIB Aqualine® and any bath rim or preformed shower base to allow for placement of sealant
- GIB Aqualine® sheets shall be touch fitted
- Where the framing or fastener centres required for tiled areas are closer than those specified for GIB® Fire Rated and GIB® Noise Control Systems, the tiling specification shall prevail. Where relevant, check that fastener lengths comply with the requirements of GIB® Fire Rated Systems or GIB® Noise Control Systems.

Jointing

- Jointing shall be carried out in accordance with instructions in the *GIB® Site Guide*
- Water resistant GIB® AquaMix is recommended for the first two coats
- No top coat is required.

Fastening the Linings – Horizontal Fixing in Tiled Areas



Note:

GIB Aqualine® is suitable for tiling to full height of walls, but if a wall is to be partially tiled (i.e. half high), only the area of wall under the tiles needs to be fixed as above. The remainder of the wall may be fixed as for non-tiled area (see page 10 & 11).

Client Details:				UBAW461
Mr Dent & Ms Lott				
Address:				
11 Matuhi Street				
Waikanae				
EH174				
Wet Area Details		Scale:	Date: 8/10/2015	Sheet no: 31
		N.T.S	Rev:	
Drawn: PM	Check: N.Davis	Call 0800 A1homes 2 1 4 6 6 3 www.A1homes.co.nz		
Wind: High	Earthq: 3			
		Exposure: C	Snow: N1	
DO NOT scale off drawings. Cross reference all drawings. Any discrepancies MUST be clarified with the designer immediately before commencing works or ordering. NO construction or site works are not to commence until Building Consent becomes unconditional.				
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00032

Hamish Wells

Civil Engineer

MIPENZ CPEng 186323

202 Otaki Gorge Road, Otaki
P O Box 188, Otaki 5542

Hamish Wells - 0274 459 757

James Wineti - 0274 549 009

Steve Bright - 022 037 6315

Email: Engenr@xtra.co.nz

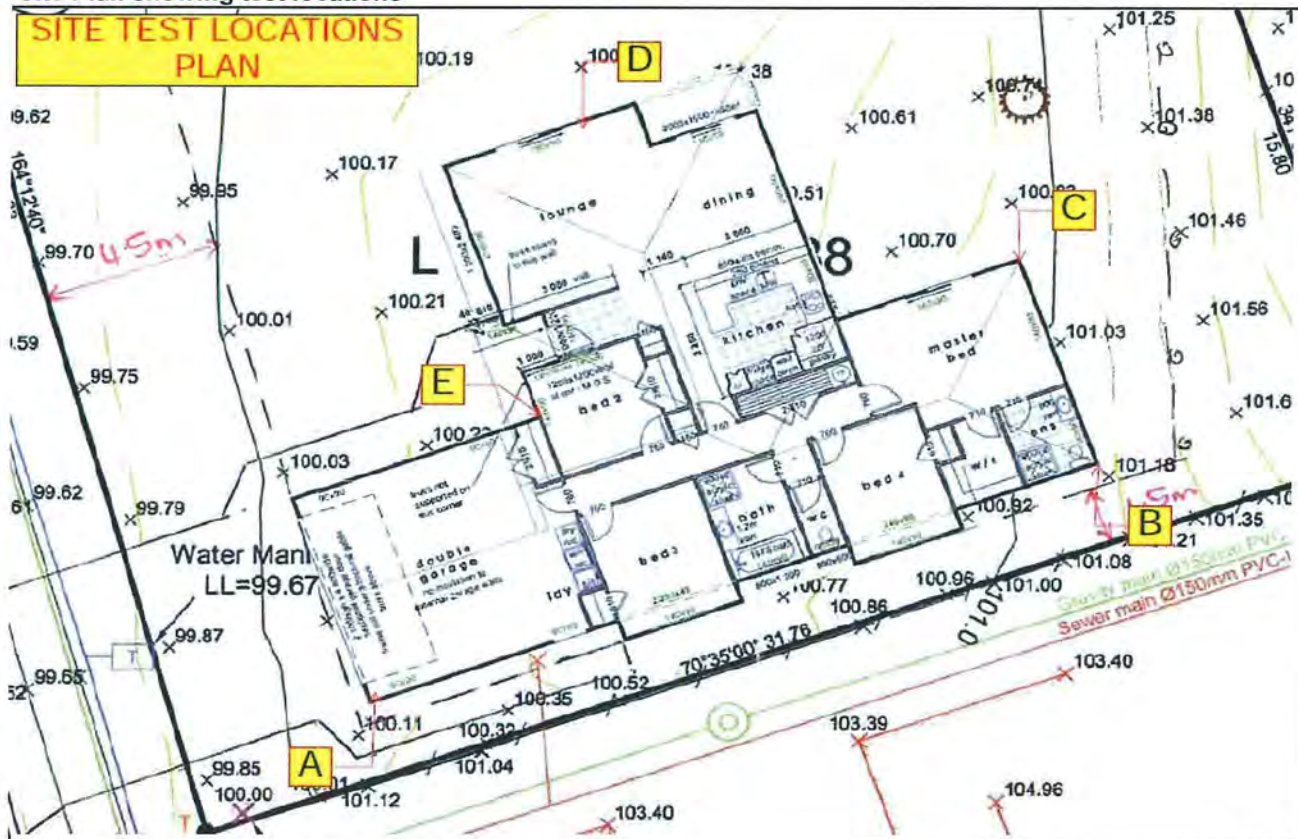
Site suitability test report in terms of NZS 3604:2011 Timber framed buildings - Section 3
"Site requirements"

Site Data					Client Data	
Date	27	8	2015		Client	A1Homes Dent & Lott
Address	11 Matuhi Street, Waikanae				Email	alan.wood@a1homes.co.nz
					Address	
Legal	Lot #	20	DP #	413488		
TA	KCDC				Mobile	021 752 857
RA	GWRC				Landline	04 977 3501

Wind Zone	H
Corrosion zone	C
Earthquake zone	3
Site subsoil class	D

Topography	Residential section with gentle contours
Basic soil type	Clay over underlying gravels
NZGS data	NA

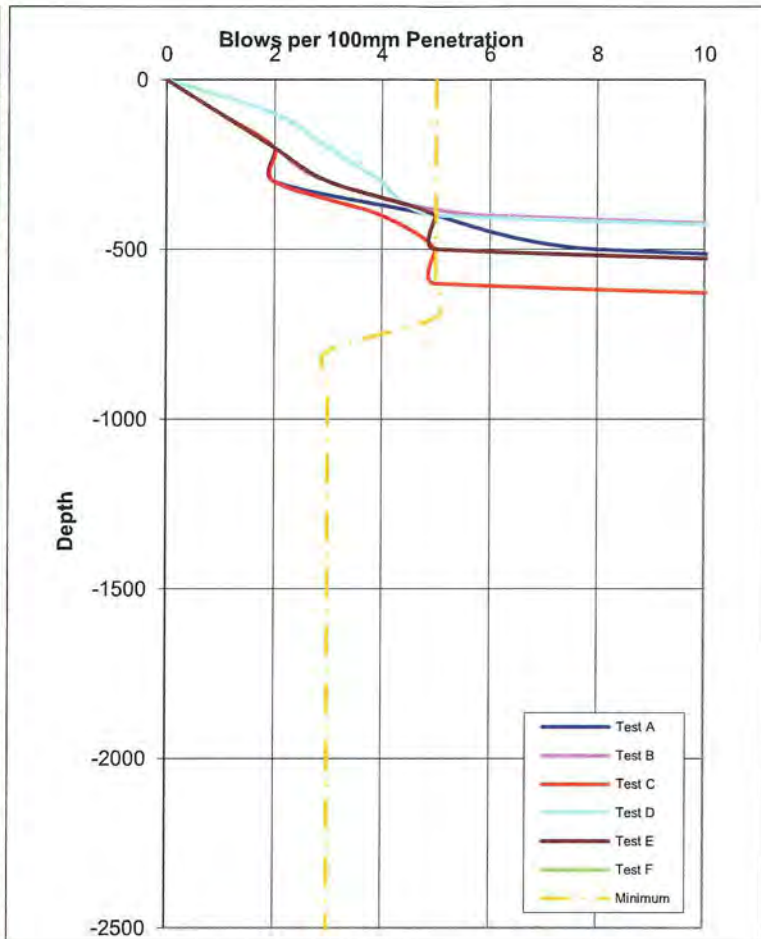
Site Plan showing test locations



Tabulated and graphed Scala penetrometer data

Site	Lot 20, 11 Matuhi Street, Waikanae
Date	27/08/2015
By	JDW

Depth	A	B	C	D	E	F	min
0	0	0	0	0	0	0	5
-100	1	1	1	2	1		5
-200	2	2	2	3	2		5
-300	2	3	2	4	3		5
-400	5	6	4	5	5		5
-500	8	30	5	30	5		5
-600	30		5		30		5
-700			30				5
-800							3
-900							3
-1000							3
-1100							3
-1200							3
-1300							3
-1400							3
-1500							3
-1600							3
-1700							3
-1800							3
-1900							3
-2000							3
-2100							3
-2200							3
-2300							3
-2400							3
-2500							3



3.3.7 Ultimate bearing capacity

3.3.7.1

The soil below the underside of the foundations shall be assumed to have an ultimate bearing capacity of not less than 300 kPa when:

- None of the following is encountered below the depth of the footing at any test site:
 - Organic topsoil
 - Soft or very soft peat
 - Soft or very soft clay
 - Fill material, except where a certificate of suitability has been issued under NZS 4431;
- Scala Penetrometer tests conducted in accordance with 3.3.2(a), where the number of blows per 100 mm depth of penetration below the underside of the proposed footing at each test site exceeds:
 - Five down to a depth equal to twice the width of the widest footing below the underside of the proposed footing;
 - Three at greater depths; and
 - Providing the set blow is relatively uniform, the number of blows per 100 mm may be obtained by averaging the number of blows for depths not exceeding 300 mm; and
- Comparisons of the results at all test sites show that soil conditions are closely similar at each test site.

Test data analysis and comments for 3604:2011 type foundations systems

Symbol	Meaning
Y	Yes
N	No
Blank	Not applicable
P	Part
A	All
SED	Specific Engineering Design

Typical 3604:2011 compliant foundation systems				
Timber subfloor			Slab on ground	
Standard piles	Driven timber piles	Ring Foundation	3604 Type	Non SED RibRaft
Y	Y	Y	N	N

- 1 Do the test results comply with NZS 3604:2011 Section 3 Site requirements?

- 2 Reasons / causes of non compliance?

a)	Peat or other organic materials					
b)	Expansive clays or/and soft silts	Y	Y	Y	Y	Y
c)	Shallow poorly consolidated sands					
d)	Deep poorly consolidated sands					
e)	Uncertified fills					
f)	Unstable ground, adjacent slips, erosion					
g)	Proximity to banks					
h)	Ground water issues					
i)	Other issues see summation para 6					

- 3 Is specific foundation design required ?

a)	Part of the site	N	N	N	N	N
b)	All of the site	N	N	N	N	N

- 4 Can the site soils be mechanically stabilised to provide a complying site?

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

Note: Site is unsuitable for a standard Rib Raft on ground unless the first 300mm of soft material is removed and replaced with clean compacted granular fill.

- 5 Piling options

a)	Driven timber piles					
b)	Cast in situ concrete					

- 6 Slab options

a)	SED required for slab and foundations					
b)	SED required for slab and foundations if the site is mechanically stabilised					

- 7 Summation

The top 300mm of site soils are unsuitable for a slab on ground or ribraft and should be replaced as per 4 above. The site is suitable for standard piles and timber subfloor and ring foundation and timber subfloor.

00033



GIB EzyBrace® 2011 Software



Demand Calculation Sheet

single storey

V11/14a

Job Details

Name Mr Dent & Ms Lott
 Street and Number 11 Matuhi Street
 Lot and DP Number Lot 20 DP 413488
 City/Town/District Waikanae
 Designer PP
 Company Name I Design Architecture Ltd
 Date 08.10.15



Select Lining Option 10 or 13 mm GIB® Plasterboard

Building Specification

Number of storeys single
 Floor Loading 2 kPa
 Foundation Type slab

Single Floor

Cladding Weight light
 Roof Weight light
 Room in Roof Space no
 Roof Pitch (degrees) 23
 Roof height above eaves (m) 2.3
 Building height to apex (m) 4.7
 Ground to lower floor level (m) 0.3

Stud Height (m) 2.4
 Building Length (m) 19.5
 Building Width (m) 13.8
 Building Plan Area (m2) 177

Building Location

Wind Zone High
 Select by Building Consent Authority Map
 or Preference High

Earthquake Zone 3
 Soil Type D&E (deep to very soft)
 Annual exceedance probability
 1/500 (NZS3604:2011 default)

Bracing Units required for Wind

Demand W (BU)		Walls single
along	slab	678
across	slab	912

Bracing Units required for Earthquake

Demand along / across E (BU)	
Walls	
single	
slab	928

GIB EzyBrace® 2011 Software



Single Storey Walls Across

V11/14a

[illegible]

GIB EzyBrace® 2011 Software



Single Storey Walls Along

V11/14a

[illegible]



00034

MiTek New Zealand Limited

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

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

MiTek 20/20 Engineering 4.6.6.246

www.mitek.nz.co.nz

Printed: 10:50:51 25 Sep 2015

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

ISSUED BY: **MiTek New Zealand Limited**

TO: **PLACEMAKERS - W.F.T.**

IN RESPECT OF: **MiTek[®] Truss Designs**

This producer statement covers the MiTek 20/20[®] truss design and the structural performance of the GANG-NAIL[®] connector plate for the job reference **2900925** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

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

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

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

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

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

On behalf of MiTek New Zealand Limited,

Date: Friday, 25 September 2015

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

PLACEMAKERS - W.F.T.

Fabricator Design Statement : Page 1

Job: 2900925

Client: Wellington Frame & Truss
Phone:

Site: A1 Homes (Lott)
11 Matuhi St
Waikanae

Description:
Building Consent No.:
MiTek 20/20 Engineering 4 6 6 248

Phone:

Printed: 10:50:52 25 Sep 2015

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator PLACEMAKERS - W.F.T., being licensed to use the MiTek 20/20® software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details		Importance Level :	2	Design Working Life :	50 years
Roof Truss		Pitch:	22.500 deg	Nominal Overhang:	590 mm
Timber Group:	MSGx45 H1.2	Ceiling		Wind	
Material:	Galv Iron .5mm	Material:	Rondo on clips	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:	1800 mm centres		
Live Load:	Q _{ur} = 0.250 kPa	Live Load:	Q _c = 1.400 kN		
	Q _c = 1.100 kN				

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

Tek® Truss List

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

Roof Truss

Treatment: Top Chords - H1.2 Bottom Chords - H1.2 Webs - H1.2														
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
EN1	1	8690	22.500	877 GB	J4A	1	2522	22.500	900	V2	1	900	22.500	889
EN2	1	6000	22.500	829	J4B	1	2522	22.500	900	V3	1	533	22.500	900
*FLY1	2	4935	22.500	245	J5	1	2977	22.500	900	V4	1	2519	22.500	877
*FLY2	2	1345	22.500	900	J5A	2	2977	22.500	900	V5	1	1642	22.500	877
*FLY3	4	3590	22.500	245	J6	1	2077	22.500	900					
*HB1	2	6459	16.325	900	J6A	1	2077	22.500	900					
*HB2	1	1870	16.325	900	J7	2	1177	22.500	900					
*HB3	1	456	16.325	900	*R1	2	958	22.500	900					
*HB4	2	5045	16.325	900	*R2	4	581	22.500	900					
J1	1	3077	22.500	900	*R4	1	881	22.500	900					
J1A	2	3077	22.500	900	*R5	3	881	22.500	900					
J1B	2	3077	22.500	900	T1	1	8000	22.500	900					
J2	2	2177	22.500	900	T1A	2	8000	22.500	819					
J2A	2	2177	22.500	900	T1B	1	8000	22.500	819					
J3	2	1277	22.500	900	T6	7	6000	22.500	829					
J3A	2	1277	22.500	900	TG1	1	8000	22.500	900					
J4	1	2522	22.500	900	V1	1	1789	22.500	889					

Treatment: Top Chords - H1.2 Bottom Chords - H3.1 Webs - H1.2				
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
T2	1	8000	22.500	819

Treatment: Top Chords - H1.2 Bottom Chords - H1.2 Webs - H1.2 Cove Chords - H1.2				
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
J6B	1	2577	22.500	900
J6C	1	2577	22.500	900
T3	4	6500	22.500	900
T3A	1	6500	22.500	877
T4A	1	6500	22.500	889
T5	1	6410	22.500	889
T5A	2	3922	22.500	889
TR2	1	6500	22.500	900

Treatment: Top Chords - H1.2 Bottom Chords - H3.1 Webs - H1.2 Cove Chords - H3.1				
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
T4	1	6500	22.500	900
TG2	1	6500	22.500	900

Roof Truss quantity : 81

Total quantity : 81

PLACEMAKERS - W.F.T.

Fabricator Design Statement : Page 2

Job: 2900925

Client: Wellington Frame & Truss
Phone:

Site: A1 Homes (Lott)
11 Matuhi St
Waikanae

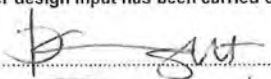
Description:
Building Consent No.:
MITek 20-20 Engineering 4.6.6.246

MITek New Zealand Limited

Phone:

Printed: 10:50:52 25 Sep 2015

The computer design input has been carried out by:

Signed: 

Date: ..Friday, 25 September 2015....

Name of Detailer: Temere Knight

Qualifications and Title:

On behalf of: PLACEMAKERS - W.F.T.



PLACEMAKERS - W.F.T.

MANUFACTURER STATEMENT : Page 1

Job: 2900925

Client: Wellington Frame & Truss
Phone:

Site: A1 Homas (Lott)
11 Matuhi St
Waikanae

Description:
Building Consent No.:
MiTek 20/20 Engineering 4.6.6.245

MiTek New Zealand Limited

Phone: Printed 10:50:55 25 Sep 2015

MANUFACTURER STATEMENT

This statement is issued by PLACEMAKERS - W.F.T. to the client listed above, and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek® trusses for the job reference 2900925 have been fabricated in accordance with the MiTek 20/20® truss design, truss layout and shop drawing output and the specifications for timber defined therein, and are covered by the Producer Statement issued by MiTek New Zealand Limited and the MiTek Fabricator Design Statement.

Summary of fabricated MiTek® trusses in accordance with MiTek 20/20® output

These MiTek® trusses must be erected in accordance with the Truss Layout. Proper erection bracing must be installed to hold the trusses true and plumb and in a safe condition until permanent bracing is fixed. All permanent bracing and fixing must be installed before any loads are applied.

Job Details

Importance Level : 2

Design Working Life : 50 years

Roof

Material: Galv Iron .5mm
Dead Load: 0.210 kPa
Restraints: 900 mm centres
Live Load: Q_{ur} = 0.250 kPa
Q_c = 1.100 kN

Ceiling

Material: Rondo on clips
Dead Load: 0.200 kPa
Restraints: 1800 mm centres
Live Load: Q_c = 1.400 kN

Wind

Area: High (44.0 m/s)
Pressure Coeff: C_{pe} = varies; C_{pi} = -0.30, 0.20

MiTek® Truss List

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

Roof Truss

Treatment: Top Chords - H1.2					Bottom Chords - H1.2					Webs - H1.2				
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
EN1	1	8690	22.500	877	GB	J4A	1	2522	22.500	900	V2	1	900	22.500
EN2	1	6000	22.500	829	J4B	1	2522	22.500	900	V3	1	533	22.500	900
*FLY1	2	4935	22.500	245	J5	1	2977	22.500	900	V4	1	2519	22.500	877
*FLY2	2	1345	22.500	900	J5A	2	2977	22.500	900	V5	1	1642	22.500	877
*FLY3	4	3590	22.500	245	J6	1	2077	22.500	900					
*HB1	2	6459	16.325	900	J6A	1	2077	22.500	900					
*HB2	1	1870	16.325	900	J7	2	1177	22.500	900					
*HB3	1	456	16.325	900	*R1	2	958	22.500	900					
*HB4	2	5045	16.325	900	*R2	4	581	22.500	900					
J1	1	3077	22.500	900	*R4	1	881	22.500	900					
J1A	2	3077	22.500	900	*R5	3	881	22.500	900					
J1B	2	3077	22.500	900	T1	1	8000	22.500	900					
J2	2	2177	22.500	900	T1A	2	8000	22.500	819					
J2A	2	2177	22.500	900	T1B	1	8000	22.500	819					
J3	2	1277	22.500	900	T6	7	6000	22.500	829					
J3A	2	1277	22.500	900	TG1	1	8000	22.500	900					
J4	1	2522	22.500	900	V1	1	1789	22.500	889					

Treatment: Top Chords - H1.2					Bottom Chords - H3.1					Webs - H1.2				
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
T2	1	8000	22.500	819										

Treatment: Top Chords - H1.2					Bottom Chords - H1.2					Webs - H1.2					Cove Chords - H1.2				
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
J6B	1	2577	22.500	900															
J6C	1	2577	22.500	900															
T3	4	6500	22.500	900															
T3A	1	6500	22.500	877															
T4A	1	6500	22.500	889															
T5	1	6410	22.500	889															
T5A	2	3922	22.500	889															
TR2	1	6500	22.500	900															

Treatment: Top Chords - H1.2					Bottom Chords - H3.1					Webs - H1.2					Cove Chords - H3.1				
Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
T4	1	6500	22.500	900															
TG2	1	6500	22.500	900															

Roof Truss quantity : 81

Total quantity : 81

PLACEMAKERS - W.F.T.

MANUFACTURER STATEMENT Page 2

Job: 2900925

Client: Wellington Frame & Truss
Phone:

Site: A1 Homes (Lott)
11 Matuhi St
Waikanae

Description:
Building Consent No.:
MiTek 20/20 Engineering 4 6 6 246

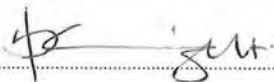
MiTek New Zealand Limited

Phone:

Printed: 10:50:55 25 Sep 2015

The MiTek® trusses are fabricated under the supervision of:

Signed:



Date:

25 Sept 15

Name of Supervisor:

On behalf of: PLACEMAKERS - W.F.T.





Job Number: 2900925
Job Description: A1 Homes (Lott),
11 Matuhi St,
Waikanae.
Run by: Tamara Knight
Licence: Basic User (No certificate req'd)
Company: Placemakers Wellington Frame a
Phone: (04)2961086

Project Report

This project consists of the following design items:

L1(W07 to Garage) - 2/90x45 KD pine SG8 H1.2 Treated

Lintel: Single 620 mm span, Trusses @ 900 mm, RLW 3590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L2(D01 to Garage) - 2/90x45 KD pine SG8 H1.2 Treated

Lintel: Single 900 mm span, Trusses @ 900 mm, RLW 3590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L3(W03 to Bed 3) - 2/140x45 KD pine SG8 H1.2 Treated

Lintel: Single 1820 mm span, Trusses @ 900 mm, RLW 3590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L4(W09 to Bath) - 2/90x45 KD pine SG8 H1.2 Treated

Lintel: Single 1220 mm span, Trusses @ 900 mm, RLW 3590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L5(W11 to WC) - 2/140x45 KD pine SG8 H1.2 Treated

TG Lintel: Single 620 mm span, Trusses @ 900 mm, RLW 4840 mm, Pitch 22.5 deg TG3922 Type 1, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L6(W02 to Bed 2) - 2/190x45 KD pine SG8 H1.2 Treated

Girder Lintel: Single 1820 mm span, Trusses @ 900 mm, RLW 3840 mm, Pitch 22.5 deg Girder Lintel Type 1, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L7(W10 to Ensuite) - 2/90x45 KD pine SG8 H1.2 Treated

Lintel: Single 620 mm span, Trusses @ 900 mm, RLW 3590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L8(W08 to Master Bed) - 2/90x45 KD pine SG8 H1.2 Treated

Lintel: Single 1220 mm span, Trusses @ 900 mm, RLW 3590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L9(D05 to Master Bed) - 2/190x45 KD pine SG8 H1.2 Treated (See full member report for specific notes.)

Girder Lintel: Single 2420 mm span, Trusses @ 900 mm, RLW 3840 mm, Pitch 22.5 deg Girder Lintel Type 1, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L10(W12 to Kitchen) - 2/90x45 KD pine SG8 H1.2 Treated

Lintel: Single 1220 mm span, Trusses @ 900 mm, RLW 4590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L11(D04 to Dining) - 2/190x45 KD pine SG8 H1.2 Treated

TG Lintel: Single 2420 mm span, Trusses @ 900 mm, RLW 4590 mm, Pitch 22.5 deg TG3077 Type 1, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L12(D03 to Dining) - 2/140x45 KD pine SG8 H1.2 Treated

Lintel: Single 1620 mm span, Trusses @ 900 mm, RLW 3667 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L13(W04 to Living) - 2/140x45 KD pine SG8 H1.2 Treated

Lintel: Single 1820 mm span, Trusses @ 900 mm, RLW 3667 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L14(W05 to Living) - 2/190x45 KD pine SG8 H1.2 Treated

TG Lintel: Single 2420 mm span, Trusses @ 900 mm, RLW 4590 mm, Pitch 22.5 deg TG3077 Type 1, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L15(D02 to Entry) - 2/140x45 KD pine SG8 H1.2 Treated

Lintel: Single 1140 mm span, Trusses @ 900 mm, RLW 4590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L16(W06 to Bed 4) - 2/190x45 KD pine SG8 H1.2 Treated

Lintel: Single 1420 mm span, RCan 710 mm, Trusses @ 900 mm, RLW 4935 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L17(W01 to Bed 4) - 2/190x45 KD pine SG8 H1.2 Treated (See full member report for specific notes.)

Girder Lintel: Single 1300 mm span, Trusses @ 900 mm, RLW 4590 mm, Pitch 22.5 deg Girder Lintel Type 1, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L18(W07 to Garage) - 2/90x45 KD pine SG8 H1.2 Treated

Lintel: Single 620 mm span, Trusses @ 900 mm, RLW 3590 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

L19(Garage Door Lintel) - 2/290x45 KD pine SG8 H1.2 Treated

Lintel: Single 4840 mm span, Trusses @ 900 mm, RLW 1800 mm, Pitch 22.5 deg, Roofing Metal Sheet (20), Ceiling 13mm P'Board (20), High wind load.

Where Hyne specific products have been specified in this project report, any substitution of non-Hyne products will void this certification.

CERTIFICATION:

I hereby certify that I have carried out these designs correctly, and that the input data for each design is correct. The above nominated sections have only been designed for the loading and dimensional data stated above as having been used to generate this report.

I consider that I have adequate experience and training to calculate and input the required data for these designs in the Hyne Design v7 Software. I am also familiar with the following codes, and the requirements of these codes and their application to the project I am designing:

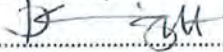
AS/NZS 1170	Part 0: Structural design actions - General Principles 2002
	Part 1: Structural design actions - Permanent, imposed and other actions 2002
	Part 2: Structural design actions - Wind actions - 2011
	Part 3: Structural design actions - Snow and Ice Actions - 2003
NZS 3604	Timber Framed Buildings - 2011
NZS 3603	Timber Structures Standard - 1993

Wind design criteria is analysed and designed in accordance with AS/NZS 1170.2, and design wind velocities and descriptions from NZS3604

EXCLUSION OF LIABILITY:

Hyne & Son Pty Ltd gives no warranties in relation to the use of the above mentioned section design and neither Hyne & Son Pty Ltd nor HR Design Group Pty Ltd will accept any liability for loss or damage, either direct or consequential, arising from the use of the above nominated section in an application not consistent with the input data used to generate this report or that requires additional data beyond the scope of the Hyne Design v7 Software.

Checked and certified by:


.....

Placemakers Wellington Frame and Truss

Dated: 25 Sept 2015

Name	Height	Width	Unit Size
460 J1	2035	520	90x45
610 J1	2035	670	90x45
710 J1	2035	770	90x45
760 J1	2035	820	90x45
1220x1210	1220	1210	190x45
1220x1820	1220	1820	190x45
1220x2420	1220	2420	190x45
1220x620	1220	620	90x45
1220x710	1220	710	190x45
2020x1140	2020	1140	140x45
2020x1620	2020	1620	140x45
2020x2420	2020	2420	190x45
2020x900	2020	900	90x45
620x1220	620	1220	90x45
820x1220	820	1220	90x45
820x620	820	620	140x45
970x1220	970	1220	140x45
D610 J1	2035	1280	90x45
D710 J1	2035	1480	90x45

Company: Placemakers Manufacturing

Customer: Wellington Frame & Truss

Customer Address: A1 Homes (Lott)

Site: 11 Matuhi St,

Site Address: Waikanae

Unit Type: Std

Unit Height: 2475

Level: prenil 1

Job: 29000925 Scale: Fit Date: 9/10/2015

Factory Notes :	Milek Version:	4.6
- Treatment : <u>Ext Walls - H1.2</u> <u>Int Walls - H1.2</u>		
Please Note : These plans are provided solely to enable the builder to erect the prenil on site. They are not intended for any other purpose and PlaceMakers will not accept any liability arising from any other use of these plans. Builder to read pre-cut plans in conjunction with architectural plans. Builder should ensure that ALL OSH approved safety practices are carried out when erecting framing. Builder to check all opening trim / lintel sizes and braces on site before enclosing. FRAME ORIENTATION: Frame markings are on the same side as the label on the plan PlaceMakers will not accept any charges for remedial work unless a written order is issued before any work is commenced. A copy of the order is to accompany any invoice to PlaceMakers Frame & Truss.		
<i>If Experiencing Problems, Contact:</i> Melissa Rodrigues Phone (04) 296 6082 email : melissa.rodrigues@placemakers.co.nz		
		
Kapiti Rd Paraparaumu		Ph 04 296 1086 Fax 04 296 2561
Customer: A1 Homes Lot1 Address: 11 Matuhi St Waikanae		
Job No.:: 2900925		
25/09/2015		
Level: Prenal 1		Drawn By : Tamara Knight
FILE	SITE	FACTORY

Please Note :

These plans are provided solely to enable the builder to erect the pre-nail on site. They are not intended for any other purpose and PlaceMakers will not accept any liability arising from any other use of these plans.

Builder to read pre-cut plans in conjunction with architectural plans.

Builder should ensure that ALL OSH approved safety practices are carried out when erecting framing.

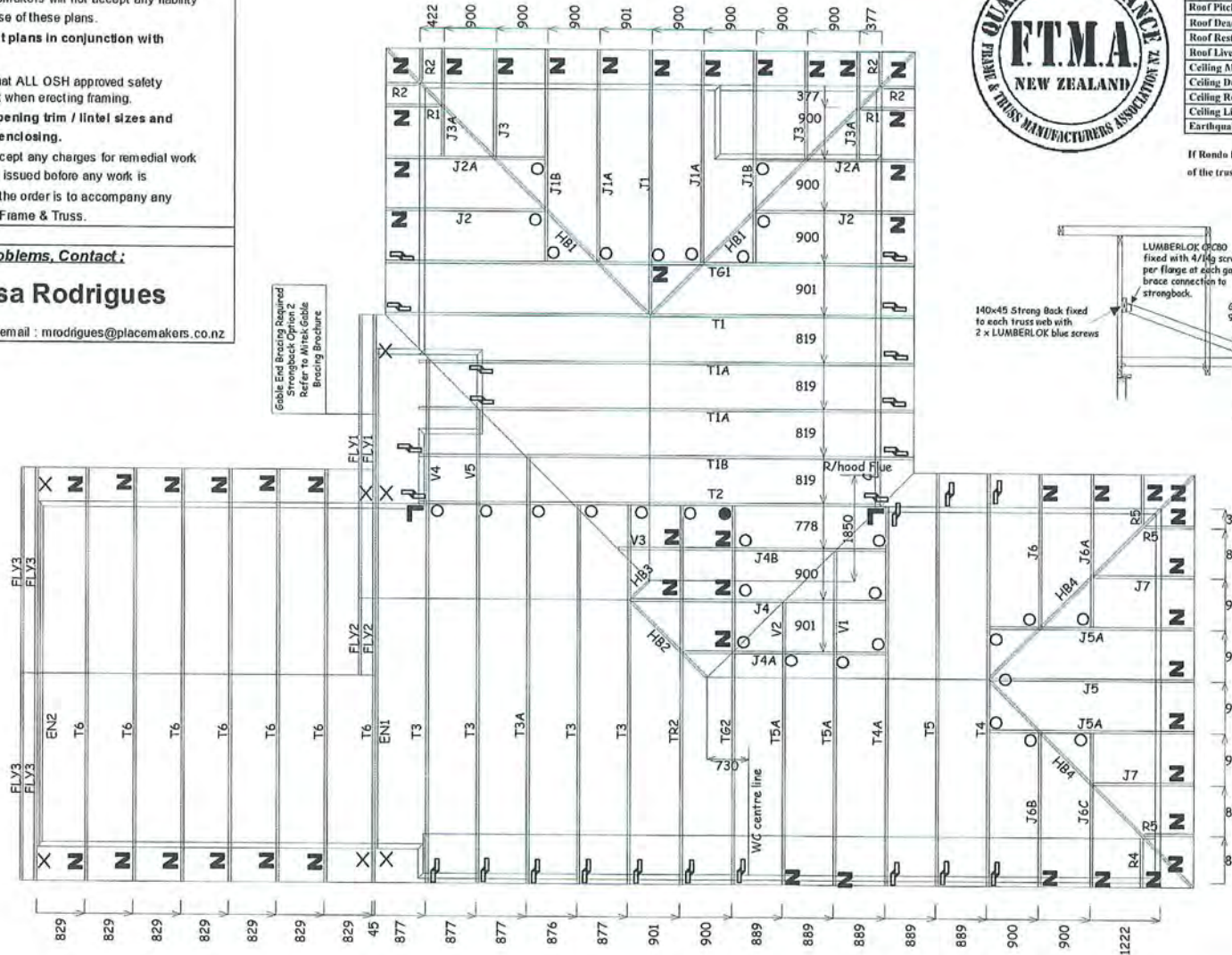
Builder to check all opening trim / lintel sizes and braces on site before enclosing.

PlaceMakers will not accept any charges for remedial work unless a written order is issued before any work is commenced. A copy of the order is to accompany any invoice to PlaceMakers Frame & Truss.

If Experiencing Problems, Contact :

Melissa Rodrigues

Phone (04) 296 6062 email : mrodrigues@placemakers.co.nz

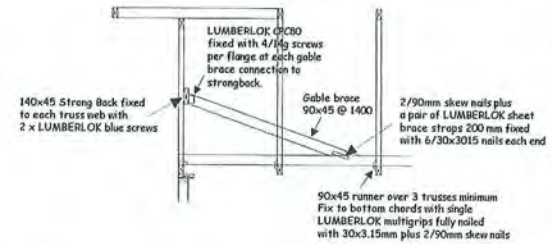


NOTE : Where no fixings have been indicated use 2 / 90 x 3.33mm (driven) skew nails.



Design from spec category	Design
Pressure Coeff : Cpe = varies ; Cpi = -30.0, 0.20	
Timber size and grades : 90x45 MSG8 & MSG10 (HL2)	
Roof Weight & Type : Light (Longrun Iron)	
Roof Pitch : 22.5 degrees	
Roof Dead Load : 0.210 kPa	
Roof Restraints : 900mm centres	
Roof Live Load : Q _{ur} = 0.250 kPa ; Q _c = 1.100 kN	
Ceiling Material : Rondo on Clips	
Ceiling Dead Load : 0.200 kPa	
Ceiling Restraints : 1800 centres (see note)	
Ceiling Live Load : Q _c = 1.400kN	
Earthquake Zone : A	Snow Zone : 1

If Rondo battens on clips are used then the bottom chords of the trusses must be restrained @ 1800 cns max.



No. off	Fixing description
52 pairs	"Z" nails (1 pair)
30	JH47 x 90
1	JH47 x 120
	JH47 x 190
	JH95 x 165
7 pairs	CPC 40s (75mm Hex screws)
2 pairs	CPC 80 (75mm Hex screws)
	200x110x1mm Nail on plate.
	320x110x1mm Nail on plate.
25 pairs	Multi-Grips (pair)
	CT200 (pair)
	CT400 (cyclone ties)

Truss to Top Plate Fixings.

CPC 80	Fill all holes with Product nails 30x3.15mm
CT200 (pair)	Fill all holes with Product nails 30x3.15mm
CT400 (cyclone ties)	8 x Product nails 30x3.15mm / 4 x Type 17, 25mm screws
"Z" nails (pair)	
Multi-Grip (pair)	Fill all holes with Product nails 30x3.15mm

Truss to Truss Fixings.

CPC 40s	3 x Product nails 30x3.15mm / 2 x Type 17, 25mm screws
CPC 40	4 x Product nails 30x3.15mm / 2 x Type 17, 25mm screws
CPC 80	8 x Product nails 30x3.15mm / 4 x Type 17, 25mm screws
200x110x1mm Nail on plate	(fill all holes to within 10mm of the timber edge)
320x110x1mm Nail on plate	(fill all holes to within 10mm of the timber edge)

TRUSS LAYOUT FOR : A1 Homes (Dent / Lott)
11 Matuhi St, Waikanae

JOB # 2900925

Placemakers Wellington Frame & Truss

Drawn by : Tamara Knight
PHONE (04) 298 8367 - FAX (04) 298 5488
E-MAIL : tknight@placemakers.co.nz

Issue Date
31 Sept 2015

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

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

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

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

References:

NZS 3603:1993 Timber Structures Standard. AS/NZS 1170:2002 Structural design actions, Parts 0 and 1.
NZS 3604:2011 Timber-framed buildings. AS/NZS 1170:2011 Structural design actions, Part 2: Wind actions.
AS 1720.1 – 2010 Timber structures. Part 1: Design methods. AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.
AS 1684.1 – 1999 Residential timber framed construction. Part 1: Design criteria.

This Design Certificate, and any associated warranty/certification, is void where there has been substitution of alternate products not detailed within the Member Specification.

Version date: 8 July 2015

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@chhwoodproducts.co.nz

Specifier details:

Specifier:	P.Pearson		
Business name:			
Address:	24 Park Street, Tauranga		
Email:			
Phone:	Mobile: 0275231310	Facsimile:	

Project & Site details:

Project:	UBAW461 Dent & Lott	Ref. no.:	
At (address):	11 Matuhi Street, Waikanae		
For (owner/s):	Mr Dent & Ms Lott		
Wind zone:	High		
Snow loading	Snow region: N0, snow loading not applicable		

MEMBER DESIGN DETAILS

Member 1

- | | |
|---------------------------------------|--|
| 1) Member code and description | JS1, Jamb studs - In single or upper storey load bearing walls |
| 2) Date prepared | 8/10/2015 |
| 3) Serviceability criteria | AS 1720.1-2010 and AS 1684.1-1999 |
| 4) Design inputs | |
| Roof type | Light roof and ceiling - 40 kg/m ² |
| Roof load width 'RLW' | 1.0 m |
| Opening width | 4840 mm |
| Stud height | 2420 mm |

5) Member specification

Size, stress grade/product Use 2/90 x 45 hyCHORD
Material type Structural Laminated Veneer Lumber to AS/NZS 4357

6) Serviceability

Load case	Limit ³ on average deflection ²	Estimated average deflection ²	Rigidity ratio ⁴
Wind load - W_S^*	16.1 mm	10.7 mm	$\frac{16.1}{10.7} = 1.51$

*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k_1^1	Limit states design reaction ^{2,3}	
		End ⁴ kN	Horizontal kN
1.35G	0.60	-1.5	
1.2G + 1.5Q	0.80	-2.3	
1.2G + W_U + $\Psi_C Q$	1.00	-3.1	2.7
0.9G + W_U	1.00	1.8	2.2

See 'Notes for interpretation of reaction data' at the end of this report

8) Installation requirements

Jamb studs to be nogged at maximum 1350 mm
Notching of the jamb studs not permitted
Multiple sections to be nail laminated as per AS 1684
Provide 1 full length stud plus 1 secondary Jamb Stud to Detail H19

Notes for interpretation of serviceability data

- "average deflection" is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS/NZS 1170, AS 1684.1 and AS 1720. Deflections calculated using this methodology cannot therefore be usefully compared with deflections calculated using other methods, eg GLTAA design methodology.
- Deflection is the flexural response to load – 'out-of-level' measurements of installations are not necessarily deflections and can incorporate 'initial out-of-straightness', whether intended or not. Furthermore, loads can be higher/lower than the notional estimate and in any comparison with measured levels, material variability needs to also be considered. AS 1720 gives the following basis for estimation of upper bound deflections for various materials.

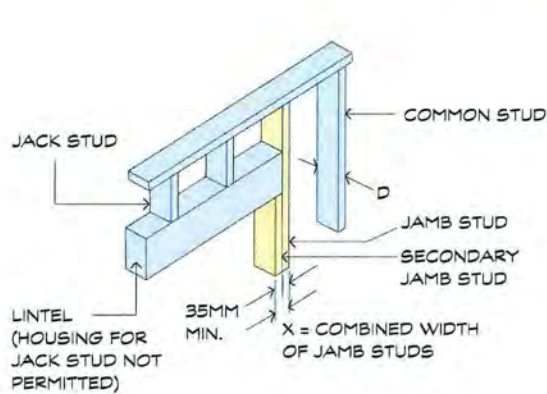
No 1 Framing – visually graded to NZS 3631	Average + 100%
SG grades – mechanically graded to AS/NZS 1748	Average + 43%
GL grades for glulam to AS/NZS 1328	Average + 33%
LVL to AS/NZS 4357 (includes hySPAN and hyJOIST)	Average + 18%

As can be seen, comparison of the 'average deflection' for different materials, even if calculated on the same basis, does not give the whole picture!
- The limits referred are those specified in AS 1684.1 for the stated load case.
- 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements of AS 1684.1

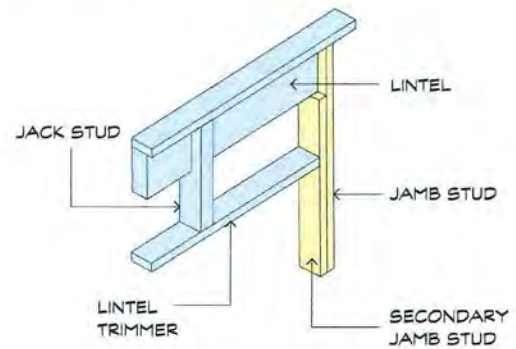
Notes for interpretation of reaction data

- Duration of load factor ' k_1 ' for strength as per NZ 3603:1993
- Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support
- Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
- End reaction includes allowance for overhang/cantilever where one has been designed

Multiple Stud Configuration



LINTELS HAVING BREADTH GREATER
THAN HALF STUD DEPTH



LINTEL DIRECTLY BELOW TOP PLATE

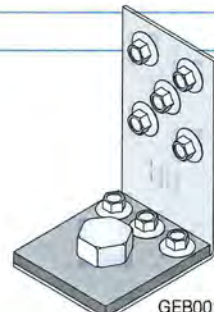
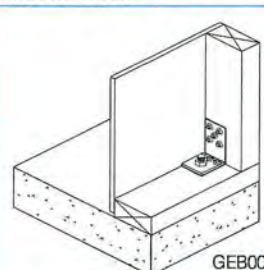
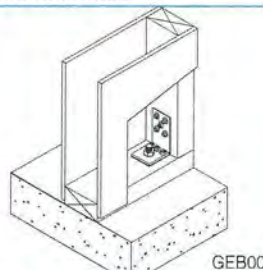
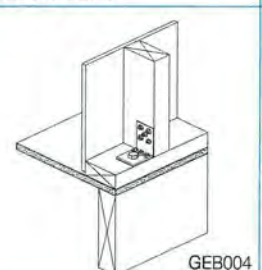
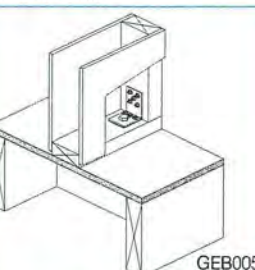
DETAIL H19



Bottom plate fixings for GIB® Bracing Elements			
Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm washers, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3 / 90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011
GS2-N	Not applicable		
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011. In addition: GIB Handibrac® fixings or metal wrap-around strap fixings and bolt as illustrated on pages 19 and 20.		Pairs of 100 x 3.75mm flat head hand driven nails or 3 / 90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011.
BLG-H	Not applicable	As for GSP-N, BL1-H, BLP-H on concrete slab above	In addition: GIB Handibrac® fixings or metal wrap-around strap fixings and bolt as illustrated below.



Panel Hold-down Details

GIB HandiBrac® – RECOMMENDED METHOD			
Developed in conjunction with MiTek™ NZ, the GIB HandiBrac® has been designed and tested for use as a hold-down in GIB® BL and GSP bracing elements. • The GIB HandiBrac® registered design provides for quick and easy installation • The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps • The GIB HandiBrac® is suitable for both new and retrofit construction • The design also allows for installation and inspection at any stage prior to fitting internal linings			 GEB001
Concrete Floor		Timber Floor	
External walls	Internal walls	External walls	Internal walls
 GEB002	 GEB003	 GEB004	 GEB005
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate		Position GIB HandiBrac® in the centre of the perimeter joist or bearer	
Position GIB HandiBrac® at the stud / plate junction		Position GIB HandiBrac® in the centre of floor joist or full depth solid block	
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN.		12x150mm galvanised coach screw	

Refer to gib.co.nz/cad for CAD details.



Bracing strap Installation

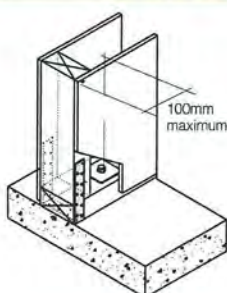
Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard. It should be positioned in such a way that the important corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the important corner fastenings to be installed without having to penetrate the bracing strap.

Concrete Floor

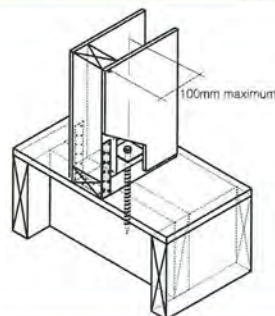
Timber Floor

400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30x2.5mm flat head galvanised nails to each side of the stud. Three 30x2.5mm flat head galvanised nails to each side of the plate. Hold down bolt to be fitted within 100mm of the end of the element.

Internal wall

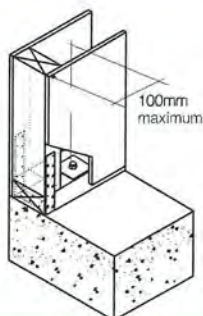


GEB006

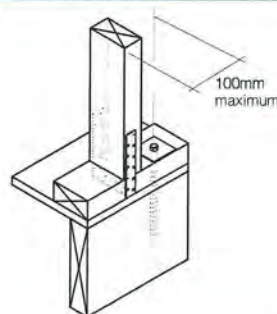


GEB007

External wall



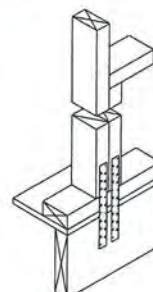
GEB008



GEB009

NB: where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at the web address gib.co.nz/cad

2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.



GEB010

Hold-down fastener requirements

Concrete floor

Timber floor

A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50x50x3mm square washer within 100mm of the ends of the bracing element.

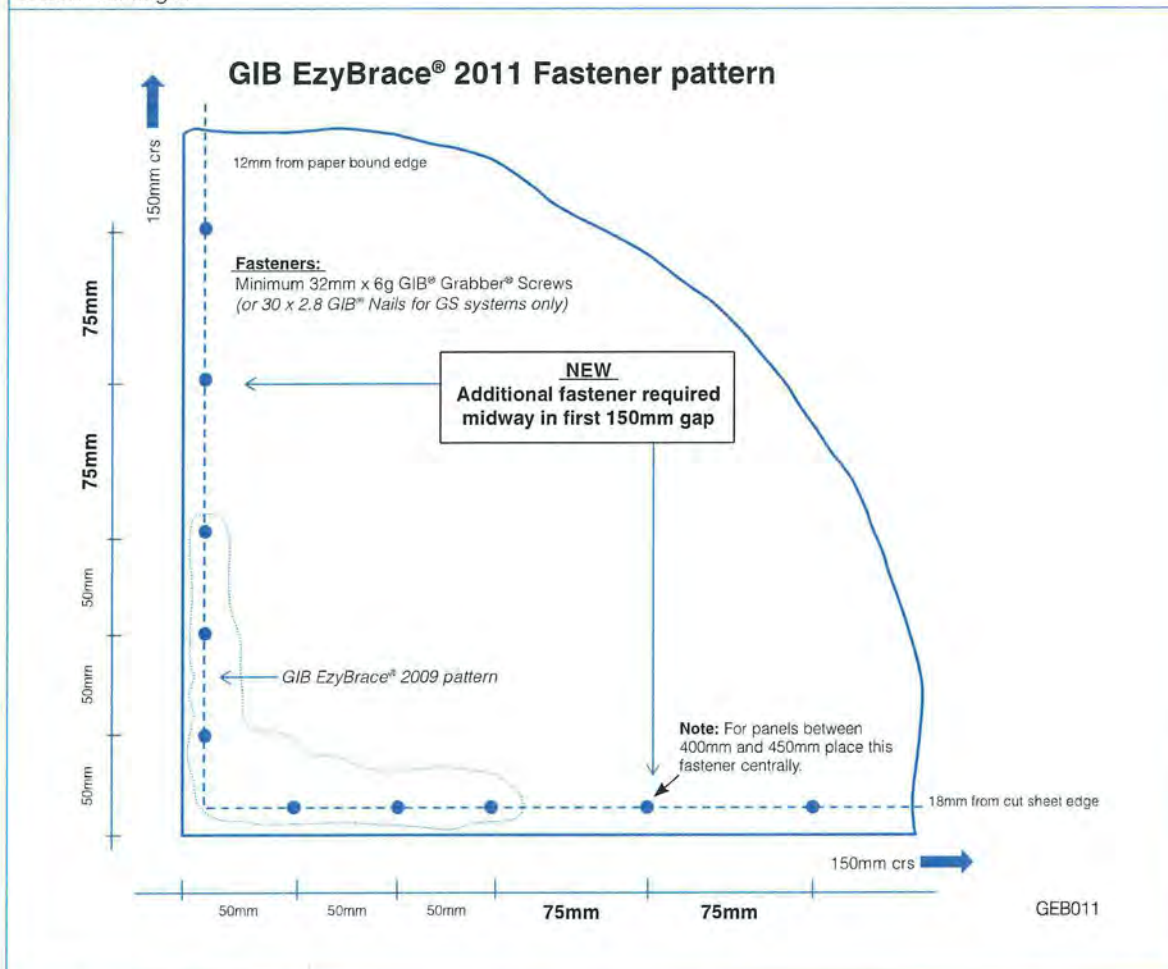
12x150mm galvanised coach screw fitted with a 50x50x3mm square washer within 100mm of the ends of the bracing element

Refer to gib.co.nz/cad for CAD details.

Revised Fastener Pattern for *all four corners* of GIB EzyBrace® Elements

As GIB Braceline® screws are no longer required for BL bracing elements, two additional fasteners must be installed in ***all four corners*** of GIB EzyBrace® GS and BL elements, as shown.

Fasteners must be placed no closer than 12mm from the paper bound sheet edge and no closer than 18mm from sheet ends or cut edges.



Refer to gib.co.nz/cad for CAD details.

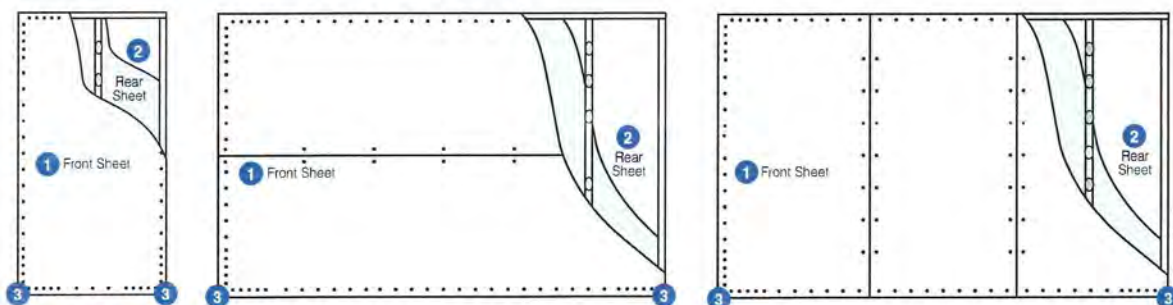
PERMITTED GIB® PLASTERBOARD SUBSTITUTIONS IN GIB EZYBRACE® SYSTEMS

GIB Ezybrace® Systems have been designed and tested using only the products specified. Occasionally additional properties may be required to be provided by a different GIB® Plasterboard product. The following table provides acceptable substitution options.

Specified	Permitted alternative GIB® Plasterboard products					GIB Fyrelite®			
	GIB® Standard	GIB Ultralite®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	OK	NOTE 2		
GIB Braceline®	X	X		NOTE 1	OK	X	NOTES 1 and 2		

NOTE 1 The element must be 900mm or longer. Use 32mm x 6g GIB® Grabber® drywall screws at **100mm** centres to the perimeter of the bracing element. The bracing corner fastening pattern, as illustrated above, applies to all four corners of the element. Panel hold-down fixings are required.

NOTE 2 The fastener type and length must be as required for the relevant FRR system but the fixing pattern must be as shown above.



System	Lining one side ①		Lining opposite side ②		Panel Hold-Down Fixings ③	Fastener spacing
	Lining	Fasteners	Lining	Fasteners		
GS1-N	Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or	Not required	Not required	Not required	GIB® Plasterboard Corner fastening pattern as illustrated above Fasteners at 150mm to bracing element perimeter, and: - at 300mm centres to intermediate sheet joints for vertical fixing, or - at stud / sheet junction for horizontally fixed elements, and - GIBFix adhesive daubs at 300mm crs to intermediate framing
GS2-N		minimum 32mm x 6g GIB® Grabber® high thread screws	Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or minimum 32mm x 6g GIB® Grabber® high thread screws		
GSP-H			Minimum 7mm Ecoply manufactured to AS/NZS 2269	50mm x 2.8mm Flat head galvanised or stainless steel nails		
BL1-H	10mm or 13mm GIB Braceline®	minimum 32mm x 6g GIB® Grabber® high thread screws	Not required	Not required	Yes, see Pages 19 and 20	Plywood Fasteners at 150mm around the perimeter of every sheet and at 300mm centres to intermediate studs. Place fasteners no closer than 7mm from sheet edges. Plasterboard corner fastener pattern does not apply to plywood.
BLG-H			Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or minimum 32mm x 6g GIB® Grabber® high thread screws		
BLP-H		GIB Braceline® Nails may be used for 10mm GIB Braceline® ONLY	Minimum 7mm Ecoply manufactured to AS/NZS 2269	50mm x 2.8mm flat head galvanised or stainless steel nails		



Specification Code	Minimum Length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard Plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING**Timber Floor**

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or

Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor**INTERNAL WALL BRACING LINES**

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

EXTERNAL WALL BRACING LINES

In accordance with the requirements of NZS 3604 for external plate fixing.

WALL LINING

Any 10mm or 13mm GIB® Plasterboard lining.

Sheets can be fixed vertically or horizontally.

Sheet joints shall be touch fitted.

Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING**Fasteners**

32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB® Nails.

Fastener centres

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.

For vertically fixed sheets place fasteners at 300mm centres to intermediate sheet joints.

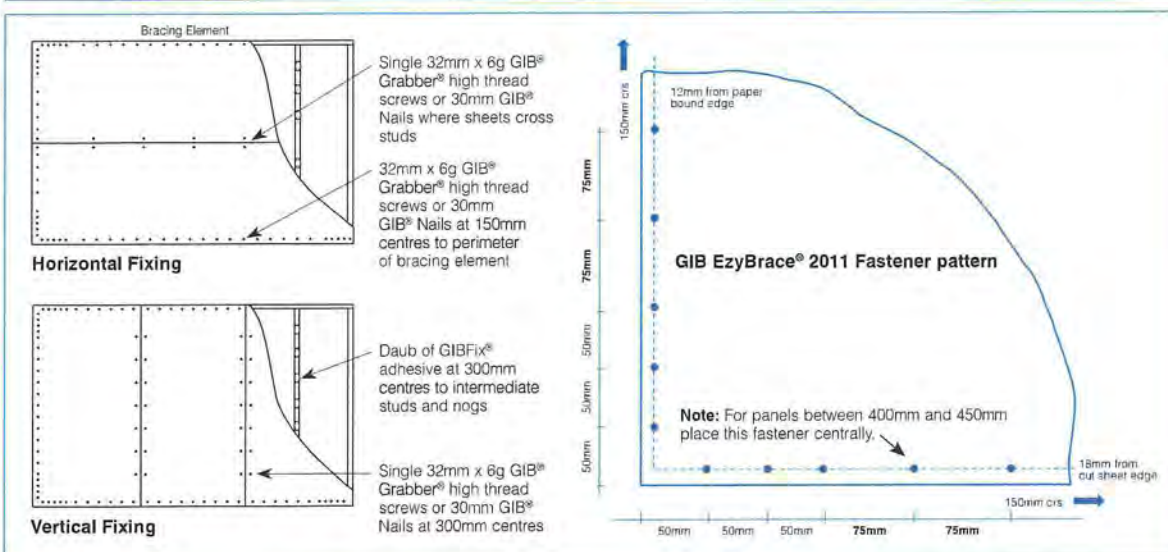
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.

Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



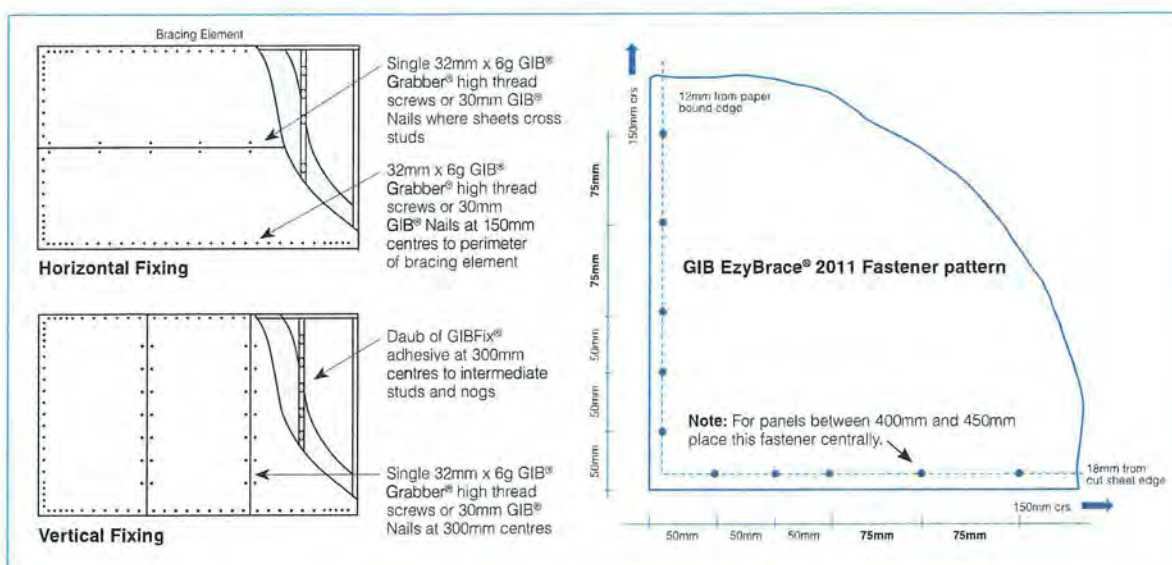
In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).





Specification Code	Minimum Length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard Plasterboard fixed to each side of the wall framing.

WALL FRAMING Wall framing to comply with; - NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011) - NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602) Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended. BOTTOM PLATE FIXING Timber Floor Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15 nails at 600mm centres. Concrete floor INTERNAL WALL BRACING LINES In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter. WALL LINING One layer 10mm or 13mm GIB® Plasterboard to each side of the wall. Sheets can be fixed vertically or horizontally. Sheet joints shall be touch fitted. Use full length sheets where possible.	PERMITTED SUBSTITUTION For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB® Ezybrace Systems 2011. FASTENING THE LINING Fasteners 32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB® Nails. Fastener centres 50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. JOINTING All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.
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In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).





Specification Code	Minimum Length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm Ecoply to the other side	Hold downs

WALL FRAMING

Wall framing to comply with:

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

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

BOTTOM PLATE FIXING**Timber floor**

Use panel hold downs at each end of the bracing element. The GIB® HandiBrac is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or

Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604.

WALL LINING

One layer 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm Ecoply construction plywood manufactured to AS/NZS 2269:2004 to the other side. Plasterboard sheets can be fixed vertically or horizontally. Plywood is to be fixed vertically with edges supported. Sheet joints shall be touch fitted. Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING**Fasteners***GIB Braceline® side*

32mm x 6g GIB® Grabber® high thread screws.
(GIB Braceline® Nails may be used with 10mm GIB Braceline® only)

Plywood

50 x 2.8mm Galv or Stainless steel FH nails.

Fastener centres*GIB® Plasterboard side*

50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element.

For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints.

For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

Use daubs of GIB®Fix adhesive at 300mm centres to intermediate studs.

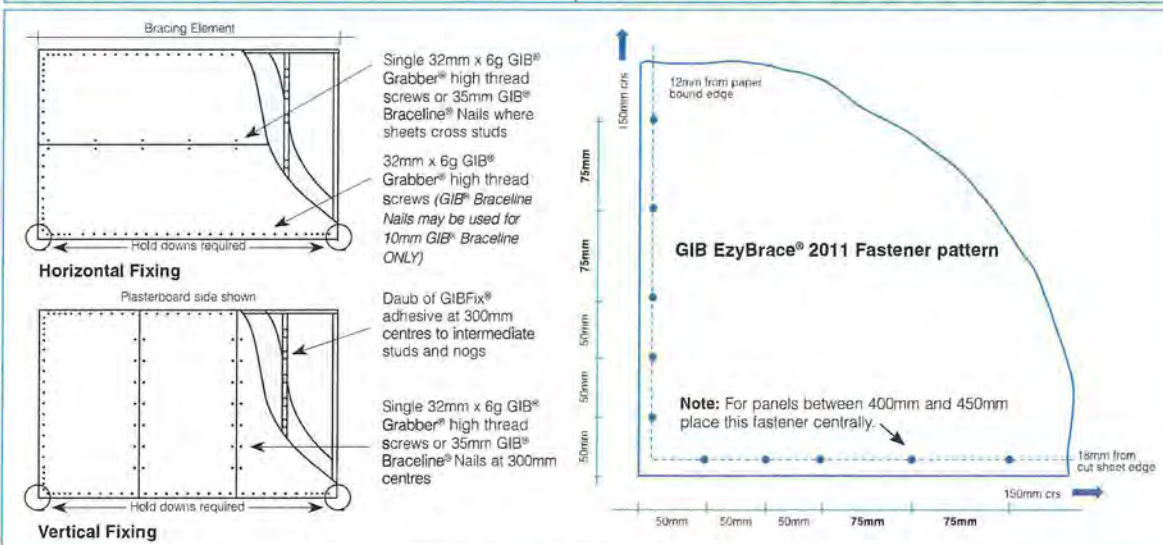
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

Plywood side

150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).





H1 Compliance Calculator

Save Project

Close without Save

Report



Got Questions? Check out the [Design Navigator message board](#). I encourage you to use it to share experiences using the Design Navigator or any other solar design issues.

Project ID: 80493

User Name: Nicola Davis A1

Company: I Design Architecture

Project Name: UBAW461 Dent & Lott

Client: Mr Dent & Ms Lott

Lot No: 20

Comment:

Select the Building Location: Wellington This is in Climate Zone 2

Building Design

Please enter floor, wall, window and roof dimensions and R-values. You have the options shown below. Once you have started entering data using a graphical method the non-graphical options will be disabled, and vice versa.

CSV File

Import a comma delimited text file (.txt or .csv) that contains the building element dimensions and R-values. Click [here](#) to download a sample CSV file. You can produce these files using a text editor like Notepad or a spreadsheet like MS Excel using the "save as..." function. If you import the data you can modify them afterward in the Design Navigator design editor. [i](#)

Upload CSV File

Revit or ArchiCAD
gbXML File

Directly import the element dimensions via a gbXML file (.xml) generated by a CAD program such as Revit or ArchiCAD. To find out more about the Revit gbXML export process refer to the [Revit Architecture 2010 User's Guide](#) under the topic "Interoperability-> Export-> Exporting Your Design to gbXML". Also check out Tim West's quick [Userguide](#) for importing Revit generated gbXML files and the comments on the Design Navigator message board (Thanks Tim!). Please add the component R-values manually using the Design Navigator design editor after you imported the element dimensions. **Important notice:** DesNav imports all ceilings, including lower storey ceilings in multi-story buildings. Please delete all internal ceilings manually after the gbXML file has been imported! [i](#)

Upload gbXML File

Manually using the in-built design editor Click the three edit-buttons below to enter or modify the values manually using the in-built design editor.

Edit Floor Details

Edit Wall and Window Details

Edit Roof and Skylight Details

BPI Calculation

The following three values are required for BPI calculations only.
Please use the BPI calculation only for complete buildings and not for addition/extensions.

Total Living Floor Area [i](#): 137.59

Average Room Height: 2.4

Thermal Mass [i](#): Medium weight Slab floor with some carpeting or direct glued timber, timber framed walls.

1. Permitted Compliance Methods

Floor Area [i](#) 137.6
net Wall (N) Area [i](#) 0
Windows (N) Area [i](#) 0
net Wall (E, S and W) Area [i](#) 0
Windows (E, S and W) Area 0
Roof Area [i](#) 137.6
Skylights Area [i](#) 0

The following compliance methods can be used to test compliance with NZS4218:2004.

NZS4218 Schedule Method [i](#) yes
NZS4218 Calculation Method [i](#) yes
NZS4218 Modelling Method yes
Building Performance Index (BPI) yes

2. Performance Targets

The house has to meet ONE of the following targets.

Schedule Method

The house must have R-values of at least:

Non-Solid Construction		
	Permitted Minimum	Proposed Minimum
Floor:	1.3	1.38
Non-solid Walls:	1.9	
Glazing in Non-solid Walls:	0.26	
Roof:	2.9	2.88
Skylights:	0.26	

Calculation Method

The house must meet the following two conditions:

The building must have a heat loss smaller than: 153 W/°C [i](#)

Your design currently has a heat loss of 147 W/°C ✓
and
 all the individual components must have at least the following R-values:

	Permitted Minimum	Proposed Minimum	
Floor:	<u>0.8</u>	<u>1.38</u>	✓
Non-solid Walls:	<u>1.1</u>	—	✓
Glazing in Non-solid Walls:	<u>0.15</u>	—	✓
Roof:	<u>1.7</u>	<u>2.88</u>	✓
Skylights:	<u>0.15</u>	—	✓

Modelling Method

Use an energy simulation program to show that the heating energy for the proposed building is smaller than that for the reference building.

Building Performance Index

If the BPI does not exceed 1.55 kWh/DegMonth.m² the building complies.

Your design has a BPI of 2.18.

Please refer to [BPI Correlation.pdf](#) regarding the recognition of the BPI for NZBC compliance verification. An alternative BPI calculation tool is the [BRANZ](#) ALF software.

3. H1 Compliance

The building complies with the ticked ✓ compliance methods. [i](#)

NZS4218 Schedule Method ☒

NZS4218 Calculation Method ☒

NZS4218 Modelling Method ☐

Building Performance Index ☒

The building complies with NZS4218:2004 or the BPI and therefore with NZBC Clause H1.

4. E3 Compliance

Component	Minimum permitted R-value	H1 R-value i	Project R-value i	
For light timber frame wall or other framed wall constructions with cavities	<u>1.5</u>			☐
For single skin normal weight masonry based wall construction without a cavity	<u>0.6</u>			☐
For solid timber wall systems no less than 60 mm thick	<u>0.6</u>			☐
For roof or ceilings of any construction	<u>1.5</u>	<u>2.88</u>		☐

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This tool was created by [Design Navigator Ltd.](#)



Water Demand Management Declaration of Compliance

This form is to be submitted with all applications for a Project Information Memorandum/Building Consent for new or relocated dwellings on land zoned residential.

Address: 11 Matahi St, Waikanae

Number of dwellings: ONE

Building Consent Number: _____

(Office Use Only)

Water Demand Management solution

1. All dwellings the subject of this development will use one of the following water demand management solutions in accordance with the District Plan (please tick one box):

- ☒ Rainwater storage tanks with a total storage volume of not less than 10,000 litres (does not include air cavity between the lid and overflow), for each house in the development
- ☐ Rainwater storage tanks with a total storage volume of not less than 4,000 litres (does not include air cavity between the lid and overflow), for each house in the development, and a complying greywater diversion device
- ☐ The application is made with an alternative solution (note that resource consent will be required)
- ☐ The application is made without provision for water demand management (note that resource consent will be required)

2. For all applications where Water Demand Management will be provided:

a. Volume of rainwater storage tanks:

10,000 LTRS.

b. I confirm all the following:

- ☒ That the rain water tank volume complies with selected water demand management option and have provided a **certificate from the manufacturer** demonstrating the tank volume
- ☒ That there will be no direct connection from the reticulated water supply to any outside taps
- ☒ That there will be a direct connection from the rainwater storage tanks to all internal toilet cisterns and any external taps
- ☒ That there will be no direct connection from the reticulated water supply to any toilet cistern
- ☒ I understand that the toby or manifold may have to be modified at my expense



I have completed KCDC Form 159: "Water Supply Connection / Alteration Application Form". An applicant is required to submit this form to KCDC Water & Wastewater Team if a new water connection or alteration of existing connection is required.

3. For applications where a Greywater Diversion Device is to be installed

a. Size of disposal field:

(Note that this needs to be marked on the site plan or the plumbing and drainage plan submitted to Council).

b. I confirm the following:

- ☐ That greywater will be collected from all laundry and bathroom drains (excluding toilets) and channelled to a greywater diversion device for use in outdoor irrigation.
- ☐ The greywater worksheet is attached and confirms that greywater diversion is suitable on the lot.
- ☐ That the device will be installed by an approved installer and that a certificate demonstrating this will be available to Council on request after installation.

Name:

Alan Wood (AI homes)

Signed:

AJ Wood.

Date::

19/11/15.

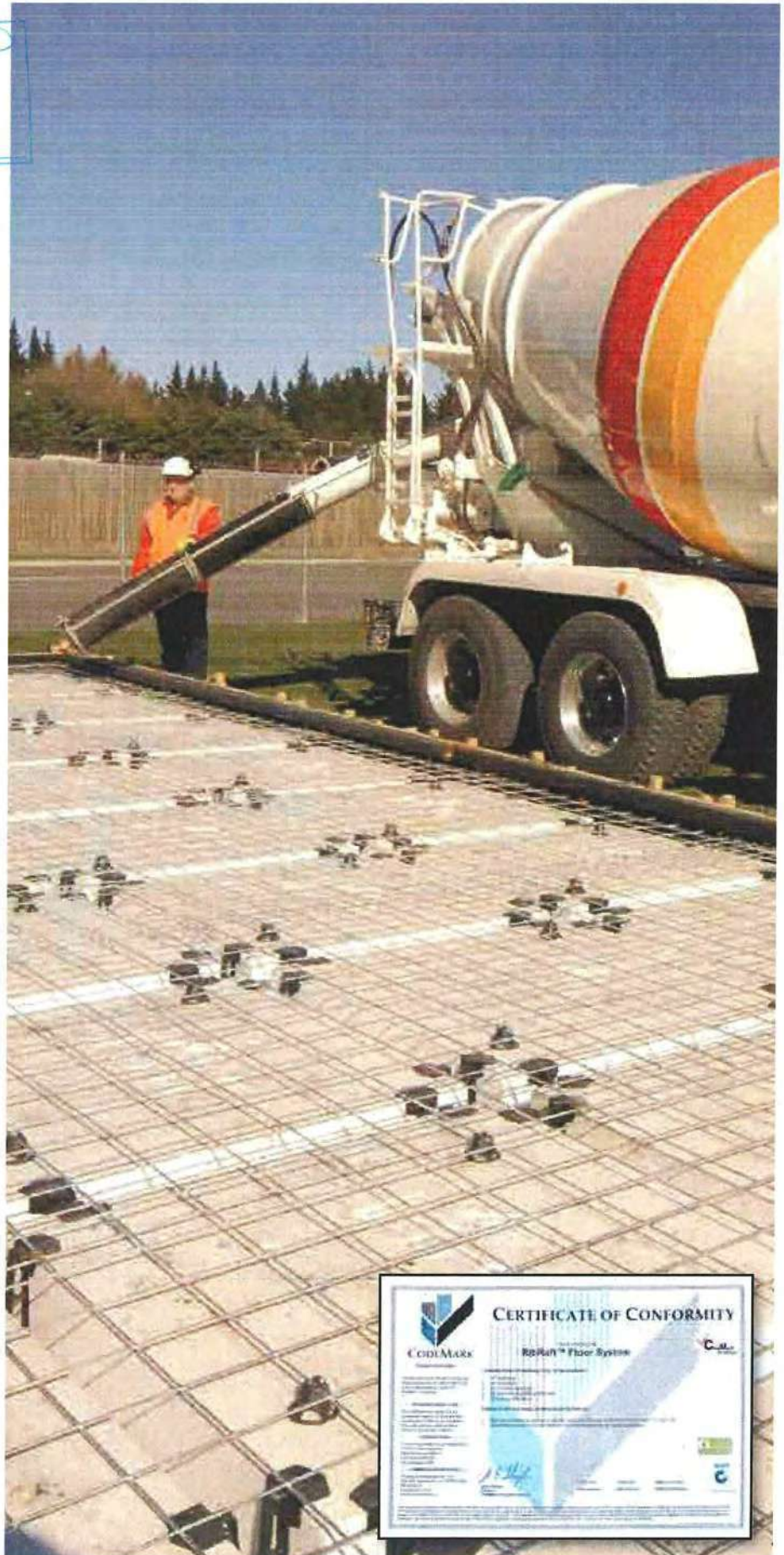


RIBRAFT® TECHNICAL MANUAL

CBI 3100/3111/3112/4711
JAN 2012



00040
RECEIVED
20 NOV 2015
BY: *Sm*



INSTRUCTIONS ON THE USE OF THIS MANUAL

This Manual consists of three Sections:

Section 1: Firth RibRaft Floor System Design Information

Section 2: Firth RibRaft Floor System Installation Information

Section 3: Firth RibRaft Floor System Verification

Section 1 contains information principally useful for the specifier or building designer. Section 2 is primarily aimed at the person on site installing the Firth RibRaft Floor system. While Section 3 describes the required verification checks.

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

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

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

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

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FIRTH RIBRAFT FLOOR SYSTEM

SECTION 1: DESIGN INFORMATION

1 GENERAL

This Section of this Manual contains design information not requiring specific engineering input for the Firth RibRaft Floor System (the system). Full information on the installation procedures is described in Section 2 of this Manual (Installation Information). Where Standards are referenced in this manual, these shall include the latest amendments.

2 TECHNICAL DESCRIPTION

2.1 Overview

The Firth RibRaft Floor System is a reinforced concrete waffle raft floor slab-on-ground. It consists of an 85mm thick slab supported by a grid of ribs normally 100mm wide at 1200mm x 1200mm centres. The overall depth is 305mm. Edge beams and ribs under load bearing walls are 300mm wide to provide for the extra load carried by these members. Where heating coils of less than 25mm diameter are embedded in the topping, the slab concrete thickness shall be 110mm meaning the overall thickness is 330mm.

2.2 Pods

Firth RibRaft polystyrene pods 1100mm square and 220mm thick are placed directly on levelled ground and are arranged in such a way as to form a reinforced concrete floor slab with a grid of reinforced concrete ribs and edge beams when concrete is placed onto them. Pods may be cut to suit specific architecture layout and also to accommodate services. [300mm thick pods are available if needed for deeper edge beams and internal ribs for construction following specific engineering design. Such uses are outside the scope of this document.]

2.3 Steel

Reinforcing steel in the slab shall consist of Welded Reinforcing Mesh complying with AS/NZS 4671:2001 with a minimum weight of 2.27kg/m², a lower

characteristic stress of 500MPa, square configuration of orthogonal bars between 150 to 300mm centres, and ductility class L or E, hereafter referred to as "665 mesh, or mesh". The reinforcing bars in the ribs and edge beams shall conform to AS/NZS 4671:2001 "Steel Reinforcing Materials". Specifically designed spacers are used to position the polystyrene pods and the rib and edge beam reinforcing steel bars in a secure manner until the concrete is placed. The reinforcing mesh is held in place by mesh chairs. Conventional timber or steel formwork is used to form the edge of the slab.

2.4 Concrete

One of the following Firth concrete products shall be used in the system:

- 1) Raftmix – a 20MPa 100mm slump structural mix available in either a 13mm or more usually a 19mm nominal aggregate size. This mix is normally placed in the floor straight from the concrete truck chute and if necessary by wheelbarrow over planks set up over the pods.
- 2) Raftmix Pump – a 20MPa 100mm slump pump mix available in either a 13mm or more commonly a 19mm nominal aggregate size. The selection of aggregate size may be determined either by the capability of the available concrete pump or by the concrete placer's preference.

The exception being for buildings constructed in the 'sea spray zone' (i.e. within 500m of the sea including harbours, within 100m of tidal estuaries or inlets, on offshore islands and elsewhere as defined as exposure zone D in 4.2.3.3 of NZS3604) in which case one of the following Firth concrete products shall be used in the system:

- 1) Raftmix25 – a 25MPa 100mm slump structural mix available in either a 13mm or more usually a 19mm nominal aggregate size. This mix is normally placed in the floor straight from the concrete truck chute

and if necessary by wheelbarrow over planks set up over the pods.

- 2) Raftmix Pump25 – a 25MPa 100mm slump pump mix available in either a 13mm or more commonly a 19mm nominal aggregate size. The selection of aggregate size may be determined either by the capability of the available concrete pump or by the concrete placer's preference.

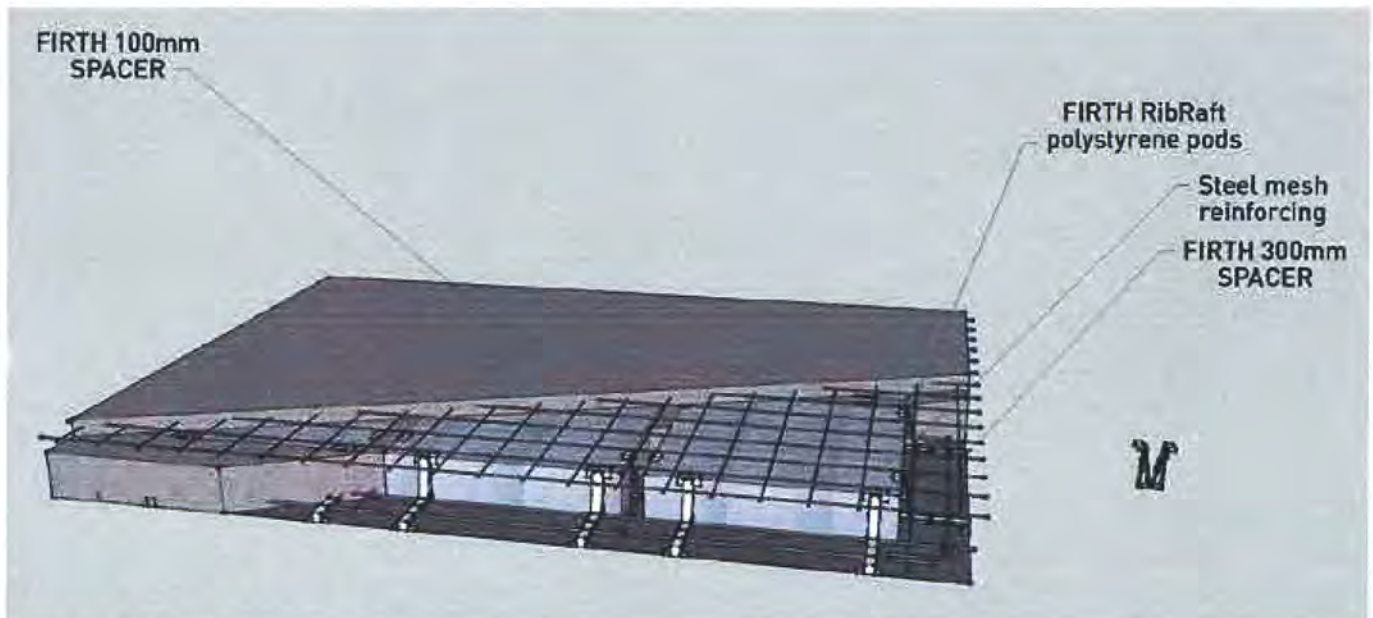


Figure 1 *The RibRaft System*

3 SCOPE

This Clause sets out the limitations that apply to the use of the system to ensure that specific engineering input is not required. The concrete floor slab for buildings or ground conditions that do not meet this scope must be subjected to specific engineering design to comply with the requirements of the New Zealand Building Code.

3.1 Structure Limitations

Specific engineering input shall not be required only where the structure supported by the system complies with the following criteria:

- The structure supported by the system is constructed in a location where the Seismic Hazard Factor Z (defined in NZ1170.5) is less than or equal to 0.45 (refer to figure 6).
- The system is laid level, and is not stepped.
- The structure supported by the system has no basement, part basement or foundation walls.
- The total height from the lowest ground level to the highest point of the roof shall not exceed 10m.
- The structure supported by the system has a roof pitch limited to 60 degrees maximum from the horizontal.
- The maximum height of each storey of the structure supported by the system is 3m.
- Only ground floor walls of the structure supported by the system are permitted to be "heavy external walls" (as defined in Clause 3.3).
- The roof truss span shall be less than or equal to 12m when the roof and ceiling loads are supported entirely by the external walls.
- Where internal load bearing walls are used to support the roof or floors, the loaded dimensions stated in Tables 8.2 and 14.10 of NZS3604:2011 shall apply, and the load bearing wall shall be supported on a 300mm wide load bearing rib as detailed in this manual.
- Floors may be of unlimited size provided that the maximum dimension between free joints shall not exceed 30m. Where free joints are required they should be detailed in accordance with NZS3604:2011.

3.2 Live Loading

The live loading cases of structures covered by these designs are:

- 1.5kPa and 3.0kPa as per NZS 3604:2011 "Timber Framed Buildings".
- 13kN concentrated load in garage over area of 0.3 x 0.3m (vehicle limited to 2500kg gross).

3.3 Dead Loading For Use With This Manual

The dead load cases of structures covered by these designs are:

- Light external walls with total mass not exceeding 60kg/m² – e.g. timber framing with weather boards and interior wall linings.
- Heavy external walls with total mass greater than 60kg/m² but not exceeding 290kg/m² – e.g. timber framing with masonry veneer or partially filled 20 series masonry blocks.
- Internal walls with total mass not exceeding 45kg/m² – e.g. timber framing and linings.
- Light roofs with total mass not exceeding 45kg/m² – e.g. ceiling linings and metal roof, including framing.
- Heavy roofs with total mass greater than 45kg/m² but not exceeding 85kg/m² – e.g. ceiling lining and concrete tiles or slates, including framing.
- Mid-floors with total mass not exceeding 60kg/m² – e.g. timber framing and flooring, including ceiling linings.
- Heavy internal walls and/or load bearing internal walls supported on a load bearing rib.

3.4 Building Types

The designs given in this Manual are limited to where the system supports Building Types A to D as described in Table 1. The classification of wall weights is as detailed in Clause 3.3 of this Section. Single and two storey shall be as defined in NZS 3604:2011.

Table 1 Building Identifier

Building Type	Description	Ground Floor External Walls	Second Storey External Walls
A	Single Storey	Light	
B	Single Storey	Heavy	
C	Two Storey	Light	Light
D	Two Storey	Heavy	Light

3.5 Foundation Soils

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

Where the ultimate bearing capacity required of the supporting ground is verified by Scala Penetrometer testing in accordance with Clause 3.3 of NZS 3604:2011. The bearing capacity shall be considered adequate when the number of blows per 300mm depth of penetration below the underside of the system at each test site, exceeds the values given in Table 2 below. For RibRaft foundations compliance with Table 2 allows ultimate bearing capacities of less than 300kPa. However, with the exception of bearing capacity all other requirements in NZS3604:2011 for "good ground" shall be complied with.

Table 2 Scala Penetrometer Blows Required For Determining Ultimate Bearing Capacity

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

3.6 Flow Diagrams

The flow diagrams on the following pages (adapted from NZS 3604:2011) will help in determining whether the non-specific details for the system can be used for the purposes of the concrete floor slab construction. There are two checks in the process. The first is to determine whether the proposed building complies with the requirements set out in this Manual (Building Check), and the second is to determine whether the site complies with the requirements set out in this Manual (Site Check).

(Note: NZS 3604:2011 provides for parts of buildings

to be considered as individual buildings. These flow diagrams apply to those parts of the building where slab-on-ground is being considered and where the part of the building can be considered as an individual building under NZS 3604:2011).

Figure 2 Building Check Flow Diagram

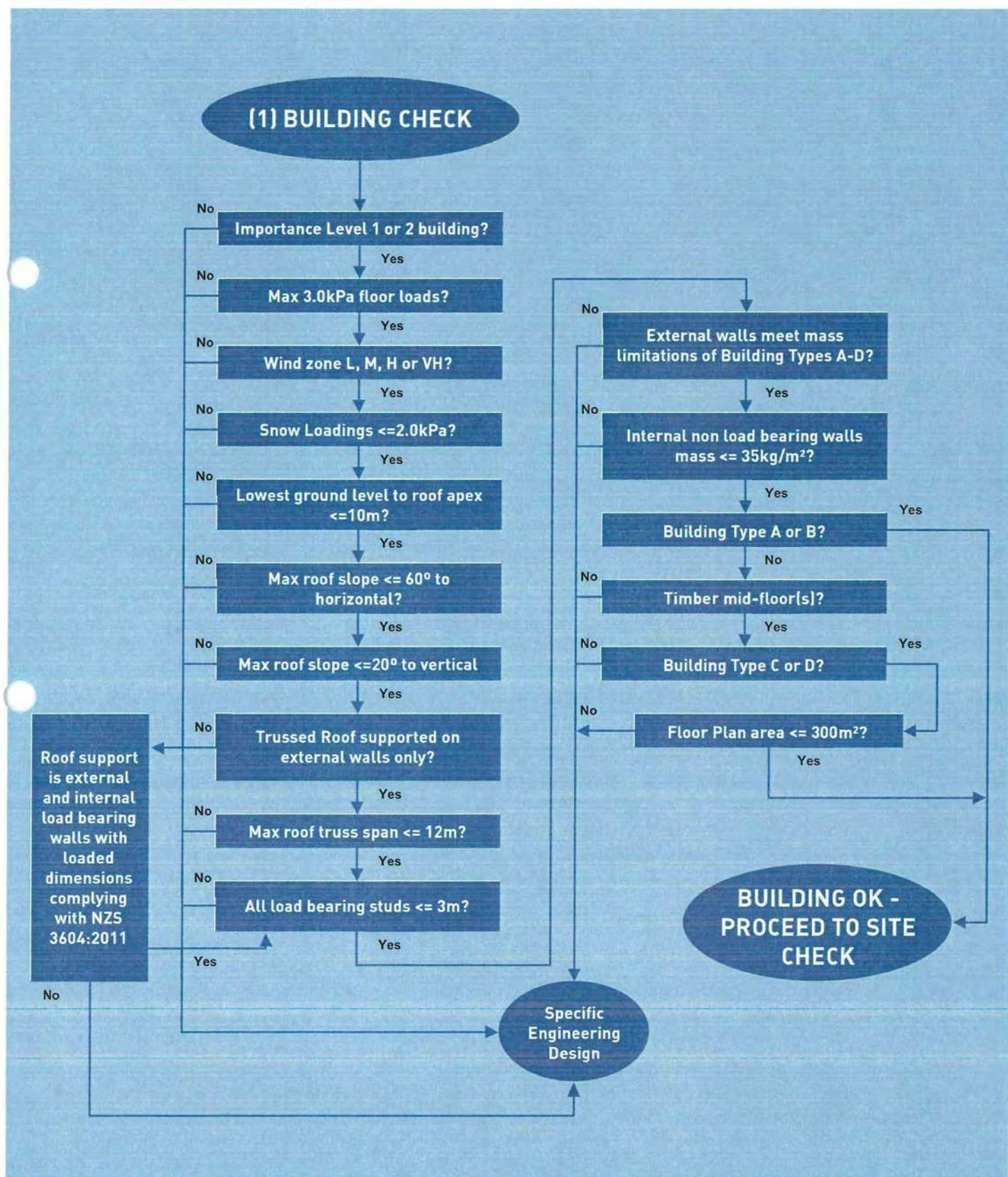
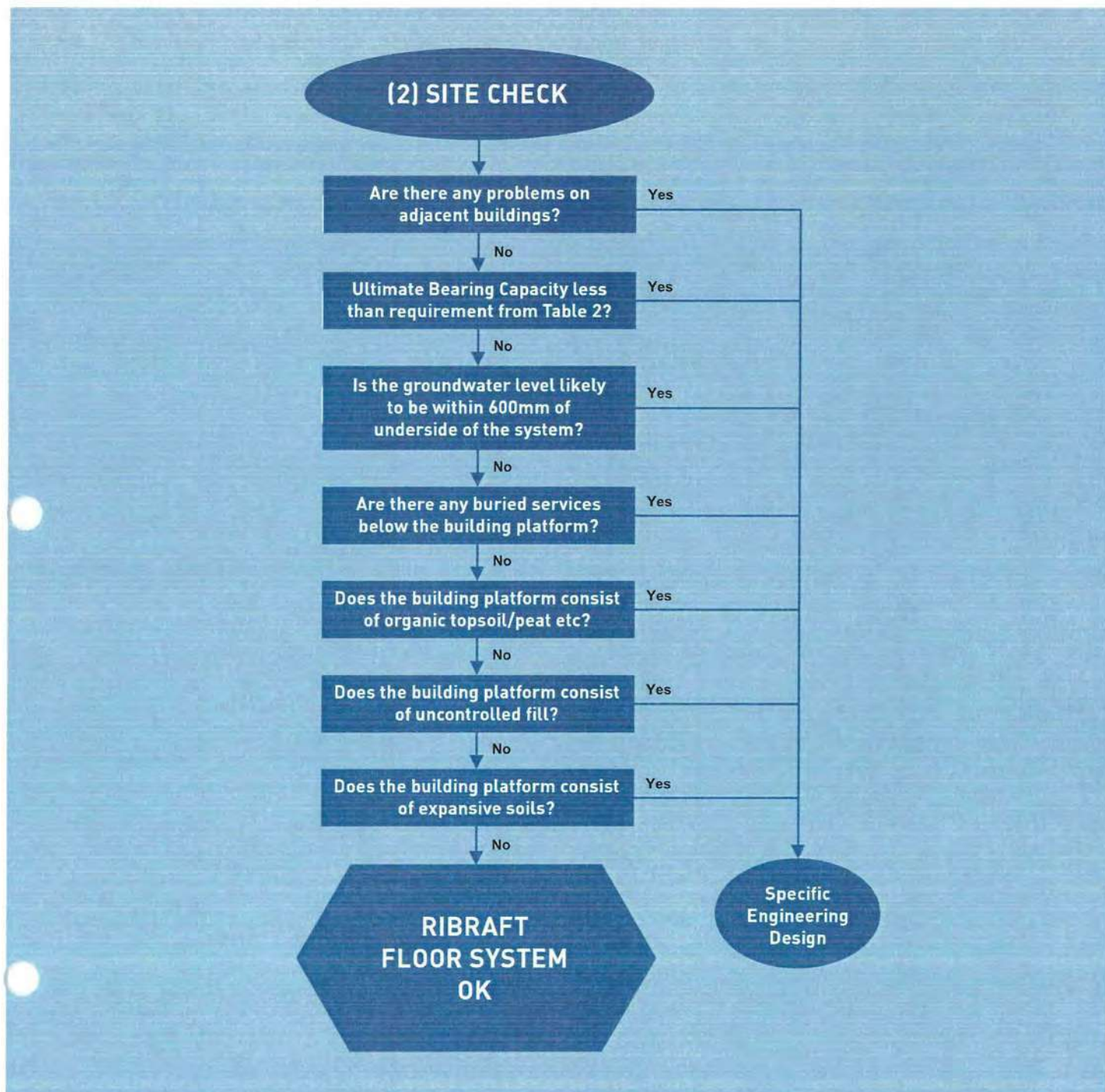


Figure 3 Site Check Flow Diagram



4 CONSTRUCTION DETAILS

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

4.1 Pod Layout

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

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

penetrations or orientation of beams and ribs.

Figure 4 below shows a typical layout of the pods and ribs. Note the part pods around the edge, where the building shape dictates, and adjacent to the 300mm rib.

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

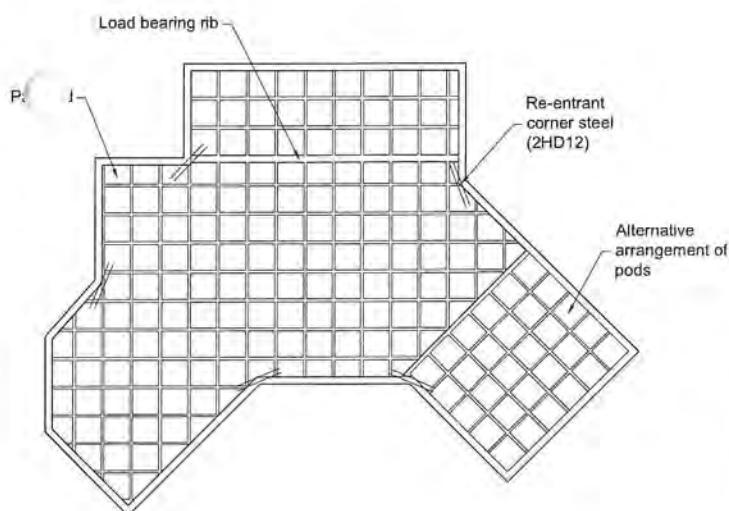


Figure 4 Typical RibRaft Plan

4.2 Edge Beam Width and Reinforcement

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

4.3 Internal Ribs (non load bearing) Width and Reinforcement

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

4.4 Internal Ribs (load bearing) Width and Reinforcement

For all load bearing walls and heavy internal walls, the pods shall be cut to create a 300mm wide rib directly under the load bearing wall, with 2-HD12 (Grade 500E) steel bars as bottom steel. Refer Figure 5(D) for construction details under load bearing walls.

Where the load bearing ribs meet and terminate at an edge beam or internal rib the bottom reinforcement from the load bearing rib shall be bent into the adjacent rib and tied together. The reinforcement shall lap for at least 720mm.

4.5 Mesh Reinforcement

The entire floor slab shall be reinforced with 665 Mesh supported on 40mm mesh chairs sitting on the polystyrene pods.

4.6 Re-entrant Corners

In order to limit cracking at the re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover from the internal corner – refer Figure 4.

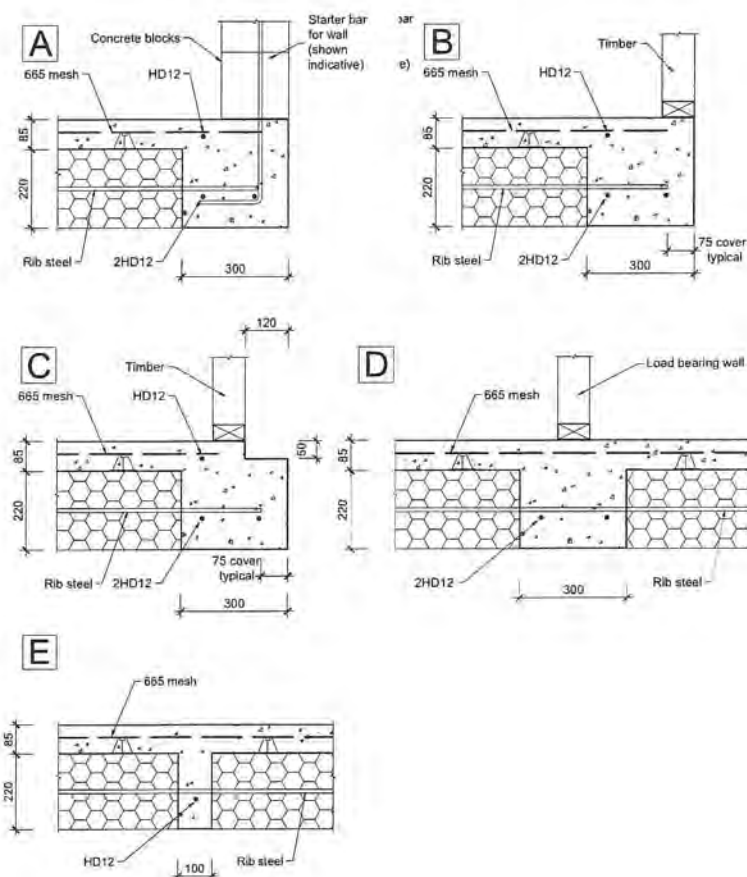


Figure 5 Standard RibRaft Construction Details

5 LATERAL RESISTANCE

5.1 Earthquake Resistance

Unlike conventional foundation systems, the Firth RibRaft system is not embedded into the ground. Sliding resistance to horizontal seismic loads is provided by frictional contact with the soil.

In locations where the Seismic Hazard Factor, Z is greater than 0.45, shear keys may be required to resist seismic loads. Such buildings require specific engineering design and are outside the scope of this document. Refer to figure 6.

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

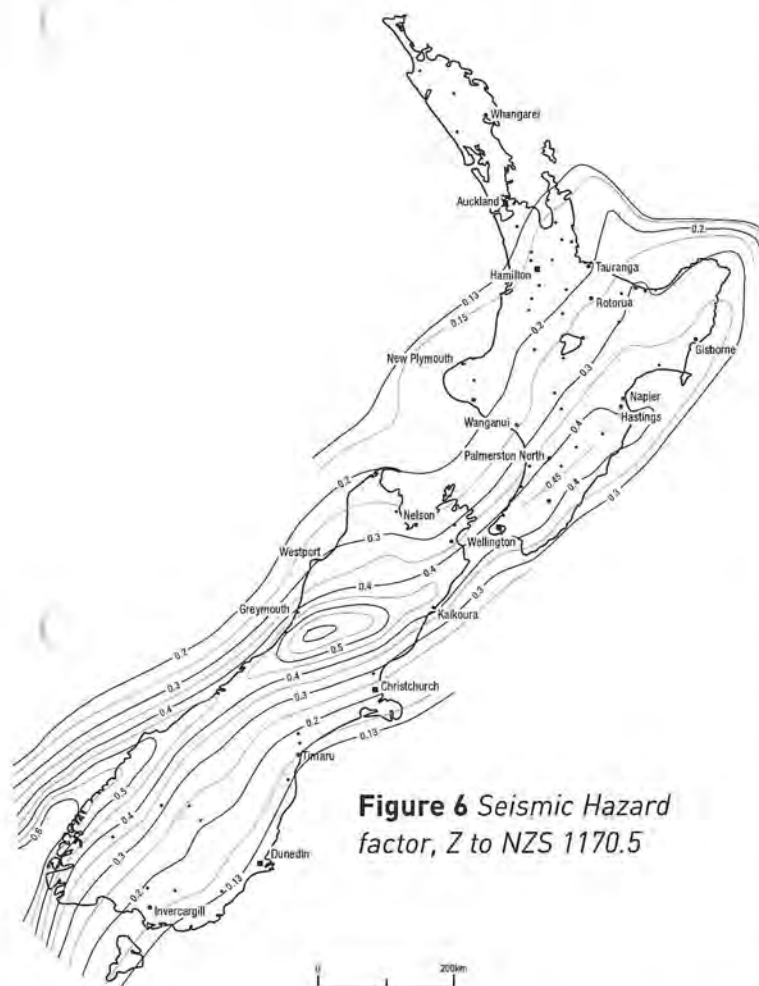


Figure 6 Seismic Hazard factor, Z to NZS 1170.5

For the purposes of this Manual, the ground shall be classified as clay or sand according to the following descriptions:

Clay: retains shape when moulded under hand pressure; may stick to boots and hands; cracks and becomes hard, but retains shape, when dried in direct sunlight; and when dug with a spade the cut vertical surface stands.

Sand: Individual particles visible to the unaided eye; when dry will run through the fingers and forms a conical mound if poured; when moist quickly dries out under direct sunlight; and when dug with a spade the vertical surface does not stand for long.

5.2 Wind Resistance

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

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

The bracing capacity provided by frictional resistance shall be determined from Table 6 depending on the building type, roof weight, and floor live loading.

The bracing capacity provided by the shear keys shall be the sum of the bracing capacity of the individual shear keys determined as follows. If the shear key is in clay, each shear key shall be considered to contribute 170 BU's. If the shear key is in sand, each shear key shall be considered to contribute 200 BU's.

If the bracing capacity of the system, determined from the frictional resistance and the shear keys as described above, is less than the bracing demand further shear keys shall be added until the bracing demand is met.

Building Type	Roof Type	BUs provided per 100m ² for live loading of:	
		1.5kPa	3.0kPa
A	Light	1150	1267
A	Heavy	1267	1383
B	Light	1800	1917
B	Heavy	1917	2033
C	Light	1617	1833
C	Heavy	1717	1950
D	Light	2267	2483
D	Heavy	2367	2600

Table 6 Bracing Capacity provided by Frictional Resistance per 100m² of ground floor area.

5.3 Shear Keys

Shear key piles required by Clause 5.2 must be uniformly distributed around the perimeter of the building, and be located at the edge beam/internal rib junction. Where a shear key is required, the minimum number of shear keys shall be two per floor plan. Where two shear keys are used they shall be placed at diagonally opposite ends of the floor plan.

Construction details of the shear keys shall be as shown on Figure 7 below. Shear keys shall be a minimum of 900mm long. The holes shall be over-drilled at least 100mm and a polystyrene RibRaft Shear Key Support placed into the bottom of each hole. This will support only the plastic (wet) concrete and then allow movement of the shear key if settlement of the supporting ground occurs. The effective end bearing of the shear keys is therefore eliminated.

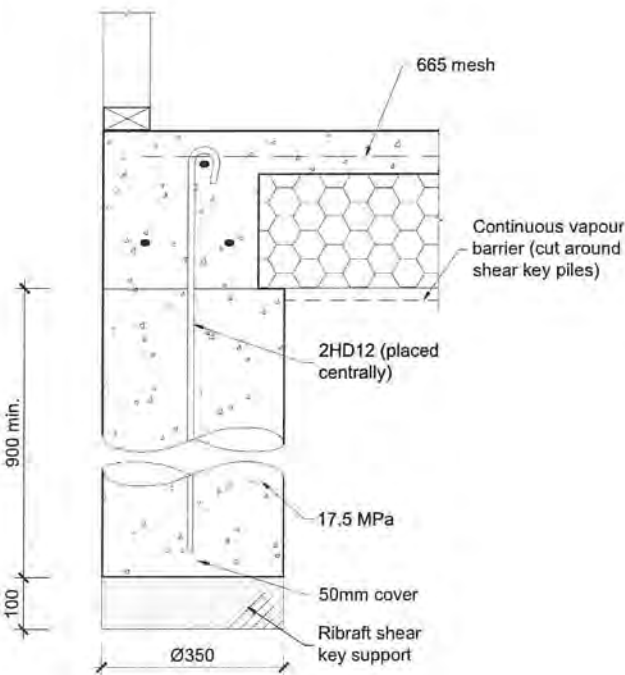


Figure 7 RibRaft Shear Key

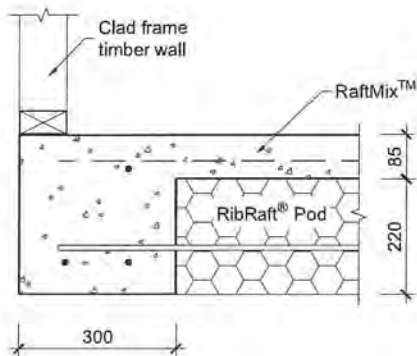
6 OTHER DESIGN DETAILS

6.1 R-Values

The insulation performance of a building element is measured by the "R-Value". The schedule method is the simplest method to achieve compliance with Clause H1 of the Building Code. Using this method the minimum R-Values required for floors are R1.3 for light timber frame construction, and typically R1.5 for masonry construction. R values of R1.3 can be used for masonry construction if glazing with greater insulation is used (refer NZBC, Clause H1). If in-floor heating is used the

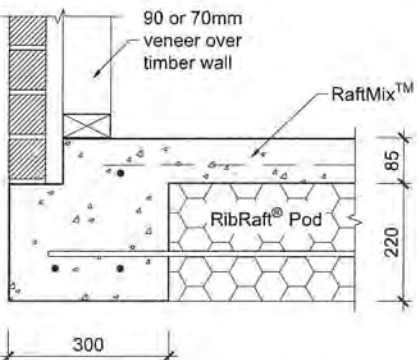
minimum required R-Value is increased to R1.9, and the resistance to thermal movement into the room must be one tenth of that to the outside environment.

The R-Value of a RibRaft floor is dependent on the floor area to perimeter ratio, and the details of the floor perimeter. The R-Value for various solutions are illustrated below. The R-Values have been independently calculated using NZS4214:2006 "Methods of Determining the Total Thermal Resistance of Parts of Buildings," though modified for perimeter heat loss using recommendations from the Building Research Establishment.



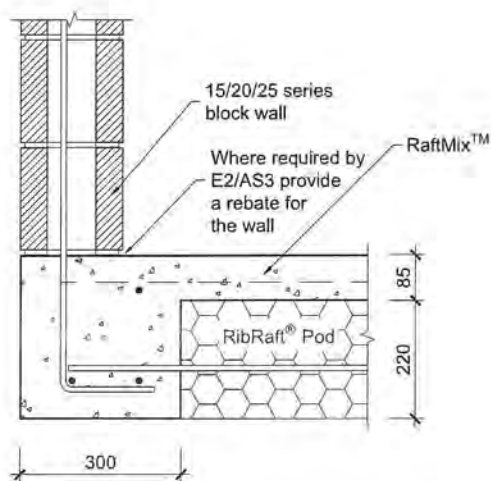
R-value m ² °C/W	Floor Area To Perimeter Ratio m ² /m									
	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
	1.48	1.52	1.64	1.75	1.86	1.97	2.07	2.17	2.38	2.57

Figure 8 RibRaft R-Values for 90mm thick walls on the floor edge.



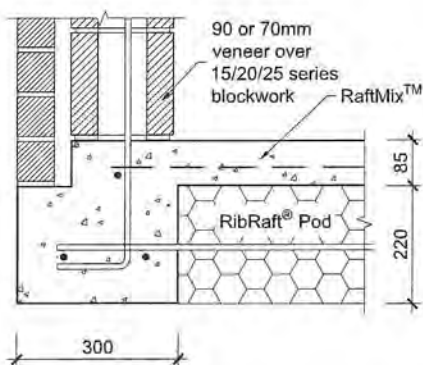
R-value m ² °C/W	Floor Area To Perimeter Ratio m ² /m									
	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
	1.54	1.67	1.80	1.93	2.05	2.17	2.28	2.40	2.62	2.84

Figure 9 RibRaft R-Values for 70-90mm thick veneer, cavity, and 90mm walls.



R-value $m^2 \text{ } ^\circ\text{C/W}$	Block	Floor Area To Perimeter Ratio m^2/m									
		1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
	15 series	1.48	1.60	1.73	1.85	1.96	2.08	2.19	2.30	2.51	2.72
	20 series	1.54	1.67	1.80	1.93	2.05	2.17	2.28	2.40	2.62	2.84
	25 series	1.59	1.73	1.86	1.99	2.12	2.24	2.37	2.49	2.72	2.95

Figure 10 RibRaft R-Values for various thicknesses of masonry walls.



R-value $m^2 \text{ } ^\circ\text{C/W}$	Block	Floor Area To Perimeter Ratio m^2/m									
		1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	4.00
	15 series	1.59	1.73	1.86	1.99	2.12	2.24	2.37	2.49	2.72	2.95
	20 series	1.64	1.78	1.92	2.06	2.19	2.32	2.44	2.56	2.81	3.04
	25 series	1.69	1.83	1.98	2.11	2.25	2.38	2.51	2.64	2.88	3.12

Figure 11 RibRaft R-Values for 70-90mm thick veneer, cavity, and various thicknesses of masonry walls.

6.2 Shrinkage Control

Shrinkage control joints reduce the risk of unwanted cracks, and their placement needs to be carefully considered where cracking could be unacceptable. Factors to consider are the type of floor finish, the location of ribs and ground beams, underfloor heating and the effect of piles restraining shrinkage. Shrinkage control joints shall be saw cut after hardening. The saw cuts shall be cut to a depth of 25mm and shall be cut no later than 24 hours. The shrinkage control joints shall be positioned to coincide with major changes in floor plan. Where the concrete is to be exposed, or brittle covering placed over, the maximum intermediate bay sizes shall be limited to 6m.

Bay dimensions formed by shrinkage control joints shall be limited to a maximum ratio of length:width of 2:1.

Shrinkage control joints shall be placed over 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide load bearing rib then the joint shall be located directly above one edge of the 300mm rib.

Supplementary reinforcing using 2-HD12 bars (Grade 500E) shall be used at all re-entrant corners as shown on Figure 4. These bars shall be 1200mm long, 200mm apart, tied to the top of the mesh, with 50mm side cover and shall not be placed across any shrinkage control joints.

6.3 Services Detailing

Ideally, services ducts shall be conveyed underground to their plan location then brought up through the polystyrene pod and the concrete floor slab, but this may not always be possible. Services shall not be placed within any concrete except to cross that section of concrete i.e. services shall not run along ribs or edge beams.

The maximum diameter of the services shall be as outlined in Table 7.

Table 7 Maximum Diameter of Pipe Services

Element	Vertical Services	Horizontal Services
300mm wide edge beam	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe unless detailed as per note 2
500mm localised wide edge beam ⁽¹⁾	100mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 2
300mm wide internal load bearing rib	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 2
100mm wide internal rib	Nil	50mm in a duct 50mm larger diameter than pipe, see note 2
Slab	110mm in a duct 50mm larger diameter than pipe or for large services 450mm square ⁽⁴⁾ see also note 2.	Nil

Notes

(1) For situations where a 100mm diameter pipe is required to pass through the edge beam, the edge beam shall be locally increased in width to a minimum of 500mm wide. This shall be achieved by keeping flush the outside face of the edge beam and removing 200mm from the pod. The width shall remain at 500mm for a distance of 600mm beyond the service pipe. Refer to figure 12 for details.

(2) The need for a duct 50mm larger than the service diameter can be deleted when the pipe work does not cross the interface between the bottom of the RibRaft system and the ground at any point along its length. An example would be services laid within the plane of the pods and passing through the edge beam and discharging to a gully trap or similar. In these cases the diameter of the service can be increased to a maximum of 100mm and a service duct is not required. The pipe work shall be wrapped in denso tape where it crosses concrete elements to prevent adhesion between the concrete and pipe work.

(3) Where a gas pipe line runs through the RibRaft floor system, in addition to the requirements above, the pipeline shall enter the building through the outside face of the perimeter foundation beam and be located in the plane of the pods. The aim being to ensure that damage to the gas pipe will most likely occur outside the building envelope should movement occur between the ground and RibRaft in a large earthquake.

(4) Larger penetrations or voids up to 450mm square (e.g. for shower waste/traps) are permitted through the slab provided all the conditions of this paragraph are met. These openings shall be trimmed with 1 HD12 (Grade 500E) bar 1500mm long placed along each side of the opening, tied to the mesh. One set of parallel bars shall be placed on top of the mesh and the other set placed under

the mesh. These openings shall not be placed over a rib or edge beam. If necessary, the rib spacing shall be reduced or the pod layout altered to ensure that the opening occurs solely in the slab above a polystyrene pod. Penetrations such as these shall not be installed in garages or other areas where large (>3kN) point loads could be present. Only one penetration greater than 110mm is permitted in the slab above any single pod or part pod. Where two large openings are required to be in close proximity, an internal rib shall separate them. For these large penetrations/voids in the slab, the services shall not be within 25mm of the edges of the void through which they pass, and the opening shall be sealed to prevent materials entering the subfloor cavities. (This type of opening is normally only required for a shower waste/trap and the installation of the shower will ensure that the void is sealed/covered).

Any services crossing ribs or the edge beam horizontally shall be placed only within the middle third of the member. Except as noted in figure 12, services crossing the ribs vertically shall also be constrained to the middle third of the width of the edge or internal load bearing rib. Except as noted in figure 12 at no stage shall any of the reinforcement bars be relocated or cut to allow for the services (it is acceptable, however to cut the mesh). In some instances this will dictate the location of the ribs. The pods shall be cut to allow for this and if necessary, the spacing of the ribs shall be decreased locally. There shall be 600mm minimum clear spacing in each direction between penetrations through the system.

Except as noted in table 7, all services shall be placed centrally within an opening 50mm greater in diameter than the service duct/pipe, where they pass through the system. This is to allow seismic tolerances to reduce the probability of shearing of the services during a seismic event. Where the services pass through the slab, the opening shall be sealed to prevent materials entering the subfloor cavities. (This can be achieved with Denso tape

and a type of easily compressible foam). A pictorial of some of the above requirements is illustrated in figure 12:

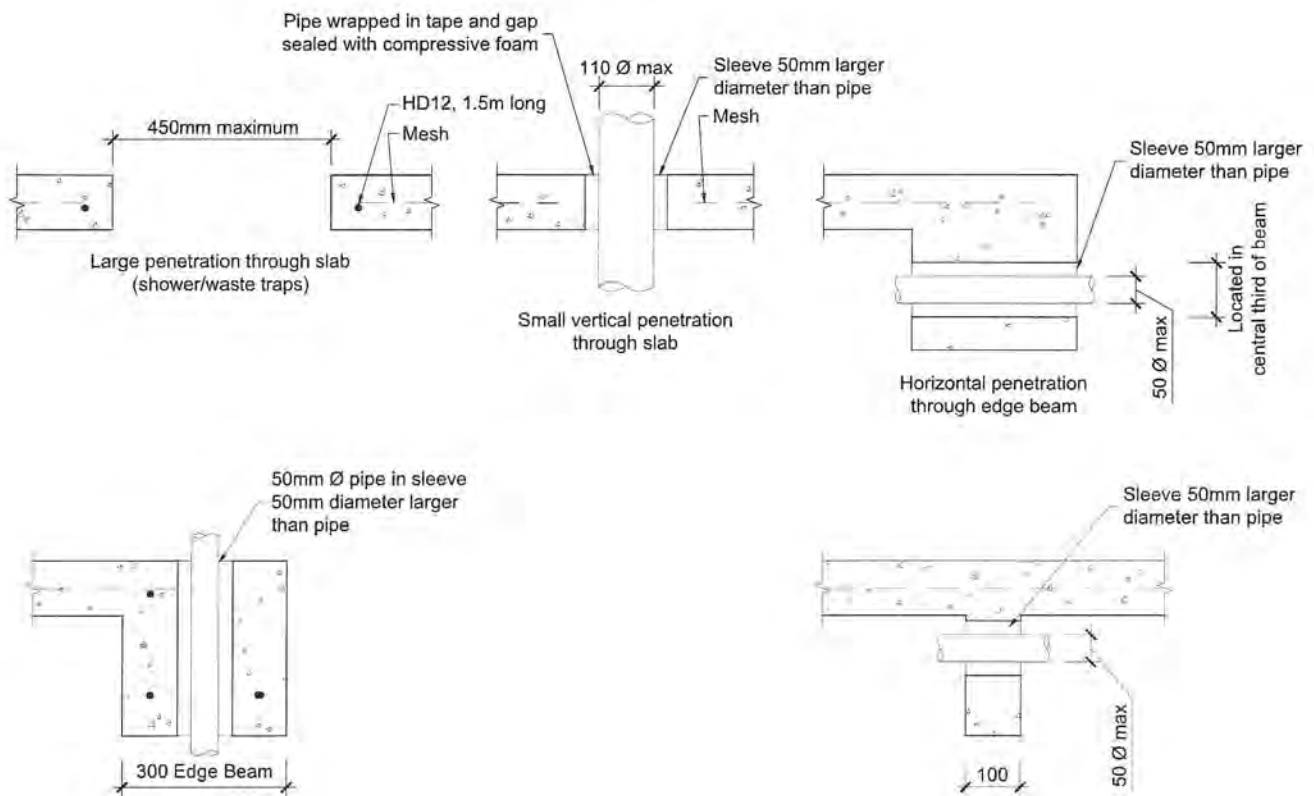


Figure 12 Example of detailing requirements for services

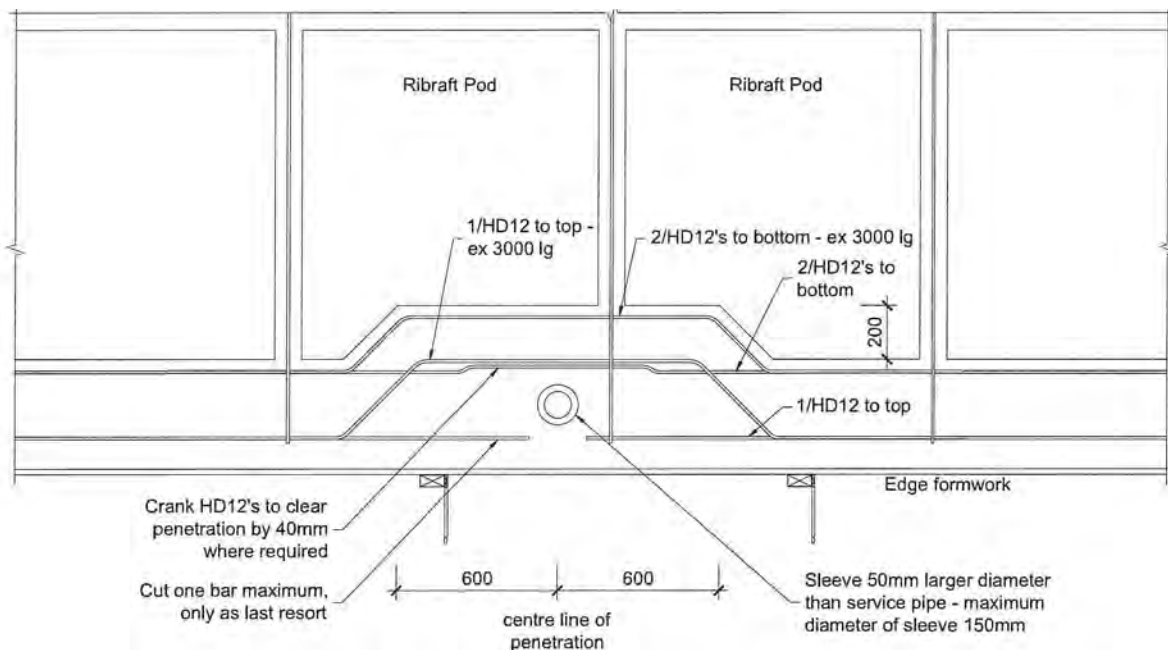


Figure 13 Localised increase in width at edge beam where vertical services up to 100mm diameter are required

FIRTH RIBRAFT FLOOR SYSTEM

SECTION 2: INSTALLATION INFORMATION

1 GENERAL

This Section details the installation information required for the Firth RibRaft Floor System (the system). Full information on the design procedures not requiring specific engineering input, and requirements for the site assessment are described in Section 1 of this Manual (Design Information). Where standards are referenced in this manual these shall include the latest amendments.

2 SITE REQUIREMENTS

2.1 General

The site requirements of this Manual are concerned solely with the soil conditions under or immediately adjacent to the system. If a site does not comply with this Manual, the system shall be subject to specific engineering design.

This Section shall only apply for building sites such that:

- The ground is as specified in Section 1 of this Manual;
- Any system erected at the top of a slope (whether fill compacted in accordance with NZS4431, or natural ground) shall be located as shown in Figure

1 so that the finished ground is always outside the dashed line shown. (The vertical distance, V, shall be measured to 50mm below the underside of the slab).

Where the finished ground does not comply with Figure 1, the slope shall be retained by a specifically designed retaining wall.

2.2 Temporary Excavations

No excavation shall take place at a location or in a manner where the stability of the foundation material is likely to be compromised. The backfilled material shall match the compaction and strength of, and have similar properties to, the surrounding material. The sides of the excavation shall be propped as necessary.

Temporary excavations shall be open for no longer than 48 hours and shall take place only above the critical depth line as shown on Figure 2. Should temporary excavations be required below this line, specific engineering design is required.

2.3 Surface Water

Surface water from the site shall not flow across the slab platform. For example, on cut and fill sites the ground uphill from the system shall be graded to direct

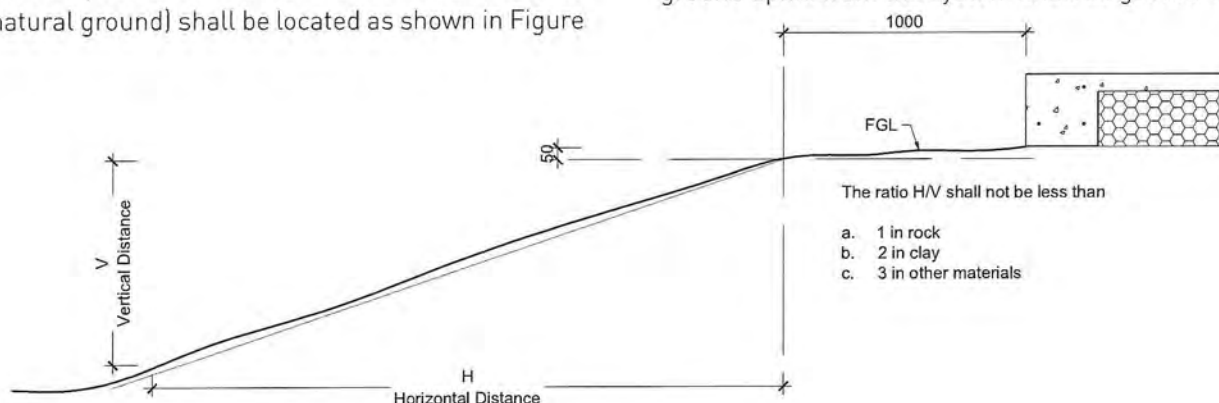


Figure 1 Relationship of RibRaft to Sloping Ground Surface

any surface run-off away from the system as shown in Figure 3.

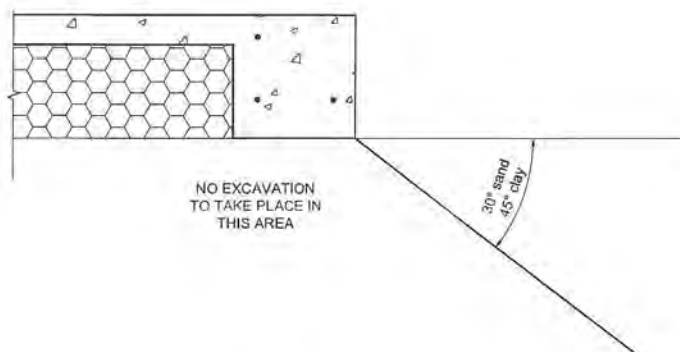


Figure 2 *Temporary Excavation Limited*

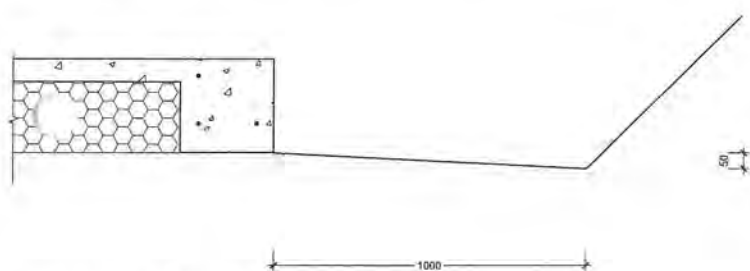


Figure 3 *Site Grading*

5 INSTALLATION PROCEDURE

3.1 Site Preparation

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

3.2 Earthworks

The formation area shall be cut or filled to a level approximately 330mm below finished floor level. Where fill is required to achieve this level, the fill shall be certified by a geotechnical engineer (outside the scope of this Manual) or shall be granular fill in accordance

Buildings". The formation area shall also extend a minimum of 1000mm beyond the slab perimeter as shown in Figure 4 below. The installer shall confirm the acceptability of the ground over the entire building platform before proceeding with the construction. Refer to Clause 3.5 of Section 1 (Design Information) for requirements.

3.3 Shear Keys

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

3.4 Plumbing and Services

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

Where required, the services can be installed by removing unnecessary polystyrene and placing pipes within the pod depth. All pipes shall be held firmly in place and have temporary end covers. Any services crossing ribs or the edge beam horizontally shall be placed only within the middle third of the member. Except as noted in figure 12 (section 1) services crossing the ribs vertically shall also be constrained to the middle third of the width of the edge or internal load bearing rib. Except as noted in figure 12 (section 1) at no stage shall any of the reinforcement bars be relocated or cut to allow for the services (it is acceptable, however to cut the mesh). In some instances this will dictate the location of the ribs. The pods shall be cut to allow for this and if necessary, the spacing of the ribs shall be decreased locally. There shall be 600mm minimum clear spacing in each direction between penetrations through the system.

Except as noted in 6.3 of section 1, services shall be placed centrally within an opening 50mm greater in diameter than the service duct/pipe, where they pass through the system. This is to allow seismic tolerances to prevent shearing of the services during a seismic event. Where the services pass through the top of the system, the opening shall be sealed to prevent materials entering the subfloor cavities. (This can be achieved with Denso tape and a type of easily

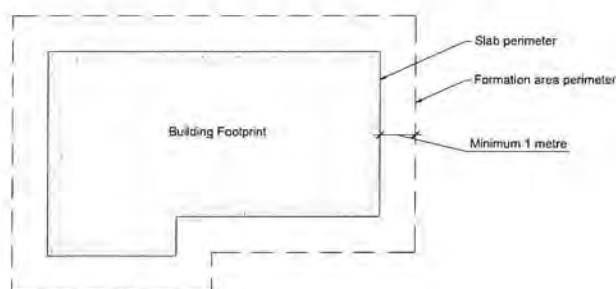


Figure 4 *Plan of Formation Area*

compressible foam).

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

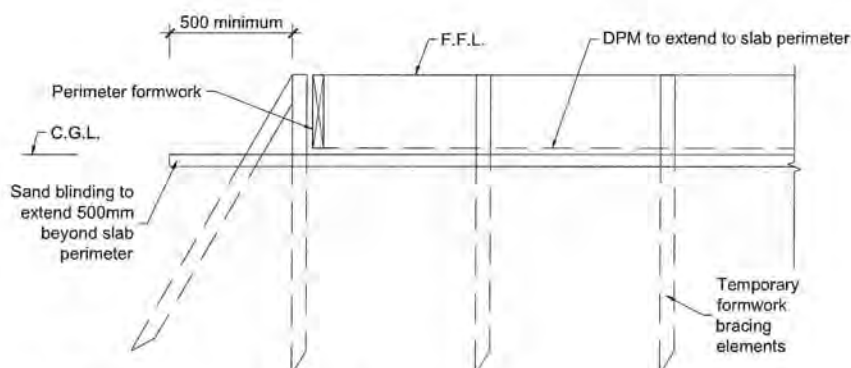


Figure 5 Sand Blinding/DPM/Formwork Details

3.5 Sand Blinding

A layer of sand shall be placed, screeded and compacted over the building platform, extending to at least 500mm beyond the system perimeter – refer Figure 5. The maximum thickness of this blinding layer shall be 50mm. The surface shall be level and a minimum of 305mm below finished floor level. A small plate compactor, vibrating roller or similar, should be used to compact the sand blinding layer. When the building platform is clay, it is essential that the blinding sand is compacted onto a clay surface that has not been softened by construction activities. If the clay has been softened (i.e. has a muddy surface layer due to construction activities), remove the softened material from under the RibRaft ribs before placing the sand. If excavation lowers the clay surface to more than 50mm

below the underside of the RibRaft, fill shall be placed in accordance with Clause 7.5.3 of NZS 3604:2011 "Timber Framed Buildings". *The sand is required to be level to ensure that pods remain stable throughout the installation of the system.*

3.6 Damp Proof Membrane

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

3.7 Edge Formwork

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

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

3.8 Laying the Pods and Spacers

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

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

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

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

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

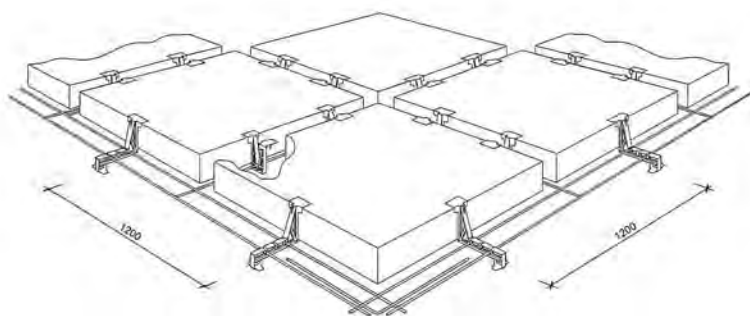


Figure 6 Detailed Layout of Pods and Spacers
(mesh and top steel omitted for clarity)

3.9 Reinforcing Steel

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

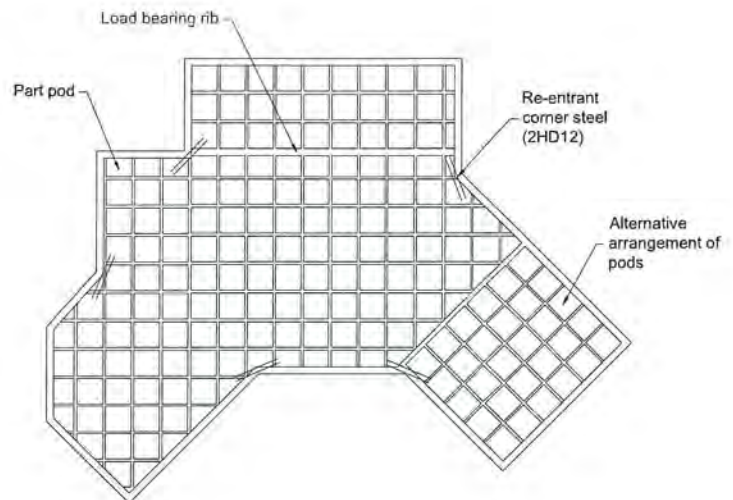


Figure 7 Typical Pod and Rib Layout

Reinforcing steel in the slab shall consist of Welded Reinforcing Mesh complying with AS/NZS 4671:2001 with a minimum weight of 2.27kg/m², a lower characteristic stress of 500MPa, square configuration of orthogonal bars between 150 to 300mm centres, and ductility class L or E, hereafter referred to as "665 mesh, or mesh".

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

3.9.1 Edge Beam Steel

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

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

3.9.2 Rib Steel

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

All steel shall be lapped a minimum of 60 bar diameters (720mm for 12mm steel). At the junction with the edge beam, each rib steel bar shall sit on top of the edge beam bars, and extend to the outermost bar. The 75mm cover to the edge of the beam shall still be allowed for. One HD12 bar (Grade 500E) shall be placed in each 100mm wide rib and two HD12 bars (Grade 500E) shall be placed in the bottom of each 300mm wide rib. For perimeter 300mm Ribs a HD12 bar is also required in the top at the beam.

3.9.3 Mesh Reinforcing

665 Mesh reinforcing shall be placed over the pods and supported on 40mm mesh chairs spaced at a minimum of 1200mm centres, with at least two mesh chairs placed per pod and at least one per part pod. The mesh shall be lapped 225mm minimum and tied at all laps.

3.9.4 Re-entrant Corner Steel

Two HD12 bars (Grade 500E), 1200mm long shall be placed across the corner, tied to the top of the mesh at re-entrant corners at 200mm centres, with 50mm cover from the internal corner as detailed in Figure 7 (this steel is to control cracking at this potential weak point).

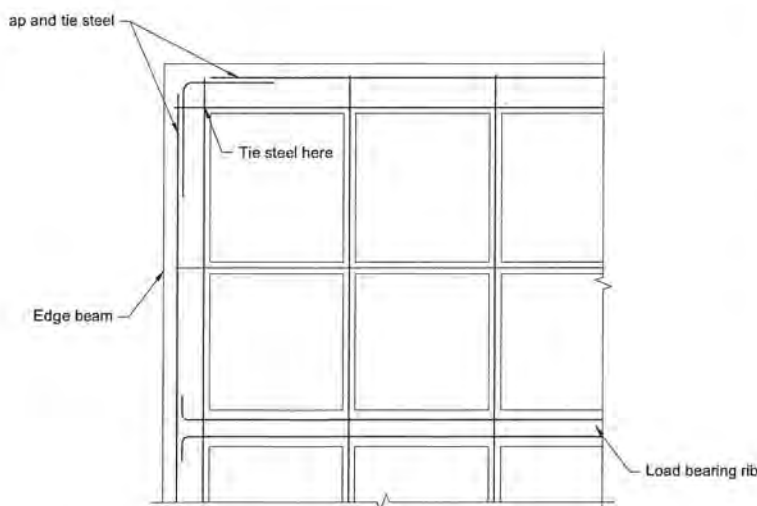


Figure 8 Corner Steel Layout
3.10 Concrete Installation

Concrete placing, finishing and curing shall be in accordance with NZS 3109:1997, Clause 7.

3.10.1 Placing

Only Firth Raftmix, Raftmix Pump, Raftmix25 or Raftmix Pump25 concrete shall be used in the floor.

These two different concrete mixes shall be used in the following instances:

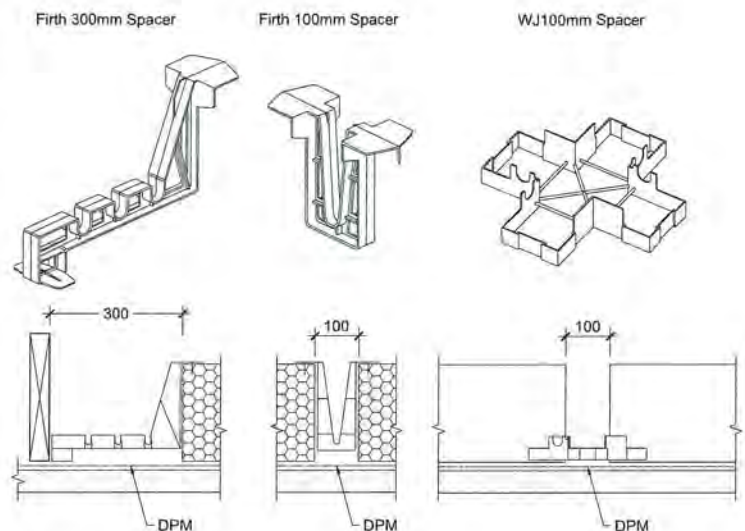


Figure 9 Spacer Details

- Raftmix – For placement in the floor directly from the concrete truck chute.
- Raftmix Pump – For placement in the floor by concrete pump.

Refer 2.4 of Section 1 for locations where RaftMix 25/ Raftmix 25 Pump is required.

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

3.10.2 Finishing

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

Early age care of the slab shall be in accordance with good trade practice appropriate for the weather conditions. The surface shall be a blemish free surface to class U3 finish (refer NZS 3114:1987 "Specification for Concrete Finishes").

3.10.3 Curing

Proper curing of the concrete must take place immediately after finishing the concrete. One of the following methods of curing is recommended:

- Ponding or continuous sprinkling of water.
- Placing a wet covering or plastic membrane over the slab.
- The use of liquid membrane curing compounds.

When warm sunny days are followed by cool nights, the change in temperature can cause cracking. Immediate and continuous wet curing to reduce the maximum temperature and/or raise the minimum temperature can reduce the risk of this type of cracking.

3.11 Shrinkage Control Joints

Shrinkage control joints shall be saw cut after hardening. The saw cut shall be cut to a depth of 25mm and shall be cut no later than 24 hours in summer, or 48 hours in winter. The shrinkage control joints shall be positioned to coincide with major changes in floor plan. Where the concrete is to be exposed or brittle covering placed over, the maximum intermediate bay sizes shall be limited to 6m. Bay dimensions formed by shrinkage control joints shall be limited to a maximum ratio of length:width of 2:1.

Shrinkage control joint shall be placed over 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide load bearing rib then the joint shall be located directly above one edge of the 300mm rib. Supplementary reinforcing bars shall not be placed across any shrinkage control joints.

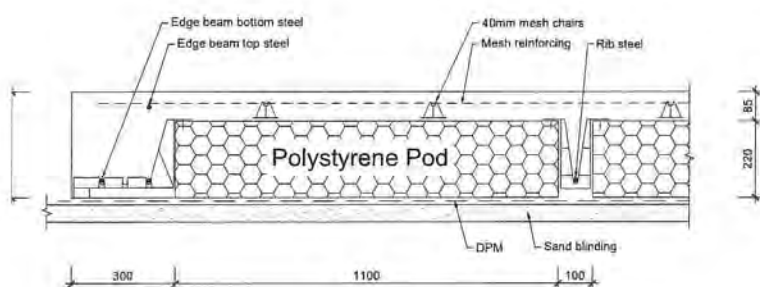


Figure 10 Detailed Section
5.12 Removal of Formwork

The formwork shall not be removed prior to 12 hours after the slab has been finished. No installation loads are to be placed on the system before adequate curing has taken place.

3.13 Masonry Veneer

Where the building is to be clad with masonry veneer, the rebate in the edge beam shall be waterproofed with a bituminous sealer due to the possibility of ponding of water. Firth recommends a Flintcote® or equivalent coating on both the vertical and horizontal faces of the rebate.

3.14 Landscaping/Paving

Landscaping and/or paving adjacent to the slab shall be kept as a minimum the specified distance below finished floor level as required by NZS 3604:2011. The landscaping shall allow for large trees to be kept sufficiently away from the edge of the slab. This is to prevent the tree roots from disturbing the soil moisture conditions under the slab. As a guide, trees should be as far away from the edge of the slab as they are tall when fully grown.

3.15 Ongoing Maintenance

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

This can also be ensured by maintaining the landscaping or providing a paved surface or similar around the edge of the building.

Shear keys, if required, shall be provided to conform to the requirements of Section 1 of this Manual. Holes for the shear keys shall be drilled at least 1000mm deep. Into the bottom of each hole a RibRaft Shear Key Support shall be placed. Every precaution shall be taken to ensure that the shear key support is laid level and at the base of the hole. The minimum depth of concrete placed on the support shall be 900mm. Refer to Figure 11 for construction details.

The connection steel (2HD12 Grade 500E) shall be secured in place and held during pouring to ensure the bars are correctly located. The concrete for the shear keys shall be placed separately to the rest of the

floor and shall be finished level to the top of the sand blinding layer. The top surface of the shear key shall be finished rough to ensure a good join to the Raftmix concrete in the system and the DPM shall be neatly cut around the shear keys.

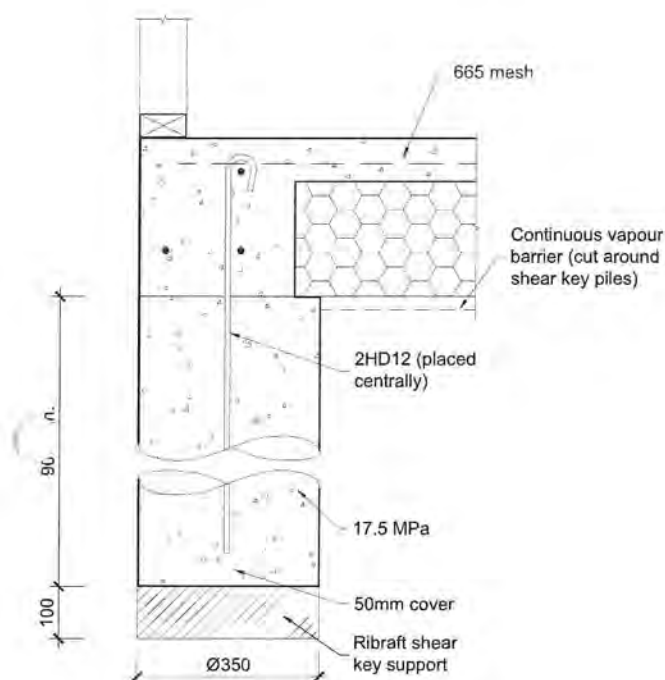


Figure 11 *Shear Pile Construction Detail*

FIRTH RIBRAFT FLOOR SYSTEM

SECTION 3: VERIFICATION

1 DESIGN

Verification that the design complies with the structural limitation outlined in this Manual is the responsibility of the designer, and shall be confirmed by the Building Control Authority issuing the Building Consent. Solutions outside the limitations outlined in this Manual will require specific engineering design.

2 CONSTRUCTION

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

To assist inspection the following checklist has been prepared for structures complying with the limitation:

Pre-pour Inspection Check list

	Confirmed
Good Ground confirmed as per NZS3604, clause 3.1.3.	
Vegetation, topsoil, organic or deleterious material removed.	
Proximity to slope-ground surface is always above dash line shown in figure 1.	
Shear piles (where required) in place and reinforcement protruding.	
Formation area extends at least 1m beyond building footprint.	
No steps in the formation.	

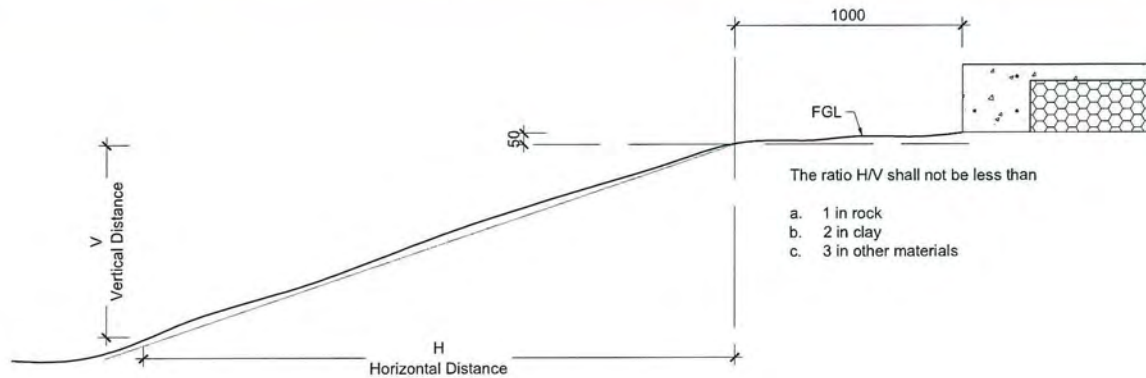


Figure 1 Relationship of RibRaft to Sloping Ground Surface

Pre-layout Inspection Check list

	Confirmed
Damp proof membrane in place.	
Perimeter foundation	Width 300mm ⁽¹⁾ .
	Reinforcement 2 x HD12 bottom, 1 x HD12 top.
	Firth supplied spacer used at 1.2m maximum centres.
Internal Ribs	Width 100mm.
	Reinforcement 1 x HD12.
	Firth supplied spacer, max spacing of one per pod or part pod.
Load Bearing ribs	Width 300mm.
	Reinforcement 2 x HD12 bottom.
	Firth supplied spacer, max spacing of one per pod or part pod.
Pods	Firth supplied RibRaft pod.
Mesh	40mm chairs, 1.2m max centres, min two per pod or one per part pod.
	Mesh in place and 665 or equivalent area.
	Mesh laps minimum of 225mm.
Reinforcement	2 x HD12 bars 1.2m long provided at re-entrant corners.
	Laps for 12mm reinforcement minimum of 720mm.
Concrete	Cover to pods minimum of 85mm or 110mm if infloor heating used.
	Firth Raftmix ordered.
Service penetrations	No reinforcement (with exception of mesh) cut to allow passage of service pipes. Refer clause 6.3 of Section 1 for exceptions.
	Diameter of opening for services 50mm greater than service pipe. Refer clause 6.3 of Section 1 for exceptions.
	Diameter/size of penetrations as per Table 7, Section 1 of this manual.

(1) At locations of service penetrations the width of the perimeter foundation maybe locally increased. Refer figure 12 section 1 for details.



SUSTAINABILITY: THE FIRTH CONCRETE & CONCRETE MASONRY SUSTAINABILITY LIFECYCLE

- ☒ Environmentally compliant manufacturing plants
- ☒ Surplus water and some aggregates recycled
- ☒ Low transport impacts
- ☒ Leftover concrete returned from construction sites
- ☒ Passive solar heated thermal mass makes completed buildings more energy-efficient

- ☒ Most wash water returned from construction sites
- ☒ Highly durable, low maintenance buildings and no rot
- ☒ High degree of noise control
- ☒ Inherent fire resistance
- ☒ Overall longer effective building life
- ☒ Demolished concrete can be recycled as hard fill or aggregate

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CERTIFICATE OF CONFORMANCE



CERTMARK™

Description

System comprises
steel reinforcing
and Firth

Use or Use

System is an
concrete floor
in insulated
technical and
method.

Order

Infrastructure

Certification Body

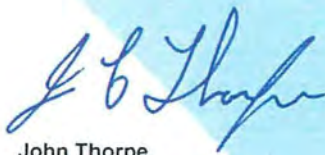
CertMark Pty Ltd
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Complies with the Building Code of New Zealand :

1. B1 Structure
2. B2 Durability
3. E2 External Moisture
4. F2 Hazardous Building Materials
5. H1 Energy Efficiency

Subject to the following conditions and limitations:

1. Must be installed according to RibRaft Technical Manual (CBI3100/3111/3112/4711) (Jan 12)
2. Specified products must be supplied by Firth Industries or an approved agency.


John Thorpe
Director
CertMark Australasia Pty Ltd

22-05-2012
Date of issue

22-05-2015
Date of expiry

CMNZ-2012-0522
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BRANZ Appraised
Appraisal No.447 [2010]

BRANZ Appraisals

**Technical Assessments of products
for building and construction**

**BRANZ
APPRAISAL
No. 447 (2010)**

This Appraisal replaces BRANZ
Appraisal No. 447 (2005) issued 4
February 2005.

Amended 5 March 2014

**SCYON® LINEA®
WEATHERBOARD
CAVITY CLADDING**

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Penrose
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00042



Product

1.1 Scyon® Linea® Weatherboard Cavity Cladding is a cavity-based bevelbacked fibre cement weatherboard wall cladding. It is designed to be used as part of an external cladding system for residential and light commercial type buildings where domestic construction techniques are used.

1.2 Scyon® Linea® Weatherboard Cavity Cladding consists of Scyon® Linea® Weatherboard, which is a bevelbacked fibre cement weatherboard, fixed over timber battens to form the cavity. The cladding is finished with a latex paint system.

1.3 The cladding incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall framing with a nominal 20 mm cavity. The cavity allows for any occasional ingress of water that may get past the external skin to drain to the exterior of the building, and any remaining moisture to dry by evaporation.



2.1 Scyon® Linea® Weatherboard Cavity Cladding has been appraised as an external wall cladding for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including Extra High.

2.2 Linea Weatherboard Cavity Cladding has also been appraised for weathertightness and structural wind loading when used as an external horizontally fixed wall cladding solution for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- constructed with timber framing complying with the NZBC; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

2.3 Scyon® Linea® Weatherboard must only be installed horizontally on vertical surfaces.

2.4 Scyon® Linea® Weatherboard Cavity Cladding is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *(The Appraisal of Scyon® Linea® Weatherboard Cavity Cladding relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone.)*

(Note: Scyon® Linea® Weatherboard Cavity Cladding can be used to provide structural bracing and fire resistance rated construction, but these aspects have not been assessed by this Appraisal and are outside its scope.)

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Scyon® Linea® Weatherboard Cavity Cladding if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Scyon® Linea® Weatherboard Cavity Cladding meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraphs 9.1 - 9.3.

Clause B2 DURABILITY: Performance B2.3.1(b), 15 years and B2.3.2. Scyon® Linea® Weatherboard Cavity Cladding meets these requirements. See Paragraphs 10.1 and 10.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.7. Scyon® Linea® Weatherboard Cavity Cladding meets this requirement. See Paragraph 12.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Scyon® Linea® Weatherboard Cavity Cladding meets this requirement. See Paragraphs 14.1 - 14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Scyon® Linea® Weatherboard Cavity Cladding meets this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

4.1 Scyon® Linea® Weatherboards are bevelback weatherboards with a tongue and groove at each end for jointing. The weatherboards are pre-primed with an acrylic primer on the front face and both edges. Scyon® Linea® Weatherboards are 16 mm thick and are available 135 mm, 150 mm and 180 mm wide. All boards are supplied 4200 mm long.

4.2 Scyon® Linea® Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a bevel is cut on the back face of the weatherboards, the front edge at the bottom of the board is chamfered and the ends are tongue and grooved for jointing. Scyon® Linea® Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

Accessories

4.3 Accessories used with Scyon® Linea® Weatherboard Cavity Cladding which are supplied by James Hardie New Zealand are:

- Scyon® Axent™ Trim - a 16 mm thick fibre cement trim manufactured from a reduced density cellulose fibre cement formulation. Linea™ Trim is pre-primed with an acrylic primer on the front face and both edges, and is available in sizes of 84 mm and 100 mm wide by 2600 mm long.
- External and internal corner mouldings - chromate treated aluminium external box corner, 90° internal corner 'W' mould and 135° internal corner 'W' mould. The mouldings are available in 2700 mm lengths.
- Corner soakers - 90° soakers are available for 135 mm, 150 mm and 180 mm Scyon® Linea® Weatherboards. The soakers are available in chromate treated aluminium, copper and stainless steel.
- Cavity vent strip - uPVC, available in 2700 mm lengths.

4.4 Accessories used with Scyon® Linea® Weatherboard Cavity Cladding which are supplied by the building contractor are:

- Flexible wall underlay - building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
- Flexible building underlay support - polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. (Note: mesh and wire galvanising must comply with AS/NZS 4534.)
- Rigid wall underlay - Plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1 Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
- Flexible sill, head and jamb flashing tape - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- Cavity battens - nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) timber treated to Hazard Class H3.1.
- Joinery head flashings - folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- Planted sill and scribes - timber treated to Hazard Class H3.1, pre-primed before installation.
- Window and door trim cavity air seal - air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- Flexible sealant - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- Cavity batten fixings - 40 x 2.8 mm flat head hot-dip galvanised nails.
- Scyon® Linea® Weatherboard fixings - 60 x 3.15 mm flat head hot-dip galvanised Hardiflex nails or stainless steel ring shank Hardiflex nails (for concealed nailing in NZS 3604 wind zones up to and including Very High), 75 x 3.15 mm jolt head hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in NZS 3604 wind zones up to and including Very High), and 90 x 4.0 mm jolt head hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa).
- Scyon® Axent™ Trim fixings - 60 x 3.15 mm or 75 x 3.15 mm hot-dip galvanised jolt head nails and stainless steel ring shank jolt head nails.

(Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680).

Paint System Specification

4.5 Paint systems are not supplied by James Hardie New Zealand and have not been assessed, therefore they are outside the scope of this Appraisal.

4.6 All exposed faces, including top edges at sills and all bottom edges of Scyon® Linea® Weatherboard, Linea™ Trim and accessories must be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730.

Handling and Storage

5.1 Handling and storage of all materials supplied by James Hardie New Zealand or the building contractor, whether on site or off site, is under the control of the building contractor. Scyon® Linea® Weatherboards must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. Weatherboards must always be carried on edge.

5.2 Accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer.

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Scyon® Linea® Weatherboard Cavity Cladding. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Framing

Timber Treatment

7.1 Timber wall framing behind Scyon® Linea® Weatherboard Cavity Cladding must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

7.2 Timber framing must comply with NZS 3604 for buildings or parts of a building within the scope limitations of NZS 3604. Buildings or parts of a building outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Studs must be at maximum 600 mm centres in Low, Medium, High and Very High Wind Zones and maximum 400 mm centres for the NZS 3604 Extra High Wind Zone and specifically designed buildings. Nogs must be fitted flush between the studs at maximum 800 mm centres (for studs at 600 mm centres) or maximum 1200 mm centres (for studs at 400 mm centres).

7.3 Timber framing must have a maximum moisture content of 24% at the time of the cladding application. *(If weatherboards are fixed to framing with a moisture content of greater than 24% problems may occur at a later date due to excessive timber shrinkage.)*

7.4 Timber wall framing must have a maximum moisture content of 18% before the weatherboards are painted.

General

8.1 When the Linea™ Weatherboard Cavity Cladding is used for specifically designed buildings up to 2.5 kPa ULS wind pressure, only the weathertightness and structural aspects of the cladding are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.

8.2 Punchings in the cavity vent strip provide a minimum ventilation opening area of 1000 mm² per lineal metre of wall.

8.3 At ground level the bottom edge of Scyon® Linea® Weatherboards must be kept clear of paved surfaces, such as footpaths, by a minimum of 100 mm and unpaved surfaces by 175 mm in accordance with NZBC Acceptable Solution E2/AS1, Table 18. The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to.

8.4 At balcony, deck or low pitch roof/wall junctions, the bottom edge of Scyon® Linea® Weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 50 mm.

8.5 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High, and rigid underlays for buildings in the Extra High wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.

8.6 Where cladding penetrations are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities by leaving a minimum gap of 10 mm between the bottom of the vertical cavity batten and the flashing to the opening.

8.7 Where Scyon® Linea® Weatherboard Cavity Cladding abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Interstorey Junctions

8.8 Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4(b).

Structure

Mass

9.1 The mass of the 135 mm wide Scyon® Linea® Weatherboard when installed on the wall is 25.7 kg/m² at equilibrium moisture content (EMC). The mass of the 150 mm wide board is 24.9 kg/m² at EMC and the mass of the 180 mm wide board is 23.9 kg/m² at EMC. Scyon® Linea® Weatherboard Cavity Cladding is therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

9.2 Scyon® Linea® Weatherboard Cavity Cladding will resist impacts likely to be encountered in normal residential use. The likelihood of impact damage to the cladding when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers provided for vulnerable areas.

Wind Zones

9.3 Scyon® Linea® Weatherboard Cavity Cladding is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa ULS wind pressure where buildings are specifically designed.

Durability

Serviceable Life

10.1 Scyon® Linea® Weatherboard Cavity Cladding installations are expected to have a serviceable life of at least 50 years provided the paint coating system is maintained in accordance with this Appraisal to ensure the Scyon® Linea® Weatherboards and fixings remain dry in service. Scyon® Linea® Weatherboards must be painted within 3 months of fixing.

10.2 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604 Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. To achieve a 50 year serviceable life in Zone D, Scyon® Linea® Weatherboards must be fixed with stainless steel fasteners. Fasteners outside Zone D may be hot-dip galvanised steel.

10.3 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of Scyon® Linea® Weatherboards in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604 Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

11.1 Regular maintenance is essential for Scyon® Linea® Weatherboard Cavity Cladding installations to continue to meet the NZBC durability performance provision and to maximise their serviceable life.

11.2 Annual inspections must be made to ensure that all aspects of the cladding system, including the paint coating system, flashings and any sealed joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately. Sealant and paint coatings must be repaired in accordance with the sealant or paint coating manufacturer's instructions.

11.3 Regular cleaning (at least annually) of the paint coating surface is recommended to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Paint systems must be recoated at approximately 7-15 yearly intervals in accordance with the paint manufacturer's instructions.

11.4 Minimum ground clearances as set out in this Appraisal must be maintained at all times during the life of the cladding. *(Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of Scyon® Linea® Weatherboard Cavity Cladding.)*

Control of External Fire Spread

12.1 Scyon® Linea® Weatherboard has a peak heat release rate of less than 100 kW/m² and a total heat released of less than 25 MJ/m² in accordance with NZBC Acceptable Solution C/AS1 Table 5.1. The system is suitable for use on buildings with a SH Risk Group classification, at any distance to the relevant boundary. Scyon® Linea® Weatherboard is also suitable for use where a non combustible material is specified. When Scyon® Linea® Weatherboard is finished with a paint coating of not more than 1.0 mm in thickness, the exterior surface finishes requirements of NZBC Acceptable Solutions C/AS2 – C/AS6 Paragraph 5.8.1 do not apply in accordance with NZBC Acceptable Solutions C/AS2 – C/AS6 Paragraph 5.8.2 a).

Prevention of Fire Occurring

13.1 When Scyon® Linea® Weatherboard Cavity Cladding is finished with a paint coating of not more than 1.0 mm in thickness, clearance separations from chimneys and flues are not required. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solutions C/AS1 – C/AS6 Paragraph 7.5.9 for the protection of combustible materials.

External Moisture

14.1 Scyon® Linea® Weatherboard Cavity Cladding, when installed in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

14.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with Clause E2.3.5.

14.3 Scyon® Linea® Weatherboard Cavity Cladding allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with Clause E2.3.6.

14.4 The details given in the Technical Literature for weather sealing are based on the design principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

14.5 The use of Scyon® Linea® Weatherboard Cavity Cladding where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

15.2 Scyon® Linea® Weatherboard Cavity Cladding is not a barrier to the passage of water vapour, and when installed in accordance with the Technical Literature and this Appraisal will not create or increase the risk of moisture damage resulting from condensation.

Installation Skill Level Requirements

16.1 Installation of Scyon® Linea® Weatherboard and accessories supplied by James Hardie New Zealand and the building contractor must be completed by tradespersons with an understanding of cavity construction and bevelback weatherboard installation, in accordance with instructions given within the Scyon® Linea® Weatherboard Cavity Cladding Technical Literature and this Appraisal.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

17.1 The selected building underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Scyon® Linea® Weatherboard Cavity Cladding system. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints. Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

Cavity Battens

17.2 Cavity battens must be installed over the building underlay to the wall framing at maximum 600 mm centres where the studs are at 600 mm centres or at 400 mm centres when studs are at 400 mm centres. The battens must be fixed in place with 40 x 2.8 mm hot-dip galvanised flat-head nails at maximum 800 mm centres.

17.3 Where studs are at greater than 400 mm centres, a building underlay support must be installed over the building underlay between the cavity battens at maximum 300 mm centres.

Scyon® Linea® Weatherboard Installation

17.4 Scyon® Linea® Weatherboards may be cut on site by power saw. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.

17.5 Weatherboards must be dry prior to installation. Before the weatherboards are installed, cut ends exposed to the exterior such as at aluminium box corners or internal corners must be sealed with an acrylic sealer to reduce the absorbency of the fibre cement.

17.6 Scyon® Linea® Weatherboards must be installed starting at the bottom of the wall. A cant strip (H3.1 treated timber or fibre cement) must be fixed behind the bottom course of weatherboards to ensure the weatherboards are set at the correct angle. The cant strip must be continuous around the perimeter of the building. The bottom course of weatherboards must overhang the bottom plate by a minimum of 50 mm.

17.7 Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner, corner soaker. The necessary flashings, including window flashings, must be installed before commencing weatherboard fixing.

17.8 The first course of weatherboards must be full length, i.e. 4200 mm and commence from an external corner. Jointing of Scyon® Linea® Weatherboards is made off the stud using the pre-cut tongue and groove joint. Tongue and groove joints may be located centrally between the studs, but must be no closer than 100 mm to the edge of a stud. A bead of sealant must be applied to the front side of the tongue before the corresponding board is inserted. Subsequent courses of weatherboards must be installed so that the tongue and groove joints are staggered by 600 mm minimum from joints in the previous course.

17.9 Scyon® Linea® Weatherboards must have a minimum lap of 30 mm, and should be set out so as near to a full board as possible will finish under and over windows and doors and at the top of the wall. A storey rod can be used to accurately position weatherboard courses.

17.10 Scyon® Linea® Weatherboards must be fixed to each stud using concealed fixings behind the lap of the boards or face nailing, except that face nailing must be provided at all corners and vertical edges of openings.

17.11 Concealed fixing must be carried out using 60 x 2.8 mm hot-dip galvanised or stainless steel Hardiflex nails depending on the location - see Paragraph 10.2. Nails must be fixed 25 mm from the top edge of the board and must be driven flush with the board surface.

17.12 Face nailing must be carried out using 75 x 3.15 mm hot-dip galvanised or stainless steel jolt-head nails in NZS 3604 wind zones up to and including Very High, or 90 x 4.0 mm hot-dip galvanised or stainless steel jolt-head nails in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa, depending on the location - see Paragraph 10.2. Nails must be fixed 15 mm up from the bottom of the board and punched a maximum of 2 mm below the surface of the board. When stainless steel nails are used, the top board at each lap must be pre-drilled.

17.13 Scyon® Linea® Weatherboards can be hand or gun nailed. Nails must not be closer than 25 mm to the end of the board when hand nailing, or closer than 50 mm when gun nailing. *(Note: Gun nailing must only be used for concealed nailing.)*

Aluminium Joinery Installation

17.14 Aluminium joinery and associated head and sill flashings must be installed by the building contractor in accordance with the Technical Literature. A 7.5 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

17.15 After installing the window and door joinery, Linea™ Trim, planted sills and scribes may be installed in accordance with the Technical Literature to provide additional weatherproofing for the joinery/weatherboard junction.

Inspections

17.16 The Technical Literature must be referred to during the inspection of Scyon® Linea® Weatherboard Cavity Cladding installations.

Finishing

17.17 The paint coating manufacturer's instructions must be followed at all times for application of the paint finish. Scyon® Linea® Weatherboards and trim must be clean and dry before commencing painting.

Health and Safety

18.1 Cutting of Scyon® Linea® Weatherboard must be carried out in well ventilated areas, and a dust mask and eye protection must be worn.

18.2 When power tools are used for cutting, grinding or forming holes, health and safety measures as set out in the Technical Literature must be observed because of the amount of dust generated.

18.3 Safe use and handling procedures for Scyon® Linea® Weatherboard and the components that make up the cladding system are provided in the relevant manufacturer's Technical Literature.

The following is a summary of the technical investigations carried out:

Tests

19.1 The following testing has been completed by BRANZ:

- BRANZ expert opinion on NZBC E2 code compliance for Scyon® Linea® Weatherboard Cavity Cladding was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Scyon® Linea® Weatherboard Cavity Cladding was tested to E2/VM1 (as contained within NZBC Clause E2, Third Edition, Amendment 5). The testing assessed the performance of the foundation detail, window head, jamb and sill details, meterbox head, jamb and sill details, balustrade to wall junction, parapet cap and internal and external corners. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of NZBC Acceptable Solution E2/AS1 for drained cavity claddings.
- Uniform wind face load tests to simulate wind pressures on 12 mm thick Scyon® Linea® Weatherboards were carried out by BRANZ, and the results were used in assessing 16 mm thick Scyon® Linea® Weatherboard used in Scyon® Linea® Weatherboard Cavity Cladding.
- Cone Calorimeter testing to determine the peak rate of heat release and total heat release of Scyon® Linea® Weatherboard was completed by BRANZ. The testing was carried out in accordance with AS/NZS 3837.

19.2 Scyon® Linea® Weatherboards have been tested by a James Hardie NATA accredited laboratory in accordance with AS/NZS 2908.2. The testing covered: soak-dry, bending strength, warm water soaking, heat/rain, freeze/thaw and apparent density. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

19.3 Testing has been carried out by James Hardie New Zealand to determine the modulus of rupture and inter-laminar bond strength of carbonated and non-carbonated Scyon® Linea® Weatherboard. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

20.1 Weathertightness, structural, fire and durability opinions have been provided by BRANZ technical experts.

20.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

20.3 The manufacturer's Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

21.1 The manufacture of Scyon® Linea® Weatherboard has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

21.2 The quality of materials, components and accessories supplied by James Hardie New Zealand is the responsibility of James Hardie New Zealand. The quality control system of James Hardie New Zealand has been assessed and registered as meeting the requirements of ISO 9001: 2008.

21.3 Quality on site is the responsibility of the installer.

21.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the building underlay, cavity battens, Scyon® Linea® Weatherboard and accessories in accordance with the instructions of James Hardie New Zealand.

21.5 Building owners are responsible for the maintenance of Scyon® Linea® Weatherboard Cavity Cladding in accordance with the instructions of James Hardie New Zealand.

Sources of Information

- AS 3730 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4534: 1998 Zinc and zinc/aluminium-alloy coatings on steel wire.
- AS/NZS 4680: 2006 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



BRANZ

In the opinion of BRANZ, Scyon® Linea® Weatherboard Cavity Cladding is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal. The Appraisal is issued only to James Hardie New Zealand, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. James Hardie New Zealand:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by James Hardie New Zealand.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to James Hardie New Zealand or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 14 September 2010

Amendment No. 1, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011 and NZBC Acceptable Solution E2/AS1 Third Edition, Amendment 5.

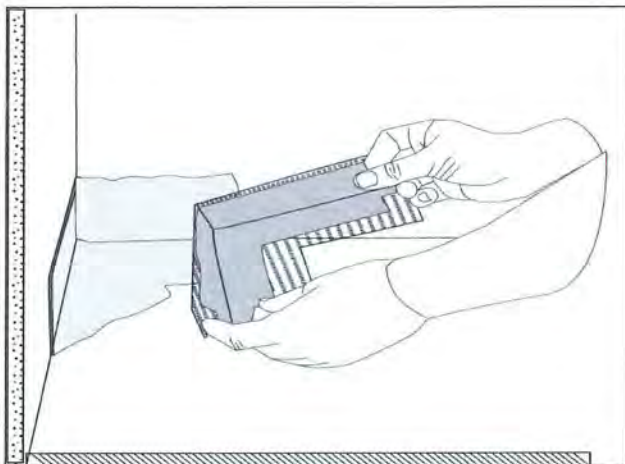
Amendment No. 2, dated 30 October 2013.

This Appraisal has been amended to change the Appraisal Holder, change the Product Name and to update clause changes as required by the introduction of NZBC Fire Clauses C1 – C6 Protection from Fire and A3 Building Importance Levels.

Amendment No. 3, dated 5 March 2014.

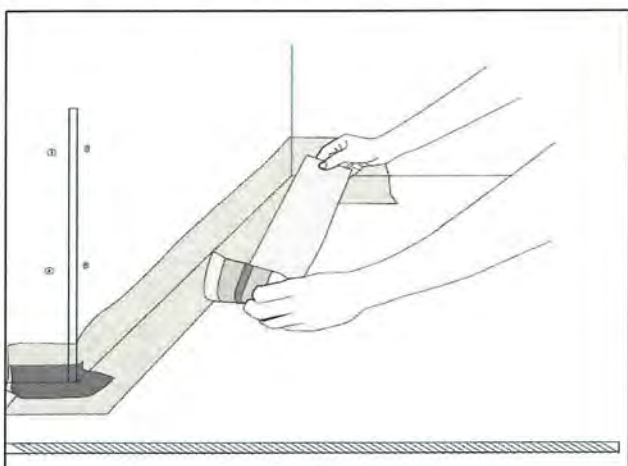
This Appraisal has been amended to alter the scope to include NZS 3604 Wind Zone Extra High, and specific design wind pressures up to and including 2.5 kPa.

Aqua Blok



Aqua Blok Elasto-Joint Corners

Aqua Blok Elasto-Joint Corners provides a superior, flexible long term sealing protection for internal 90° and external 270° corner intersections. Aqua Blok Elasto-Joint Corners offer a simplified solution over other sealing methods at critical corner intersections. Elasto-Joint Corners are used in conjunction with the Elasto Joint Band to ensure a flexible, seamless elastic seal.



Aqua Blok Elasto Joint Band

The Aqua Blok Elasto-Joint Band provides long term protection at volatile joint intersections and movement zones. Constructed of high strength flexible rubber compound, the Aqua Blok Elasto Joint Band is rupture, chemical and water resistant, and can accommodate movement over joints with up to 95% elastic recovery. As an approved bondbreaker system conforming to AS 3740 The Aqua Blok Elasto-Joint Band provides for a simplified, superior sealing method at volatile areas whilst offering time saving efficiencies over conventional bond breaking tapes, foam rods, and sealants.

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Aqua Blok Elasto-Tap Sleeve

Aqua Blok Elasto-Tap Sleeves provide simple, effective sealing around penetrations including pipes, drainage outlets, and cabling by creating a permanent tight, flexible waterproof seal.

RECOMMENDED FOR

- Wall/floor junctions.
- Movement and expansion Joints.
- Sheeting/substrate abutments
- Corner intersections
- Pipe penetrations, drainage outlets
- Internal and external applications
- As an approved bond breaker for use in areas covered by AS3740-2010.

PRODUCT FEATURES

- * Approved bond breaker system in accordance with AS 3740
- * Easy, time saving application
- * Superior sealing system over traditional bond breaking methods
- * Superior movement capabilities - able to withstand movement in both longitudinal and lateral directions.
- * Made from a unique high strength rubber with excellent water, chemical and rupture resistance



APPLICATION

1. Apply a liberal coat AquaBlok SBR or AquaBlok 2-Part membrane to internal and external corner intersections approximately 150mm wide.
2. Embed Aqua Blok Elasto-Joint Corners into wet membrane, ensuring full saturation of the fabric edges. Remove any air pockets, voids or creases that may have formed behind the fabric edges using a brush or spatula.
3. Measure and cut AquaBlok Elasto-Joint Band for all wall/floor junction areas. Ensure Joint Band is measured to allow for a minimum 50mm overlap onto AquaBlok Elasto-Joint Corners
4. Apply a liberal coat of AquaBlok SBR or AquaBlok 2-Part membrane to the surface approximately 150mm on walls and floors at the junction.
5. Embed AquaBlok Elasto-Joint Band into wet membrane, ensuring full saturation of the fabric edges. Remove any air pockets, voids or creases that may have formed behind the fabric edges using a brush or spatula.

IMPORTANT

- * When installing the Aquablok Elasto Joint Band, ensure enough wet membrane is applied behind the band to achieve proper adhesion to substrate.
- * Joint Band must be bedded into a wet film of waterproofing membrane. Do not allow membrane to skin or dry before bedding in position
- * Lengths of AquaBlok Elasto-Joint Band are to be overlapped and adhered a minimum of 50mm onto AquaBlok Elasto-Joint Corners using the selected AquaBlok membrane
- * After installation of the bandage and corners, total area may be covered over with AquaBlok WPU, AquaBlok SBR or AquaBlok 2 Part waterproofing membranes.

PACKAGING

AquaBlok™ Elasto-Joint Band
120mm x 50m roll

AquaBlok™ Elasto-Joint Corner
100mm x 100mm
10 x units per carton

AquaBlok™ Elasto-Tap Sleeve
120mm x 120mm
10 x units per carton

LIMITATIONS

- * AquaBlok Elasto-Joint Band must not be used over joints greater than 20mm wide.
- * AquaBlok Elasto-Joint Band must not to be used over joints with expected movement greater than 50% of the original joint width.
- * AquaBlok Elasto-Joint products must only be used in conjunction with AquaBlok SBR, AquaBlok WPU and AquaBlok 2 Part waterproofing membranes.
- * AquaBlok Elasto-Joint products must not be used with any solvent based membranes or coatings.
- * AquaBlok Elasto-Joint is not designed as an exposed joint sealant for external applications
- * Contact **CTA Technical Department** for further information.

GUARANTEE

CTA Pty Ltd guarantees this product for 12 years provided the application is in accordance with the manufacturer's written directions for use and the Australian Standard for waterproofing AS3740-2010 "Waterproofing of domestic wet areas.". The representations and recommendations regarding the products are based on tests which CTA believes to be reliable. However, no guarantee of their accuracy can be made because of the great range of field conditions and variations encountered in raw materials, manufacturing equipment and methods. Thus the products are sold with a limited warranty only and on the condition that the purchasers will make their own tests to determine the suitability of the product for their particular purposes. Under no circumstances will CTA Pty Ltd be liable to anyone except for replacement of the products or refund of the purchase price.

QUEENSLAND

70 Platinum Street Crestmead QLD 4132
PO Box 1135 Browns Plains BC QLD 4118
T : (07) 3489 3000
F : (07) 3489 3099

NEW SOUTH WALES

2 Prime Drive (Cnr Powers Road) Seven Hills
NSW 2147
T : (02) 9674 1004
F : (02) 9674 2002

WESTERN AUSTRALIA

Unit 2 / 51 Wittenberg Drive
Canning Vale WA 6155
T : (08) 9256 1074
F : (08) 9256 1076

SOUTH AUSTRALIA

PO Box 872
Brighton SA 5048
T : (08) 8387 2356
F : (08) 8387 9268

Aqua Blok

PRODUCT HIGHLIGHTS

- Low VOC content
- Permanently flexible - accommodates cracking in substrate
- Excellent adhesion to a wide variety of substrates
- Dries to a keyed finish to promote adhesion with tile adhesives
- Single pack
- Quick drying
- Safe and easy to use
- No priming required
- Designed for use with a 12mm bond-breaker



BEST FOR:

- Shower recesses
- Bathroom floor areas
- Laundries
- Kitchens
- Balconies
- Patios
- Steel (suitably primed)
- Concrete, cement render, plaster
- Wet area wall lining board
- Hardie/CSR sheet flooring
- Brick
- Light weight aggregate block
- Plasterboard, MDF
- Plywood sheet flooring

Aqua Blok is a waterborne flexible waterproof membrane designed for use under tiled finishes that is capable of accommodating expected structural movement.

SURFACE PREPARATION

All surfaces to be waterproofed must be firm, clean, dry, sound and smooth. All grease, oil, wax, curing compounds, dust, droppings, loose material, paint and any other contaminants must be removed. Fibrous cement sheeting, water resistant plasterboard, marine ply and level 3 treated ply must be fixed in accordance with the manufacturer's installation directions. Concrete must be allowed to cure for 28 days and cement render and sand / cement screeds must be allowed to cure for 7 days prior to the application of Aqua Blok. Porous substrates must first be primed using an appropriate water based primer. Damp or moist substrates and dense non - porous substrates must be primed using "Aqua Blok Epoxy Seal".

Apply an appropriate neutral cure silicone as a bond breaker to the wall/wall joints, the wall/floor joints, and wherever there is a change in the direction of the substrate. All sheet joints and fixings must also be filled with neutral cure silicone before applying a coat of Aqua Blok over all sheet joints, extending 100mm either side of the joints.

Static crack treatment

For cracks less than 1mm, clean thoroughly before filling with an appropriate neutral cure silicone. Aqua Blok cannot span gaps. For dynamic cracks/expansion joints and control joints contact the CTA Technical Department for further advice.

APPLICATION - Internal Wet Areas

Aqua Blok must be applied using a brush or roller.

A minimum thickness of 1mm dried film thickness of Aqua Blok is required for optimum waterproofing properties. The surface onto which Aqua Blok is applied must be continuous. Aqua Blok cannot span gaps. A minimum of two coats of Aqua Blok is required.

Shower Recesses

Apply Aqua Blok to the internal vertical corners of the shower using a brush extending at least 100mm either side of the joint. Ensure the corner is well coated. This must extend past the height of the shower rose. It is important to coat around the tap protrusions in the wall. The wall/floor joint must be coated with Aqua Blok. The membrane must extend onto the floor at least 100mm and onto the wall 100mm. Aqua Blok must extend a minimum of 25mm above the height of the hob. The walls should then be coated. Once the wall/wall junctions, wall/floor junctions, tap protrusions and walls are coated, then the shower floor must be coated. When coating the floor, the Aqua Blok must be dressed down into the floor waste a minimum of 50mm. The floor must be coated with the Aqua Blok ensuring a minimum dry film thickness of 1mm is achieved. Apply a final coat to ensure there are no imperfections in the membrane.

manufactured by:



Queensland
70 Platinum Street
Crestmead QLD 4132
T 07 3489 3000
F 07 3489 3099

South Australia
T 08 8387 2356
F 08 8387 9268

New South Wales
118A Long Street
Smithfield NSW 2164
T 02 9756 0066
F 02 9756 0060

www.ctaustralia.com.au

Walls of Wet Areas (excluding joints)

Aqua Blok must be applied at 0.5 litre per M² per coat. The minimum dry film thickness must be a minimum of 0.5mm.

Floors of Wet Areas

Apply Aqua Blok to the wall/floor joints and sheet flooring joints and fixings using a brush, extending at least 100mm either side of the joints. Once these areas are dry, the entire floor area can be coated. Sufficient Aqua Blok must be applied onto the surface to achieve a 1mm dried film thickness. Aqua Blok must be applied at 1 litre per M² per coat. Two coats are required.

Roofs

Aqua Blok is recommended as a waterproofing membrane for non-trafficable areas. Application is recommended as for "Floors of Wet Areas". There must be sufficient falls for effective drainage to eliminate ponding.

DRYING

Allow 4 – 6 hours between coats. Allow 48 hours to dry prior to tiling. Allow longer in adverse weather conditions.

CLEAN UP

Clean tools and equipment with warm water and detergent while the membrane is still wet.

PACKAGING

15 litre plastic pails

COVERAGE

Floors - 2 litres per M² at 1mm dry film thickness

Walls – 1 litre per M² at 0.5mm dry film thickness

TILING

Use an appropriate CTA Pty Ltd recommended tile adhesive

SHELF LIFE

Unopened pails can be stored for up to 12 months in a cool, dry and weatherproof environment. Bags must be stored off the floor.

SAFETY DIRECTIONS

CTA supports best practice in material handling: gloves, mask, safety goggles and protective clothing should be worn. If the product comes into contact with the skin, wash off with warm soapy water. Avoid inhaling the dust by wearing a suitable dust mask and provide adequate ventilation. If swallowed drink plenty of water and seek medical advice. In case of contact with the eyes, rinse with an eye wash or wash away with plenty of water.

FIRST AID

If poisoning occurs, contact a Doctor or Poisons Information Centre (Phone Australia: 13 11 26, New Zealand: 0800 764 766). EMERGENCY INFORMATION: 1800 033 111 (ALL HOURS). SEE THE MATERIAL SAFETY DATA SHEET FOR ADDITIONAL INFORMATION.

LIMITATIONS

- Aqua Blok is not designed to stop a hydrostatic head of water pressure
- Aqua Blok must not be used over damp, wet or contaminated substrates
- Aqua Blok must not be applied if it is raining or if rain is imminent
- Aqua Blok must not be applied directly over protective coatings
- Aqua Blok must not be applied over the recommended coverage of 1 litre per m²
- To eliminate possible surface contamination or damage, it is recommended that tiling be carried out as soon as the membrane has cured
- Timber and particleboard flooring must be overlaid with fibrous cement sheeting
- Aqua Blok must not be used as a wearing surface for foot or vehicle traffic
- Aqua Blok must only be used as recommended
- Do not apply where the surface temperature is below 10°C or greater than 35°C

manufactured by:



GUARANTEE

CTA Pty. Ltd. guarantee this product for 12 years provided application is in accordance with manufacturer's written directions for use and the Australian Standard for Tiling Practice (AS3958.1-2007). The representations and recommendations regarding the products are based on tests which we believe to be reliable. However, no guarantee of their accuracy can be made because of the great range of field conditions and variations encountered in raw materials, manufacturing equipment and methods. Thus, the products are sold with a limited warranty only, and on the condition that purchasers will make their own tests to determine the suitability of the product for their particular purposes. Under no circumstances will CTA Pty Ltd. be liable to anyone except for replacement of the products or refund of the purchase price.



BRANZ Appraised

Appraisal No.724 [2011]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 724 (2011)**

Amended 31 January 2012

AQUABLOK INTERIOR WATERPROOFING MEMBRANES

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Product

1.1 AquaBlok Interior Waterproofing Membranes are single and two part waterproofing membranes for use under ceramic or stone tile finishes in internal wet areas.

CTATM CONSTRUCTION
TECHNOLOGIES
AUSTRALIA



Aqua Blök

2.1 AquaBlok Interior Waterproofing Membranes have been appraised for use as waterproofing membranes for internal wet areas of buildings, within the following scope:

- on floor substrates of concrete, flooring grade particleboard, plywood, compressed fibre cement sheet and fibre cement sheet tile underlay, and on wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
- when protected from physical damage by ceramic or stone tile finishes; and,
- where floors are designed and constructed such that deflections do not exceed 1/360th of the span.

2.2 The use of AquaBlok Interior Waterproofing Membranes on concrete slabs where hydrostatic or vapour pressure is present from below is outside the scope of this Appraisal.

2.3 Movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.

2.4 The ceramic or stone tile finishes are outside the scope of this Appraisal.

2.5 The membranes must be installed by trained applicators, approved by Construction Technologies Australia Pty Ltd.

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, AquaBlok Interior Waterproofing Membranes if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. AquaBlok Interior Waterproofing Membranes meet this requirement. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Interior wet area floors and walls incorporating AquaBlok Interior Waterproofing Membranes will meet this requirement. See Paragraphs 11.1- 11.6.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. AquaBlok Interior Waterproofing Membranes meet this requirement and will not present a health hazard to people.

This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

4.1 Materials supplied by Construction Technologies Australia Pty Ltd are as follows:

AquaBlok SBR

- AquaBlok SBR is a styrene-butadiene copolymer-based, one-part, ready-to-use, liquid-applied membrane supplied as a thixotropic paste in 4 and 15 litre pails.

AquaBlok 2 Part

- AquaBlok 2 Part is a quick drying, latex based, two-part, flexible, cementitious-based, liquid-applied membrane. It is supplied as AquaBlok Part A liquid in 10 litre pails and AquaBlok Part B powder in 15 kg bags. When dry, the membrane is light grey in colour.

Eco Prime WB Primer

- Eco Prime WB is a synthetic, latex based liquid which is used for priming a variety of substrates prior to the application of the AquaBlok Waterproofing Membranes. It is supplied in 5 litre and 20 litre containers.

Elasto-Joint Bandage and Corners

- Elastomeric bond-breaker tapes are used at movement and expansion joints, and elastomeric formed corner sections for use at internal and external corner wall/floor junctions as set out in the Technical Literature. The tapes are available in rolls 50 m long x 120 mm wide. The corner sections are approximately 150 mm long and are available for internal corner/floor junctions (90°) and external corner/floor junctions (270°).

Handling and Storage

5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The membrane products have a shelf life of 12 months from date of manufacture in the original unopened packaging. Once opened, the products must be used within 3 months.

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the AquaBlok Interior Waterproofing Membranes. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

General

7.1 AquaBlok Interior Waterproofing Membranes are for use in buildings where an impervious waterproof membrane is required to floors and walls to prevent damage to building elements and adjoining areas.

7.2 The membranes must be protected from physical damage by the application of ceramic or stone tile finishes.

7.3 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ "Good Practice Guide Tiling".

7.4 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

Substrates

Plywood

8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3 (CCA treated). **LOSP treated plywood must not be used.** The plywood must be supported with dwangs or framing with a maximum span of 400 mm in each direction and fixed with 10 g x 50 mm stainless steel countersunk head screws at 150 mm centres on the edges and 200 mm through the body of the sheets.

Fibre Cement Compressed Sheet / Fibre Cement Sheet Tile Underlay

8.2 Fibre cement compressed sheet must be manufactured to comply with the requirements of AS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Fibre cement sheet tile underlay must be suitable for use in internal wet areas. Installation must be in accordance with the instructions of the manufacturer.

Particleboard

8.3 Particleboard must be specified for the end use in accordance with NZS 3602.

Concrete and Concrete Masonry

8.4 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101, concrete slab-on-ground to NZS 3604, and concrete masonry to NZS 4229 and NZS 4230.

Wet Area Wall Linings

8.5 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588 and be suitable for use in internal wet areas.

8.6 Fibre cement sheet must be suitable for use in wet areas.

Durability

Serviceable Life

9.1 AquaBlok Interior Waterproofing Membranes, when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tile finishes with a design service life of 15-25 years.

Maintenance

10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the tiled areas to ensure they are sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grouts and sealants.

10.2 In the event of damage to the membranes, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.

10.3 Drainage outlets must be maintained to operate effectively, and ceramic or stone tile finishes must be kept clean.

Internal Moisture

11.1 AquaBlok Interior Waterproofing Membranes are impervious to water and when appropriately designed and installed will avoid the likelihood of water penetrating behind linings or entering concealed spaces.

11.2 AquaBlok Interior Waterproofing Membranes are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of Code Compliance for overflow is given in NZBC Acceptable Solution E3/AS1 Paragraph 2.

11.3 Surfaces must be finished with ceramic or stone tile finishes. A means of Code Compliance to NZBC Clause E3.3.3 and E3.3.4 is given in NZBC Acceptable Solution E3/AS1 Paragraph 3.1.1 (b), 3.1.2 (b) and 3.3.1 (b).

11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1500 mm out from the shower rose. Floor wastes and drainage flanges must be provided and the floor must fall to the outlet.

11.5 The waterproofing membranes must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions can be obtained from AS 3740, BRANZ "Good Practice Guide Tiling", and flooring and wallboard manufacturers.

11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30 mm.

Installation Skill Level Requirement

12.1 Installation of the membranes must be completed by trained applicators, approved by Construction Technologies Australia Pty Ltd.

12.2 Installation of substrates must be completed by tradespersons with an understanding of internal wet area construction, in accordance with instructions given within the Construction Technologies Australia Pty Ltd Technical Literature and this Appraisal.

Preparation of Substrates

13.1 Substrates must be dry, clean and stable before installation commences. With surfaces that are even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.

13.2 The relative humidity of the concrete must be 75% or less before membrane application. Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 424.

13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor and wall/wall junctions must have reinforcing mesh installed as set out in the Technical Literature.

13.4 Porous substrates must be primed with Eco Prime WB Primer and allowed to dry fully before the membranes are installed.

Membrane Installation

14.1 Installation must not be undertaken where the substrate surface temperature is below 5°C or above 35°C.

14.2 AquaBlok Part B liquid and AquaBlok Part A powder must be mixed and left to stand for 5 minutes before re-mixing, then applying. AquaBlok must be thoroughly stirred before application.

14.3 The membranes must be applied in a minimum of two coats at the rates set out in the Technical Literature to give a total minimum finished thickness of 1.2 mm. Subsequent coats must be applied in an opposite direction to the previous coat.

14.4 Application can be made by roller (medium/long nap), brush (long bristle), or a non-edge serated flat steel trowel.

14.5 In all situations, reinforcement provisions as set out in this Appraisal and the Technical Literature apply.

14.6 Clean up may be undertaken with water.

Tiling

15.1 The membranes must be fully cured before tiling. The cured membranes must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.

15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Tiling Practice Guide. The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or Construction Technologies Australia Pty Ltd.

Inspections

16.1 Critical areas of inspection are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.

- Membrane curing and integrity prior to the installation of tiles including protection from mechanical damage during curing and prior to tile installation.

Health and Safety

17.1 Safe use and handling procedures for the membranes are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

The following is a summary of the technical investigations carried out:

Tests

18.1 The following testing of AquaBlok Interior Waterproofing Membranes has been undertaken by the following organisations:

- Amdel Limited, Australia – water absorption; tensile strength and elongation; shore A hardness; water vapour transmission; accelerated weathering and low temperature flexibility.
- CSIRO, Australia – mass per unit area and gravimetric thickness; tensile strength and elongation at break; tensile strength and elongation at break after UV exposure, including immersion in water, bleach and detergent; loss on heating; moving joint test and cyclic strain.

Test methods and results have been reviewed by BRANZ and found to be satisfactory.

18.2 The following testing of AquaBlok Interior Waterproofing Membranes has been undertaken by Amdel Limited, Australia – wet area durability testing in accordance with AS/NZS 4858 covering immersion in water, bleach, detergent, and heat ageing; UV ageing; water absorption; low temperature flexibility and water vapour transmission. Test methods and results have been reviewed by BRANZ and found to be satisfactory.

18.3 Although not required by the standard AS/NZS 4858 as water vapour transmission testing had already shown compliance, additional testing of AquaBlok Interior Waterproofing Membranes was also undertaken by Amdel Limited for suitability over particleboard in accordance with AS/NZS 4858, Appendix C, and found to be satisfactory.

Test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

19.1 An assessment was made of the durability of AquaBlok Interior Waterproofing Membranes by BRANZ technical experts.

19.2 Site inspections were carried out by BRANZ to examine the practicability of installation.

19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

20.1 The manufacture of the membranes has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

20.2 The quality management system of the membrane's manufacturer has been assessed and found to be satisfactory.

20.3 The quality of supply to the market is the responsibility of Construction Technologies Australia Pty Ltd.

20.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing systems and the substrates.

20.5 Quality on site is the responsibility of the trained applicators, approved by Construction Technologies Australia Pty Ltd.

20.6 Building owners are responsible for the maintenance of the ceramic tiles in accordance with the instructions of Construction Technologies Australia Pty Ltd.

Sources of Information

- AS 2908.2: 2000 Cellulose-cement products - flat sheet.
- AS 3740 – 2010 Waterproofing of wet areas within residential buildings.
- AS 3958.1: 1991 Guide to the installation of ceramic tiles.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2269: 2008 Plywood – Structural.
- AS/NZS 4858 - 2004 Wet area membranes.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3602: 2003 Timber and wood-based products for use in buildings.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4229:1999 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230:1990 Code of practice for the design of masonry structures.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition (Amendment 12, 10 October 2011).
- The Building Regulations 1992.
- Good Practice Guide Membrane Roofing, BRANZ , October 2003.



BRANZ

In the opinion of BRANZ, **AquaBlok Interior Waterproofing Membranes** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Construction Technologies Australia Pty Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Construction Technologies Australia Pty Ltd**:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Construction Technologies Australia Pty Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Construction Technologies Australia Pty Ltd** or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 5 April 2011

Amendment No. 1, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011.

4311M METALCRAFT PROFILED ROOFING - CORRUGATE

The following branded section has been prepared by Construction Information Ltd (Masterspec) in conjunction with the product manufacturer. The downloading and/or use of this section are subject to the following terms and conditions:

- Users of this section shall rely solely on their professional judgment and skill in determining the appropriateness of using or referring to this section and to satisfy themselves as to the accuracy of the data it contains.
- Users acknowledge that neither Construction Information Limited nor the manufacturer of the products and systems described in the text are in any way liable in respect of any particular use or application of the material provided.

Masterspec sections must be customised to suit the project being specified, by removing irrelevant information and adding project-specific information and selections.

1. GENERAL

This section relates to the supply and fixing of Metalcraft profiled roofing complete with accessories.

Modify or extend the above description to suit the project being specified.

Related work

1.1 RELATED SECTIONS

Refer to ~ for ~.

Include cross references to other sections where these contain related work.

This section does not include for rainwater gutters, spoutings and pipework. Some flashing work is also often covered elsewhere.

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1170.2 Structural design actions - Wind actions

AS 3566 Self-drilling screws for the building and construction industries

NZS 3604 Timber framed buildings

NZMRM NZ Metal roof and wall cladding - Code of practice

Documents listed above and cited in the clauses that follow are part of this specification.

However, this specification takes precedence in the event of it being at variance with the cited document.

Delete from the DOCUMENTS clause any document not cited. List any additional cited documents.

RELATED DOCUMENTS

Refer to the following related documents when preparing this section:

NZBC E2/AS1 External moisture, 8.0 Roof claddings

AS 1397 Steel sheet and strip - hot-dipped, zinc-coated or aluminium/zinc-coated
AS/NZS 2728 Prefinished/pre-painted sheet metal products for interior/exterior
building applications - performance requirements
NZS 3403 Hot-dip galvanized corrugated steel sheet for building purposes
BS EN 2070 Aluminium and aluminium alloy wrought products. Technical
specification. Sheet, strip formed profiles and plate.

BRANZ BU 488 Coil-coated metal claddings
BRANZ BU 318 Care of coil-coated metal claddings
BRANZ BU 358 Crest fixing of profiled metal roofing
BRANZ BU 393 Powder-actuated and mechanically powered fasteners
BRANZ BU 408 Roofs on exposed sites
BRANZ BU 465 Domestic flashing installation
BRANZ BU 466 Timber-frame parapets, balustrades and columns
BRANZ BU 467 Principles of flashing design
BRANZ publication Selecting roof claddings

1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are available on the website or by contacting Metalcraft Industries Ltd.

For technical assistance contact Metalcraft Roofing
Web: www.metalcraftroofing.co.nz

Metalcraft area office details are available through the website.

1.4 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification:
BMT Base metal thickness NZMRM New Zealand Metal Roofing Manufacturers Inc

Refer general section INTERPRETATION & DEFINITIONS for abbreviations used throughout the specification.

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

1.6 QUALIFICATIONS

Roofers are to be Metalcraft Approved Installers, or experienced, competent roofers familiar with Metalcraft products.

1.7 MAINTENANCE INSTRUCTIONS

Provide one bound copy of all relevant Metalcraft Roofing maintenance information on completion of the roofing work.

Warranties

1.8 MANUFACTURER'S WARRANTY

Warrant this work under normal environmental and use conditions against:
15 years Failure of coating adhesion (manufacturer's standard warranty)
15 years Weatherproofing failure caused by material penetration as a result of

corrosion (manufacturer's standard warranty)
5 years Weatherproofing failure caused by substandard workmanship

From: Date of completion of installation

Refer to the general section WARRANTIES for additional requirements.

*Check with Metalcraft for the appropriate warranty terms and conditions.
Check general section WARRANTIES for the date of commencement of warranties;
which is normally practical completion of the contract. Refer to the chosen conditions
of contract as it may also contain information on warranties and guarantees.*

Performance

Note that in using the next clause you are setting a standard of performance for the contractor to meet. Specifiers should therefore consider adding some means of confirming (say by testing or certification) that the performance criteria will be or have been met. Specification of a Metalcraft Approved Installer in QUALIFICATIONS will ensure that performance criteria are met.

1.9 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604, or by wind loads given by AS/NZS 1170 Part 2. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Confirm with Metalcraft the fastener type and fixing pattern for the load capacity required.

Modify this clause depending on whether NZS 3604, or AS/NZS 1170.2 are being used as a design basis for the project.

Confirm with Metalcraft the fastener type and location to achieve the load capacity required.

1.10 CO-ORDINATE

Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof.

1.11 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets.

Refer to later EXECUTION clause on co-operating with others on the installation of elements which penetrate or adjoin the roofing system; including walls and parapets, skylights, sundry elements fixed through the roofing surface, service pipework, etc.

2. PRODUCTS

Select the product that suits the brief and use the PRODUCTS and EXECUTION clauses that follow to suit the product selected.

Materials - General

2.1 WIRE NETTING

Refer to WRAPS, UNDERLAYS AND DPC for wire mesh.

2.2 SAFETY MESH

Refer to WRAPS, UNDERLAYS AND DPC for safety mesh.

Consult Metalcraft for advice on when safety mesh is required. Can be supplied plastic covered. Delete this clause if safety mesh is not required.

2.3 UNDERLAY

Refer to WRAPS, UNDERLAYS AND DPC for underlays.

2.4 METALCRAFT ROOFING

Refer to SELECTIONS for type.

2.5 TRANSLUCENT ROOFING

Topglass® Ice Clear White Tint, Opalescent and Opaque UV Smart reinforced Polyester roof sheeting as manufactured by Alsynite NZ Ltd to comply with AS/NZS 4256.3 JASANZ Certification Licence No 2349.

The sheeting to be manufactured to conform to the nominated roofing and cladding profile.

2.6 FLASHINGS GENERALLY

Formable grade 0.55 mm BMT for galvanized, Zinalume® and pre-coated steel, and 0.90 mm BMT for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

Revise the clause wording to suit the specified roofing. Soft Edge Aluminium is recommended as suitable for corrugated profile only; Flashguard can be used on all profiles below 33 mm.

2.7 FLASHINGS TO VERGE, RIDGE AND HIP

Supplied by Metalcraft to match or to suit the roofing.

Grade G300 steel is used for flashings and cappings. If specifying Zinalume® sheet use only compatible materials for soft edgings - soft pure aluminium, 0.45 mm thick, or Flashguard.

Components

2.8 FASTENERS GENERALLY

Minimum Class 4 durability and not less than the roofing material being fixed. Screw fasteners to be head stamped identifying the manufacturer and class.

2.9 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, and wind load as required by Metalcraft, and with a durability not less than the material fixed.

Length of fixing will depend on the height of the selected profile. Number of fasteners and use of washers will depend on the wind loads. Check Metalcraft requirements.

Where thermal movement might exceed 10 mm prepare a separate clause specifying profiled washers and oversized holes as required by Metalcraft and consider detailing a step in the roofing (check details with Metalcraft).

2.10 RIVETS

Sealed aluminium, minimum diameter 4.8 mm.
Refer to Metalcraft requirements.

Accessories

2.11 SEALANT

Neutral curing silicone or polymer sealant as required by Metalcraft and used as directed.

2.12 CLOSURE STRIPS

Polyurethane profiled closed cell foam strips to fit the sheet profile.

Brand: Ecofoam
Profile: Corrugate

3. EXECUTION

Conditions

3.1 INSPECTION

Inspect the roof framing and supporting structure to ensure that it is complete and fully braced ready for roofing and free from any misalignments or protrusions that could damage the roofing.

3.2 STORAGE

Take delivery of and accept packs of roofing dry and undamaged on delivery. Reject all damaged material. Store on a level firm base clear of the ground, with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets.

3.3 HANDLING

Avoid distortion and contact with damaging substances, including cement. Do not drag sheets across each other or other materials. Protect edges and surface finishes from damage. Use soft, flat sole shoes when fixing and for all other work on the roof.

3.4 SEPARATION

Isolate dissimilar materials in close proximity as necessary by painting the surfaces or fitting separator strips of compatible materials. Place isolators between metals and treated timber and cement based materials. Do not use unpainted lead sheet in contact with or allow water run-off onto galvanized steel or Zinalume®.

Application

The following execution clauses are written specifically to suit profiled, pre-coated galvanized steel, or Zinalume®.

3.5 SET-OUT & LAYING

Carefully set out to allow cover flashings of equal width at the ends of the building. Lay sheets with side laps away from the prevailing wind ensuring ends of sheets are true to line. Check during fixing to eliminate creep or spread and use string lines along purlin centres to keep fastenings in line.

3.6 FORMING

Form stop-ends and downturns to Metalcraft recommendations.

3.7 END LAPS

End laps are not recommended, except where specifically detailed to Metalcraft requirements.

If end laps cannot be avoided, check detail with Metalcraft.

3.8 THERMAL MOVEMENT

Roof fixing and jointing to conform to Metalcraft requirements for thermal movement.

3.9 FIXING GENERALLY

Install and fix in accordance with the Metalcraft Roofing and Cladding Systems Manual and the NZMRM NZ Metal roof and wall cladding - Code of practice and to Metalcraft required fixing patterns and details for each area of the building roofing. Use only screws as required by Metalcraft. Paint colour matched fixings and accessories before installation.

Especially with residential work, nail fixing is still favoured by some installers. Check with Metalcraft before specifying.

3.10 FIX UNDERLAY, NETTING AND MESH

Refer to WRAPS, UNDERLAYS AND DPC for the installation of underlays, wire netting and safety mesh.

Modify to suit.

3.11 FIX INSULATION

Refer to INSULATION for the installation of thermal and acoustic insulation.

Modify to suit.

3.12 MARKING AND CUTTING

Cut only by shearing tools. Do not use black lead pencils for marking Zinalume®, Colorsteel® products.

3.13 FIX SHEETS

Fix sheets in place using the fastening system required by Metalcraft for specified profiles, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet.

3.14 FIX TRANSLUCENT ROOFING

Installation to be carried out in accordance with the requirements of AS/NZS 1562.3: 1994, NZ Roofing Code of Practice and Alsynite NZ Ltd Technical catalogue.

3.15 FLASH

Flash roof to parapets, walls and penetrations to detail in Metalcraft installation manual and to the NZMRM NZ Metal roof & wall cladding - Code of practice and Metalcraft requirements. Cut accurately and fix using sealant and rivets to detail and to Metalcraft requirements to form a weatherproof cover. Ensure flashings are designed and installed to avoid water ponding.

3.16 FIX RIDGES AND HIPS

Cut accurately and fix using primary fasteners to the purlins. Join using neutral curing silicone or polymer sealant and sealed rivets to detail and to the NZMRM NZ Metal roof and wall cladding - Code of practice. Ensure flashings are designed and installed to avoid water ponding.

3.17 FIX VERGE AND CAP FLASHINGS

Cut accurately and fix using primary fasteners to the purlins. Join using neutral curing silicone or polymer sealant and sealed rivets to detail and to the NZMRM NZ Metal roof and wall cladding - Code of practice. Ensure flashings are designed and installed to avoid water ponding.

Add further description of associated flashings and overflashings to penetrations, parapets, roof-mounted equipment and similar installations, either here or in other sections, as appropriate to the project.

3.18 PENETRATIONS

Flash and overflash all penetrations through the roof.

Expand this very general clause to better describe the various types and forms of penetrations needing to be flashed.

3.19 PENETRATIONS AND JUNCTIONS

Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof. Required work includes the following:

- underlay turned up at wall and parapet lines
- underlay finished and dressed off to all openings, ready for the installation of skylights and other penetrations
- roofing installation neatly finished to all sides of openings and to all wall and parapet junctions
- installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings).

Completion

3.20 REPLACE

Replace damaged or marked elements.

3.21 LEAVE

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

3.22 REMOVE

Remove all trade rubbish, swarf and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spoutings, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

4. SELECTIONS

Select the product that suits the brief and use and EXECUTION clauses that follow to suit the product selected.

Materials - roofing products

There is also a range of finish choices offering different warranty levels. Select from the following finishes for steel depending on personal preference and environmental considerations based on AS/NZS 2728.

Unpainted galvanized steel (zinc coated steel, Z450) receives no warranty in any environment category.

Mild (ISO category 1-2) Moderate (ISO cat. 2) Marine (ISO cat. 3) Industrial (ISO cat. 3-4)

Unpainted Zinalume® (zinc/aluminium coated steel, AZ150)

Colorsteel® Endura™ (Zinalume® substrate)

Colorsteel® Maxx™ (Zinalume® substrate)

Severe marine (ISO category 4)

Colorsteel® Endura™ (Zinalume® substrate)

Colorsteel® Maxx™ (Zinalume® substrate)

Very severe (ISO category 5)

Colorsteel® Maxx™ (Zinalume® substrate)

Refer to Colorsteel® / colour chart.

Refer to Metalcraft installation manual for appropriate choice of profile and base material to suit the load/span requirements.

4.1 METALCRAFT CORRUGATE

Profile: Corrugate

Base material: Steel

BMT: ~ mm

Coating system: ~

Colour: ~

Corrugated profile. Nominal rib height 18 mm. Screw fixed through ribs. BMT: 0.40 mm or 0.55 mm.

Coating system: Zinalume®, Galvsteel™, Colorsteel® Endura™, Colorsteel® Maxx™

For moderate and marine environments choose either Colorsteel® Endura™, Colorsteel® Maxx™ or unpainted Zinalume.

For severe marine environments choose either, Colorsteel® Endura™, Colorsteel® Maxx™, painted or unpainted aluminium.

For very severe marine environments choose either Colorsteel® Maxx™, painted or unpainted aluminium.

Colour: Refer to Colorsteel® colour chart.

4.2 METALCRAFT SPECIALITY ROOFS

System: ~
Profile: Corrugate
Base material: Steel
BMT: ~ mm
Coating system: ~
Colour: ~

Available as either pre-curved by machine crimping or rolling, or drape curved on site, in a range of profiles and finishes:

Refer to Metalcraft for guide to minimum radii for convex spring curved and pre-curved roofing

Option System:

Pre-curved - Corrugated only

Drape Curved (Sprung Curved)

BMT: 0.40 mm or 0.55 mm for Drape Curving

0.55 mm for Roll Curving corrugate

Coating system: Zinalume, Galvanised Steel, Colorsteel® Endura™, Colorsteel® Maxx™

For moderate and marine environments choose either Colorsteel® Endura™, Colorsteel® Maxx™ or unpainted Zinalume.

For severe marine environments choose either, Colorsteel® Endura™, Colorsteel® Maxx™, painted or unpainted aluminium.

For very severe marine environments choose either Colorsteel® Maxx™, painted or unpainted aluminium.

Colour: Refer to Colorsteel® colour chart.

4.3 TRANSLUCENT ROOFING

Profile: Corrugate
Type: Alsynite Topglass® UV Smart reinforced Polyester roof sheeting
Weight: ~ g/m² (~ mm)
Colour: ~

Manufactured to suit roofing profile.

Colour: Clear, opalescent SPF, and Opaque UV Smart. Other colours available on request to suit specific design applications.

Refer to manufacturer's website for selections: <http://www.alsynite.co.nz>

Product Warranty

James Hardie®
WEATHERBOARDS

February 2013

James Hardie New Zealand ("James Hardie") warrants for a period of 15 years from the date of purchase that the James Hardie Weatherboards (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

- a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.
- b) This warranty is not transferable.
- c) The Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice.
- d) The project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("NZBC"), regulations and standards.
- e) The claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product.
- f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces).
- g) All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law.
- h) If meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. James Hardie has tested the performance of James Hardie Weatherboards when installed in accordance with the James Hardie Weatherboards technical specification, in accordance with the standards and verification methods required by the NZBC and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

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Ask James Hardie™
Call 0800 808 888
www.jameshardie.co.nz



FIRST
WINDOWS & DOORS

Producer Statement/ Warranty

This Producer Statement covers product supplied as per our quotation and is based on window schedules, floor plans and elevations as supplied.

Quote No.

Date

Revision Date

Supplied Only ☐

Supplied & Installed ☐

Unglazed ☐

Glazed ☐

Please read reverse for
guidance on care and
maintenance of your FIRST
Windows & Doors

To validate this Performance Warranty

Please complete this portion (your name as the actual owner may not yet be on our records) and return to:

Sample Only

Owner

Site address

Manufacturer

Date installation completed

Warranty No.

Our windows comply with the building code

We hereby certify that all products supplied by our company meet or exceed the requirements of the New Zealand Building Code Means of Compliance, NZS 4211:2008 Performance of Windows and NZS 4223, Glazing in Buildings Parts 1,2 and 3.

This means that our windows have been designed and tested to perform under the most diverse New Zealand weather conditions, and:

- have been successfully tested for strength under a range of wind pressures appropriate for the various wind zones in New Zealand.
- meet the requirements for deflection under simulated loads.
- meet stringent requirements for waterproofing and air leakage.
- have glass of the correct thickness and toughness to cope with expected wind loads and accidental human impact.

In accordance with our TERMS AND CONDITIONS OF SALE a guarantee for all FIRST products is provided under normal conditions of use against failure of materials and workmanship for 5 years from date of practical completion.

DURABILITY. FIRST WINDOWS & DOORS products can be expected to have a trouble-free serviceable life of not less than 15 years as required by section B2 of the New Zealand Building Code. This pertains specifically to the structural elements of the joinery.

In the course of normal use decorative elements and non-structural fittings such as window fasteners, door rollers, weatherpile and the like may need to be replaced as they wear out. This process does not contravene the B2 Durability requirements of the New Zealand Building Code or the warranty given by the manufacturer.

The decorative coating on the joinery is covered by a separate warranty.

A window and door hardware warranty covers manufacturing defects, functionality and surface finish for 5 years, assuming that the care and maintenance guidelines are followed. Plated (soft) finishes are excluded from this warranty as deterioration is possible under some environmental conditions.

Please Note: This warranty is subject to correct installation as outlined in the Building Code Acceptable Solution Clause E2/AS1 External Moisture.

Purchaser

Address

Site address

Manufacturer

Address

Date installation completed

Signature

Warranty No.

MARLEY NZ / Guarantee

Marley New Zealand Limited (**Marley**) guarantees the purchaser of Marley spouting or downpipe products (**Products**) against defects in material and manufacture (**Guarantee**) for a period of 15 years from the original date of purchase (**Guaranteed Period**).

Conditions: This Guarantee is subject to the following conditions:

- The Products must be used only as external spouting and downpipes and are not suitable for use as a concealed system.
- The Products must be used and installed strictly according to the then current Marley published installation instructions as at the original date of purchase.
- If the Products are to be used in any application not covered by the then current Marley literature as at the original date of purchase, written confirmation of suitability must be obtained from Marley and a copy provided to Marley with any claim made under this Guarantee.
- Only Marley fittings and uPVC solvent cement (MCS) should be used in conjunction with the Products to ensure the integrity of the completed system.
- The Products must be maintained in accordance with the then current maintenance program available in Marley's Rainwater literature at the original date of purchase.

Failure to meet all the conditions set out above will deem this Guarantee invalid.

Exclusions: This Guarantee does not apply to:

- Any colour fading of the Products, including any colour fading caused by environmental conditions. Over time the Products will weather, as is customary with all exterior pigmented finishes. The rate at which fading occurs will be dependent on the environmental conditions the Product is exposed to, including UV levels, pollution and building orientation.
- Any Products modified, repaired or interfered with in any way other than by Marley or a Marley authorised person.
- Any Products purchased for the purposes of a business under the Consumer Guarantees Act 1993.
- Any defects in the Products caused by or resulting from causes not attributable to faulty material or manufacture, including defects caused by or resulting from any act or omission by the purchaser including misuse, neglect, incorrect installation or accidental damage.

Procedure

- Subject to the conditions and exclusions above, if during the Guaranteed Period you consider that our Guarantee has not been fulfilled, do not attempt repairs or replacement.
- Contact Marley with your claim in writing, with proof of purchase and evidence of the original purchase date. Marley will then recommend an appropriate course of action.

Scope of the guarantee

- Subject to the conditions and exclusions above and provided that any claim is made within the Guaranteed Period, if any Products supplied breach this Guarantee, we will, at our option, provide replacement Product or refund the Product's original purchase price.
- This Guarantee is given to "consumers" as defined in, and who have the rights under, the Consumer Guarantees Act 1993 and should be read with the statutory consumer guarantees contained in that Act. This Guarantee is not intended to exclude, restrict or modify a consumer's rights under the Consumer Guarantees Act 1993.
- There may be some colour variation between existing Product and new Product supplied for replacement. Marley do not guarantee that any replacement Product will be an exact colour match to the original Product.
- Nothing expressed or implied in this Guarantee will confer any liability on Marley for any indirect, consequential or special loss or damage directly or indirectly resulting from any breach of this Guarantee.



Your new water storage tank may not be the largest investment around your home but for the health and well being of your family it could very well be your most important.

ELETANK provides the cost-effective solution for your storage of cool, clear water.

ELETANKs are manufactured in concrete with steel mesh reinforcing, using the most modern precasting procedures.

Kept cool by the natural insulation properties of the substantial concrete walls, water stored in an ELETANK is far less likely to be affected by bacterial or algal growth.

ELETANKs are manufactured in the latest technology steel mould system that ensures consistent wall thickness without variation.



ELETANKs are the superior concrete water tanks, incorporating 36 percent greater wall thickness than the New Zealand Standard, together with 40 percent greater quality of custom designed and manufactured reinforcing steel.

With 65 years of history, the customer has peace of mind for their servicing and back-up needs.

- Strong as an elephant!
- Strong concrete tanks that can be placed above ground or be partially or totally buried.
- Available in different sizes- up to 5000Gallon – 25,000 Litre capacity
- Ideal for farms, lifestyles, homes and businesses that need to supply their own water
- Extra water storage for those drought times.
- Six soft spots for convenient pipe entry
- Certified lifting points
- Two 32mm outlets and one 50mm outlet
- Two overflow soft spots
- Batch and tested concrete
- Can be transported throughout New Zealand
- **Product Guaranteed for twenty five years**
- **Also available are Flat Top tanks, Flood wash tanks and Effluent Sumps.**

Tank Accessories Available

Large range of Water pumps
Water level indicators
Leaf eaters
Filters
First flush diverters
Gate & ball valves
25mm to 300mm fittings available
PVC pipes and fittings

6. This warranty shall not apply to:

- 6.1 Any products, or components manufactured by any other person or company other than Larsens, except for any warranty indemnification as specified in Clause 3.
- 6.2 Any faults which may have been caused by external factors outside the manufacturers control.
- 6.3 Any products which Larsens determines have, by Customer or otherwise, been subjected to operating and/or environmental conditions in excess of the maximum specifications or operating instructions or otherwise have been subject to misuse, neglect, improper installation, repair, alteration or modification of any kind.
- 6.4 Installation or maintenance performed by service personnel not authorised, qualified and/or equipped in Larsens opinion to perform such services.

7. **Larsens** shall not be responsible in any contract or under any form of liability at law or equity or otherwise for any loss, damage, expense or injury of any kind whatsoever consequential or otherwise arising out of or in connection with the installation, use or failure of the products or any defect therein or any part thereof or from any cause whatsoever including (and without limitation) the negligence of **Larsens** or its employees or agents and whether or not any such matter amounts to a fundamental breach of a fundamental term of the contract.

General

8. This warranty contains **Larsens** sole liability with respect to the products sold and all other warranties or representations whether statutory or otherwise and whether express or implied, oral or written, as to the state, quality or fitness of the products and coverage capabilities are hereby expressly excluded.



HOW TO GET WARRANTY SERVICE

Should your product need servicing under warranty you should contact the sales outlet from which it was purchased. If you are not located near the outlet from please contact **Larsens Concrete & Drainage** 437 Heads Rd, WANGANUI. Phone: 06 344 5911 Fax: 06 344 8189 E-mail: sales@larsensconcrete.co.nz

IMPORTANT

To qualify for warranty service you will also need to provide evidence of purchase date from a copy of your purchase invoice. Include reference to the serial numbers on the product.

*Thank you for selecting a quality Larsens product
Please record this information for your reference.*

Customer Name:

Address:

Phone Number:

Product Code:

Product Description:

Delivered to:

Date Purchased:

Sales Representatives Name:

Sales Representatives Signature:

The Warranty

1. Larsens warrants that all tanks of its own manufacture sold by Larsens will at the date of purchase by the Customer and for a period of 8 years * there-after be free from defects in materials and workmanship and will conform to Larsens applicable specifications or, if appropriate to specifications accepted by Larsens, therefore.

Larsens Obligation

2. Larsens obligation under this warranty is limited to, at Larsens option, either:

- 2.1 Repairing; or,
- 2.2 Refunding the purchase price of; or
- 2.3 Replacing the products of part thereof (on an exchange basis)

for which Larsens is responsible under this warranty and for which written notice of the defect is forwarded to and received by Larsens or a Larsens agent at the Customer's expense within thirty (30) days after the date upon which the Customer becomes aware of the defect. Under no circumstances will Larsens accept any notification or return of the product after more than the years stated above* from purchase date.

3. Larsens obligation for all portions of products not manufactured by Larsens shall consist only of passing on to the Customer any warranty indemnification payment actually received by Larsens from the original manufacturer so far as Larsens is permitted to do so.

Exclusions from Warranty

4. Customer is defined as the initial end user only. This warranty extends to the Customer only and not to subsequent customers or users of the Customer's products or purchases from the Customer or assignees, or lessees.
5. In no event shall Larsens be liable for any incidental or consequential damage caused to the Customer or any third party.

Submersible jet pump GPS-X-AJE

Application

Self-priming jet water pumps with a very high hydraulic performance and a considerable pressure capacity. Able to operate at suction lifts of up to 8 metres, and work perfectly even in aerated water. Suitable for submerged or surface installation. Typically this pump is used to pressurise the water supply into to small dwellings or pump water from retention tanks into reuse systems from underground water storage tanks.

Suitable for use as a domestic pressure system in-conjunction with or without a small pressure tank a electronic flow control system automatically switches the pump on and off as water is demand request.

Special Features

- Built in pump control system, no external control system required for automatic operation
- Built in run dry protection
- Built in self test sequence every 72 hours
- Adjustable starting pressure, preset to 2.2bar

Operating conditions

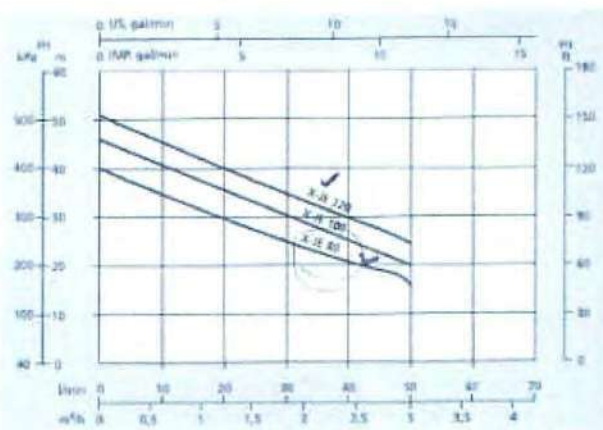
- Liquid temperature between 2 and 37°C
- Ambient temperature up to 40°C
- Total suction lift up to 8m
- Pumped liquid to be free of solids and abrasives

Motor

- Two pole induction motor (2850rpm)
- Water cooled, by pumped liquid
- Insulation - class F
- Protection IP68

Materials

- Pump body - stainless steel 304
- Motor body - stainless steel 304
- Back bracket - stainless steel 304
- Shaft - stainless steel 416
- Impeller - stainless steel 304
- Diffuser - techno-polymer
- Mechanical seal - silicon/silicon
- Power cable - 10m
- Electronic board with microprocessor
- Flow sensor with cobalt Samario magnets



Technical Data GPS-X-AJE

Type	Voltage	Power P ₂		Capacitor		Full load current	Capacity (litres per minute)							
							L/m	0	10	20	30	40	50	60
50Hz		kW	Hp	uF	Volt	Amps	Total Head (metres)							
X-AJE080	230	0.60	0.8	16	450	4.5	H (m)	40	33	30	24	20	15	
X-AJE100	230	0.75	1.0	18	450	5.3		47	40	35	30	25	20	5
X-AJE120	230	0.90	1.2	20	450	5.9		51	45	40	34	30	24	8



10,000 Litre Concrete Tank Warranty

This Warranty is offered by Walter Larsen and Sons Ltd (Larsens)
for Eletank 10,000 Litre Precast Concrete Tank

installed at

This warranty is offered to the original purchaser (other than for purposes of resale) for a period of Eight Years.

This Warranty covers manufacturing defects in materials and workmanship, which occur within the duration of the warranty period.

This Warranty does not cover-

1. Any incidental, indirect, or consequential loss, damage or expense that may result from any defect, failure or malfunction of the warranted product.
2. Any failure that results from an accident, purchaser's abuse, neglect, use in association with corrosive chemical or solvents, operation in excess of stated maximum working pressure and temperature or failure to operate and maintain the warranted product.
3. Items or service that is normally required to maintain the product (eg. Reseal inner surface)
4. Any product not actually manufactured by Larsens. Components supplied with the tank are covered by their respective manufacturers warranties. Larsens obligation shall consist only of passing on to the Customer any warranty indemnification payment actually received by Larsens from the original manufacturer so far as Larsens is permitted to do so.

Responsibilities of Larsens are to-

Repair or replace at Larsens option the affected concrete tank that has failed as a result of faulty manufacture, within the duration of the warranty period. If repair or replacement is not feasible, Larsens may at its option refund the purchase price.

Responsibilities of Purchaser are to-

1. Provide access to the concrete tank. Travel costs or any costs associated with providing access to the tank, if incurred must be borne by the purchaser.
2. Use reasonable care in the operation and maintenance of the product
3. Report any faults within 30 days of becoming aware of the defect so that it can be remedied with a minimum of fuss and costs.
4. for warranty service, send a written description of the defect with a copy of your invoice to-

Larsens Concrete
437 Heads Road
Castlecliff,
Wanganui 4501



NEW ZEALAND INSTITUTE OF
ARCHITECTS
INCORPORATED



Building Code Clause(s)

PRODUCER STATEMENT – PS1 – DESIGN

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

ISSUED BY: SUMI RESOURCES LTD
(Design Firm)
TO: LARSEN'S CONCRETE & DRAINAGE
(Owner/Developer)
TO BE SUPPLIED TO:
(Building Consent Authority)
IN RESPECT OF: LARSEN'S ELE 10000 LITRE WATER TANK
(Description of Building/Work)
AT:
(Address)
..... LOT DP SO

We have been engaged by the owner/developer referred to above to provide STRUCTURAL DESIGN TO
REINFORCED CONCRETE TANK services in respect of the requirements of

Clause(s) 6.7 & AS/NZS 1546.1:1998 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
(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
..... and numbered

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
- (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, DAVID MULHOLLAND am: ☐ CPEng #
(Name of Design Professional) ☐ Reg Arch #

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

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: [Signature] ON BEHALF OF SUMI RESOURCES LTD
(Design Firm)

Date: 15/2/2010 (signature) DAVID MULHOLLAND [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.

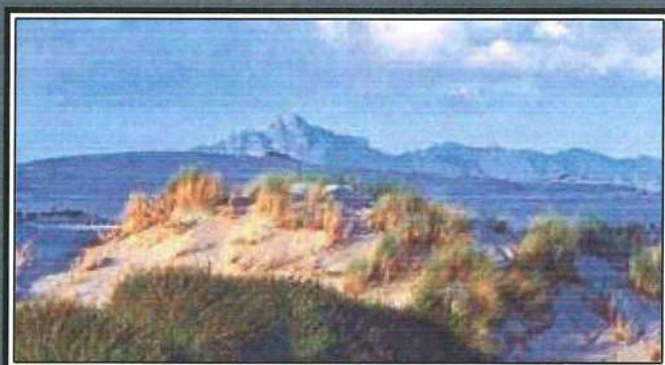
September 2003

(Replaces March 2000)

*This edition of the New Zealand Steel
Environmental Categories Guide supersedes
all previous editions.*

ENVIRONMENTAL

CATEGORIES



GALVSTEEL™

COLORSTEEL®

Zincalume®

ENVIRONMENTAL CATEGORIES AND PRODUCT RECOMMENDATIONS

INTRODUCTION

New Zealand has a wide range of environmental conditions, from the harsh West Coast beaches, to the relative shelter of the Waikato farming region. Therefore, New Zealand Steel Limited offers a range of steel products which are suitable for most locations.

VERY SEVERE – ISO CATEGORY 5

50m from high water from East Coast, 100m from high water from West Coast.

Characterised by:

- Heavy salt deposits.
- The almost constant smell of salt spray in the air.
- Close to breaking surf (typically 0-100 metres) such as is found on exposed coasts.

This environment may be extended inland by prevailing winds and local conditions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

SEVERE – ISO CATEGORY 4

Characterised by:

- Light salt deposits.
- A frequent smell of salt in the air.
- Typically 100-500 metres from breaking surf such as is found on exposed coasts.
- In the immediate vicinity of large expanses of calm salt water such as harbour foreshores.

This environment may be extended inland by prevailing winds and local conditions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

MODERATE COASTAL – ISO CATEGORY 3

Characterised by:

- Little or no salt deposits.
- The occasional smell of salt in the air.
- Typically 500-1000 metres from breaking surf such as is found on exposed coasts, OR
- In the immediate vicinity of calm salt water such as estuaries.

MODERATE INLAND – ISO CATEGORY 2

Characterised by:

- No obvious marine or industrial influences.
- Typically more than 1000 metres from the exposed coasts or more than 500 metres from industrial emissions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

COMMERCIAL WARRANTY

Such as schools, warehouses and buildings, refer to New Zealand Steel Limited for details of commercial warranties. Maximum warranty offered on commercial buildings is 15 years.

IMPORTANT

- As product use is dictated by local conditions, seek advice from your roofing supplier or fixer for the best New Zealand Steel Limited product to suit your specific environment.
- Gutters should be installed according to manufacturer's instructions.
- Unwashed and high risk areas – manual washing every 3 months.

0 metres

50 metres

COLORSTEEL[®] Maxx[™]

COLOUR FOR THE EXTREME

Greater than 50m from breaking surf on the East Coast.
Greater than 100m from breaking surf on the West Coast.

WARRANTIES

15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.

10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

MAINTENANCE

- Rain washing
- Rain washing plus manual washing every 3 months.
- Manual washing every month.
- Manual washing every month.

15 years: covering the paint surface against flaking, peeling and excessive fade. **20 years:** against perforation as a result of corrosion.

15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.

10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

- Rain washing
- Rain washing plus manual washing every 6 months.
- Manual washing every 3 months.
- Manual washing every 3 months.

15 years: covering the paint surface against flaking, peeling and excessive fade. **30 years:** against perforation as a result of corrosion.

15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.

- Rain washing
- Rain washing plus manual washing every year.
- Manual washing every 6 months.
- Manual washing every 6 months.

10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

COLORSTEEL[®] Endura[™]

COLOUR FOR THE FUTURE

WARRANTIES

Not recommended

MAINTENANCE

Not recommended

15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

No warranty

5 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.

5 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

- Rain washing
- Rain washing plus manual washing every 6 months.
- Manual washing every 3 months.
- Manual washing every 3 months.

18 years: covering the paint surface against flaking, peeling and excessive fade. **30 years:** against perforation as a result of corrosion.

15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.

- Rain washing
- Rain washing plus manual washing every year.
- Manual washing every 6 months.
- Manual washing every 6 months.

10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.

VERY SEVERE COASTAL

100 metres

SEVERE COASTAL

500

Zincalume®

GALVSTEEL™

WARRANTIES

Not recommended

MAINTENANCE

Not recommended

WARRANTIES

Not recommended

MAINTENANCE

Not recommended

Not recommended

Not recommended

Not recommended

Not recommended

15 years: against perforation as a result of corrosion.

- Rain washing

No warranty

- Rain washing

15 years: against perforation as a result of corrosion.

- Rain washing plus manual washing every 6 months.

- Rain washing plus manual washing every 6 months. Painting may be advisable depending on the specific location.

10 years: against perforation as a result of corrosion.

- Manual washing every 3 months.

- Manual washing every 3 months. Painting may be advisable depending on the specific location.

10 years: against perforation as a result of corrosion.

- Manual washing every 3 months.

- Manual washing every 3 months. Painting may be advisable depending on the specific location.

MODERATE COASTAL

MODERATE INLAND

metres

1000 metres

Zincalume®

GALVSTEEL™



SPECIAL ENVIRONMENTS

In New Zealand there are areas where local conditions create an increased likelihood of corrosion. Special consideration should be given to material selection in these areas. They include:

1. Geothermal Areas

Hydrogen sulphide associated with geothermal activity creates a corrosive environment. Variations in natural activity or draw-off from steam bores plus the effects of weather conditions make the high risk areas hard to define.

2. West Coast, South Island

In this area, smoke from the coal burning fires may cause high concentrations of sulphur dioxide in the air. The combination of this and the high rainfall for the region creates an aggressive situation which must be considered when choosing the appropriate COLORSTEEL® prepainted steel coating. The effects of a severe coastal environment aggravate the situation.

This area combines the most severe features of both industrial and coastal environments. Please contact your local supplier for the best COLORSTEEL® prepainted steel product to use.

3. Internal Environments

Some commercial or agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. Similarly a corrosive environment can develop within sheds used for intensive animal farming. Please consult New Zealand Steel Limited for further details.

4. Industrial Environments

Close to corrosive industrial emissions and subject to heavy fallout from them. Please consult New Zealand Steel Limited for further details.

Further Assistance

Further advice on the selection of the appropriate product to suit your particular location can be obtained from New Zealand Steel Limited or your local COLORSTEEL® prepainted steel supplier.



VERY SEVERE SPECIAL ENVIRONMENTS



FURTHER INFORMATION

For additional information, literature or technical assistance, please contact:

Roofing and Cladding Sector
New Zealand Steel Limited
Private Bag 92 121, Auckland
Telephone: 0-9-375 8999
Facsimile: 0-9-375 8213
Free Phone: 0800 100 523
Email Address: info@colorsteel.co.nz
<http://www.colorsteel.co.nz>

Zincalume®

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GALVSTEEL™

GALVSTEEL™ is a trademark of New Zealand Steel Limited.

COLORSTEEL® Maxx™

COLOUR FOR THE EXTREME

MAXX™ is a trademark of New Zealand Steel Limited.

COLORSTEEL® Endura™

COLOUR FOR THE FUTURE

ENDURA™ is a trademark of New Zealand Steel Limited.

COLORSTEEL®

COLORSTEEL® is a registered trademark of New Zealand Steel Limited.

THE ROOF OF NEW ZEALAND®

is a registered trademark of New Zealand Steel Limited.

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THE ROOF OF NEW ZEALAND®



New Zealand Steel Limited, Private Bag 92 121, Auckland, New Zealand. Ph 0-9-375 8999 Fax 0-9-375 8213



BRANZ Appraised

Appraisal No.450 [2011]

BRANZ Appraisals

Technical Assessments of products
for building and construction

BRANZ APPRAISAL No. 450 (2011)

This Appraisal replaces BRANZ
Appraisal No. 450 (2005) dated
10 June 2010.

Amended 19 June 2013

PROTECTO TAPE FLASHING TAPE

Marshall Innovations Limited
PO Box 9411
Greerton
Tauranga

Tel: 0800 776 9727

Fax: 07 541 1029

Web: www.mwnz.com



BRANZ
BRANZ Limited
Private Bag 50 908
Porirua City
New Zealand
Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz



Product

1.1 Protecto Tape flashing tape is a self-adhering waterproofing membrane used for flashing parapet and balustrade caps. The tape provides a base to which most plaster or texture coat finishing systems are able to be applied, creating a monolithic finish that conceals the tape from view.



Scope

2.1 Protecto Tape flashing tape has been appraised for use as a waterproofing membrane tape within the following scope:

- on buildings within the scope of NZBC Acceptable Solution E2/AS1 Paragraph 1.1 with regards to building height and floor plan area; and,
- on parapets and balustrades, which have a minimum slope of 10° (1 in 4); and,
- with proprietary EIFS and texture coated fibre cement cladding systems; and,
- over fibre cement, polystyrene or timber substrates; and,
- as a sealing 'bandage' over fixing blocks in external walls.

2.2 Proprietary EIFS and texture coated fibre cement cladding systems have not been assessed in this Appraisal and are outside the scope of this Appraisal.

Building Regulations

New Zealand Building Code (NZBC)

3.1 Protecto Tape flashing tape as a product is not within the scope of the NZBC, however it is used in conjunction with building elements and proprietary cladding systems that are required to meet the NZBC. Therefore, in the opinion of BRANZ, Protecto Tape, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years. The Protecto Tape flashing tape meets this requirement. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Protecto Tape flashing tape contributes to meeting this requirement. See Paragraphs 7.1 - 7.4 and 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Protecto Tape flashing tape meets this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of NZBC compliance.

Technical Literature

4.1 System components and accessories supplied by Marshall Innovations Limited are:

- Protecto Tape flashing tape is a black, self-adhering, conformable, modified SBS (styrene-butadiene-styrene) rubberised asphalt tape. The adhesive surface of the tape is covered with a silicone release paper. A white polyester bonding layer is laminated to the topside of the tape. The tape is 1.0 mm thick and supplied in roll sizes 75, 150, 300, 400 and 600 mm wide by 30 m long. Special sizes are available on request.
- Protecto Wrap JS160H is black mastic sealant/adhesive. It is supplied in 310 mls cartridges.
- Protecto Tak is a blue solvent-based spray-on adhesive primer. It is supplied in 369 g cans.

Handling and Storage

5.1 Protecto Tape flashing tape, primer and mastic adhesive must be protected from damage and weather. They must be stored under cover in clean, dry conditions away from direct exposure to sunlight, heat or flame. The materials should not be removed from packaging until they are ready to use.

5.2 Handling and storage of the materials, whether on-site or off-site, is the responsibility of the installer.

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Protecto Tape. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the scope of this Appraisal and the Technical Literature must be followed.

General

7.1 Protecto Tape flashing tape when used with an EIFS or fibre cement cladding system provides an Alternative Solution to the parapet and balustrade capping specified in Section 6 of NZBC Acceptable Solution E2/AS1. Protecto Tape is also an Alternative Solution to the waterproofing membranes specified in Paragraph 9.7.7.1 and 9.9.10.1 of NZBC Acceptable Solution E2/AS1.

7.2 The use of waterproofing membrane tapes over parapets and balustrades is critical to assist in achieving overall weathertightness performance of EIFS and texture coated fibre cement cladding systems. Where a cladding manufacturer specifies the use of a generic waterproof tape over parapets and balustrades as part of their system, Protecto Tape may be used.

7.3 Protecto Tape flashing tape is primarily designed to prevent moisture penetration through the top of parapets and balustrades and at wall junctions of parapets and balustrades. Protecto Tape may also be used as a sealing 'bandage' over cladding and fixing block junctions in EIFS and fibre cement cladding systems.

7.4 The performance of the product is reliant on it being supported by a suitable substrate and protected by a proprietary plaster or texture coat finishing system.

7.5 Where a proprietary cladding system is used, all flashing details must be carried out in accordance with the specifications of the system. Flashing details which are outside the scope of the cladding system are the responsibility of the designer.

7.6 Protecto Tape flashing tape is suitable for use with most plaster or texture coat finishing systems. Confirmation of the suitability of using Protecto Tape flashing tape with a given plaster or finishing system must be obtained from the cladding manufacturer, proprietary plaster or coating finishing manufacturer, or from Marshall Innovations Limited.

7.7 The use of Protecto Tape flashing tape is not designed to overcome poor detailing and workmanship of wall cladding installation. Protecto Tape flashing tape must not be considered in isolation, but as part of the wall cladding system.

Framing

7.7 When Protecto Tape flashing tape is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of the tape.

Durability

8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of the Protecto Tape flashing tape during both normal use and maintenance of the building.

Serviceable Life

8.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Protecto Tape flashing tape is expected to have a serviceable life equal to that of the cladding.

Maintenance

9.1 No maintenance is required for the Protecto Tape flashing tape, however regular checks must be made of the plaster or texture coat finish on parapets, balustrades and around fixing blocks to ensure it is sound and will not allow moisture penetration. The finishing system must be recoated as required by the manufacturer of the system which typically is every 5-10 years.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Protecto Tape from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

11.1 Protecto Tape flashing tape provides suitable flashing and sealing of parapet and balustrade caps when used in conjunction with proprietary cladding systems and other building elements, to meet code compliance with Clause E2.3.2.

Installation Skill Level Requirements

12.1 Installation of materials supplied by Marshall Innovations Limited must be completed in accordance with the Technical Literature from Marshall Innovations Limited.

General

13.1 Installation must be in accordance with this Appraisal and the Technical Literature.

13.2 The substrate must be clean, dry and free from any foreign matter that may adversely affect the adhesion of the membrane. All fibre cement sheet joints must be jointed and sealed before Protecto Tape flashing tape is applied.

13.3 Protecto Tape flashing tape must not be installed in temperatures lower than 7°C.

13.4 Before the Protecto Tak adhesive primer is applied, the substrate surfaces must be clean, dry and free from any surface contaminant such as dust, grease and the like which may cause loss of adhesion. The Protecto Tak adhesive primer must be sprayed along the entire length of the substrate that is to be covered by Protecto Tape flashing tape.

13.5 The correct roll width must be selected to ensure that when centred over the top of the parapet or balustrade, Protecto Tape flashing tape covers the top surface and extends a minimum of 50 mm down the face of the polystyrene or fibre cement board.

13.6 For maximum adhesion to the substrate, the backing paper should be removed in small sections and the tape progressively rolled or pressed firmly to the substrate to avoid air being trapped underneath.

13.7 Protecto Tape flashing tape must be lapped 100 mm at all end laps. Two beads of JS160H mastic adhesive must be applied to the end of the installed piece of Protecto Tape flashing tape to seal the overlap. The mastic must be trowelled smooth before the second length of Protecto Tape is installed over the mastic adhesive.

13.8 Protecto Tape flashing tape must not be exposed to the weather or UV light for more than 90 days. It must be replaced with new material should exposure exceed 90 days.

Health and Safety

14.1 Safe use and handling procedures for the components that make up the Protecto Tape flashing tape is provided in the Technical Literature.

14.2 Extra care must be taken when using Protecto Tak primer in areas where there is insufficient ventilation, and suitable respiratory equipment must be worn at all times. Additional information on the products are available in the Material Safety Data Sheets available from Marshall Innovations Limited.

15.2 Adhesion tests to various substrates have been carried out by ADCO in accordance with ASTM C974. The results have been reviewed by BRANZ experts and found to be satisfactory.

Other Investigations

16.1 An assessment was made of the durability of Protecto Tape flashing tape by BRANZ technical experts.

16.2 The practicability of installation was assessed by BRANZ and found to be satisfactory.

16.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

Quality

17.1 The manufacture of Protecto Tape flashing tape has not been examined by BRANZ, but details of the quality and composition of the materials used were obtained and found to be satisfactory.

17.2 The quality of manufacture of Protecto Tape flashing tape is the responsibility of the Protecto Wrap Company Inc.

17.3 The quality of supply to the market is the responsibility of Marshall Innovations Limited.

17.4 The quality of installation on site is the responsibility of the installer.

17.5 Designers are responsible for the building design, and building contractors are responsible for the quality of the installation of the framing system and the substrates.

17.6 Building owners are responsible for the maintenance of the EIFS or texture coated fibre cement cladding system.

Sources of Information

- ASTM C794: 2001 Standard test method for adhesion-in-peel of elastomeric joint sealants.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 (Amendment 5, 1 August 2011).
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

The following is a summary of the technical investigations carried out:

Tests

15.1 Tests have been carried out which covered fungus and micro-organism growth, breaking strength, dimensional stability and waterproofness. The test results were reviewed by BRANZ experts and found to be satisfactory.



BRANZ

In the opinion of BRANZ, **Protecto Tape Flashing Tape** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Marshall Innovations Limited**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Marshall Innovations Limited**:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Marshall Innovations Limited**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Marshall Innovations Limited** or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 1 February 2011

Amendment No. 1, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011 and NZBC Acceptable Solution E2/AS1 Third Edition, Amendment 5.

Amendment No. 2, dated 15 April 2013.

This Appraisal has been amended to update Appraisal Holder details.

Amendment No. 3, dated 19 June 2013.

This Appraisal has been amended to update clause changes as required by the introduction of NZBC Fire Clauses C1 – C6 Protection from Fire and A3 Building Importance Levels.



BRANZ Appraised

Appraisal No.444 [2011]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 444 (2011)**

This Appraisal replaces BRANZ
Appraisal No. 444 (2005) dated
20 July 2005.

Amended 19 June 2013

**PROTECTO SILL
WINDOW SEALING
SYSTEM**

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Product

1.1 The Protecto Sill Window Sealing System comprises Protecto Wrap Detail Tape, Protecto Wrap Sill Tape and Protecto Tak spray-on adhesive primer. The system is used around timber framed joinery openings as a secondary weather resistant barrier.

1.2 The system is installed into and around the framed joinery opening over the building wrap and exposed timber frame to cover both the face and edge of the opening framing. Protecto Wrap Sill Tape is also used at joinery heads to seal flashing upstands to the building wrap.



Scope

2.1 The Protecto Sill Window Sealing System has been appraised as a flexible flashing system for use around window and door joinery openings for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a flexible flashing system; and,
- with wall wraps compatible with the flashing tape; and,
- situated in NZS 3604 Wind Zones up to, and including, 'Extra High'.

2.2 The Protecto Sill Window Sealing System has also been appraised as a flexible flashing system for use around window and door joinery openings for steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, with regards to building height and floor plan; and,
- constructed with steel framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with wall wraps compatible with the flashing tape and steel frame cladding systems; and,
- situated in NZS 3604 Wind Zones up to, and including, 'Extra High'.

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Protecto Sill Window Sealing System, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. The Protecto Sill Window Sealing System meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Protecto Sill Window Sealing System contributes to meeting this requirement. See Paragraphs 7.1 – 7.4 and 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Protecto Sill Window Sealing System meets this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance. See Paragraph 7.1.

4.1 System components and accessories supplied by Marshall Innovations Limited are:

- Protecto Wrap Detail Tape is a black, self-adhering, un-reinforced, conformable, modified SBS (styrene-butadiene-styrene) rubberised asphalt membrane tape. The tape is covered on one side by a silicone release paper and on the other side by a protective removable film. The tape is 1.0 mm thick and is supplied in rolls 150 mm wide and 15 m long.
- Protecto Wrap Sill Tape is a polyethylene backed, modified SBS rubberised asphalt adhesive membrane tape. The adhesive surface of the tape is covered with a silicone release paper. The tape is 0.5 mm thick and is supplied in rolls of 200, 150 and 50 mm wide and 30 m long.
- Protecto Tak is a solvent based spray-on adhesive primer, coloured blue. It is supplied in 369 g cans.

Handling and Storage

5.1 Handling and storage of all materials supplied by Marshall Innovations Limited, whether on or off site, is under the control of the installer. The Protecto Sill Window Sealing System components must be protected from damage and weather. Rolls must be stored under cover, in clean, dry conditions away from direct exposure to sunlight.

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Protecto Sill Window Sealing System. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

General

7.1 The Protecto Sill Window Sealing System meets the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.5(b). Refer to the Technical Literature for details of the underlays that are compatible with the system. The installation method for the Protecto Sill Window Sealing System is an alternative solution to the installation method shown within NZBC Acceptable Solution E2/AS1, Figure 72.

7.2 The use of flexible flashing systems around window and door joinery openings is critical to assist the overall weathertightness performance of window and door joinery installations.

7.3 The Protecto Sill Window Sealing System is designed to prevent air leakage and water penetration around window and door openings at framing junctions (e.g. at the sill trimmer and opening stud junction), and to keep any water that gets past the cladding, or through the joinery, from direct contact with the framing.

7.4 The Protecto Sill Window Sealing System is not designed to overcome poor detailing and workmanship of the window or door joinery installation. The system must not be considered in isolation, but be considered as part of the wall cladding system. The Protecto Sill Window Sealing System is designed to be used in conjunction with air seals and joinery flashing systems, not as a substitute.

7.5 When the Protecto Sill Window Sealing System is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of the system.

Durability

8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of the Protecto Sill Window Sealing System both during normal use and maintenance of the building.

Serviceable Life

8.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, the Protecto Sill Window Sealing System is expected to have a serviceable life equal to that of the cladding.

Maintenance

9.1 No maintenance is required for the Protecto Sill Window Sealing System. Regular checks, at least annually, must be made of the junctions between the joinery and wall cladding to ensure that they are maintained weathertight and that the primary means of weather resistance for the junction e.g. flashing, sealant, etc continues to perform its function, to ensure that water will not penetrate the cladding.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to the Protecto Sill Window Sealing System from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

11.1 Where a cladding manufacturer specifies the use of generic flashing tapes around window and door joinery openings at framing junctions as part of their system, or they specify the use of flexible flashing tapes that comply with NZBC E2/AS1, Paragraph 9.1.5(b), the Protecto Sill Window Sealing System may be used.

Installation

Installation Skill Level Requirements

12.1 Installation of the Protecto Sill Window Sealing System must be completed by tradespersons with an understanding of flexible flashing systems, in accordance with instructions given within the Protecto Sill Window Sealing System Technical Literature and this Appraisal.

General

13.1 The selected building underlay must be installed in accordance with the manufacturer's instructions, and must completely cover the joinery opening. The wrap is then cut on a 45° angle away from each corner of the opening so the flaps can be folded into the opening and secured to the interior face of the timber framing.

13.2 Before the Protecto Tak adhesive primer is applied, the substrate surfaces must be clean, dry and free from any surface contaminants such as dust and grease that may cause loss of adhesion. The Protecto Tak adhesive primer must be sprayed onto the wrap and exposed timber frame along the entire length of the sill trimmer, the inside and front face of the opening studs and into the top corners of the joinery opening.

13.3 A 300 mm length of Protecto Wrap Detail Tape is installed around all four corners of the opening, keeping the tape flush with the interior face of the opening and ensuring the exposed timber framing is covered. After removing the protective film, the tape that overhangs the front of the opening is 'moulded' onto the face of the building wrap to create an airtight seal at the framing junction.

13.4 The Protecto Wrap Sill Tape is cut in individual lengths to suit the opening of the sill. The Protecto Wrap Sill Tape is installed flush with the interior face of the opening and is applied along the entire length of the sill. The overhanging tape is folded onto the face of the building underlay.

13.5 Two 300 mm lengths of Protecto Wrap Sill Tape are cut for the jambs. The tape is installed flush with the interior face of the opening and tight into the sill/jamb junction. The overhanging tape is folded onto the face of the building underlay.

13.6 Protecto Wrap Sill Tape must not be stretched. To avoid wastage, the tape can be lapped 100 mm minimum onto itself without reducing the performance of the Protecto Sill system.

13.7 If Protecto Sill is exposed to the weather or UV light for more than 90 days, then it must be replaced with new material.

Installation Temperature

13.8 The Protecto Sill Window Sealing System must not be installed at temperatures of less than 10°C.

Inspections

13.9 The Technical Literature must be referred to during the inspection of Protecto Sill Window Sealing System installations.

The following is a summary of the technical investigations carried out:

Tests

14.1 Cyclic and static water pressure leakage tests in accordance with AS/NZS 4284 were carried out by BRANZ on cladding systems incorporating the Protecto Sill system. The test results were reviewed by BRANZ experts and found to be satisfactory.

14.2 The adhesion of Protecto Wrap Sill Tape and Protecto Wrap Detail Tape to black bituminous Kraft building paper complying with the requirements of NZBC Acceptable Solution E2/AS1, Table 23 and selected other synthetic wall underlays have been tested by BRANZ and found to be satisfactory.

14.3 Tests have been carried out on Protecto Wrap Sill Tape in accordance with ICC Evaluation Service Criteria for Flashing Materials, AC148. The results have been reviewed by BRANZ experts and found to be satisfactory.

Other Investigations

15.1 An assessment was made of the durability of the Protecto Sill Window Sealing System by BRANZ technical experts.

15.2 Site inspections were carried out by BRANZ to examine the practicability of installation.

15.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

Quality

16.1 The manufacture of the Protecto Sill Window Sealing System has not been examined by BRANZ, but details of the quality and composition of the materials used were obtained and found to be satisfactory.

16.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.

16.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and building wraps in accordance with the instructions of the designer.

16.4 The quality of installation, handling and storage on site is the responsibility of the installer in accordance with the instructions of Marshall Innovations Limited.

Sources of Information

- ICC Evaluation Service, Inc, AC148 Acceptable Criteria for Flexible Flashing Materials, July 2001.
- NZS 3604: 2011 Timber-framed buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 (Amendment 5, 1 August 2011).
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



BRANZ

In the opinion of BRANZ, **Protecto Sill Window Sealing System** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Marshall Innovations Limited**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Marshall Innovations Limited**:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Marshall Innovations Limited**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Marshall Innovations Limited** or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 1 February 2011

Amendment No. 1, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011 and NZBC Acceptable Solution E2/AS1 Third Edition, Amendment 5.

Amendment No. 2, dated 15 April 2013.

This Appraisal has been amended to update Appraisal Holder details.

Amendment No. 3, dated 19 June 2013.

This Appraisal has been amended to update clause changes as required by the introduction of NZBC Fire Clauses C1 – C6 Protection from Fire and A3 Building Importance Levels.



BRANZ Appraised

Appraisal No.548 [2013]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 548 (2013)**

This Appraisal replaces BRANZ
Appraisal No. 548 (2007) dated
27 July 2007.

Amended 17 December 2013

**TEKTON® BUILDING
WRAP**

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Product

1.1 Tekton® Building Wrap is a synthetic breather-type flexible wall underlay and air barrier for use under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is manufactured of a coated spun-bonded polypropylene.



Scope

2.1 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on timber framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with absorbent wall claddings directly fixed to framing; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
- situated in NZS 3604 Wind Zones up to, and including 'Very High'.

2.2 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer subject to specific design; and,
- situated in NZS 3604 Wind Zones up to, and including 'Very High'.

2.3 Tekton® Building Wrap has been appraised for use as a flexible wall underlay over rigid wall underlays on timber and steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or specific design for steel framed buildings; and,
- situated in NZS 3604 Wind Zones up to and including 'Extra High'.

2.4 Tekton® Building Wrap has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Tekton® Building Wrap into their design in accordance with the declared properties and the instructions of Marshall Innovations Limited.

Building Regulation

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Tekton® Building Wrap, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1(a), not less than 50 years, B2.3.1(b), 15 years and B2.3.2. Tekton® Building Wrap meets these requirements. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Tekton® Building Wrap will contribute to meeting this requirement. See Paragraphs 12.1 – 12.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Tekton® Building Wrap meets this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of the New Zealand Building Code compliance.

Product Description

4.1 Tekton® Building Wrap is a 100 g/m² light grey sheet polypropylene membrane material approximately 0.6 mm thick.

4.2 The product is supplied in rolls 1.370 m x 74 m and 2.743 m x 37 m. The product is printed with the Tekton® logo repeated along the length of the roll. The rolls are wrapped with an instruction sticker.

Accessories

4.3 Accessories used with Tekton® Building Wrap which are supplied by the installer are:

- Fixings – staples, clouts, screws or proprietary wrap fixings, or other temporary fixings to attach the wall wrap to the framing.
- Wall underlay support – polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall wrap in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

Handling and Storage

5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Tekton® Building Wrap. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Construction Detail

Timber and Steel Framing

7.1 Studs must be provided at maximum 600 mm centres. Dwangs must be fitted flush between the studs at maximum 1200 mm centres.

General

7.2 Tekton® Building Wrap is intended for use as an alternative to conventional building papers which are fixed over timber and steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.

7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.

7.4 Tekton® Building Wrap must not be exposed to the weather or ultra violet light for a total of more than 60 days before being covered by the wall cladding.

7.5 Tekton® Building Wrap is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23, except that it must not be used with non-absorbent wall claddings such as vinyl or metal based sidings or weatherboards in direct fixed installations. Tekton® is suitable for use under cavity based wall claddings as a non-absorbent synthetic wall underlay as called up in NZS 2295, Table 2.4 on steel framed buildings. Refer to Table 1.

7.6 Tekton® Building Wrap is also suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, as called up in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 (c). Refer to Table 1.

Table 1: NZBC E2/AS1 Table 23 Requirements

NZBC E2/AS1 Table 23 Wall Wrap Properties	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m ²	Classified as non-absorbent (see paragraph 7.4)
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 5.5 and ≤ 8	9.78 (Note 1)
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear: Machine direction = 228 N Cross direction = 186 N Tensile strength: Machine direction = 4.4 kN/m Cross direction = 3.9 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m ³	Pass

Note 1: Further testing of Tekton® Building Wrap was completed to determine the effect of the high pH level on the wall underlay and materials it is likely to come into contact with during its serviceable life. The testing confirmed that the high pH had no adverse effects on the wall underlay performance, or the performance of other materials.

7.6 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

Stucco Plaster

7.7 Tekton® Building Wrap is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1. The wall underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.2.

7.8 Tekton® Building Wrap may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3(b).

Structure

8.1 Tekton® Building Wrap is suitable for use in all Wind Zones of NZS 3604 up to, and including, 'Very High' when used as a flexible building underlay, and all Wind Zones of NZS 3604 up to, and including, 'Extra High' when used as an overlay for rigid building underlays.

Durability

9.1 Tekton® Building Wrap meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for building wraps used where the cladding durability requirement or expected serviceable life is not less than 50 years, and code compliance with NZBC Clause B2.3.1 (b), 15 years for building wraps used where the cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Tekton® Building Wrap is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Tekton® Building Wrap has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Tekton® Building Wrap from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Tekton® Building Wrap must be used behind claddings that meet the requirements of the NZBC, e.g. such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.

12.2 Tekton® Building Wrap, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding systems compliance with NZBC Clause E2.

12.3 When used as an air barrier, particular care must be taken to ensure an air tight barrier is achieved, and weather sealing at all openings and penetrations through the cladding meets the requirements of the NZBC.

Installation Skill Level Requirements

13.1 Installation must always be carried out in accordance with the Technical Literature and this Appraisal, by competent tradespersons with an understanding of wall wrap installation.

Wrap Installation

14.1 Tekton® Building Wrap must be fixed to all framing members at maximum 300 mm centres with hot-dip galvanised, large-head clouts 20 mm long, zinc plated 6-8 mm staples, self-drilling screws, or proprietary wrap fixings. The membrane must be pulled taut over the framing before fixing.

14.2 Tekton® Building Wrap must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess wall underlay may be cut off flush with the internal face of the wall frame.

14.4 Tekton® Building Wrap can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

14.6 Any damaged areas of Tekton® Building Wrap, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Inspections

14.7 The Technical Literature must be referred to during the inspection of Tekton® Building Wrap installations.

The following is a summary of the technical investigations carried out:

Tests

15.1 The following tests have been carried out on Tekton® Building Wrap by Scion: Folding strength of paper in accordance with AS/NZS 1301.423; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1 and air resistance in accordance with BS 6538-3.

15.2 The following tests have been carried out on Tekton® Building Wrap by BRANZ: Absorbency in accordance with AS/NZS 4201.6, Vapour transmission in accordance with ASTM E 96B, Shrinkage in accordance with AS/NZS 4201.3, Water barrier in accordance with AS/NZS 4201.4 and pH of extract in accordance with AS/NZS 1301.421. A range of these tests were completed before and after Tekton® Building Wrap was exposed to ultra-violet light.

15.3 The Flammability Index of Tekton® Building Wrap has been evaluated in accordance with AS 1530.2.

Other Investigations

16.1 A durability opinion was given by BRANZ technical experts.

16.2 Site inspections were carried out by BRANZ to assess methods used for the installation of Tekton® Building Wrap, and to examine completed installations.

16.3 The marketer's Technical Literature, including installation instructions, have been examined by BRANZ and found to be satisfactory.

Quality

17.1 The manufacture of Tekton® Building Wrap has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of product certification by ICC-ES and CCMC covering quality aspects associated with the product.

17.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall wrap into their design in accordance with the instructions of Marshall Innovations Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Marshall Innovations Limited.

Sources of Information

- AS 1530.2 – 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1988 Determination of the pH value of aqueous extracts of paper, board and pulp – cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays – materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays – Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays – Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays – Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test – Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays – Methods of test – Surface water absorbency.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, Permeable Building Underlays.
- NZS 3604: 2011 Timber-framed buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 (Amendment 5, 1 August 2011).
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



BRANZ

In the opinion of BRANZ, Tekton® Building Wrap is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Marshall Innovations Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. Marshall Innovations Limited:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by Marshall Innovations Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Marshall Innovations Limited or any third party.

For BRANZ

C Percy
Chief Executive

Date of issue: 16 December 2013

Amendment No. 1, dated 17 December 2013.

This Appraisal has been amended to fix an editorial error.

TEKTON SPECIFICATION

PRODUCT DESCRIPTION

Tekton Wall Underlay is a synthetic breather-type Wall Underlay for use as a wall underlay and air barrier under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is a coated spun-bonded polypropylene, and is approximately 0.6mm thick. Tekton Wall Underlay is supplied in rolls 2740mm x 37m and 1370mm x 37m.

FEATURES /BENEFITS

- Tekton Wall Underlay can be used in all wind zones up to and including very high and extra high with RAB Systems.
- Tekton Wall Underlay is fire retardant with a zero flammability index and can be used without restriction on all buildings, however must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the NZ Building Code.
- Tekton Wall Underlay can be installed as an air barrier to walls that are not lined, such as gable ends.
- Tekton Wall Underlay has superior water hold out - keeping framing drier while permanent cladding is installed.
- Tekton Wall Underlay has 50 year durability.
- Tekton Wall Underlay can be left exposed for up to 60 days.
- Tekton Wall Underlay has optimal surfactant resistance (will not lose integrity if exposed to most soaps, detergents and cleaning chemicals).
- Tekton Wall Underlay is Branz appraised # 548 (2013)
- Tekton Wall Underlay can be used as a non-rigid backing material for stucco plaster and as a slip layer over rigid backing for stucco plaster.
- Tekton Wall Underlay is compatible with metal cavity battens.

APPLICATION RANGE

TIMBER FRAMED BUILDINGS

- With absorbent wall claddings directly fixed to the framing.
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer.
- In building wind zones up to and including very high.

STEEL FRAMED BUILDINGS

- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer.
- In building wind zones up to and including very high.

Tekton Wall Underlay can also be used on buildings subject to specific weathertightness design.

STORAGE

Tekton Wall Underlay must be stored on its end in a clean and dry environment. It is the responsibility of the installer to protect the roll from damage and weather.

SURFACE PREPARATION

Studs must be provided at a maximum of 600mm centres. Nogs must be fitted flush between the studs at a maximum of 1200mm centres. The framing must be free from any sharp protrusions that may damage the wall underlay.

INSTALLATION

PLACEMENT

- The branded side of the wall underlay must face away from the framing.
- The wall underlay must run horizontally.
- The wall underlay must extend from the upper side of the top plate to the underside of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs.
- Horizontal laps must be no less than 75mm with the direction of the lap ensuring that water is shed to the outside.
- End laps must be made over framing and be no less than 150mm wide.

It is preferable to tape all joints.

APPLICATION

- Position the roll of Tekton Wall Underlay against the framing with a short length of wall underlay free of the roll.
- Align the guide marks printed on the Tekton Wall Underlay with visible studs and nail /staple to the framing

Fix the wall underlay into place using 6-8mm zinc/stainless plated staples, hot dip galvanised large head clouts or proprietary wall underlay fixings.

- Unroll the wall underlay across the framing and fix to all framing members at a maximum of 300mm centres.
- Keep the wall underlay straight and taut over the framing.
- The wall underlay should be run over any openings and these should be left covered until the windows and doors are ready to be installed. To form the openings cut the wall underlay at a 45 degree diagonal in from each corner. Fold and staple the wall underlay to the inside of the framed opening. Excess wall underlay can be trimmed.

- All openings must be detailed using a Branz appraised flexible flashing system like Super-Stick, Protecto One Piece Sill Tape or the Protecto Sill System.
- Where cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when insulation is installed.
- Tekton Wall Underlay can be added as a second layer over head flashings as per E2/AS1 or the headflashing can be sealed to the wall underlay using Protecto Head Flashing Tape.
- Any damaged areas of the wall underlay must be repaired by overlapping with new material and taping, or by taping small tears.

When fixing wall underlay in windy conditions, care must be taken due to the large sail area created by the roll widths.

WARRANTY

Tekton Wall Underlay meets the durability requirements of NZBC B2.3.1(a), 50 years and B2.3.1(b), 15 years. Tekton Wall Underlay is warranted to be free of defect in manufacture. This warranty is limited to replacement of the Tekton Wall Underlay material. Marshall Innovations NZ/AUS Ltd (the distributor) is not liable for incorrect installation or any accidental or wilful damage to the product.



SPECIFICATION

PART A - Preliminary and General

Standard of Construction and Materials

Mr Dent & Ms Lott

at

11 Matuhi Street, Waikanae.

NOTE: If there should be any discrepancy or conflict between the quote and this specification, then the quote shall take precedence in all cases.

PART A PRELIMINARY & GENERAL

General

This section relates to the following specifications as a whole; to each specification for any work to which a separate contract is let by the Client, and to the work of all Subcontractors.

Regulations and Standards

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

The Contractor and Subcontractors undertaking this work shall obtain copies of the relevant sections of the New Zealand Building code and documents relating to acceptable solutions and verification methods, and shall be conversant with their contents. The following is a list of Approved Documents referred to in this Specification;

B1/AS1	Structure - general
B1/AS2	Structure - timber barriers
B1/AS4	Foundations
B2/AS1	Durability
C2/AS1	Means of Escape
C3/AS1	Spread of Fire
C4/AS1	Structural Stability during fire
D1/AS1	Access routes
E1/AS1	Surface water
E2/AS1	External Moisture
E3/AS1	Internal moisture
F1/VM1	Hazardous agents on site
F2/AS2	Hazardous substances and processes
F4/AS1	Safety from falling
F5/AS1	Construction and demolition hazards
G1/AS1	Personal hygiene
G2/AS1	Laundering
G3/AS1	Food preparation
G4/AS1	Ventilation
G6/AS1	Airborne and impact sound
G7/AS1	Natural light
G8/VM1	Artificial light
G9/VM1	Electricity
G10/AS1	Piped services
G11/AS1	Gas as an energy source
G12/AS1	Water Supplies
G13/AS1	Foul water - sanitary plumbing
G13/AS2	Foul water - drainage
H1/AS1	Energy efficiency

Standards

Throughout this specification, references are made to Standards produced by the Standards Association of New Zealand and other associations as well as various Acts and Regulations. The latest edition at the date of contract applies, unless stated otherwise. It is the responsibility of The Contractor or the Subcontractor to be informed of the material in those publications which are referred to in this specification.

Scope of Work

The scope of work is to construct, completely finish and maintain for a specified time the various works described or indicated on the plans and in the specifications.

Documents

The Contractor and its subcontractors shall be deemed to have familiarised themselves with all the documents comprising the contract including any amendments thereto.

Consents, Permits and Certificates

The Client will lodge a Building Consent Application with the Territorial Authority and pay all fees in connection therewith. Work in all trades shall be in accordance with consents and the New Zealand Building Code.

All Subcontractors are to obtain all other necessary permits and give all necessary notices.

Where Producer Statements are required by the Territorial Authority prior to the issue of a Code Compliance Certificate the Supplier or Subcontractor shall obtain and provide such required statements to the Client.

The Contractor shall uplift a Code Compliance Certificate (covering the whole of the building work) from the Territorial Authority or the Building Certifier as applicable on completion of the contract.

Inspections

The Contractor shall establish from the Territorial Authority or Building Certifier, before construction commences, a list of their required site inspections during the construction process. The Contractor (unless otherwise agreed) shall notify them at

Specification Part A

least 24 hours prior to a scheduled inspection item being available for a site inspection.

Drawings and Specifications

The drawings, with all notes and explanations, the specifications and the general conditions of contract as present at the time of the signing of the contract must be signed when the contract is executed. A copy of all drawings and specifications shall be kept on the site at all times.

In the event of there being differences between the drawings and this specification, the drawings shall take precedence.

Trade Names and Approvals

Where any article or material is referred to by a tradename this shall be deemed to mean the article or material mentioned. The Client, at its discretion, may substitute other brands or materials as the Client deems suitable.

Dimensions

Figured dimensions shall be taken in preference to scale measurements and large scale details in preference to those of small scale. Where dimensions are not shown on the drawings and cannot be deduced from other drawn details they shall be agreed with the Client.

Boundaries

The Client shall arrange for the location of appropriate survey pegs to be established.

Setting out of work

The Contractor shall accurately set out the building in accordance with the site plan and shall take full responsibility for the accuracy of such setting out. Any error shall be made good at the Contractors expense.

In case of alteration to the drawings being found necessary, the Contractor shall immediately report the matter to the Client.

Tradesmanship

The whole of the work is to be carried out in a thoroughly tradesmanlike manner to the true intent and meaning of the plans and this specification.

Protection of Property

The Contractor shall be held solely responsible for all damage to any adjoining buildings or property caused by him or his

employees during the execution of the contract and shall indemnify the Client against all claims on account thereof.

Temporary Vehicular Crossings

The Contractor shall provide such temporary crossings (where required by the Territorial Authority) as are necessary for the protection from damage of all kerbs, channels, footpaths, berms, and public utility services over which vehicles in any way connected with the supply of materials or services for the contract are likely to pass.

Site Access

The Client shall provide access before work commences.

The Contractor shall take all possible measures to maintain safe and clear access to all neighbouring buildings at all times during the currency of this contract and in particular, to avoid construction vehicles or processes blocking thoroughfares or pedestrian routes adjoining the site.

Toilets

The Contractor shall provide toilet facilities.

Water and Power

The Contractor shall arrange and pay for all temporary supply of water and power as required to be used during the construction of the works.

Rubbish Removal

The Contractor shall ensure that all work sites are cleaned regularly and all rubbish is removed.

EARTHWORKS AND EXCAVATIONS:

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

The work specified in this section consists of clearing the site, earthworks for site development, excavations, trenching and trimming, etc., necessary to prepare the site as specified and indicated on the drawings.

The Contractor shall arrange to check existing site levels before commencing work, as no claim will be entertained in respect of any discrepancy on levels or amount of variation from what may have been anticipated, once the work has started.

Where a geotechnical investigation report is available the Contractor shall obtain a copy of this report and be fully familiar with its contents and recommendations.

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

- B1 Structure
- E1 Surface Water
- F1 Hazardous Agents on Site
- F5 Construction & Demolition Hazards

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZS 3604:1999 Code of Practice for Light Timber Framed Buildings Not Requiring Specific Design.

Trees to be retained

Mark trees which are required to be retained using suitable non-injurious, easily visible and removable means of identification. Remove the identification on completion.

Protect from damage trees which are required to be retained. Do not remove topsoil from the area within the drip line of the trees and keep this area free of construction material and debris.

If excavating near trees required to be retained, use hand methods to locate, expose and cleanly remove the roots on the line of excavation.

[i] EARTHWORKS

Site Clearance

Demolish and remove from the site all existing structures, vegetation and rubbish as may be necessary for the proper conduct of the construction work. Provided that all such items as are mentioned in Part B hereof shall be protected, reclaimed or preserved from damage.

Topsoil

Strip all topsoil from all such areas as is necessary to construct the work or as is shown on the drawings and stockpile as directed for future use. The topsoil will remain in the ownership of the Client.

Cut to Fill

Cut to fill and compact all such subsoil material as may be necessary to construct the subgrade to correct levels for building platforms, parking areas, driveways, footpaths and landscaping features as are shown on the plans.

Before any fill is placed the subgrade shall be inspected and approved by the Client (or its nominated consultant).

Under areas to be metalled and paved, excavate down to subgrade level and trim off a true, even surface.

Sound material from the excavations may, where approved, be used for building up low areas and yards, etc., but not under building foundations or floor slabs.

Imported Filling

Where the quantity of cut material on the site is insufficient to complete all required filling, the Contractor shall import additional fill material to make up the deficiency. All such imported fill shall be fit for the purpose for which it is intended and where the work is under the observation of the Client (or its nominated consultant) then it is to be to the approval of the Client (or its nominated consultant).

Specification Part A

Unsuitable Subgrade

Where any subgrade materials are unstable or have insufficient strength to carry the loads required of them, the Contractor shall excavate and remove from the site all such material.

Wet Conditions

Where the presence of ground water in the subsoil is detrimental to the stability of the site, the Contractor shall construct such remedial works as are necessary to stabilise the site, before proceeding with any cut to fill or backfilling operation.

Compaction

All fill and backfill materials shall be placed and compacted in layers in accordance with NZ Building Code B1/VM4

All imported fill shall be truck-spread to avoid segregation of particle sizes or be remixed and machine-spread in the appropriate layer before compaction.

The whole of the area to be paved shall be compacted to optimum density and present a homogeneous and stable surface with no signs of movement or weaving under a 10-12 tonne roller. This requirement shall apply to the compaction of the surface or cut areas formed for pavement subgrades.

Hardfill

Except where permitted in yard areas, all bulk filling shall be hardfill, which shall be broken rock or all scoria of an approved grading.

Compaction shall be by rolling with an 8-10 tonne smooth-wheel roller or approved vibrating equivalent, until a firm unyielding base is obtained.

Clay Fill

In yard areas where clay filling is permitted, material shall be placed and compacted in accordance with NZ Building Code B1/VM4

Fill Under Floor Slab

In areas where the ground is required to support a floor slab backfilling shall be all in scoria or broken rock.

Unless instructed otherwise placing and compaction shall be in compliance with NZS 3604; Appendix E5.

Surface or Filled or Cut Areas

Under concrete slabs the finished level shall at no point be more than +0 or -28mm in height to the correct level. This shall include the depth of granular fill as required for concrete floor slab on ground.

Under yards and roads the tolerance allowed on the finished subgrade shall be +12mm and -25mm and at no point shall the surface hold water.

[ii] EXCAVATIONS

Foundations Generally

Construct, form and trim all foundation excavations true to shape, line, level and profile, as shown on the drawings. Allow sufficient work space.

Unsuitable Foundations

Where unsuitable material is encountered in foundation excavations, the Contractor shall notify the Client (or its nominated consultant) forthwith and seek its instructions upon how to proceed.

For the purpose of this clause "unsuitable material" shall include all topsoil, organic material and any soft, wet or uncompacted material whose bearing strength appears to be lower than that required to carry the design loadings.

Protection of Open Excavations

The Contractor shall at all times protect from damage and deformation all open excavations. The Contractor shall provide adequate means of ensuring that water is not allowed to accumulate or remain in any excavation and shall keep all such excavations clear of any rubbish, soil or other detritus.

Excavated Material

All excavated unsuitable material shall be disposed of off the site.

All other excavated material shall be stockpiled well clear of excavations and disposed of as directed.

Site Concrete

Site concrete for use in foundation excavations shall be as specified generally in the Concrete section of this specification or as

directed by the Client (or its nominated consultant).

Specification Part A

Slab Foundations

Refer to specification for Floor Slab on Ground Construction.

Backfilling Foundation and Walls

After completion of foundation footings and walls, other construction below elevation of final grades, removal of forms, inspection and approval of proofing membranes and prior to backfilling, clean the excavation of rubbish and debris. Use approved excavated material for backfilling. Place backfill in horizontal layers not exceeding 150mm in thickness and compact with approved machine tampers to a density not less than 95% of its maximum. Allow for anticipated settlement and shrinkage.

In the case of retaining walls backfill shall be of granular material between the angle of the cut area and the back face of the retaining wall. The type of granular material shall be as detailed on the drawings.

Protection of Adjacent Structures

Provide all necessary supports, shoring, strutting, underpinning, etc., to ensure the stability of structure, in or adjacent to the site until such times as the permanent work is completed.

Underpinning of foundations shall be designed by a Registered Engineer employed by the Client.

Existing Services

Refer to the plans provided, to the "Project Information Memorandum", and to the relevant Territorial and Network Utility Operator for the positions of existing services.

Care shall be taken not to damage any existing drains that are to be retained but all superfluous drains shall be grubbed up and sealed. Protect any existing retained drains under the new building with concrete to the satisfaction of the Regional or Territorial Authority.

Live services damaged in any way shall be made good at the Contractor's expense. Should it be necessary to remove any services to make way for new work, then new alternatives shall be properly installed before

disturbing the existing services which shall then be removed and suitably stopped off. No drains shall be removed without the approval of the Client (or its nominated consultant).

Trenching

All trenches for new underground services shall be excavated true to line and gradient and shall be of the minimum width necessary to permit the convenient construction of the service for which it is intended.

Ensure a minimum of disturbance to surrounding ground during all trenching operations.

Services Construction

Construct all services, connections and fittings as shown on the drawings to the best trade practice and in accordance with the New Zealand Building Code, and with the Territorial Authority or Network Utility Operator's specifications as appropriate.

Backfilling of Trenches

Backfill all trenches under paved areas, foundations and concrete floor, with hardfill and all other trenches with material excavated therefrom and compact to the same standard as the surrounding subsoil. Where hardfill is placed over services, the services shall be protected from damage by a layer of sand or equivalent to a minimum depth of 300mm over the top of the services.

Do not backfill trenches before services have been inspected and tested.

Dispose of all surplus material off the site.

Reinstatement

Upon completion and acceptance of construction work the Contractor shall forthwith restore all surfaces as appropriate to the same condition as that which was immediately precedent to the commencement of the construction of the service utilities.

Acceptance

Upon completion of construction work on each service utility the Contractor shall obtain from the Network Utility Operator a certificate to the effect that the work complies with the requirements of the Building Consent and shall supply a copy of that certificate to the Client (or its nominated consultant).

CONCRETE WORKS:

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

The work covered by this specification is to provide all materials and execute all work necessary for the construction of the concrete floor slabs and other concrete works as detailed in the drawings and as described in this specification.

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B1	Structure
B2	Durability
E1	Surface Water
E2	External Moisture
F5	Construction & Demolition Hazards
G15	Solid Waste

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZS 3604:1999 Code of Practice for Light Timber Framed Buildings Not Requiring Specific Design.

Site

The site shall be levelled within an accuracy of ± 0 or ± 28 mm to a height of at least 200mm below the finished floor level in preparation for the granular fill.

Granular Base, Vapour Barrier, Reinforcement, etc

The granular base, vapour barrier, reinforcement etc., shall comply with the requirements of the New Zealand Building Code as listed above and NZS 3604; Appendix E.

Surface Finish

The surface finish of all concrete slabs is to be in accordance with NZS 3114:1987 or as specified on the drawings. Consideration shall be taken of the type of covering to be applied to the slab - eg carpet, vinyl, etc

MASONRY CONSTRUCTION:

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

Work covered by this specification is to provide all materials and execute all work necessary for the completion of the masonry content of the contract work.

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B1	Structure - general
B2	Durability
E1	Surface Water
E2	External Moisture
F5	Construction & Demolition Hazards

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZS 3604:1999 Code of Practice for Light Timber Framed Buildings Not Requiring Specific Design

Registered Mason

Masonry constructed to this specification shall be carried out by or under the continuous supervision of a Registered Mason.

A Registered Mason is a mason who is accepted for registration by the New Zealand Masons' Registration Committee and is a holder of a current registration certificate.

Masonry construction done under the supervision of A Registered Mason shall be carried out by tradespeople skilled in masonry construction.

Workmanship

Workmanship inspections and details of construction, unless specifically detailed on the plans and in this specification, shall be in accordance with NZ Building Code B1, E1 and

NZS 3604; Appendix F and shall be approved as conforming to good trade practice.

Brick Veneer

Brick Veneer construction shall be as described in NZ Building Code B1, E1 and NZS 3604 as applicable. Where required by these codes or their commentaries, horizontal, seismic and vertical movement details between the brick veneer and its supporting structure shall be provided.

Bracing

The Subcontractor shall ensure that all masonry walls are adequately braced during erection as required for safe construction against wind, earthquakes, etc. His work shall be sufficiently strong at all times to resist all strains and stresses to which it may be subjected.

Attendance on Other Trades

The Contractor shall provide chases, openings and raglets, and install anchors, bolts, hangers, etc., where required to accommodate the work of other trades.

Starter Bar Positioning for Concrete Masonry

Refer to the New Zealand Concrete Research Association Information Bulletin 1B 047 for the correct placement of starter bars.

Finishing Up

On completion of work, all surfaces shall be thoroughly cleaned down using methods approved by the Client (or its nominated consultant). The site shall be cleared of plant and rubbish and left in first class order.

CARPENTER AND JOINER:

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

The work covered by this section includes all work shown on the plans and in the specifications normally executed by carpenters, including all temporary work, preparatory work, fixing of metalwork, hardware and finishing etc., and attendance, and setting out and finishing for other trades.

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B1	Structure - general
B2	Durability
C3	Spread of Fire
C4	Structural Stability during Fire
D1	Access Routes
E1	Surface Water
E2	External Moisture
E3	Internal Moisture
F2	Hazardous Building Materials
F4	Safety from Falling
F5	Construction & Demolition Hazards
G1	Personal Hygiene
G2	Laundering
G3	Food Preparation and Prevention of Food Contamination
G4	Ventilation
G5	Interior environment
G6	Airborne and impact sound
G7	Natural Light
H1	Energy Efficiency

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZS 3604:1999 Code of Practice for Light Timber Framed Buildings Not Requiring Specific Design.

Setting Out

The Contractor shall be responsible for setting out of all carpentry work in this section. All dimensions to be checked and any

discrepancy notified to the Client (or its nominated consultant).

Workmanship

The whole of the work is to be carried out in a thoroughly tradesmanlike manner to the true intent and meaning of the plans and this specification.

Stability of Structure

The Contractor shall in all cases use proper care and diligence in bracing and supporting all parts of his work. He shall also protect the work from damage by water. His work shall be self-supporting, absolutely strong and fully equal to resisting all strains and stresses to which it may be subjected.

Quality of Internal Wall Finishes

The Contractor shall provide a timber framed wall with an in-service wall lining surface appropriate to the general acceptable level of finish and decor of the wall surface specified in the Painter and Paperhanger and Fibrous Plasterer and Gibraltar Board Stoppers.

The Contractor shall also ensure that he installs wall linings in accordance with the manufacturer's recommendations for the level of finish specified for the final decoration of the wall.

Wall Lining

All wall linings and bracing panels shall be installed in accordance with the manufacturer's installation instructions in the locations indicated on the drawings.

INTERIOR LININGS AND EXTERIOR CLADDINGS

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

The work required under this specification is the supply of all cladding and/or lining material and its installation in the building.

NZ Building Code .

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B2	Durability
C3	Spread of Fire.
E2	External Moisture
F2	Hazardous Building Material
G1	Personal Hygiene
G3	Food Preparation and Prevention of Food Contamination
G6	Airborne and impact sound
H1	Energy Efficiency

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZS 3604:1999 Code of Practice for Light Timber Framed Buildings Not Requiring Specific Design

Workmanship

All workmanship shall be in accordance with the best trade practice and shall be carried out by a skilled tradesman. The installer shall be a Plumber, Carpenter, Wall Board Fixer depending on the type of cladding or lining specified.

Trade Literature

The tradesman undertaking the installation of the cladding or lining material shall obtain the manufacturer's written installation instructions (in the form of trade literature or other) and shall adhere rigidly to those instructions. Installation instructions obtained shall be kept

on site and freely available to the Client (or its nominated consultant), the Building Certifier and/or Territorial Authority Inspector.

Quality of materials

Cladding and lining materials shall be new, best quality materials, of the manufacture or brand specified. No seconds or second hand materials will be accepted.

Installation

The Contractor shall be familiar with the contents of the finishes schedules.

Cladding and lining materials shall be installed in strict accordance with the manufacturer's specifications and to a grade of surface suitable to accept the specified finish.

Completion

On completion of work the Contractor is to tidy up, remove all rubbish associated with his work, and leave the work in 'as new' condition ready to accept the decorative or protective finish as specified

PLUMBER

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

The work required under this specification is the provision of all materials and execution of all works necessary for the proper completion of the plumbing work.

Provide and install all special items and equipment, etc., as detailed on the drawings and/or as specified.

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B2	Durability
C1	Outbreak Of Fire
C3	Spread of Fire
E1	Surface Water
E2	External Moisture
G1	Personal Hygiene
G2	Laundering
G3	Food Preparation and Prevention of Food Contamination
G4	Ventilation
G5	Interior environment
G6	Airborne and impact sound
G10	Piped Services
G12	Water Supplies
G13	Foul Water
G14	Industrial Liquid Waste
G15	Solid Waste

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZ Standard Plumbing & Drainage
AS Standard Plumbing & Drainage

Flashings, Waterproofing and Rainwater Plumbing

All work shall be carried out by skilled plumbers, sheetmetal works and/or specialists to provide full weather tightness.

Sanitary Plumbing and Water Supply

The sanitary plumbing and water supply work shall be executed by licensed plumbers in accordance with the appropriate regulations and bylaws.

Workmanship

All work to be completed according to New Zealand Plumbing and Drainage Standards AS/NSC/3500

All piping to be installed in accurate lines and uniform grades. Piping to be arranged so as free from vibration, while allowing for thermal movement. Ensure no direct contact between incompatible metals and keep the number of joints to a minimum.

All water pipes are to be held under test at main pressure during construction.

Where possible, all piping and fittings are to be concealed within non-habitable enclosed spaces, while allowing inspection access.

Adjacent pipelines are to be at least 25mm apart and subfloor pipelines are to be at least 150mm clear of the ground.

Any piping which passes through building elements is to be adequately protected or sleeved.

Any exposed piping emerging from wall, floor or ceiling finishes is to be cover-plated with stainless steel or any nonferrous metal.

Any fixings for stays to vent pipes shall be sealed watertight at the point of penetration. Vent pipes must be terminated with bird-proof vent cowls made of the same material and colour as the vent

Cold water taps are to be to the right of, or below the hot water taps.

Ensure installation of accessories and fittings necessary for the proper functioning of the plumbing systems, including valves, taps, outlets, pressure and temperature control devices, strainers, gauges and pumps.

Specification Part A

Water heaters are to be located so as to allow maintenance or replacement without damaging adjacent structures, fixtures or finishes. The maximum water temperature at ablution outlets is to be 50 degrees Celsius, and it is recommended that a thermally activated safety device (eg. Butylene Aquafuse) diverts hot water in excess of 70 degrees Celsius to an open drain.

If a fire hose reel is services by the general reticulation system, the total pipe work shall be of copper and/or galvanised iron.

On Completion

On completion of any freshwater pipeline plumbing, the pipes are to be flushed with water and left clean.

The subcontractor must tidy up, remove all rubbish associated with his work from the site and leave the work in "as new" condition, upon completion of the plumbing work.

DRAINLAYER

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

The work covered by this section comprises the supply of all the materials and execution of all works described on the plans and in the specifications necessary to complete the drainage work.

The Contractor shall provide lights, guards, fencing and notices, etc., as may be necessary for the protection of the drainage work and for the protection of the public

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B2	Durability
C1	Outbreak Of Fire
C3	Spread of Fire
E1	Surface Water
E2	External Moisture
G1	Personal Hygiene
G2	Laundering
G3	Food Preparation and Prevention of Food Contamination
G4	Ventilation
G5	Interior environment
G6	Airborne and impact sound
G10	Piped Services
G12	Water Supplies
G13	Foul Water
G14	Industrial Liquid Waste
G15	Solid Waste

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZ Standard Plumbing & Drainage
AS Standard Plumbing & Drainage

Workmanship

All workmanship shall be in accordance with the best trade practice and shall be carried out by licensed, skilled tradesman.

Water in Excavations

- **Standard**

All work to be completed according to New Zealand Plumbing and Drainage Standards AS/NSC/3500.

- **Stormwater/Wastewater Excavations**

During construction openings are to be provided with temporary covers to keep the systems free of debris and upon completion to be flushed and left clean.

All excavation trenches are to be kept free of water.

Pipelines are to be laid with the spigot ends in the direction of the flow.

Drain branch pipelines are to be turned up so that down-pipe connections are 50mm above finished ground or pavement level.

- **Subsoil drains.**

Connect subsoil drains to the stormwater drainage system.

Minimum trench width 450mm.

Proprietary perforated plastic pipes are to be used.

Filter fabric: use a polymeric fabric formed from a plastic yarn containing stabilisers to make the filaments resistant to ultraviolet light deterioration.

Filter sock: use a polyester permeable sock capable of retaining particles of 0.25mm size. The sock is to be securely fitted at each joint.

Backfilling of Trenches

Refer to "Earthworks and Excavation" section for specific requirements relating to backfilling under floor slabs, foundations and pavement areas.

Trenches shall not be backfilled until inspected and approved by the Territorial Authority Inspector or the Building Certifier or the Client's nominated Consultant, and any defects made good.

The Contractor shall also notify (when applicable) those persons appointed by the Client to provide the Territorial Authority with a "Construction Review Producer Statement".

The Contractor shall ensure that the required "as-built" measurements are obtained for the Territorial Authority prior to backfilling. A copy of such "as-builts" shall also be provided for the Client's records.

Backfill with 20mm nominal sized washed screenings to the following levels;

- to the underside at the bases of overlaying structures such as pavements, slabs and channels
- to within 75mm of the finished surface of unpaved or landscaped areas.

Pit Covers

Covers or gratings are to be located flush with any paved area, or 25mm above the finished surface of any landscaped area, and must be set to receive any run-off without ponding.

Septic Tanks

Any septic tank is to be made of precast concrete or glass fibre reinforced plastic.

When a septic tank system is to be installed the type of tank and method of effluent disposal shall be as designed by a Registered Consulting Engineer, and approved by the Territorial Authority.

Completion

On completion the Contractor shall return the ground surface to its original condition, dispose of surplus spoil to the satisfaction of the Client (or its nominated consultant), remove all debris and leave the site clean and tidy.

PAINTER AND PAPERHANGER

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

Work covered by this Specification is to provide all materials and execute all work necessary for the completion of the building decoration and includes all painting, varnishing, staining and polyurethaning, etc., and paperhanging

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B2	Durability
C3	Spread of Fire
E1	Surface Water
E2	External Moisture
E3	Internal Moisture
G1	Personal Hygiene
G5	Interior environment

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

- NZS 7703:1985 The Painting of Buildings
- NZS 5807:1990 Industrial Identification by Colour Working or other coding
- BS 5252:1976 Standard Colour Range
- NZS 3604:1999 Code of Practice for Light Timber Framed Buildings Not Requiring Specific Design

Materials

Paint materials shall be delivered in sound and sealed containers, labelled clearly by the manufacturer stating:-

1. The type of product
2. Brand name
3. Directions for use
4. The Manufacturer's batch number

Workmanship

• Standard

All work shall be completed in accordance with the requirements of the New Zealand Building Code and New Zealand Standard Painting practices NZC 7703 and manufacturer's instructions.

• Painting

Before commencing any painting, all exposed hardware, fittings, furniture, switch plates, light fittings and other fixtures shall be removed and carefully stored ready for refixing in "as new" condition on completion of the painting.

Clear timber finishes are to be completed prior to the commencement of opaque paint finishes in the same area.

Marks, paint spots and stains are to be progressively cleaned and any touch ups are to be done with the paint batch used in the original finish.

Apply the first coat of paint as soon as possible after preparation of the substrate and ensure that each coat or paint or clear finish is uniform in colour, gloss, thickness and texture and free of runs, sags, blisters or other discrepancies.

Apply a first coat to any exposed timber roof trim, timber doors (including tops and bottoms), window frames, trims and scribes prior to fixing.

Steel is to receive a priming coat of zinc based paint.

Timber and cork floors are to be finished with three (3) coats of clear floor sealer.

Paperhanging

All walls to be papered shall be sized or sealed after stopping.

All wallpapers shall be trimmed, cut straight and true, butt jointed and hung plumb with

patterns correctly matched. Each drop of paper shall be hung in one piece over its entire length. Cut-in patches will not be accepted unless approved by the Client (or its nominated consultant).

Paste shall be an approved brand of prepared paste with a fungicide incorporated by the manufacturer.

Completion

Remove all scaffolding, planks, rubbish and debris, thoroughly sweep up, clean windows both inside and out, replace all hardware removed during the course of the work and leave the premises ready for occupation.

WINDOWS AND GLAZING

General

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

Scope

The work done under this section comprises the supply and glazing of all windows and doors normally supplied by the window manufacturer, glazing of interior door panels where applicable, decorative glass and mirrors.

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

- B2 Durability
- C3 Spread of Fire
- E1 Surface Water
- E2 External Moisture
- F2 Hazardous substances and processes
- F4 Safety from Falling
- G1 Personal Hygiene
- G5 Interior environment
- G7 Natural Light

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZS 3604:1999 Code of Practice for
Light Timber Framed Buildings Not
Requiring Specific Design

Materials

All glass provided shall be of approved manufacture, in accordance with the requirements of the New Zealand Building Code and suitable for its end use. Refer to the drawings and/or Part B of this specification for glass types, window materials and window finish.

Protection and Cleaning

Precautions are to be taken to prevent glazing from damage during and after installation, cracked or broken panes are to be replaced. All glazed surfaces inside and out are to be thoroughly cleaned, free from marks and paint spots and in perfect condition on completion.

ELECTRICIAN

General

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

Handbook to the Electrical Wiring Regulations:
1976

[Building Code reference G9/VM1]

Scope

Supply of all materials and fittings and the execution of all work necessary for the proper completion of the electrical installation.

The Contractor shall give all necessary notices, obtain all permits and pay all fees or charges as required.

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B2 Durability
C3 Spread of Fire
F3 Hazardous Substances and processes
G5 Interior environment

Handbook to the Electrical Wiring Regulations:
1976

[Building Code reference G9/VM1]

Circuit Wiring

Circuit wiring shall be carried out with concealed TPS cables.

Wiring in concrete and concrete blockwork shall be TPS cables run through PVC conduit.

Interior Lighting

The placement of light fittings shall be as shown on the plans.

Where no lighting plan is provided the placement of light fittings and illumination from such fittings shall be in accordance with the requirements of the New Zealand Building Code Approved Documents. The design shall be undertaken by a person competent in the field of lighting design.

Switches, Sockets, Roses, etc

All switches, sockets and ceiling roses shall be of approved manufacture.

Responsibility for Correct Completion

Where any work does not comply with the drawings and this specification the Contractor shall correct such noncomplying work at their own expense.

Testing and Completion of Work

The Contractor shall carry out all testing as required by Regulations and the Network Utility Authority. The electrical work shall be deemed completed when all requirements of the regulations and this specification have been met in full and the installation passed by the Network Utility Authority's Inspector.

ROOFER

(Incorporating Concrete Roof Tiles, and Metal Wall Claddings)

General

Refer to Preliminary & General and other sections which may have clauses affecting work done under this section.

Scope

The work covered by this section comprises the supply of all the materials and execution of all works described on the plans and in the specifications necessary to complete the roofing work.

The Contractor shall provide lights, guards, fencing and notices, etc., as may be necessary for the protection of the roofing work and for the protection of the public

NZ Building Code

All work and materials shall be in accordance with the requirements of the Building Regulations 1992 and with the New Zealand Building Code Handbook and Approved Documents.

B2	Durability
C3	Spread of Fire
E1	Surface Water
E2	External Moisture
E3	Internal Moisture
G4	Ventilation
G12	Water Supplies

Where applicable the following standard and related documents and subsequent amendments shall form part of this specification:

NZS 3604:1999 Code of Practice for Light Timber Framed Buildings Not Requiring Specific Design

Workmanship

All workmanship shall be in accordance with the best trade practice and shall be carried out by licensed, skilled tradesman.

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

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

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

THE BUILDING

Street address: 11 Matuhi Street

Suburb:

Town/City: Waikanae

Postcode:

THE OWNER

Name(s): Mr Dent & Ms Lott

Mailing address:

Suburb:

PO Box/Private Bag:

Town/City:

Postcode:

Phone number:

Email address:

BASIS FOR PROVIDING THIS MEMORANDUM

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

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

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

PRIMARY STRUCTURE: B1

Design work that is restricted building work	Description	Carried out/ supervised	Reference to plans and specifications
Tick (✓) if included Cross (X) if excluded	[If appropriate, provide details of the restricted building work]	[Specify whether you carried out this design work or supervised someone else carrying	[If appropriate, specify references]

		out this design work]	
--	--	-----------------------	--

Primary structure

All RBW Design work relating to B1	(√)	-	() Carried out (√) Supervised	-
Foundations and subfloor framing	(√)	<i>Firth RibRaft Foundation</i>	() Carried out (√) Supervised	Sht 5, 11 & 12
Walls	(√)	<i>Timber Frame</i>	() Carried out (√) Supervised	Sht 11 & 12
Roof	(√)	<i>Timber Trusses</i>	() Carried out (√) Supervised	Sht 11 -13 + Prenail Truss Design
Columns and beams	(√)	<i>Timber</i>	() Carried out (√) Supervised	Sht 13
Bracing	(√)	<i>GIB Ezybrace system</i>	() Carried out (√) Supervised	Sht 18 + Bracing calculations
Other	(X)		() Carried out () Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2	(√)	-	() Carried out (√) Supervised	-
Damp proofing	(√)	<i>0.25 polythene on sand blinding</i>	() Carried out (√) Supervised	Sht 5, 11 & 12
Roof cladding or roof cladding system	(√)	<i>Longrun roofing</i>	() Carried out (√) Supervised	Sht 9-12
Ventilation system (for example, subfloor or cavity)	(√)	<i>Drained cavity</i>	() Carried out (√) Supervised	Sht 11 & 12
Wall cladding or wall cladding system	(√)	<i>JH Linea w/board</i>	() Carried out (√) Supervised	Sht 9-12
Waterproofing	(X)		() Carried out () Supervised	
Other	(X)		() Carried out () Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or	(X)		() Carried out () Supervised	
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other			
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Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.

Note: continue on another page if necessary.

WAIVERS AND MODIFICATIONS

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

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

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

Note: continue on another page if necessary.

ISSUED BY

Name: Nicola Davis	LBP or Registration number: BP125092
The practitioner is a: (✓) Design LBP () Registered architect () Chartered professional engineer	
Design Entity or Company (optional): I Design Architecture NZ Ltd	
Mailing address (if different from below):	
Street address / Registered office: 24 Park Street	
Suburb:	Town/City: Tauranga
PO Box/Private Bag:	Postcode: 3110
Phone number: 07 578 7345	Mobile: 027 523 1310
After Hours:	Fax:
Email address: nicola@idesignarchitecture.co.nz	Website:

DECLARATION

I Nicola Davis [name of practitioner], LBP,

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

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

Signature: 

Date: 08 October 2015



COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Historical Search Copy



R. W. Muir
Registrar-General
of Land

Identifier 700573
Land Registration District Wellington
Date Issued 09 June 2015

Prior References

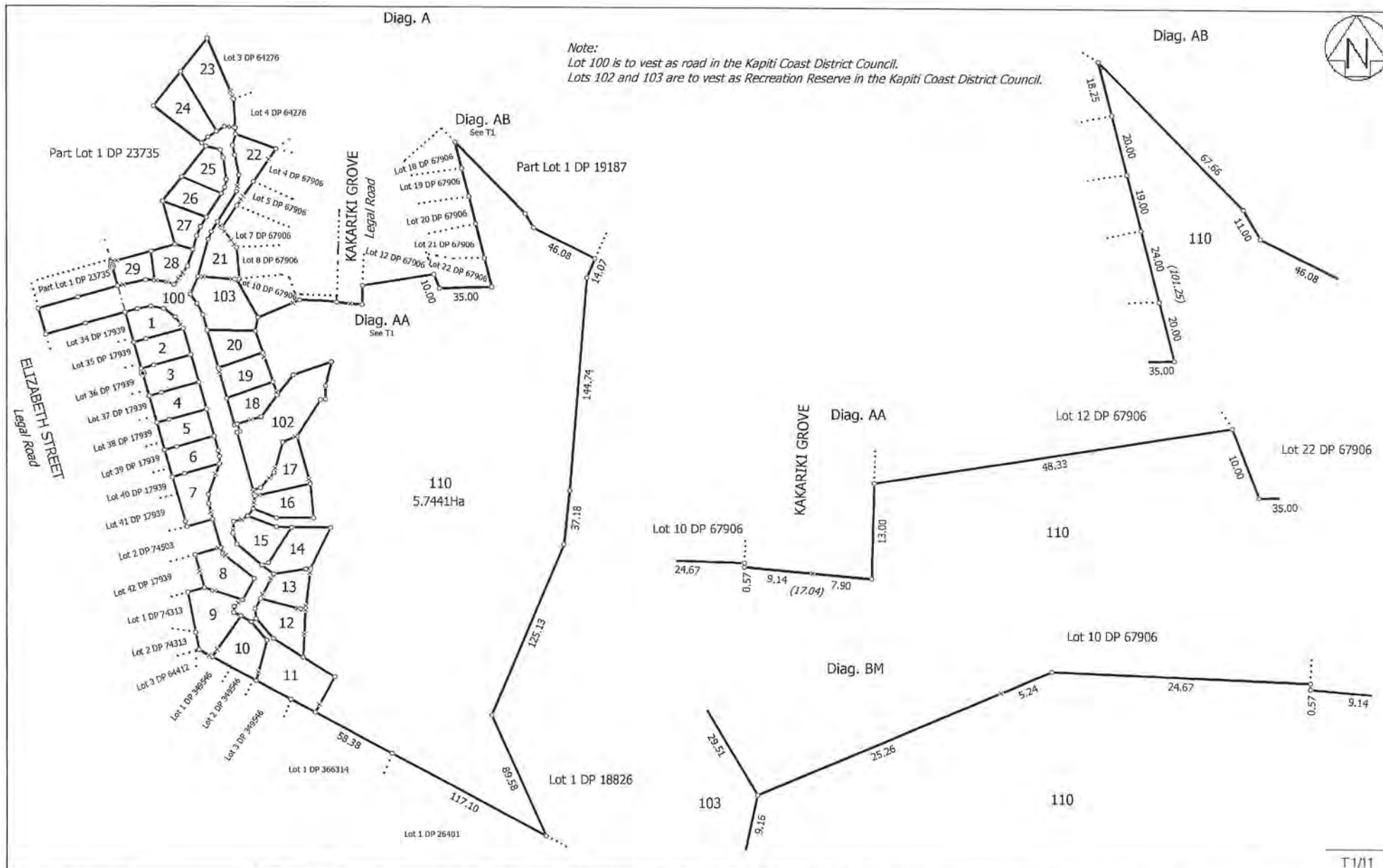
678142

Estate Fee Simple
Area 665 square metres more or less
Legal Description Lot 20 Deposited Plan 413488

Original Proprietors
Kapiti Views Trustees Limited

Interests

Land Covenant in Easement Instrument 7963080.2 - 20.1.2009 at 11:59 am
8429713.1 Mortgage to Westpac New Zealand Limited - 4.3.2010 at 11:56 am
8546972.5 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 21.7.2010 at 4:05 pm
Land Covenant in Easement Instrument 8546972.11 - 21.7.2010 at 4:05 pm
Land Covenant in Easement Instrument 8567999.1 - 27.8.2010 at 4:12 pm
Fencing Covenant subject to Section 6(2) of the Fencing Act 1978 in Easement Instrument 8546972.12 - 21.7.2010 at 4:05 pm
10101797.1 Discharge of Mortgage 8429713.1 - 26.6.2015 at 3:27 pm
10101797.2 Transfer to Shaun Mitchell Dent and Alexandra Maree Elizabeth Lott - 26.6.2015 at 3:27 pm
Fencing Covenant in Transfer 10101797.2 - 26.6.2015 at 3:27 pm
10101797.3 Mortgage to Bank of New Zealand - 26.6.2015 at 3:27 pm
10139605.1 Variation of Mortgage 10101797.3 - 30.7.2015 at 5:17 pm



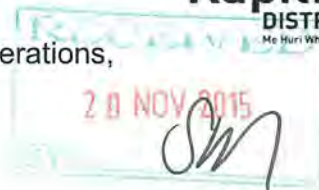
Land District: Wellington Digitally Generated Plan Generated on: 03/08/2010 08:25am Page 7 of 17	Lots 1-29, 100, 102, 103, & 110 Being a Subdivision of Pt Lot 7-8 DP 59365 & Lot 33 DP 17939	Surveyor: Nicola Kate Todd Firm: Cuttriss Consultants Ltd (Kapiti)	Digital Title Plan DP 413488 Deposited on: 21/07/2010
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CHECKSHEET: SINGLE RESIDENTIAL DWELLING AND ACCESSORY BUILDING

including single stand-alone dwellings, dwelling additions and/or alterations,
re-piling, garages, decks, gazebos, sheds, retaining walls etc.



Kapiti Coast District Council,
175 Rimu Road, Paraparaumu 5032
Private Bag 60601, Paraparaumu 5254
For enquiries, phone 04 296 4700



Address of Project: 11 MATUHI STREET, WAIKANAE.

This checksheet shows you the information that has to be supplied with your building consent application. Please attach **2 copies** of the following information (unless otherwise specified) with your completed Building Consent Application Form.

Please tick relevant box in the Customer Use column as you attach the information. If the box is not relevant to your application, write NA across the box. Please check each section carefully and complete those sections that are relevant to your project.

Once you have attached all the required information, please check for completeness as an incomplete application or lack of any supporting information will mean that your application cannot be accepted for processing.

An Application Form is attached to this checksheet — Please include this checksheet with your application

Customer Use	1	GENERAL	For Office Use Only
		Complete this section for all applications	
☒	a	Building Consent Application Form (1 copy) Completed and signed by the owner or by an agent on behalf of the owner	☒
☒	b	Proof of Ownership (1 copy) <u>Please Search Title</u> One recent copy of <u>current</u> certificate/s of title (i.e. not older than 3 months) or where applicable one copy of purchase agreement (if recently purchased) or one copy of relevant portions of current lease.	☐
☒	c	Locality Plan (1:500) showing: Physical location of the subject building in relation to streets or landmarks, north point, name of building and lot and DP number.	☒
☒	d	Restricted Building Work Does the application involved restricted building work? ☐ Yes ☐ No If Yes, provide certificate(s) of design work and advise Council of your Licensed Building Practitioner(s) as per the Advise of Licensed Building Practitioners Guidance sheet.	☒
☒	e	Inspections and Monitoring Details of proposed inspection regime including monitoring by council officers and other professionals e.g. architects, engineers, surveyors and certification to be supplied on completion.	☒
☒	f	Site Plan (1:100) showing: Dimensions of all boundaries, north point, finished floor levels, ground contours (extended to boundaries) and/or levels, site area, street name and number, lot and DP number, outline of building, distance to boundaries and the position of swimming or spa pools. Include on the site plan the designated wind zone of the site (e.g. specific design, very high, high, medium or low).	☒

For office use only Received on the grounds that all information appears to have been provided to enable assessment for compliance in accordance with the Building Act 2004 and the NZ Building Code:

Name:

Jeremy

Signature:

ah

☒	g	Application Fee <i>on our Account Please</i> Applications will not be accepted without payment of the appropriate fees. Fees payable are set out in the published fee schedule of the council that has jurisdiction over the project site.	☐
2 CHANGE OF USE Complete for all existing buildings where the proposal involves forming a household unit where one did not exist before. Example: the conversion of a garage or shed into a residential unit			
NA ☐	a	Assessment of the Building for Compliance with the Building Code Section 115(a) of the Building Act 2004 requires that the building, in its new use, complies fully with all clauses of the Building Code.	☐
NA ☐	b	Reasonably Practicable The above assessment must relate to all building code clauses. If the proposal is for the project to meet anything less than full compliance with any clauses, your application must clearly state your reasoning, with supporting documentation, and show how you will meet the highest level of compliance that can be considered reasonably practicable.	☐
3 FOUNDATIONS / FLOOR Complete for all new buildings, for existing buildings where the footprint of the building will change or where an additional storey is being added			
☒	a	Foundation Plan (1:100 / 1:50) showing: • Dimensions of all new foundations • Sub-floor, including bracing • Footing details • If a concrete slab, show basic details including reinforcing and contractions joints • Piles and footing • If the addition is an upper storey show details on upgrading existing foundations, joints, piles etc • Indicate ventilation to sub floor spaces	☒
NA ☐	b	Subfloor Bracing Provide subfloor bracing plan and calculations for all piled structures. Where the structure is specifically engineered, this should be included with the structural calculations. Subfloor bracing plan and calculations are required where an additional storey is to be added	☐
4 CONSTRUCTION Complete for all new structures or alterations to existing structures.			
NA ☐	a	Existing Floor Plan (1:100 / 1:50) showing: (For additions and alterations only) • All levels • All designated spaces • All removals • Sanitary fixtures • Smoke detectors	☐
☒	b	Proposed Floor Plans (1:100 / 1:50) showing: • Room dimensions • Location of partitions • All designated spaces • All floors (new or altered) • Location of sanitary fixtures • Stairs, barriers, handrails, floor joists and beams • Floor joist layout for each level with timber floors • Smoke detectors • Note where wall will form part of the swimming pool fence	☒

☒	c	Pre-nail Truss and Frames - Specific design wall framing requires clarification - Truss layout must be supported by design certification and design of fixing details, including consideration of load paths to ground - Lintels carrying point loads, such as from girder trusses, require specific engineering design	☒
☒	d	Wall Bracing Plan (1:100 / 1:50) showing: - Bracing details and calculations for wall bracing (also required for existing lower storeys where an additional storey is being added) - Sub-floor bracing for decks projecting more than 2m from the house - Location, type and number of bracing elements to indicate compliance with NZS 3604:2011 (include calculations) - If the bracing was specifically designed by a structural engineer, provide calculations (required for specific design wind zones and lateral distribution of upper floor loads where lower storey bracing is provided in walls beyond the upper storey footprint)	☒
☒	e	Sections and Details (1:50 / 1:20 / 1:10) showing: - Foundation details involving reinforcing and connections - Stairs, handrails, decks and decking - Insulation systems and materials to floors, walls and roof - Barriers providing safety from falling. Specific engineering design required where detail does not comply with NZBC B1/AS2 - Framing sizes, beams, lintels - Roof cladding, eaves, fascias, gutters - Flashings to openings - Fire rated systems on all walls – closer than 1 metre to boundary - Stud heights of rooms and total height from lowest ground floor level to top of ridge - Window and door installation details - Retaining wall details e.g. type, height of retained ground, relationship to boundary, waterproof membrane and proposed drainage	☒
NA ☐	f	Fire Report For domestic dwellings of 4 storeys or more, or buildings providing more than one household unit	☐
5 EXTERNAL Complete for new buildings or existing buildings with alternations to the external shell			☐
☒	a	Elevations (1:100 / 1:50) showing: Accurate lines from boundary to boundary on each elevation, relevant District Plan daylight control lines, the maximum height on each elevation, location of door and window openings, fixed and opening sashes, sill heights, floor levels in relation to ground levels, exterior cladding nominated to all elevations, down pipes and spouting, ventilators to sub-floor area (suspended floors only)	☒
☒	b	Risk Assessment <i>(Risk matrix in E2/AS1 may be used for buildings within scope)</i> Consider exposure, design and detailing to support appropriate selection of cladding	☒
☒	c	Cladding Details (1:50 / 1:20 / 1:10) Provide details around all penetrations, joinery and other junctions at a level appropriate to the level of risk e.g. roof/wall, balcony/wall, junction of different types of cladding, back flashing details for cavity systems	☒
☒	d	Production Certification Supply copies of product certificates relied on as compliance documents	☒
NA ☐	e	Alternative Solutions If the proposal uses products or systems that are not covered in the Acceptable Solutions of clause E2 of the building code provide supporting current information including test results (fully signed reports), case studies, expert opinion (including evidence of experience/qualification, basis for forming opinion and statement of independence) etc to demonstrate compliance.	☐

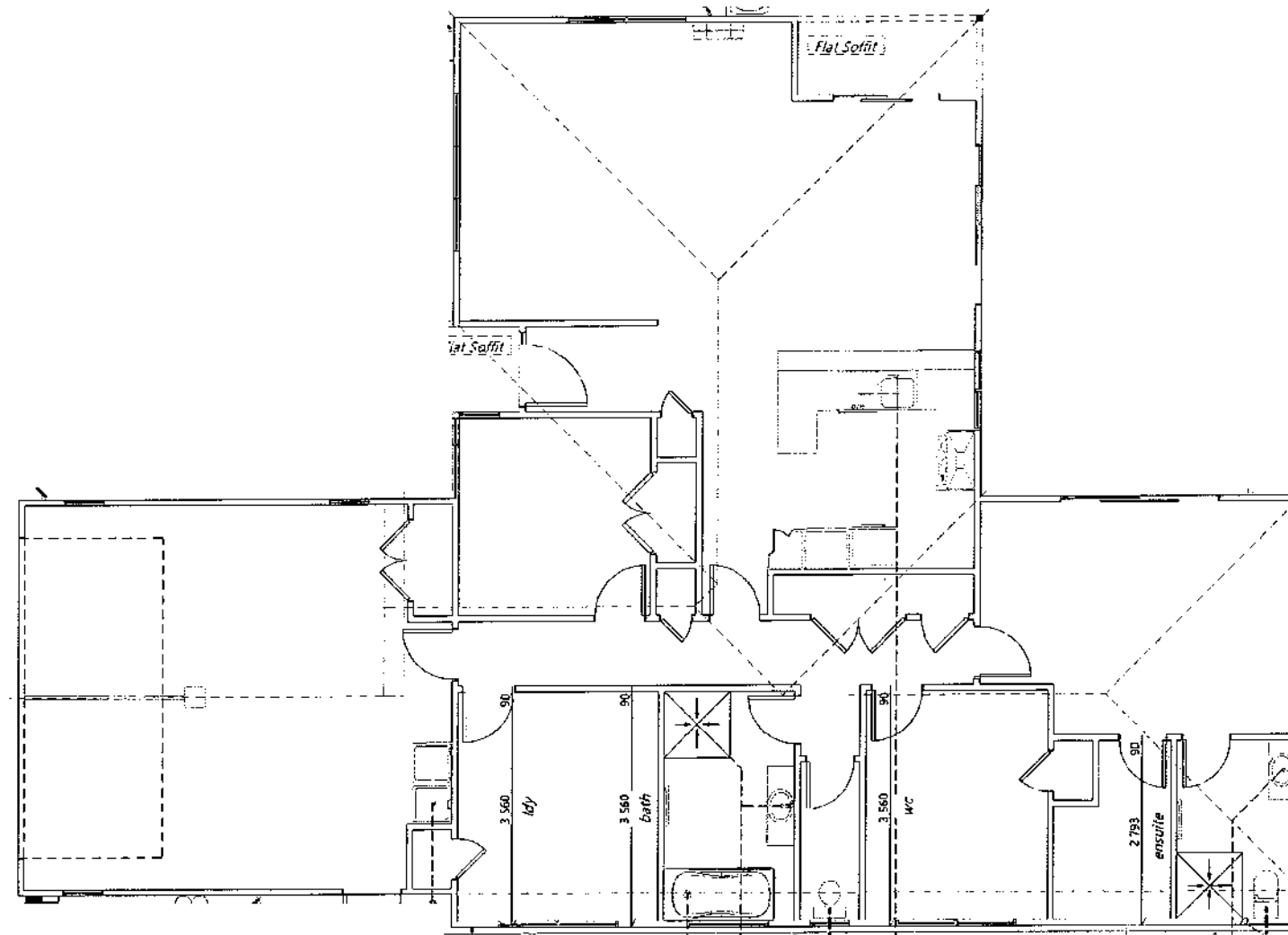
6 SERVICES		
Complete for all projects with new installations or alteration of plumbing or drainage services ☐		
☒	a	Plumbing and Drainage Plan 1:100 / 1:50) showing: <i>Note: if you have supplied drainage details for surface water disposal on the site plan, no drainage plan is required.</i> • Sizes of pipe work and drains • Fixtures and fittings, hot water system(s) • If the building is more than one storey with sanitary fittings on upper floors, provide an isometric layout showing wastes, pipes and falls • Drainage layout with inspection bends and junctions indicated for both sewer and stormwater • Any other drainage on site including council mains and retaining wall field drains • Ventilation of sanitary rooms • Calculations for sizing of down pipes • Gully traps including overflow relief gullies
7 STRUCTURAL		
Complete for all projects incorporating specific structural design		
NA ☐	a	Structural Calculations If any design work required the services of a structural engineer, attach 2 copies of the calculations with this. The calculations must be prefaced with information explaining the design philosophy and justification of assumptions and methodologies used in analysis
NA ☐	b	Expert Opinion (Producer Statements) If this application for consent relies on any expert opinion including producer statements certifying compliance with the New Zealand Building Code, a copy must be attached with this application. (Note all structural producer statements are required to have accompanying calculations.)
8 SPECIFICATIONS		
Complete for all applications		
<i>Note: the specification must be specific to the project and cover all aspects of the proposed work</i>		
☒	a	Specification: General • Elements of structure (size, spacing, timber treatment) • Finish or fixings to meet durability requirements • Plumbing and drainage materials and design that installation is to comply with • Wet area surfaces • Ventilation systems • Flooring slip resistance for access routes • Glazing • Type of smoke detectors (including existing smoke detectors where they will remain)
☒	b	External Claddings For each of the following claddings provide details of the product name, manufacturer, maintenance requirements and warranties offered • Building wraps • Wall claddings • Roof claddings • Membranes (roof and decks) • Tanking • Joinery

9		DEMOLITION / REMOVAL		☐
Complete for all projects involving demolition of significant parts of buildings or the demolition or removal of whole buildings.				
☐	a	Means of Barricading the Site Provide details of temporary barriers, gates which swing inwards or other means of restricting public access to the area		☒
☐	b	Proposed Tipping Location for Demolition Materials (address/landfill)		☐
☐	c	Hazardous Building Material Provide safety plan detailing the safe handling and disposal of hazardous materials		☐
☐	d	Site Management Plan Covering Management to control silt runoff, noise and dust		☐
☐	e	Proposed Destination for Relocate Building		☐
☐	f	Access To and From the Site (including use of kerb crossings)		☐
☐	g	Specify Termination of Existing Services • Water • Sewer • Stormwater <i>NA</i>		☐
☐	h	Details About the Building such as: Number of storeys, type of materials the building is constructed (Photographs of the building would be useful)		☐
		Note: You will need to contact the relevant service authorities specified below to advise them of the extent of your work: Electricity, gas, drainage, water, transport, telecommunications, cable television or any other services that may be affected. Transportation of Relocated Building You will be required to contact and provide details to Councils Transportation and Traffic Department.		
10		OTHER APPROVALS		
Complete for all projects involving demolition of significant parts of buildings or the demolition or removal of whole buildings.				
<i>NA</i> ☐		Please check Territorial Authority regarding the requirement for other approvals required and fees payable. These may include: • Consents under the Resource Management Act • Approvals under bylaws including earthworks, vehicle crossings, road openings and water connections. Show the location of swimming or spa pools on the property and describe how compliance with the Fencing of Swimming Pools Act will be achieved.		☐

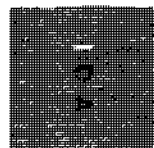
The issue of a building consent does not relieve the owner of any duty or responsibility under any other Act.

BED DRAINS ARE TO BE LAID IN PEA METAL

BC 150804



kitchen



DESIGN ARCHITECTURE

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

Client Details :				UBAW461	
Mr Dent & Ms Lott					
Address:					
11 Matuhi Street					
Waikanae				BH174	
Drainage Plan			Scale:	Date: 8/10/2015	Sheet no:
			1:100	Rev:	3
Drawn:	PM	Check:	N.Davis		
Wind:	Earth:	Exposure:	Snow:	Call 0800 A1homes	
High	3	C	N1	214663	
				www.A1homes.co.nz	
DO NOT scale off drawings. Cross reference all drawings. Any discrepancies MUST be clarified with the designer immediately before commencing works or ordering. NO construction or site works are not to commence until Building Consent becomes unconditional.					
COPYRIGHT: Any and all drawings commissioned remain the property of A1 Homes Limited, including all copyright and similar rights subsisting in those drawings, and are solely for use as described on the drawings, and may not be used for any other purpose or reproduced in whole or in part without written permission obtained from A1 Homes Limited.					

BUILDING CONSENT DOCUMENTATION FILED

R B W

Building Consent Number:

BC150804

Street Address:

11 matuhi st, waikanae.

Tick indicates documents (s) included in this Building Consent

✓

Building Consent Documentation

✓

Application Workflow Coversheet

✓

Application for a Building Consent Form

✓

Application for a Building Consent Checksheet

✓

Proof of ownership

✓

Costing Schedule

✓

Building plans and specifications

✓

Processing Checklist

✓

Scope of Inspection Sheet and Inspection Checksheets

1-33 40-51 92, 103 120, 132 136, 140

✓

Building consent and memorandum

Inspection reports

Application for CCC

Site Plan

PIM

Certificate of Design Work

Copy of electrical certificate

Copy of gas certificate

An "as-built" drainage plan

Plumbing (Form 125) for pressure test and installation piped services

Drainage (Form 126) for stormwater installation

Drainage (Form 127) for private sewer installation

A Construction Review (PS4) statement for structural engineering

A Construction Review (PS4) statement for fire engineering

A Construction Review (PS4) statement for geo-technical engineering

Roof cladding warranty

Solar water heating technical specifications

Wall cladding/texture coating installation applicator warranty

A copy of the lift certificate

A certificate from the fire alarm installer

A certificate from the sprinkler certifier

A copy of wet-area membrane installers warranty

A copy of deck membrane manufacturer's installers warranty/guarantee

FPIS (verifier) Fire Systems Certification

Specified Systems – Make - Model - Location	
A copy of windows	
A copy of water tank warranty	
A copy of septic tank warranty	
Record of work	
Owner Builder Statutory Declaration	
Extension of Completion Time for Building Consent letter	
Lapsed Building Consent letter	
Compliance Schedule	
Compliance Schedule Statement	
Building Consent Amendment Documentation Filed	
Peer review documents	
Fire design documents	
Requests for further information and other correspondence	
Amendments	
Supplementary information	
Notices to Fix	
Code of Compliance Certificate	
Refuse to Issue Code Compliance Certificate letter	

This form comprises part of the Building Consent documentation and indicates the contents of the Building Consent File.

COMPLIANCE CERTIFICATE REVIEW CHECKSHEET



Criteria: All building work except for minor works or major projects.
Refer QAS: B14, B15, B16

Address of Project: 11 matchi st, waikanae.	
Date:	BC No: 150804

	N/A	Yes	No
Application for Code Compliance Certificate (Form 278) completed?		☐	☐
Confirm all required inspections and been completed and passed		☐	☐
If inspections have been missed, what supporting information and method of verification has been provided to compensate for missed inspections?			

or consents issued after change to inspection fees on 1 July 2015			
Inspections estimated at time consent issued (number)			
Inspections undertaken (number)			
Number of extra inspections to be invoiced and paid before CCC issued			
☐ Invoice actioned Date:			
	N/A	Yes	No
Work in accordance with approved consent and approved amendments		☐	☐
no, has NTF been issued?	☐	☐	☐
Have items of non-compliance been resolved and NTF uplifted?	☐	☐	☐

Note: If work is not in accordance with consent, (and approved amendments) or NTF matters have not been resolved, suspend application for Code Compliance Certificate.

Supporting documentation required in Building Consent addenda. Form completed during BC Approval process

Tick indicates yes, N/A indicates considered – but not applicable

	Req'd	Supplied	Accept
Copy of electrical certificate	✓		
Copy of gas certificate	✓		
An "as-built" drainage plan	✓		
Plumbing (Form 125) for pressure test and installation piped services	✓		
Drainage (Form 126) for stormwater installation	✓		
Drainage (Form 127) for private sewer installation	✓		
A Construction Review (PS4) statement for structural engineering			
A Construction Review (PS4) statement for fire engineering			
A Construction Review (PS4) statement for geo-technical engineering			
Roof cladding warranty	✓		
Solar water heating technical specifications			
Wall cladding/texture coating installation applicator warranty			
A copy of the lift certificate			
A certificate from the fire alarm installer			
A certificate from the sprinkler certifier			
A copy of wet-area membrane installers warranty	✓		
A copy of deck membrane manufacturer's installers warranty/guarantee			
FPIS (verifier) Fire Systems Certification			
Specified Systems – Make - Model - Location			
A copy of windows	✓		
A copy of water tank warranty 10 k Cent for tank installed	✓		
A copy of septic tank warranty			
Record of work	✓		
Owner Builder Statutory Declaration			
Building Consent Amendment Documentation Filed			

If specified supporting documentation has not been provided, what alternative information or verification method has been provided to compensate? (Describe)

Compliance Schedule	Yes	No
Is a new or amended compliance schedule required?	☐	☒
If "Yes" Has it been issued? (Refer note below)	☐	☐
If the new/revised compliance schedule has not been issued, what action has been taken to ensure it will be issued? (Outline)		

Note: If the draft/ revised compliance schedule has not been issued, the Code Compliance Certificate cannot be issued. Suspend issuing CCC until this matter is addressed.

Building Consent Requirements	Yes	No
Are there any items specified in the Building Consent or PIM that have not been completed? (If yes, outline below)	☐	☐
Are there any development impact fees to be paid outstanding? (if Yes, CCC cannot be issued)	☐	☐
Are there any other outstanding fees? (if Yes, CCC cannot be issued)	☐	☐

Decision
Issue Code Compliance Certificate? ☐ or Refuse Code Compliance Certificate? ☐
Give reasons for decision:
☐ On review of the inspection notes and supporting documentation it can be considered on reasonable grounds that all work has been completed in compliance with the Building Consent.
OR
☐ Other

Building officer:	Co- reviewer:	
Signature:	Signature:	
Date:	Date:	
Name:	Name:	
Copies	Yes	No
File: Compliance Schedule, Compliance Schedule Statement, and CCC placed on file.	☐	☐
Applicant: Copies of Compliance Schedule, Compliance Schedule Statement sent out with the CCC	☐	☐
Inspection Pack: Add copies of Compliance Schedule, Compliance Schedule Statement and CCC	☐	☐

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BUILDING CONSENT PROCESSING CHECKLIST

Proposal: <i>new dwelling</i>	BC: <i>150804</i>
Address: <i>11 matuhi st</i> <i>Waikanae</i>	Category: <i>1</i>
	Residential: ☒ Commercial: ☐

Key	
N/A ☐	Not Applicable to this application. (The deletion of whole sections as N/A is permitted. For alternatives comment below each section.)
No ☐	Plans, specifications & documentation not complying with the Building Code &/or Bld Act (The reason specified alongside each prompt)
Yes ☐	Plans, specifications & documentation complying with Category Bld Code &/or Bld Act (The reason specified alongside each prompt)
Note	The further information requests are identified by hand written numbers and corresponding on FIR letters / e-mails sent

Site Plan (NZS 3604 Sec 3.4, 4, 5 Code clB1, B2, E1, E2, F1 & F2 Sect. 72, 75 BA04)			
N/A	No	Yes	Comments
☐	☐	☒	Wind zone High W High Specific (GIS) Site specific (3604)
☒	☐	☐	Flooding / ponding hazards (GIS)
☒	☐	☐	Slippage / fault line hazards (GIS)
☒	☐	☐	Erosion, river & coastal hazards (GIS)
☒	☐	☐	Subsidence / soft soil hazards (Site inspection notes)
☐	☐	☒	Corrosion zone Zone B Zone C
☒	☐	☐	Soil contamination (F1 GIS)
☐	☐	☒	Distances to boundaries / siting (District plan)
☐	☐	☒	Floor levels / contours (E2/AS1 & NZS 3604 E1)
☒	☐	☐	Two or More Allotments (Sec 75 – 83 Bld Act)
☒	☐	☐	Noise / sound insulation (airport & highway)
☐	☐	☒	CT/221 notice reviewed <i>Foundation design.</i>
Additional comments:			

Design Work			
N/A	No	Yes	Comments
Specific Design (Verified Online PS2, B1, B2, VM1)			
☐	☐	☒	PS1 Design Certificate (B1 B2 VM1) <i>Hamish Wells</i>
☒	☐	☐	PS2 Peer Review (B1 B2 VM1) <i>Mitek</i>
☐	☐	☒	Calculations (VM1) <i>Site Testing</i>
☐	☐	☒	CPEng (Verified Online) <i>to Test site compaction</i>
Other Design			
☐	☐	☒	Certificates of Design work <i>Nicola Davis</i>
☒	☐	☐	Declaration of owner-builder
☐	☐	☒	LBP / Architect registration number <i>BP126092</i>
Additional comments:			

Concrete / Foundation Plan (NZS 3604, NZS 4210 & 4229 E2/AS1)

N/A No Yes Comments

Layout

☐	☐	☒	Layout dimensions (NZS 3604)
☐	☐	☒	Control joints (NZS 3604)
☐	☐	☒	Slab thickening (NZS 3604, cl 7.5)
☒	☐	☐	Alternative (specify reason)

Section

☐	☐	☒	Depth & width (NZS 3604)
☐	☐	☒	Reinforcement (NZS 3604:B2)
☐	☐	☒	Plate fixings (NZS 3604:B2 cl 7.5)
☐	☐	☒	DPM (NZS 3604:B2)
☒	☐	☐	Engineer design and Calcs (B1;B2)
☐	☐	☒	Concrete strength (B1;B2 cl 4.8.2)
☒	☐	☐	Foundation wall tanking (B2, E2)
☒	☐	☐	Alternative (specify reason)

Additional comments:

All soft soil to be removed & compact fill site under slab.

Timber / Subfloor (NZS 3604, NZS 3602 & 3640, B1, B2)

N/A No Yes Comments

Layout

☒	☐	☐	Layout dimensions
☐	☐	☐	Bearers details (B1,B2)
☐	☐	☐	Joist details (B1;B2)
☒	☐	☐	Alternative (specify reason)

Section

☒	☐	☐	Foundation type/size (NZS 3604;B2)
☐	☐	☐	Piles post sizes & treatment (NZS 3604;3602;3640;B2)
☐	☐	☐	Pile c/c (NZS 3604)
☐	☐	☐	Fixing (NZS 3604;B2)
☐	☐	☐	Coatings(durability) (NZS3604 ;B2)
☐	☐	☐	Ventilation& Access to sub floor spaces (NZS 3604)
☒	☐	☐	Alternative (specify reason)

* If the addition is an upper storey show details on upgrading existing foundations, joints, piles, etc (may require Engineer design)

Additional comments:

Floor plans / layout (B1, B2, C1-4, D1, E3, F7, G1, G2, G12, G3, G9, G11, G13)

N/A	No	Yes	Comments
☐	☐	☒	Room dimensions
☐	☐	☒	Sectional lines
☐	☐	☒	Location of partitions
☐	☐	☒	All designated spaces
☐	☐	☒	Lintels (NZS 3604:B2) <i>As per Mitre design -</i>
☐	☐	☒	Beams (NZS 3604, B2 by engineer) <i>It design Beam -</i>
☒	☐	☐	Point loads by engineer or preailer (B1 B2)
☐	☐	☒	Smoke detectors (F7) <i>location shown on plans -</i>
☐	☐	☒	Wet areas / WCs (D1, Table 2; B2) <i>Tiled showers -</i>
☐	☐	☒	Kitchen (G3) <i>finishes</i>
☒	☐	☐	Alternative (specify reason)

* Changes to existing work requires both an existing floor plan and proposed floor plans. * Facility provided for washing utensils / food G3, Section 1.1 & Figure 1: * Preparation Area and Access to Facility Paragraphs 1.1.2 and 1.5

Additional comments:

Wall Framing (B1, B2, B3)

N/A	No	Yes	Comments
☒	☐	☐	Identify engineering / Structural items/ portals (B1 B2)
☐	☐	☒	By preailer or to NZS 3604 (B1 B2)
☐	☐	☒	Fixing types (NZS 3604 B1 B2)
☐	☐	☒	Stud c/c as per wind zone (NZS 3604 B1 B2) <i>90x45 @ 600 c/c -</i>
☐	☐	☒	Wall Cladding section <i>linea w/bands -</i>
☐	☐	☒	Stud heights of rooms (NZS 3604 B1 B2) <i>2420</i>
☒	☐	☐	Alternative (specify reason)

Additional comments:

Roof (NZS 3604, 3602 & 3640 B1, B2, E2, E2/AS1)

N/A	No	Yes	Comments
Trussed / by preailer or Framed roof (NZS 3604)			
☐	☐	☒	Fixing layout & details (B1 B2)
☒	☐	☐	Correct layout (B1)
☒	☐	☐	Max span (12m or Engineer) (B1)
☐	☐	☒	Purlin or battens etc (B1 B2) <i>70x45 @ 900 c/c -</i>
☐	☐	☒	Rafters / Beams (B1 B2) <i>Veradek. It design Guide -</i>
☐	☐	☒	Ceiling joists, ceiling battens
☒	☐	☐	Alternative (specify reason)
Roof cladding – Metal; Profiled Metal; Masonry, Membranes (Code E2, E2/AS1 B2)			
☐	☐	☐	Pitch / profile / grade (E2) <i>22.5° Corrugated Longspan Color steel</i>
☐	☐	☐	Underlay (E2) <i>Thermakraft 215</i>
☐	☐	☒	Flashings (E3;E2, B1 B2)
☒	☐	☐	Parapets (B1 E2 B2)
☒	☐	☐	Membrane Roofs and substrate (Code E2/AS1 B2)
☐	☐	☒	Gutters, Barges & Fascias detail (Refer E2, section 8.3, cl 8.3.9)
☒	☐	☐	Alternative (specify reason)

Installation of profiled metal roof cladding shall be by trained installers, approved by the tile manufacturer or NZ agent. In some cases experienced builders undertake installation, refer E2, section 8.4, cl 8.4.2 'General'

Additional comments:

Claddings (Code B1 & B2 E2/AS1, Branz good practice Guides & Weather tightness Vol 12&3)

N/A	No	Yes	Comments
☐	☐	☒	Risk matrix Cavity or direct (E2/AS1) 8
☐	☐	☒	Building wrap (E2/AS1) Tekton building wrap.
☒	☐	☐	Brick Veneer (E2/AS1; B2)
☒	☐	☐	Timber Weatherboard (E2 Branz Timber Guide Vol 1&2; B2)
☒	☐	☐	Stucco (B1 NZS 3604 Branz good practice guide; B2)
☒	☐	☐	Profiled Metal (E2 Metal Roofing Practice; B2)
☒	☐	☐	Plywood (E2; B2)
☐	☐	☒	Fibre Cement W/b (E2; B2)
☒	☐	☐	Board & Batten (Branz good practice guide; B2)
☒	☐	☐	Fibre Cement Sheet (E2; B2)
☐	☐	☒	Weathertightness details (E2; B2)
☒	☐	☐	Alternative (specify reason)
Additional comments:			

Bracing (NZS 3604 B1, B2, E3)

N/A	No	Yes	Comments
☒	☐	☐	Subfloor bracing (B1 & NZS 3604)
☐	☐	☒	Wall bracing (B1 & NZS 3604)
☐	☐	☒	Roof bracing (B1 & NZS 3604) Lumberlock Strip bracing.
☐	☐	☒	Bracing calculations (B1 & NZS 3604)
☐	☐	☒	Provide bracing plan layout (B1 & NZS 3604)
☐	☐	☐	Double top plate (if > 5m) (B1 & NZS 3604. Required where ceiling lining density is less than 600kg per m3 e.g. pinex)
☐	☐	☒	Indicate dragon tie (if > 6m) (B1 & NZS 3604) Dragon ties used in Garage roof.
☒	☐	☐	Diaphragm ceilings (if > 7.5m) (B1 & NZS 3604)
☐	☐	☒	Check for distribution (B1 & NZS 3604)
☒	☐	☐	Alternative (specify reason)
Additional comments:			

Light & Ventilation B1 G4, Clause 1.2; G4, clause 1.3 G7, G9, F2

N/A	No	Yes	Comments
General			
☐	☐	☒	Vent 5% (G4)
☐	☐	☒	Light 10% (G7)
☐	☐	☒	Electrical (G9) Cont @ CCC
☒	☐	☐	Mechanical ventilation (G4)
☒	☐	☐	Exterior space for awareness (G7)
Joinery & Glazing			
☐	☐	☒	Safety glass (F2) Note on Consent & Statement from Window firm.
☐	☐	☒	Wind zone (B1. NZS 3604 NZS4223)
☒	☐	☐	Visual manifestation (NZS 4223)
☒	☐	☐	Joinery (NZS) 4211
☒	☐	☐	Alternative (specify reason)
Additional comments:			

Insulation (BRANZ Home Insulation Guide, NZS 4218, AS/NZS 2918)

N/A	No	Yes	Comments
☐	☐	☒	Floor (H1) Rib RAFT
☐	☐	☒	Wall (H1) R 2.2 w
☐	☐	☒	Roof (H1) R 3.2 c
☐	☐	☒	Windows / glazing (H1) dble glazed
☒	☐	☐	Alternative (specify reason)
Additional comments:			H1 Compliance Calculator

Stairs / Landings / Handrails (D1, sec 4)

N/A	No	Yes	Comments
☒	☐	☐	Stair tread & risers (D1)
☒	☐	☐	Landing size (D1)
☒	☐	☐	Handrail (D1)
☒	☐	☐	Riser opening (min) where children (D1)
☒	☐	☐	Head Height (D1)
☒	☐	☐	Balustrading/guarding
☒	☐	☐	Alternative (specify reason)
Stair type: Minor Private: Max rise 220mm/Min tread 220mm, Secondary Private: Max rise 200mm/Min tread 250mm, Main Private: Max rise 190mm/Min tread 280mm. (Main private includes exterior stairs)			
Additional comments:			

Decks / Balconies / Barriers (D1, F4 & NZS 3604, Section 6 & 7)

N/A	No	Yes	Comments
☒	☐	☐	Barrier & deck fixing durability (D1 B1 B2 F4)
☐	☐	☐	Top rails, balusters, bottom rails, palings (D1 B1)
☐	☐	☐	If Engineer then calculations required (B1 B2)
☐	☐	☐	Max 3m height or Engineer (B1 B2)
☐	☐	☐	Deck joist sizes, grade, treatment, span & spacing (D1 B1 B2)
☐	☐	☐	Piles & bearers the correct grade, treatment, size, spacing & span (D1 B1 B2)
☐	☐	☐	Slip resistance (D1)
☐	☐	☐	Appropriate waterproofing membrane (B1 B2)
☐	☐	☐	Stringer size & connections (D1 B1 B2)
☐	☐	☐	Thresholds (D1 E2)
☐	☐	☐	Veranda posts (uplift, size, treatment, connections) (B1 B2)
☒	☐	☐	Beams (spans, size, treatment) (3604 B1 B2)
Additional comments:			

Fire (Residential) (NZBC F7:Cdoc)

N/A	No	Yes	Comments
☐	☐	☒	Travel distances max 25m (C/AS1 T3.2)
☐	☐	☒	Smoke detectors (F7) location shown on plans
☒	☐	☐	Wood burners (F7)
☒	☐	☐	Garage fire wall details (C7 (C7.10 C7.8)
☒	☐	☐	Alternative (specify reason)
Additional comments:			

Swimming Pool & Fencing *Fencing of Swimming Pools Act 1987*

N/A No Yes Comments

☒ ☐ ☐ Refer to Compliance for sign off☐ ☐ ☐ Specific Engineering Design☐ ☐ ☐ Proprietary system/design☐ ☐ ☐ Section/construction☐ ☐ ☐ Pool backwash discharging the sewer☐ ☐ ☐ Fence height☒ ☐ ☐ Gate(s) / door(s) open outwardAdditional
comments:**Ambiguity / Contradictions**

N/A No Yes Comments

☒ ☐ ☐ Manufacturers Specs☐ ☐ ☐ Engineer compared with Designer/Arch☒ ☐ ☐ Any Other contradictionsAdditional
comments:**Alternative Solutions**

Record assessment, decision and reasons for decisions below. Has the designer substantiated why they believe the proposal complies with the Building Code? Is there a determination on a similar proposal? Has corroborative evidence been provided (peer review, appraisal or determination)? Include reference to comparison with acceptable solutions, other documents / standards / best practice guides / publications, expert opinion, determinations, in-service history, product certification, professional judgment, Building Code objectives. Refer BRANZ Bulletin # 456 (Dec 2004). List any conditions / communications / actions:

This Sheet relevant to plumbing & drainage only

N/A No Yes Comments

General

☐	☐	☒	Kitchen area (G3/AS1)
☐	☐	☒	Laundry in the Enlarge area
☐	☐	☒	Bathrooms
☐	☐	☒	Location of sanitary fixtures
☐	☐	☒	Plumbing layout
			Plumber's Reg No: T-B A Drainlayer's Reg No: T-B A

Additional Comments:

Effluent Disposal Systems

☐	☐	☐	Engineering Site Investigation
☐	☐	☐	Design Specification & Producer Statement

The design criteria should include: Capacity based on bedroom numbers, Loading calculation, site evaluation, soil profile, site characteristics.

Additional Comments:

Water Supplies

☐	☐	☒	G12 external gas infinity on gas bottles
☐	☐	☒	Town supply
☐	☐	☒	Private scheme Roof catchment to supply w.c's and external hose taps
☐	☐	☒	Type & location Council full metered supply to the balance of fixtures
☒	☐	☐	Alternative (specify reason)

Additional Comments:

Sanitary Drainage

☐	☐	☒	G43 AS/NZS5000
☐	☐	☒	Layout 1x ORG
☐	☐	☒	Council availability or 1x Terminal vent
☐	☒	☐	Septic tank design & calcs
☒	☐	☐	Alternative (specify reason)

Additional Comments:

Stormwater Drainage

☐	☐	☒	E1 8x Downpipes
☐	☐	☒	Layout
☐	☐	☒	Council availability
☒	☐	☐	Alternative (specify reason)

Additional Comments:

Sanitary Plumbing

☐	☐	☒	G13 AS/NZS5000
☐	☐	☒	Layout
☒	☐	☐	Alternative (specify reason)

Additional Comments:

Rules forms ✓

22d Notice attached to E-C ✓

P-C Pack

Times reat ✓

Gas checked no services running through the lot service location ✓

D-P checkmark

Accessibility (D1, G5, F8, NZS 4121)			
N/A	No	Yes	Comments
☒	☐	☐	Car parks
☒	☐	☐	Projections
☒	☐	☐	Kerb ramps
☒	☐	☐	Footpaths / Ramps / Landings
☒	☐	☐	Entrances
☒	☐	☐	Public Facilities
☒	☐	☐	Lifts
☒	☐	☐	Stairs
☒	☐	☐	Stair / ramp / handrails
☒	☐	☐	Doorways / Doors / Corridors / Lobbies
☒	☐	☐	Controls
☒	☐	☐	Places of assembly / entertainment / recreation
☒	☐	☐	Warning Systems
☒	☐	☐	Toilet Facilities / Laundering
☒	☐	☐	Food preparation / accommodation
☒	☐	☐	Signs
☒	☐	☐	Residential Accessibility (D1)
Additional Comments:			

Commercial Fire report (C/NM1, C/As1, C/AS2, C/A34, C/AS4, C/AS5, C/AS6, C/AS7, F6, F7, F8)			
N/A	No	Yes	Comments
☒	☐	☐	Risk Group
☒	☐	☐	Fire cell separation / use of building
☒	☐	☐	Life rating FRR
☒	☐	☐	Property rating FRR
☒	☐	☐	Occupancy numbers
☒	☐	☐	Means of escape
☒	☐	☐	Travel distances
☒	☐	☐	External walls / unprotected areas / Cladding properties
☒	☐	☐	Fire resistance to supporting elements / floors / walls
☒	☐	☐	Risks to/below escape routes
☒	☐	☐	Fire safety systems
☒	☐	☐	Internal surface linings
☒	☐	☐	Signs
☒	☐	☐	Hazardous agents / materials / substances on site
☒	☐	☐	Referral to NZFS Fire Engineering unit
☒	☐	☐	Alternative (specify reason)
Additional Comments:			

Solid Waste (G1b)			
N/A	No	Yes	Comments
☒	☐	☐	Waste bin area
☒	☐	☐	Environmental health referral
☒	☐	☐	Alternative (specify reason)
Additional Comments:			

Hazardous Agents, Materials and substances (F1-F3)

N/A	No	Yes	Comments
☐	☐	☐	Waste bin
☐	☐	☐	Environmental health referral
Additional Comments:			

Work Sheet

E3 tiled showers. Membrane = Aqua Blok
Bratz app 724

General stamp prompts:

Wind Zone
Corrosion
Cladding
Electrical
Bracing Highlighted
Boundary setting out
Engineers design and addendum

Set Status
Complete checklist
Addendum and note re fire report
Section 72 / ponding
Set inspections

Inspections

No of inspections estimated on application	No of inspections estimated at processing	Additional fees actioned if required
10 - 1	10 - 1	

List further information requested, info received, records / reference of communication etc.
via Phone / Email / letter / counter / fax

List further information requested, info received, records / reference of communication etc.
via Phone / Email / letter / counter / fax

[illegible]

Change of Use – Sec 114: (Record decisions and basis for decisions – confirm whether sec 115 applies)

Date:

Alteration to Existing Building - Sec 112 (Record decisions and basis for decisions – confirm whether sec 118 applies and if so, has it been complied with?). List conditions / communications / actions:

Date:

Hazards – Sec 71-74: (Record decisions and basis for decisions – see under "site plan above already done")

Date:

Compliance Schedule – Sec 100 - 107: (Record if new / amended compliance schedule required, and attach copy of replica compliance schedule. Ensure that note is recorded on building consent that new / amended compliance schedule will be issued).

Date:

Note :- Refer to the associate code clause along side each prompt above for compliance or reason of decision

Plan checked yet Unsatisfactory

Refer to the official request for further information correspondence (letter, email or phone call) for final list of required information. For acceptance of returned information refer to addendum to form 436.

Signature, name & date

Bldg:

Plumbing:

Fire:

I am satisfied on reasonable grounds that the provisions of the Building Code are met and the

Building consent may be granted (refer Bld Act Sec 49(1))

No Further Information Requests have been made.

Signature, name & date

Bldg:

(for all pages except those listed below)

Plumbing: Portion only (relevant NZBC clauses E1,G10,G11,G12,G13)
(For pages 7 of 11 unless otherwise listed)

Fire:

(As listed on page 8 of 11)

[illegible]

Refusal of Consent ☐ Letter one sent ☐ Letter two sent	Consent Refused ☐ Signature: Date:
---	--

I am satisfied on reasonable grounds that the provisions of the Building Code are met and the Building consent may be granted (refer Building Act Sec 49(1). All previous Further Information Requests now satisfactory.		NOTE: ONLY PAGE 1 OF ADDENDUM WILL BE SIGNED BY THE AUTHORISED BUILDING CONTROL OFFICER
Building:	Signature, name and date	
Plumbing:		
Fire:		

Addenda to Form 436

Allocation of work to approvals officer outside current competency

Building Category	Circle Appropriate Category	0	R1	C1	R2	C2	R3	C3	4

1) Authorised by Team Leader of delegate	Level of supervision required	Reason for decision
Name, Signature & date:	Coaching Mentoring Peer review on completion	In training Vetting one level above competency Other
2) Approval Officer undertaking training	Record of Learning	Decision
Name, Signature & date:		I am satisfied on reasonable grounds that the provisions of the Building Code are met and the building consent may be granted (Refer Bld Act 49(1))
Current competency level Category 0, R1, C1, R2, C2, R3, C3		
3) Coach / Mentor / Peer reviewer	Training needs identified	Comments
Name, Signature & date:		I am satisfied on reasonable grounds that the provisions of the Building Code are met and the building consent may be granted (Refer Bld Act 49(1))
Current competency level Category R1, C1, R2, C2, R3, C3, 4		

Allocation Notes
- Categories of building are determined on receipt of application. - All applications are reassessed for the category and allocated to each appropriate Officer at the earliest opportunity and then placed in processing shelves accordingly. - Approvals staff are aware of their own competency level and check the allocation of work. - Approvals staff may select, for training purpose, a consent 1 (one) category higher than their current competency for the purpose of increasing their skill level provided they gain approval from the Team Leader Building Consent Approvals. Once approval is given the Team Leader Building Consent Approvals will arrange for the appropriate supervision and final peer review.

CHECKSHEET : SPECIFIED SYSTEMS



Kapiti Coast District Council,
175 Rimu Road, Paraparaumu 5032
Private Bag 60601, Paraparaumu 5254
For enquiries, phone 04 296 4700

THE BUILDING

Building name:

Building street address:

SPECIFIED SYSTEMS

System		Applicable		Test Regime		Installed					
		No	Yes	New	Existing	Yes	No				
SS1	Automatic systems for fire suppression (e.g. sprinkler systems)	☐	☐	☐	☐	☐	☐				
Type:											
Interfaced?		☐	☐								
Notes:											
SS2	Automatic or manual emergency warning systems for fire or other dangers (other than a warning system for fire that is entirely within a household unit and serves only that unit)	☐	☐	☐	☐	☐	☐				
Type:											
Interfaced?		☐	☐								
Notes:											
SS3	Electromagnetic or automatic doors or windows (e.g. ones that close on fire alarm activation)										
SS3.1	Automatic doors/windows	☐	☐	☐	☐	☐	☐				
Type:											
Notes:											
SS3.2	Access controlled doors egress	☐	☐	☐	☐	☐	☐				
Type:											
Interfaced?		☐	☐								
Notes:											
SS3.3	Interfaced fire or smoke doors	☐	☐	☐	☐	☐	☐				
Type:											
Notes:											

System		Applicable		Test Regime		Installed	
		No	Yes	New	Existing	Yes	No
SS4	Emergency lighting systems	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS5	Escape route pressurisation systems	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS6	Riser mains for use by Fire Service use	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS7	Automatic back-flow preventers connected to a potable water supply	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS8	Lifts, escalators, travelators, or other systems for moving people or goods within buildings	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS9	Mechanical ventilation or air conditioning systems	☐	☐	☐	☐	☐	☐
Type:							
Interfaced?	☐	☐					
Notes:							
SS10	Building maintenance units for providing access to the exterior and interior walls of buildings	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS11	Laboratory fume cupboards	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS12	Audio loops or other assistive listening systems	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS13	Smoke control systems	☐	☐	☐	☐	☐	☐
Type:							
Interfaced?	☐	☐					
Notes:							

System		Applicable		Test Regime		Installed	
		No	Yes	New	Existing	Yes	No
SS14	Emergency power systems for, or signs relating to, a system or feature specified in any clauses 1-13						
SS14.1	Emergency power systems	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS14.2	Signs	☐	☐	☐	☐	☐	☐
Correct type/location/legible						☐	☐
Notes:							
SS15	Any or all of the following systems and features, so long as they form part of a buildings means of escape from fire, and so long as those means also contain any or all of the systems or features specified in clauses 1 to 6, 9 and 13						
S15.1	Systems for communicating spoken information intended to facilitate evacuation	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS15.2	Final exits (as defined by clause A2 of the Building Code); and	☐	☐	☐	☐	☐	☐
Correct location:						☐	☐
Complying hardware:						☐	☐
Locked/Barred/Blocked:						☐	☐
Notes:							
SS15.3	Fire separations (as so defined); and	☐	☐	☐	☐	☐	☐
Type:							
Penetrations sealed/collared:						☐	☐
Notes:							
SS15.4	Signs for communicating information intended to facilitate evacuation; and	☐	☐	☐	☐	☐	☐
Type:							
Notes:							
SS15.5	Smoke separations (as so defined)	☐	☐	☐	☐	☐	☐
Type:							
Penetrations/Smoke Seals satisfactory:						☐	☐
Notes:							

ADVICE OF LICENSED BUILDING PRACTITIONER(S)

Owner must notify names of licensed building practitioners before restricted building work commences

Building Act 2004, section 87

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

Council use only:
Application #
Property ID

THE BUILDING (project location)

Building name (if applicable)

11 Matuhi street

Building street address

THE PROJECT

Building consent number

150804

THE OWNER (must be completed and all details must be the owner's)

Owner's name (for individuals, state the preferred form of title, e.g. Mr, Mrs, Ms, Miss, Dr. For companies, trusts and other organisations provide a contact person's name)

Shaun Dent & Alex Lott

Address

Date

Landline

Mobile

After hours

Fax

Email

LICENSED BUILDING PRACTITIONERS ENGAGED TO CARRY OUT/SUPERVISE RESTRICTED BUILDING WORK

Particular work to be carried out or supervised	Name	Licensing class	Licensed building practitioner number (or registration number if treated as being licensed under section 291 of Act)
Both	Shaun Collaghan	Carpentry	106222
Both	Aaron Arthur	Roofing	127133

LICENSED BUILDING PRACTITIONERS ENGAGED TO CARRY OUT/SUPERVISE RESTRICTED BUILDING WORK (cont.)

Particular work to be carried out or supervised	Name	Licensing class	Licensed building practitioner number (or registration number if treated as being licensed under section 291 of Act)

COUNCIL USE ONLY

LBP(s) checked	Y	All OK	Y	N
Comments				
Date issued				