



- Contractor's and sub-contractor's PS3s and QA records where available
- Third-party inspection and test results

Reinforced Concrete Masonry

Compliance with cover and concrete quality requirements for B1/VM1 are in accordance with NZS4230:2004 Section 4.

Regards,

Prepared by:

Reviewed by:

Joshua Mulligan

Domenico Sclofani

Structural Engineer

Technical Lead Structural





3. Structural Maintenance Schedule

12 Rawene Street, Waikanae (Residential)

This schedule of ongoing inspection and maintenance of structural elements shall be included with the O&M manuals and provided to the Owner/Body Corporate and building managers.

Inspection/Mainter	nance Timeframe and Item	
(a) Half-yearly	Wash down all exposed steelwork that is not in a fully interior environment including:	
	 Veranda steelwork Steel carpark structure (beams, columns, braces etc.) Deck and balcony steelwork Exposed façade steelwork, both primary and secondary structure Sub-ground floor mild-steel structures such as beams. 	
(b) 5-yearly	Inspect and repair sealant that encloses structural mild-steel components and/or timber with mild-steel fixings.	
(c) 10-yearly	Check exposed timber fixings for corrosion; repair as required.	
	Inspect/replace sealant that encloses structural mild-steel components and/or timber with mild-steel fixings. This will typically include sealants around the perimeter of precast panels. Note that 10 years is the expected useful life for many sealants.	
	Check all exposed steelwork that is not in a fully interior environment for signs of corrosion. Repair protective coatings as required.	
(d) 25-yearly	Inspect samples of structural steel that is hidden from view but not enclosed within a vapour barrier, and repair protective coatings as necessary. A typical example is a veranda with built-in steelwork (Such steelwork should typically have duplex protective coatings). Inspection may typically require removal of claddings and/or the drilling of holes for borescope access. Repair as required.	
	Inspect all exposed, external timber. Repair as required.	
	Inspect all exposed, external reinforced concrete for signs of spalling and the resulting exposed reinforcing for corrosion. Repair as required.	
Following seismic shaking > SLS1 event	Inspections and repair as per b), c) and d) above.	



4. 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 I	Building			
Addr	ess:	12 Rawene Street, Waikanae		
Town	n/City:		Postcode:	
The	Owner(s)			
Nam	e(s):	Mike & Sonya Howland c/ Box Archite	ecture Ltd	
Maili	ng Address:	12 Rawene Street, Waikanae		
Subu	rb:			
Town	n/City:		Postcode:	
Emai	l address:		Phone Number:	
Basis	For Providing	This Memorandum		
I am	providing this m	emorandum 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				
\boxtimes	specialist designer who carried out specific elements of RBW design work as outlined in this memorandum – other designers will be providing a memorandum			

Identification of Design Work That is Restricted Building Work (RBW)

covering the remaining RBW design work

I Domenico Sclofani carried out / supervised the following design work that is restricted building work.



Design Work That is RBW	Description of RBW (if appropriate)	Carried out or supervised	Reference to plans and specifications (if appropriate)
Primary Structur	e: B1		
Foundations and subfloor framing ☑ Included ☐ Excluded	Piles	☐ Carried Out ☑ Supervised	CGW Drawings S-00-01 to S- 01-02 Rev A
NAC II			
Walls		☐ Carried Out☐ Supervised	
☐ Included		_ Supervised	
☐ Excluded			
Roof		☐ Carried Out	
☐ Included		☐ Supervised	
☐ Excluded			
Columns and beams		☐ Carried Out☐ Supervised	
☐ Included			
☐ Excluded			
Bracing		☐ Carried Out	
☐ Included		☐ Supervised	
☐ Excluded			
Other		☐ Carried Out	
☐ Included		☐ Supervised	
☐ Excluded			



Design Work That is RBW	Description of RBW (if appropriate)	Carried out or supervised	Reference to plans and specifications (if appropriate)
External Moistur	e Management Systems: E2		
Damp Proofing		☐ Carried Out	
☐ Included		☐ Supervised	
⊠ Excluded			
Roof cladding or roof cladding system		☐ Carried Out☐ Supervised	
□ Included			
⊠ Excluded			
Ventilation system (for example subfloor or cavity)		☐ Carried Out☐ Supervised	
☐ Included			
⊠ Excluded			
Wall cladding or wall cladding system ☐ Included		☐ Carried Out☐ Supervised	
⊠ Excluded			
Waterproofing		☐ Carried Out	
☐ Included		☐ Supervised	
⊠ Excluded			
Other		☐ Carried Out	
☐ Included		☐ Supervised	
⊠ Excluded			



Design Work That is RBW	Description of RBW (if appropriate)	Carried out or supervised	Reference to plans and specifications (if appropriate)	
Fire Safety System	ms: C1 – C6			
Emergency warning systems		☐ Carried Out☐ Supervised		
Evacuation and fire service operation systems				
Suppressions control systems				
Other				
\square Included				
⊠ Excluded				
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				
Waivers and Modifications				
Waivers or modifications of the Building Code are required: ☐ Yes ☒ No				

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 List relevant clause numbers of building code	Waiver/modification required Specify nature of waiver or modification of building code required		





Issued By				
	ntact details of the licensed buildi	-	s licensed to	
carry out or su	upervise design work that is restri	ctea building work		
Name:	Domenico Sclofani	LBP or Registration	1028481	
		Number:		
The practitione	er is: \square Design LBP \square Registered	architect 🗵 Chartere	d Professional	
Engineer				
Design Entity o	or Company: Cameron Gibson and \	Wells Ltd		
Mailing addres	s (if different from below): PO Box 7	'11, Nelson		
Street Address,	/Registered Office: Level 4, 241 Hard	dy Street		
Suburb: Nelso	Suburb: Nelson City Town/City: Nelson			
Phone number: (03) 548 8259 Mobile:				
After Hours: Fax:				
Email address: office@cgwl.co.nz Website: www.cgwl.co.nz			o.nz	
•		_		

Declaration

- I, Domenico Sclofani, CPEng, 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: 26/08/2021



5. Inspection Schedule

Job Number: **#21452**

Date: 26/08/21

Job Description: Pile Foundations for Extension

Job Location: 12 Rawene Street, Waikanae

Client: Mike & Sonya Howland c/ Box Architecture Ltd

- As per ENGNZ recommendation we require the below inspections which will enable a degree of assurance as to the compliance of the structural works undertaken.
- On completion of the inspections and the satisfactory completion of the work on site, Cameron Gibson & Wells Ltd will issue a Producer Statement for Construction Review covering the work inspected.
- If we are not notified of an inspection, or our engagement is terminated, or our ability to issue a Producer Statement for Construction Review is otherwise affected, then we will notify the controlling Territorial Authority.
- If we are unable to issue a Producer Statement for Construction Review, then the
 controlling Territorial Authority will not be able to issue a Code Compliance Certificate
 for the works until they are satisfied that the work complies with the New Zealand
 Building Code.

Inspections			
No	Description	Date Inspected	Carried Out By
1	Subgrade inspections once all topsoil and organic material have been removed from the excavation	TBC	Geotechnical Engineer
2	Pre-pour inspection	TBC	Structural Engineer
3	Timber Connection Inspection – preline	TBC	Structural Engineer

Contractor Submissions			
No	Description	Date Received	Approved By
1	Contractors PS3 for all works	TBC	Structural Eng

Document Number: 21452-BCD-001-A

Issued: 26 August 2021





6. Drawings



BC210994 Received by Kapiti Coast District Council 8/11/21



Drawings Register:

 S-00-02
 STANDARD NOTES
 A
 27.08.21

 S-01-01
 FOUNDATION LAYOUT
 A
 27.08.21

 S-01-02
 FOUNDATION DETAILS
 A
 27.08.21

Project: 12 RAWENE STREET, WAIKANAE

Client: MIKE & SONYA HOWLAND

CGW Job no: 21452



REBECCA CURD
DATE: 27.08.21

Consulting Civil, Structural, Environmental & Geotechnical Engineers

Directors: V.J. Anderson BE C&M • R.A. Puklowski NZCE (Civil) REA MEngNZ • C.F. Short BBS PG Dip Man • A.R. Wilton BE CMEngNZ CPEng IntPE DipMS



2. REFER TO THE ARCHITECTS DRAWINGS FOR ALL NIBS. REBATES. SETDOWNS AND THE LIKE AS

2. REFER TO THE ARCHITECTS DRAWINGS FOR ALL NIBS, REBATES, SETDOWNS AND THE LIKE AS WELL AS ANY SETTING OUT NOT SHOWN HEREIN. ALL DISCREPANCIES IN SETTING OUT SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.

3. SETOUT OF THE STRUCTURE ON THE SITE IS SHOWN ON THE ARCHITECTS DRAWINGS.

4. THE DRAWINGS AND SPECIFICATION SHALL TAKE PRECEDENCE OVER THESE NOTES.

5. ALL DIMENSIONS RELATIVE TO SETTING OUT OF SITE WORK SHALL BE VERIFIED BY THE

CONTRACTOR BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED.

6. THE ENGINEERS DRAWINGS SHALL NOT BE SCALED.

DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE

 DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE AND TIDY CONDITION ENSURING NO PART BECOMES UNDULY STRESSED BY CONSTRUCTION ACTIVITIES.
 WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE NEW ZEALAND BUILDING CODE AND RELEVANT DESIGN STANDARDS INCLUDING LOCAL AUTHORITY REGULATIONS. WHERE THE DRAWINGS CONFLICT WITH THE BUILDING CODE OR THE LOCAL AUTHORITY REGULATIONS THE ENGINEER SHALL BE CONSULTED.

I IF DURING CONSTRUCTION ANY PART OF THE WORKS SHOW SIGNS OF DISTRESS, EXCESSIVE DEFLECTION, CONFLICT OF COMPONENTS OR OTHER PROBLEMS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER WHO SHALL INVESTIGATE AND ISSUE SUCH INSTRUCTIONS AS ARE CONSIDERED NECESSARY.

10. ALTERNATIVE MATERIALS AND METHODS TO THOSE SPECIFIED MAY ONLY BE USED WITH THE WRITTEN APPROVAL OF THE ENGINEER.

11. THE DESIGN ADEQUACY INCORPORATED IN THESE DRAWINGS IS SUBJECT TO THE REQUIREMENTS INCLUDED IN THE SPECIFICATION FOR THE WORKS AND THE DESIGN ASSUMPTIONS INCORPORATED INTO THE CALCULATIONS AND REPORTS FOR THE PROJECT. 12. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE. ALL LEVELS ARE

INSPECTIONS

13. THE CONTRACTOR SHALL PROVIDE THE ENGINEER 48 HOURS MINIMUM NOTICE OF NEEDING AN INSPECTION OF THE WORKS, REFER TO THE BUILDING CONSENT DOCUMENTATION AND THE ENGINEERS INSPECTION SCHEDULE FOR THE REQUIRED INSPECTIONS. REQUESTING

ENGINEERS INSPECTION SCHEDULE TO R THE REQUIRED INSPECTIONS. REQUESTING INSPECTIONS IS THE RESPONSIBILITY OF THE CONTRACTOR.

14. THE CONTRACTOR MUST BE SATISFIED THAT THE WORKS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS BEFORE CONFIRMING AN INSPECTION BY THE ENGINEER. ANY ADDITIONAL INSPECTION COSTS DUE TO WORK BEING INCOMPLETE MAY BE PASSED ONTO THE CONTRACTOR

NUMBER

STRUCTURAL STEEL

STANDARD ABBREVIATIONS

GENERAL	
BOT	BOTTOM

CGL	CLEARED GROUND LEVEL	NOM	NOMINAL
CL	CENTRELINE	NTS	NOT TO SCALE
COL	COLUMN	OA	OVERALL
CONC	CONCRETE	OD	OUTSIDE DIAMETER
COS	CHECK ON SITE	PCD	PITCH CIRCLE DIAMETER
CRS	CENTRES	PVC	POLY VINYL CHLORIDE
DIA, Ø	DIAMETER	RL	REDUCED LEVEL
DIM	DIMENSION	SECT	SECTION
DPM	DAMP PROOF MEMBRANE	SQ	SQUARE
FL	FINISHED LEVEL	SS	STAINLESS STEEL
FWAR	FILLET WELD ALL ROUND	THRU	THROUGH
HDG	HOT DIPPED GALVANISED	TYP	TYPICAL
MAX	MAXIMUM	UNO	UNLESS NOTED OTHERWISE
MIN	MINIMUM	UTS	ULTIMATE TENSILE STRENGTH

NOMINAL BORE CONCRETE

В	BOTTOM	DB	DONOBRACE
C	CENTRE	EA	EQUAL ANGLE
CJ	CONTROL JOINT	FL	FLAT BAR
D	DEFORMED BAR	FG	HIGH STRENGTH FRICTION GRIP
EF	EACH FACE	MS	MILD STEEL
EW	EACH WAY	PFC	PARALLEL FLANGE CHANNEL
HD	HIGH YIELD DEFORMED BAR	RB	REIDBAR
HR	HIGH YIELD ROUND BAR	RHS	RECTANGULAR HOLLOW SECTION
NF	NEAR FACE	S	SNUG TIGHT (I.E. M16 8.8/S)
PC	PRECAST CONCRETE	SHS	SQUARE HOLLOW SECTION
R	ROUND BAR	SS	STAINLESS STEEL
RB	REIDBAR	TB	FULLY TENSIONED BEARING
RC	REINFORCED CONCRETE		JOINT (I.E. M16 8.8/TB)
REINF	REINFORCEMENT	UA	UNEQUAL ANGLE
STR	STARTER	UB	UNIVERSAL BEAM
STRP	STIRRUP	UC	UNIVERSAL COLUMN
T	TOP		
TRM	TRIMMER		
VL	VARYING LENGTH		

EXCAVATION AND BACKFILL

1. EXCAVATION SHALL NOT COMMENCE UNTIL SEDIMENT CONTROL PROVISIONS HAVE BEEN PUT

IN PLACE.

2. EXCAVATION SHALL BE CARRIED OUT TO THE LINES AND LEVELS DIRECTED BY THE ENGINEER. THE MINIMUM EXCAVATION SHALL PROVIDE FOR THE REMOVAL OF ALL TOPSOIL, UNCONTROLLED FILL AND ANY OTHER UNSUITABLE MATERIAL TO EXPOSE COMPETENT NATURAL SOIL AND SHALL EXTEND A DISTANCE OUTSIDE THE BUILDING FOOTPRINT EQUAL TO THAT OF THE EXCAVATION DEPTH. THE FINAL EXTENT OF THE EXCAVATION SHALL BE DETERMINED BY THE ENGINEER ON INSPECTION OF THE EXPOSED EXCAVATION.

3. ALL EXCAVATION AND BACKFILLING SHALL BE CARRIED OUT IN THE DRY. IF DEWATERING IS REQUIRED TO ACHIEVE THIS, THEN THE SITE SHALL BE MAINTAINED IN A DEWATERED

REQUIRED IO ACRIEVE ITIBIL, THEN IT HE SHE SHALL BE MAINTAINED IN A DEWATERED CONDITION FOR THE DURATION OF THE EARTHWORKS.

4. EXCAVATION AND FILLING SHALL BE MANAGED IN SUCH A WAY AS TO AID DRAINAGE AND MINIMISE SURFACE PONDING IN THE EVENT OF RAIN.

5. ALL FILL MATERIAL USED SHALL BE AP65 UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS

OR ON THE GEOTECHNICAL REPORT. HARDFILL SHALL BE SELECTED CLEAN FREE-DRAINING MATERIAL

6 PRIOR TO ANY FILL BEING PLACED. THE EXCAVATED SURFACE SHALL BE COMPACTED IN A PRIOR TO ANY THIL BEING PLACED, THE EACHWRIED SURFACE SHALL BE COMPACTED IN A SMILLAR MANNER TO THAT TO BE USED FOR THE FILL. IF REQUIRED BY THE GEOTECHNICAL ENGINEER, PLACE A LAYER OF GEOTEXTILE (E.G. BIDIM A19) OVER THE PREPARED SURFACE THE LAP OF THE GEOTEXTILE SHALL BE PER THE MANUFACTURERS SPECIFICATION, WHICH TYPICALLY NO LESS THAN 300mm. IF THE PLACEMENT OF THE GEOTEXTILE IS NOT OBSERVED

BY THE ENGINEER PHOTOGRAPHIC EVIDENCE SHALL BE PROVIDED. 7. THE FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS OF UNIFORM QUALITY AND THICKNESS, THE MAXIMUM LINCOMPACTED THICKNESS OF EACH LAYER SHALL BE 200mm AND

THICKNESS. THE MAXIMUM NOCOMPACTED THICKNESS OF EACH LATER SHALL BE ZUMINI AND THE MINIMUM THICKNESS SHALL NOT BE LESS THAN 2.5 TIMES THE MAXIMUM PARTICLE SIZE. FILL SHALL BE PLACED AND COMPACTED TO A UNIFORMLY DENSE CONDITION OF AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AND TEST CERTIFICATES ISSUED TO THE ENGINEER FOR APPROVAL. COMPACTION OF EACH LAYER SHALL CONTINUE UNTIL THE WHOLE LAYER HAS ACHIEVED THE REQUIRED UNIFORM DENSITY.

9. WATER MAY BE ADDED AS NECESSARY TO AID COMPACTION BUT SHOULD BE LIMITED TO PREVENT HEAVING OF THE FILL UNDER THE WEIGHT OF THE COMPACTING EQUIPMENT AFTER COMPACTION

10. PRIOR TO PLACING SLABS AND FOUNDATIONS, ENSURE THAT THE HARDFILL SURFACE HAS A SUITABLE BLINDING LAYER TO MINIMISE PROJECTIONS AND PROTECT THE DPM.

CONCRETE

 ALL CONCRETE CONSTRUCTION IS TO BE IN ACCORDANCE WITH NZS 3109. THE CONTRACTOR IS REQUIRED TO MAINTAIN A COPY OF NZS3109 ON SITE.
 ALL CONCRETE SHALL BE SUPPLIED FROM A READY MIXED CONCRETE BATCHING PLANT. WHICH HOLDS A MINIMUM OF "HIGH GRADE" PRODUCTION STANDARD AS DEFINED BY NZS

3. CONCRETE SUPPLIER BATCHING AND QA INFORMATION IS TO BE KEPT AND SUPPLIED TO THE

CONCRETE SUPPLIER BATCHING AND QATINFORMATION IS TO BE KEPT AND SUPPLIED TO THE ENGINEER UPON REQUEST.

ALL CONCRETE SHALL BE FULLY COMPACTED BY APPROVED VIBRATION EQUIPMENT, WITH THE EXCEPTION OF SELF-COMPACTING CONCRETE WHERE THE USE OF THIS HAS BEEN PRE-APPROVED BY THE ENGINEER. VIBRATION SHALL BE APPLIED IN A UNIFORM PATTERN WITH CARE TAKEN NOT TO OVER-VIBRATE. 5. NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE

STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT THE APPROVAL OF THE ENGINEER

ALLOW FOR ALL CAST-IN CLEATS, HOLDING DOWN BOLTS AND THE LIKE BEFORE LAYING

WHERE APPROVED BY THE ENGINEER, ALL CONSTRUCTION JOINTS SHALL BE FULLY ROUGHENED IN LINE WITH NZS3109 TYPE B JOINT UNLESS NOTED OTHERWISE.

8. WHERE SPECIFIED, ALL CONTROL JOINTS SHALL BE PROPERLY FORMED AS DETAILED AND

WHERE SHOWN ON THE DRAWINGS, OR AS SPECIFICALLY APPROVED BY THE ENGINEER 9. SLABS ON GROUND SHALL BE SAWCUT 1/4 SLAB THICKNESS (BUT NO GREATER THAN THE COVER TO THE FIRST LAYER OF REINFORCING) TO THE LAYOUT ON THE DRAWINGS OR 5,000 x 5,000 MAXIMUM GRID WITHIN 24 HOURS AFTER POURING. NO REINFORCING LAPS SHALL OCCUR AT SAWCUTS.

10. ALL SEALANTS AND WATERSTOPS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS.

GROUT

11. WHERE REQUIRED BY THE DRAWINGS, GROUT SHALL BE SHRINKAGE COMPENSATED

CEMENTITIOUS GROUT WITH COMPRESSIVE STRENGTH ≥ 50MPA. WHERE CAST AGAINST

SAWCUT FACES OR BORES, THE FACE SHALL BE PREPARED WITH SUITABLE EPOXY TIE COAT TO EFFECT BOND. ALTERNATIVES SHALL BE APPROVED BY THE ENGINEER

12. GROUTS, MORTARS AND EPOXIES SHALL BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS.

SLABS

13. SLABS SHALL BE PLACED CONTINUOUSLY WITHOUT CONSTRUCTION JOINTS AND WITH STRICT
ATTENTION TO AVOID COLD JOINTS AND PLASTIC SHRINKAGE.

14. SHOULD DELAYS OCCUR WITH CONCRETE SUPPLY, THE UNFORMED EDGES OF FRESHLY

PLACED CONCRETE SHALL BE COATED WITH AN EVAPORATION RETARDANT (SIKAFILM OR SIMILAR APPROVED) AND JOINS SHALL BE SUITABLY VIBRATED ON CONTINUATION OF PLACING.

15. EVAPORATION RETARDANT SHALL BE APPLIED GENEROLISLY IN ACCORDANCE WITH NZS3109 TO SLAB SURFACES TO PREVENT PLASTIC SHRINKAGE LINDER ADVERSE AMBIENT CONDITIONS 16. IN-SITU AND PRECAST SUSPENDED SLABS AND BEAMS SHALL BE GIVEN A POSITIVE UPWARD CAMBER OF 2mm PER 1000mm OF SPAN. ALLOWANCES SHALL BE MADE FOR CAMBER WHEN

<u>CURING</u>
17. FRESHLY CAST CONCRETE SURFACES SHALL BE PROTECTED FROM MOISTURE EVAPORATION

IN ACCORDANCE WITH NZS 3109 AS SOON AS THE EXPOSED SURFACE HAS HARDENED SUFFICIENTLY BUT NOT LATER THAN TWO HOURS AFTER FINISHING.

18. CURING SHALL BE CONTINUOUS FOR AT LEAST SEVEN (7) DAYS USING ONE OF THE METHODS CONTAINED IN NZS3109. PHOTOGRAPHIC PROOF OF CURING SHALL BE PROVIDED TO THE ENGINEER

19. ATTENTION SHALL BE GIVEN TO CURING METHODOLOGY DURING FROSTS IN ACCORDANCE WITH NZS3109 IF APPROPRIATE.

SURFACE FINISHES

20. CONCRETE SURFACES SHALL BE FINISHED TO THE STANDARD DESCRIBED IN NZS3114 FOR THE FOLLOWING ELEMENT CLASSIFICATIONS UNLESS SPECIFIED DIFFERENTLY BY THE

FORMED FOUNDATIONS FACES BELOW ADJACENT GROUND LEVELS 2. FORMED FOUNDATIONS FACES ABOVE FINISHED GROUND LEVELS FLOOR SLARS LIPPER SURFACES OF FOUNDATIONS EXTERIOR SLABS (CONTRACTOR TO CHECK ARCHITECTS SLIP RESISTANCE REQUIREMENTS)

21. IF THE ARCHITECT'S SPECIFICATION DIFFERS FROM THESE NOTES, THE CONTRACTOR SHALL CONSULT THE ENGINEER

CONCRETE GRADE AND COVER 22. UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE FOLLOWING CONCRETE COMPRESSIVE

STRENGTHS SHALL BE USED:

1. SITE CONCRETE / BLINDING FOUNDATIONS 25.0 MPa

25.0 MPa 23. UNLESS NOTED OTHERWISE. THE MINIMUM COVER TO REINFORCING SHALL BE:

SITUATION		FOUNDATION	BEAM & COLUMNS	SLABS & WALLS	
CAST AGAINST OR EXPOSED TO GRO CAST AGAINST GROUND BUT PROTE		75 50	75 50	75 50	
EXPOSED TO WEATHER (B1)	IN-SITU PRECAST	50 40	50 40	40 35	
NOT EXPOSED TO WEATHER (A1)	IN-SITU PRECAST		40 35	25 25	

COVER SHALL BE MEASURED TO THE STIRRUPS OR REINFORCEMENT WHICH IS CLOSEST TO THE

CONCRETE FIXINGS
25. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO MAGNETIC OR RADAR SCAN
AND MARK-OUT EXISTING REINFORCEMENT AND TENDONS WITH REFERENCE TO THE ORIGINAL
CONSTRUCTION DRAWING SET, PRIOR TO DRILLING HOLES IN CONCRETE. DAMAGE TO
EXISTING REINFORCING STEEL IS TO BE LOGGED BY THE CONTRACTOR AND CONVEYED TO

THE ENGINEER. 26. UNLESS OTHERWISE NOTED ON THE DRAWINGS, CHEMICAL FASTENERS SHALL BE GRADE 8.8 . UNLESS OTHERWISE NOTED ON THE DRAWINGS, CHEMICAL FAST ISHERES SHALL BE GRADE 8.8 GALVANISED THREADED ROD, FIXED WITH RAMSET 68 EPOXY, ALL HOLES WHETHER IMPACT OR CORE DRILLED ARE TO BE THOROUGHLY CLEANED WITH COMPRESSED AIR PRIOR TO EPOXYING. THE CONTRACTOR IS TO HAVE A QUALITY CONTROL SYSTEM INCLUDING VISUAL MARKINGS AND INSTALLATION RECORDS TO HELP ENSURE THAT BEST PRACTICE IS MAINTAINED WITH REGARD TO ALL EPOXY FIXINGS.

MAINTAINED WITH REGARD TO ALL EPOXY FIXINGS.

27. DIMENSIONS OF POST-FIXED ANCHORS SHALL BE AS PER THE DRAWINGS. IF DIMENSIONS ARE MISSING FROM THE DRAWINGS THE CONTRACTOR SHALL REQUEST SUCH DIMENSIONS FROM THE ENGINEER, DO NOT GUESS DIMENSIONS OR INSTALL TO KNOWN TYPICAL DIMENSIONS.

THE ENGINEER. DO NOT GUESS DIMENSIONS OF INSTALL TO KNOWN TYPICAL DIMENSIONS.

28. ALL POST FIXED ANCHORS ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE

MANUFACTURERS GUIDELINES. THE CONTRACTOR SHALL TEST THE FIRST ANCHOR AND THEN

5% AFTER THE FIRST ANCHOR TO ENSURE THAT THE LOAD CARRYING CAPACITY OF THE

ANCHOR IS ACHIEVED. TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE

MANUFACTURERS GUIDANCE UP TO THE WORKING LOAD OF THE ANCHOR.

ENGINEERED TIMBER

ALL STRUCTURAL TIMBER MANUFACTURERS SHALL BE LICENSED BY THE STANDARDS

ASSOCIATION OF NEW ZEALAND TO USE THE N.Z. CERTIFIED MARK ON THEIR PRODUCTS

ASSOCIATION OF NEW ZEALAND TO USE THE N.Z. CERTIFIED MARK ON THEIR PRODUCTS.
ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH NZS 3602 & NZS 3603.
LIGHT TIMBER FRAMED CONSTRUCTION THAT IS NOT SPECIFICALLY DESIGNED SHALL BE IN
ACCORDANCE WITH NZS 3604 PROVIDED IT COMPLIES WITH THE LIMITATIONS OF NZS 3604. IF
IN DOUBT THE ENGINEER SHALL BE APPROACHED TO PROVIDE DETAILS.
ALL TIMBER SHALL BE GRADE SG8 UNO ON THE DRAWINGS.

THERE SHALL BE GRADE SG8 UNO ON THE DRAWINGS.

TIMBER SHALL BE PROVIDED WITH A MINIMUM SEATING OF 45mm

6. ALL TIMBER, EXCEPT THAT TREATED TO H5, SHALL BE PROTECTED FROM CONCRETE WITH A

ALL LIMBER, EXCEPT THAT IREATED TO BIS, STIELL BE FROTE-TED FROM CONCRETE WITH A DPC, OVERHANGING THE EDGES BY AT LEAST 6mm.
ALL PILES SHALL BE TREATED TO HAZARD CLASSIFICATION H5 TO NZS3640. ALL OTHER TIMBER TO BE AS PER THE REQUIREMENTS OF NZS 3602.
ALL CUTS AND NOTCHES IN PILES SHALL BE TREATED WITH ENSEAL TIMBER PRESERVATIVE.

9. ALL TIMBER TREATED AS SPECIFIED IN THE DRAWINGS AND TO A MINIMUM OF

a. H1.2 FOR INTERIOR NON EXPOSED TIMBER WHERE THERE IS NO RISK OF DAMPNESS. b. H3.2 FOR EXTERIOR USE BUT NOT IN CONTACT WITH GROUND.

H5 FOR EXTERIOR USE IN CONTACT WITH GROUND OR CONCRETE

I. H6 FOR EXTERIOR USE IN CONTACT WITH SEA WATER OR ESTAURINE GROUND.

BOLTING & FIXING

10. ALL BOLTS, WASHERS, NAILS AND ASSOCIATED COMPONENTS (WASHERS ETC.) TO BE TREATED PER THE REQUIREMENTS OF NZS3604 SECTION 4. HOT DIP GALVANISED AS A MINIMUM, ALL BOLTS SHALL HAVE WASHERS PLACED AGAINST TIMBER FACES

11. UNLESS SHOWN OTHERWISE THE DRAWINGS, WASHER SIZES SHALL BE NOT LESS THAN THE 11. UNLESS SHOWN OTHERWISE THE DRAWINGS, WASHER SIZES SHALL BE NOT LESS THAN TH FOLLOWING SIZES:

a. M12 BOLTS - 35x35x3mm WASHERS.
b. M16 AND M20 BOLTS - 50x50x4mm WASHERS
c. M24 AND GREATER - 65x65x5mm WASHERS
d. BOLTS ASSOCIATED WITH HOLD-DOWN STRAPS (I.E. IN TENSION) SHALL BE PROVIDED

WITH 50x50x3 WASHERS. 12. CHECK AND TIGHTEN ALL FIXING BOLTS AFTER ERECTION IS COMPLETED

12. OHECK AND INGREDIED AND APPEAR DECITION IS COMPLETED.

3. ALL PROPRIETARY FIXINGS (I.E. JOIST HANGERS, STRAPS ETC.) SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS, WITH THE CORRECT NUMBER OF FIXINGS TO ACHIEVE THE REQUIRED CAPACITY.

14. ALL BOLTS SHALL BE INSTALLED ALONG THE MEMBER CENTRELINE UNO. A MINIMUM END

DISTANCE OF 100mm SHALL BE MAINTAINED (EXCEPT FOR 90mm WIDE MEMBERS WHERE BOLTING SHALL BE ALONG THE MEMBER CENTRELINE).

15. ANY STRINGER OR PLATE FIXED TO CONCRETE OR STEEL SHALL BE PROVIDED WITH M12 BOLTS AT 600mm CRS UNO

16. BUILT-UP TIMBER MEMBERS SHALL BE FIXED TOGETHER AS NOMINATED ON THE DRAWINGS OR AS PER CLAUSE 2.4.4.7 OF NZS3604 IF NOT SPECIFIED ON THE DRAWINGS.

17. ALL FIXINGS OF H3.2 TIMBER OR HIGHER SHALL BE STAINLESS STEEL. IF THIS IS NOT

SPECIFICALLY STATED ON THE DRAWINGS CHECK WITH THE ENGINEER

CONSTRUCTION

1. UNLESS NOTED OTHERWISE, THIS BUILDING IS OF STANDARD CONSTRUCTION METHODOLOGY AND AS SUCH, A COMPETENT CONTRACTOR SHOULD BE CAPABLE OF ITS CONSTRUCTION.

2. IN GENERAL, PROPPING OF ELEMENTS (INCLUDING BUT NOT LIMITED TO BEAMS, WALLS, THE CONTRACTOR BUT NOT LIMITED TO BEAMS, WALLS, THE CONTRACTOR BUT NOT LIMITED AND INSPECTED BY THE CONTRACTOR (OR SUBCONTRACTORS). IT IS RECOMMENDED THAT THE PROPPING PLAN IS PROVIDED TO THE

OR SUBCUNING LORS). IT IS RECOMMENDED THAT THE PROPHING PLANTS PROVIDED TO ENGINEER FOR REVIEW PRIOR TO PROCEEDING.

SPECIFIC PROPPING THAT A COMPETENT CONTRACTOR MIGHT NOT BE AWARE OF ARE SPECIFICALLY NOTED ON THE DRAWINGS.

SPECIFIC RISKS – THE FOLLOWING SPECIFIC RISKS REMAIN IN THE STRUCTURAL DESIGN

5. APPROVED FILL MATERIAL MUST BE PLACED AND COMPACTED AS PER THE REQUIREMENTS OF NZS4431:1989 "EARTHFILL FOR RESIDENTIAL DEVELOPMENT"

ALTERATIONS AND DECONSTRUCTION

1. ALL ALTERATIONS TO PRIMARY STRUCTURE SHALL BE UNDERTAKEN UNDER GUIDANCE OF A CPENG STRUCTURAL ENGINEER. THE ENGINEER SHALL CONSIDER THE NOTES ABOVE REGARDING CONSTRUCTION RISKS AND REVIEW THE DESIGN FEATURES REPORT WHICH

SHOWS THE LOADS ALLOWED IN THE DESIGN. 2. GENERALLY, THE STRUCTURE SHOULD BE DEMOLISHED IN THE REVERSE SEQUENCE THAT IT GENERALLY, THE STRUCT UNE SHOULD BE DEMOLISHED IN THE REVERSE SEQUENCE THAT IT WAS BUILT. HOWEVER, A DECONSTRUCTION SEQUENCE SHALL BE PREPARED AND REVIEWED BY A CPENG STRUCTURAL ENGINEER TO ENSURE THE DECONSTRUCTION CAN BE COMPLETED SAFELY WITHOUT THE STRUCTURE BECOMING UNSTABLE. THE ENGINEER SHALL CONSIDER THE NOTES ABOVE REGARDING CONSTRUCTION RISKS AND REVIEW THE DESIGN FEATURES REPORT WHICH SHOWS THE LOADS ALLOWED IN THE DESIGN.

SPECIFIC DECONSTRUCTION RISKS – THE FOLLOWING SPECIFIC RISKS REMAIN IN THE

STRUCTURAL DESIGN A. NONE

CONSULTING ENGINEERS NELSON • CHRISTCHURCH • WANAKA • AUCKLAND • WELLINGTON 03 348 1000

MIKE & SONYA HOWLAND

12 RAWENE STREET, WAIKANAE

STANDARD NOTES

ESIGNED BY:							E(OR COI	NOEN
OSHUA MULLIGAN									NO⊏I
							SCALE		
RAFTED BY:							1:1		
IADEZDA]						PROJECT NO	TYPE	SHE
TANOJEVIC	A DEV	27.08.21	FOR CONSENT	PEVISION	DS	RC APD	21452	DWG	S-00

DR

NT SIZE A3 HEET REV 0-02

LEGEND: ANCHOR PILES BOX architecture

(M)

(N)

BED R'M 2

KITCHEN

FOUNDATION LAYOUT SCALE 1:75 A3

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MIKE & SONYA HOWLAND

BED R'M 4

LOUNGE

L'DRY

12 RAWENE STREET, WAIKANAE

FOUNDATION LAYOUT

-St

DESIGNED BY: JOSHUA MULLIGAN DRAFTED BY: NADEZDA STANOJEVIC A 27.08.21 FOR CONSENT REV DATE 21452

ALTERATION: HOWLAND 12 RAWENE STREET WAIKANAE

PRELIMINARY

FOR CONSENT SCALE A3 REV DWG S-01-01

GENERAL NOTES

GENERAL NOTES A3

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3. DO NOT SCALE FROM DRAW INGS.

4. THE ADEQUACY OF THE DESIGN INCORPORATED ON THE PLANS IS SUBJECT TO THE REQUIREMENTS INCLUDED IN THE SPECIFICATION FOR THE WORKS AND THE DESIGN ASSUMPTIONS INCORPORATED IN THE CALCULATIONS AND REPORTS FOR THE PROJECT.

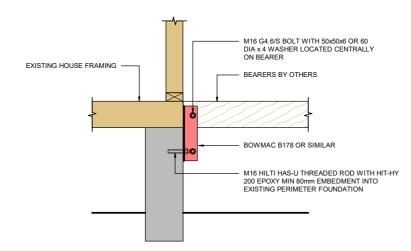
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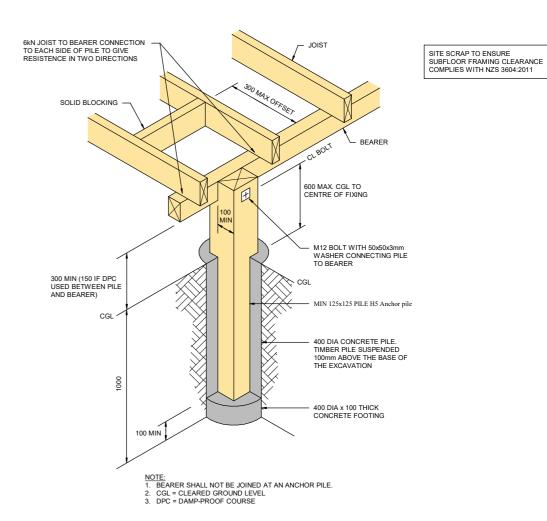
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NEW BEARER TO EXISTING PERIMETER BEAM CONNECTION DETAIL SCALE 1:20 A3



ANCHOR PILE DIRECTLY CONNECTED TO BEARER ONLY

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MIKE & SONYA HOWLAND

12 RAWENE STREET, WAIKANAE

FOUNDATION DETAILS

DESIGNED BY: JOSHUA MULLIGAN DRAFTED BY: A 27.08.21 FOR CONSENT

FOR CONSENT SCALE 1:20 REV 21452 DWG S-01-02





7. Supporting Documents

7.1. Calculations



Civil
Environmental
Fire
Geotechnical
Project Management
Structural

Job Title:	12 Rawene St		Page No.
Subject:	Bracing Design		
Date: 25,	/08/2021	Designed: JM	
Job No:	21146		

CALCULATION PURPOSE

The purpose of this calculation is to carry out bracing calculations for NZS3604 type buildings. The demands calculation uses 2 possible methods (which is chosen by the designer) 1) Specific Engineering Design (SED) or 2) NZS3604 approach. The capacity calculation uses two possible methods of load distribution (which is chosen by the designer) 1) Specific Engineering Design (SED) or 2) NZS3604 approach. If using the NZS3604 force distribution approach, the designer must check that the bracing meets the bracing distributrion clauses of NZS3604.

WALL BRACING DEMAND

Building Specification

Number of storeys

Floor Loading

Foundation Type

Subfloor Cladding Weight

Does the dwelling have eaves?

single
2.0 kPa
Subfloor
Light

Yes

Cladding Weight Roof Weight

Room in Roof Space

Roof Pitch (degrees)
Roof height above eaves (m)

Stud Height (m)

Building height to apex (m) Ground to lower floor level (m)

Building Length (m) Building Width (m)

Building Plan Area (m²)

Single Floor
Light
Light

no

15 1.78

3.05 m

4.48 m 0.46 m

8.6 m 4.5 m 38.7 m²

Building Location

Select by Building Consent Authority Map

High

High - 44m/s

or Preference

Wind Zone

Earthquake Zone

SED

Soil Type

D (Deep or soft)

SED Earthquake $C_d(T_1)$ ULS=

 $C_d(T_1)$ ULS= 0.3505 Along $C_d(T_1)$ ULS= 0.3505 Across

SED Earthquake ductility μ = 3.5

 μ = 3.5 Along μ = 3.5 Across

Wind Bracing Demand (kN)

	Subfloor	Walls Upper
Along	13.7	7.0
Across	24.7	13.3

Earthquake Bracing Demand (kN)

	Subfloor		Walls single	
Along	26.7		21.3	
Across	26.7		21.3	
Subfloor demand is scaled to μ=3.5				

EARTHQUAKE DESIGN SPECTRA (NZS 1170.5:2004)

Project: 12 Rawene St Subject: Cd(t) Designer: JM Date: 25/08/2021



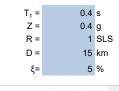
Design Data

Site Characteristics

Structures' Period Hazard Factor Return Period Factor Distance to Nearest Fault

Equivalent Damping Site Subsoil Class

Type of Analysis



D - Deep or Soft Soil Sites

Equivalent Static

Note: Enter to 2 Decimal Places Note: Refer Table 3.3, NZS1170.5 Note: Refer Table 3.5, NZS1170.5 Note: Refer Table 3.3, NZS1170.5

If not near a fault enter "-".

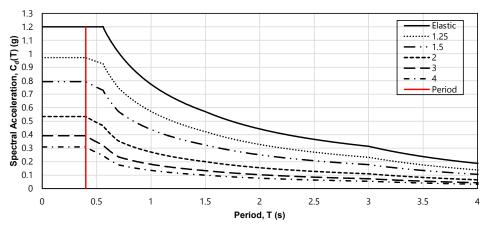
Design Spectra

Design Parameters (for period entered above)

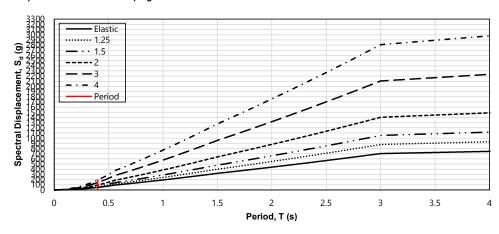
μ	$C_d(T)(g)$	$C_d(T)/S_p(g)$	$S_d(T)$ (mm)
1	1.200	1.200	48
1.25	0.971	1.050	60
1.5	0.793	0.933	72
2	0.535	0.764	95
3	0.392	0.560	143
4	0.309	0.442	191

Note: Displacement are scaled by $\boldsymbol{\mu}.$ Additional scaling may be required by NZS1170.5.

Spectral Acceleration Chart 5% Damping



Spectral Displacement Chart 5% Damping





Project				Job Ref.		٦
12 Rawene St			2	1452		
Section				Sheet no./rev.		
	CALCULATIONS				1	
Calc. by	Date	Chk'd by	Date	App'd by	Date	
.IYM	25/08/202					

1. Pile Design

1.1. LATERAL CAPACITY CHECK

ALONG DIRECTION

Wind 13.7 kN

EQ 26.7 kN

Critical Line is GL N

Demand per pile

Wind = 13.7 kN x 1.9 m / 4.35 m / 5 piles = 1.20 kN

EQ = 26.7 kN x 1.9 m / 4.35 m / 5 piles = 2.33 kN

ACROSS DIRECTION

Wind 24.7 kN

EQ 26.7 kN

Critical Line is GL B - C

Demand per pile

Wind = $24.7 \text{ kN} \times 1.72 \text{ m} / 8.6 \text{ m} / 3 \text{ piles} = 1.65 \text{ kN}$

EQ = 26.7 kN x 1.72 m / 8.6 m / 3 piles = 1.78 kN

Use 125x125 MSG8 H5 PILE

 ϕ Mnx = ϕ k_1 k_8 f_b Z

 $\phi = 0.8$

 $k_1 = 1$ short term load

 $k_8 = 1$ restrained

f_b = 14 MPa MSG8

 $Z = bd^2/6 = (125 \text{ mm})^3/6 = 322521 \text{ mm}^3$

 ϕ Mnx = ϕ k₁ k₈ f_b Z = 0.8 x 1.0 x 1.0 x 14 MPa x 322521 mm³ = 3.61 kNm

400 x DIA CONCRETE SOCK



	Project				Job Ref.	1
,		12 Ra	214	152		
0	Section				Sheet no./rev.	
		CALCU		2		
	Calc. by	Date	Chk'd by	Date	App'd by	Date
	IVM	25/08/202				

1.2. BEARING CHECK

BEARING CHECK

Trib Area = $1.72 \text{ m} \times 1.9 \text{ m} = 3.27 \text{ m}^2$

Loading 1.2G + 1.5Q

G = 0.5 kPa

Q = 1.5 kPa

 $N^* = (1.2 \times 0.5 \text{ kPa} + 1.5 \times 1.5 \text{ kPa}) \times 3.27 \text{ m}^2 = 9.3 \text{ kN}$

ADDITIONAL WEIGHT OF CONCRETE SOCK

Wgt. Conc = $(\pi \times (0.4 \text{ m})^2 / 4 - 0.125 \text{ m} \times 0.125 \text{ m}) \times 1 \text{ m} \times 23.5 \text{ kN/m}^3 = 2.6 \text{ kN}$

 $Nb^* = 1.2 \times 2.6 \text{ kN} + 9.3 \text{ kN} = 12.4 \text{ kN}$

As per CGW geotechnical Report

UBC = 300 kPa at 1 m bgl

phiUBC = 0.5 x 300 kPa = 150 kPa

End bearing capacity, $\phi Nb = 150 \text{ kPa x } \pi \text{ x } (0.4 \text{ m})^2 / 4 = 18.8 \text{ kN} > 12.4 \text{ kN } //OK$

2. BLOCKWORK WALL ALONG GL A

THE ADDITTIONAL DEMAND ON GL A FROM THE EXTENSION WILL BE

Wind = 1.65 kN / 2 = 0.83 kN

EQ = 1.78 kN / 2 = 0.89 kN

This additional demand will be negligible compared with the capacity of the existing house subfloor blockwork wall along this line. Therefore, no further analysis is required, and the capacity of the existing subfloor bracing will be OK by inspection.



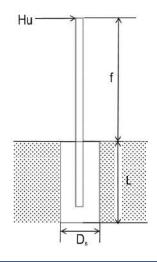
Civil **Environmental** Geotechnical **Project Management** Structural

Job Title:	12 Rawene St		Page N
Subject:	Cantilever		
Date:	25/08/2021		
Job No:	21452	Designed: JM	

LATERALLY LOADED PILES TO NZBC B1/VM4

CALCULATION PURPOSE

This spreadsheet is for the calculation of ultimate lateral strength of piles in soil. All references are to NZBC Code B1/VM4 except where noted. The spreadsheet considers fixed and free headed piles and also cohesive and cohesionless soils. The user must confirm that the design method from B1/VM4 is appropriate to the application.



Free Head

0.5

0.8

0.4

3.61

0.6

1.711

4.28 Ds

1.00

kNm

m

m

kPa

 $\phi =$

 $\phi =$

 $D_s =$ $\phi M = M_{ult} =$

LATERAL LOAD CALCULATION

Fixed or Free Head

Case 1 - Horizontal shear applied to the pile

Case 2 - Horizontal shear applied to the pile

Maximum Moment Capacity of Pile

Diameter of the pile shaft

Distance above the ground surface shear is applied

4.6.1 Centre to centre spacing of piles in a group

(input large number for a single pile)

Pile Spacing Factor

Ground characterisation

Angle of shearing resistance

Coefficient of passive earth pressure

Unit weight of soil in which the pile is embedded

Cohesionless

Reduction factor =

θ = 28 $K_p =$

deg 2.80 kN/m³ 18

Length of the pile shaft

Case 1 - Ultimate lateral strength of pile Case 2 - Ultimate lateral strength of pile

Governing Pile Classification

Position long pile shaft at which maxium moment occurs

Maximum Pile shaft moment

0.90

 $\phi H_u =$ 2.12 kΝ

3.40 kΝ $\phi H_u =$ Long

0.37 m g =

3.61 kNm $M_{max} =$

END BEARING CAPACITY

Ultimate Bearing Capacity (at end bearing depth) Strength reduction

Pile vertical capacity (end bearing)

Circular

1.65

2.33

kΝ

kΝ

300 $q_{ult} =$ 0.5 $\phi =$

φN = 18.8 kΝ





7.2. Geotechnical Information



Liquefaction Assessment Report

12 Rawene Street, Waikanae

Mike & Sonya Howland c/ Box Architecture Ltd

Document Number: 21452-RPTGEO-001-A

Date: 16 July 2021

Prepared by

Emma Cody PhD

Engineering Geologist

Emma lodg

BSc, MSc, MEngNZ

Reviewed by

Martin Williams

Principal Geotechnical Engineer

MSc, CMEngNZ, CPEng

Consulting Civil, Structural, Environmental & Geotechnical Engineers

Directors: V.J. Anderson BE C&M • R.A. Puklowski NZCE (Civil) REA MEngNZ • C.F. Short BBS PG Dip Man • A.R. Wilton BE CMEngNZ CPEng IntPE DipMS









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Exe	cutive Summary	3
1.	Introduction	4
2.	Proposed Development	4
3.	Scope of Works	5
4.	Site Information	5
5.	CGW Site Walkover and Investigation	6
6.	Ground Model	8
7.	Liquefaction Risk	8
8.	Geotechnical Engineering Recommendations	9
9.	References	10
App	endix A: Limitations	11
App	endix B: CGW Site Investigation Logs	.12



Executive Summary

Table 1: Report Summary					
t	Site Address Consent Application		12 Rawene Street, Waikanae		
Project			Building Consent		
<u>م</u>		Consent Authority	Kapiti Coast District Council		
		Liquefaction Risk	TC1		
		Lateral Spreading Risk	None		
ų.	Geotechnical	Slope Stability Risk	None		
Site Assessment	Hazard Assessment	Groundwater Level	Groundwater was not encountered during testing		
e Asse		Site Subsoil Classification	Class D – Deep Soils Site		
Sit		AS2870:2011 Expansive Soils Classification	Class A – Non Expansive		
		HAIL Assessment	Not part of CGW scope		
	If fill present, is the fill engineered and to what depth		None		
ndati n ssm	Geotechnical Ultimate Bearing Capacity 300 kPa Depth		On shallow gravels >1.0 m bgl		
Capacity 300 kPa Dept Foundation Recommendation		on Recommendations	SED, shallow piles embedded into gravels		



1. Introduction

CGW Consulting Engineers (CGW) have been engaged by Mike & Sonya Howland (clients) c/ Box Architecture Ltd to undertake a liquefaction assessment for a proposed extension to the existing property at 12 Rawene Street, Waikanae (site).

This report summarises our findings and recommendations and may be used to support a building consent application to Kapiti Coast District Council (KCDC). Our geotechnical limitations are presented within Appendix A of this report.

2. Proposed Development

It is understood the clients are proposing to construct an extension at the rear of the existing property at 12 Rawene Street. The addition will be approximately 41 m² and include a master bedroom and ensuite. A number of internal changes will be made to walls within the existing property.

It is anticipated the development may include minor earthworks, however at this stage CGW have not been provided with a proposed earthworks plan.



Figure 1: Development plan as supplied by Box Architecture Ltd (Sheet A1.0) showing the rear extension with master bedroom and ensuite.



3. Scope of Works

Our scope of works, as per the short form agreement dated 14/06/2021, are as follows:

- Service clearance;
- 1x test pit to confirm gravels in front yard;
- Prepare a qualitative liquefaction assessment report to support a building consent application to Kapiti Coast District Council (KCDC).

4. Site Information

4.1 Site Description

The site, 12 Rawene Street, Waikanae, is located approximately 1.0 km west of Waikanae town centre and is legally described as Lot 9 DP 22673 (Fig. 2).

The site slopes slightly from RL 9 m at the road to RL 8 m at the rear. Mature trees line the boundary of the property with the remainder grassed or paved.

The main structure on the site is a single storey residential dwelling of approximately 130 m² with a detached single car garage and car port along the western boundary. A deck extends off the back of the property in the area in which the extension is proposed.



Figure 2: Photo of site looking northeast from the rear of the property. The extension will adjoin the right had side of the house.

4.2 Published Geology

From GNS mapping of the Kapiti region (2008), the site is underlain by alluvial deposits (Q1a), described as "well sorted floodplain gravels".



According to the GNS Science Active Fault Database, the site lies 3 km west of the Northern Ohariu Fault, a strike slip fault which has a recurrence interval of 2000 – 3500 years. The site has a moderate seismic shaking hazard.

There is no mapped slope stability hazard.

4.3 NZGD Review

A review of the New Zealand Geotechnical Database (NZGD) identified no previous geotechnical investigations within close proximity (200 m) of the site.

CGW has completed several nearby investigations (100 to 150 m north) in similar alluvial deposits. These investigations have found well sorted fine to moderate, dense gravels from depths of 0.5 m bgl.

4.4 Historical Aerial Photography Review

A review of historic aerial photography sourced from Google Earth and RetroLENS shows the site to be located within an abandoned river channel, now infilled, with the river terrace located 300 m north of the site.

The original house can be seen on the site from 1964. By 1973 the surrounding area had been developed and mature trees can be seen on the imagery.

4.5 Council Information

A review of the KCDC hazard mapping and GIS database indicate the following:

- The site is zoned as residential:
- Liquefaction mapping of the area by Greater Wellington Regional Council (GWRC) shows the site to be at low risk of liquefaction. Generally speaking liquefaction occurs in saturated (i.e. below the groundwater table) cohesionless fine grained sediments, typically silts and sands;
- The site is within a ponding hazard area and Rawene Street is mapped as an overflow pathway.

5. CGW Site Walkover and Investigation

A CGW Engineering Geologist attended the site on 02/07/2021 and undertook a site walkover and site specific investigations.

5.1 CGW Site Walkover

During the site walkover the following were observed:

- The site is relatively flat and drops slightly at the back at a gentle gradient to the southern end of the section;
- No wet areas or areas of ponding were noted;



- The site was grass covered with mature trees and established garden along the boundaries;
- The area of development was currently gravel covered and included a small vegetable garden along the eastern boundary of the section;
- The house and detached garage were closely spaced with only walking space between.

5.2 CGW Site Specific Investigations

The following site investigations were undertaken by CPT Elite under the supervision of a CGW engineering geologist:

- 2 machine augered holes at the rear of the site to 0.6 and 1.1 m bgl;
- 2 scala penetrometer tests to between 0.8 and 1.1 m;

Due to the presence of shallow gravels, it was not possible to undertake a Cone Penetrometer Test (CPT), which would have refused at shallow depth.

The site investigations were undertaken by a CGW Engineering Geologist who set out the investigation locations, supervised the sub-contractors and carried out insitu testing.

A visual tactile classification of the soils encountered during the investigation was carried in accordance with the NZGS guidelines (2005). Scala penetrometer testing was completed in accordance with NZS 4402:1988 Test 6.5.2.



Figure 3: Site testing locations relative to approximate build location.



6. Ground Model

Ground conditions are summarised from the CGW investigations at the site, as follows.

CGW Site Investigation logs can be found in Appendix B.

6.1 Subsurface Conditions

Table 2 below presents the soils conditions encountered at the site, as indicated by test pitting.

Table 2: Site Ground Model				
Soil Type	Depth to base of layer (m bgl)	Thickness (m)	Relative Density / Consistency	
Fine sandy SILT - TOPSOIL	0.3	0.3		
SILT – some clay and fine sand, trace gravel	0.5 – 1.0	0.2 – 0.7	Firm	
GRAVEL – silty, fine to medium, sub rounded	>1.0		Dense to very dense	

6.2 Groundwater

Groundwater was not encountered during the CGW investigations.

It should be noted that groundwater levels may vary in response to environmental factors including seasonal variation and weather events.

6.3 Site Subsoil Classification

We consider that the site subsoil category in terms of NZS1170.5 Clause 3.1.3 is Class D (Deep soils) based on the following:

- Site specific investigations indicate alluvial/fluvial gravels;
- Geology mapping of the Wellington region (2002);
- Clause 3.1.3 and Table 3.2 of NZS1170.5:2004.

7. Liquefaction Risk

Although not developed for non-residential building or construction outside of Canterbury, the MBIE Canterbury earthquakes guidance provides a useful benchmark in classifying the liquefaction risk to a property and is now being used more widely across New Zealand.

The MBIE Guidelines provide broad classifications of land for future land performance based on index values of expected settlements.



The site investigation by CGW has identified gravels from 0.3 m at the site. These gravels extend to at least 1.1 m bgl as identified through test pitting where refusal was met. In consideration of the fluvial environment and river terraces of the Waikanae River, it is likely that the gravels extend to considerable depth.

Based on observations of soils at the site we do not consider the site to be at risk of liquefaction and consequently assess the site as TC1 (low risk) classification as per the MBIE guidelines. This concurs with the GWRC mapping.

8. Geotechnical Engineering Recommendations

The following geotechnical recommendations are for the proposed development mentioned above in this report. If alternative development is proposed for the site, then further site investigations may be required to be undertaken.

8.1 Earthworks and Site Preparation

We anticipate that minor earthworks may be undertaken at the site. However, at this stage CGW have not been provided with proposed earthworks plans.

All earthworks across the site should be undertaken in accordance with NZS4431:1989.

Site preparation should generally include the following procedures:

- Remove vegetation, topsoil and soil containing significant amounts of organic material from beneath building slabs, shallow foundations and proposed fill areas;
- Remove any existing 'uncontrolled' fill materials, if encountered, from beneath building footprints and fill areas;
- Excavate where required to the design foundation and roading levels;
- Proof roll and compact the exposed subgrade materials using a heavy roller to reveal soft or loose areas and to densify the subgrade soils. Soft or loose areas which do not improve with compaction should be over excavated and replaced with compacted engineered fill;

8.2 Foundations

The scala tests indicate the site does not consistently meet NZS3604:2011 'good ground' requirements. An ultimate bearing capacity (UBC) of 300 kPa is expected from 0.4 m to 1.2m bgl.

The site has been classified as TC1 regarding liquefaction risk (refer Section 7.3), which does not require any specific foundation precautions.



Shallow foundations are suitable for the site, however specific design is required with foundations taken down to the gravels, which provide an UBC of 300kPa.

8.2.1 **Geotechnical Inspections**

It is recommended that foundation excavations be inspected by a geotechnical engineer to confirm that founding conditions are consistent with those on which the design recommendations are based.

9. References

- Begg, J.G.; Johnston, M.R. (compilers) 2000: Geology of the Wellington area: scale 1:250,000. Lower Hutt: Institute of Geological & Nuclear Sciences. Institute of Geological & Nuclear Sciences 1:250,000 geological map 10. 64 p. + 1 folded map
- Ministry of Business, Innovation & Employment (2012) *Repairing and Rebuilding Houses Affected by the Canterbury Earthquakes.*
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 Geotechnical Engineering Practice Module 1: Overview of the guidelines.
- New Zealand Geotechnical Society (2005) Field Description of Soil and Rock.
 Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes.
- Standards New Zealand. (1988) *NZS4402.6.5.2:1988 Methods of testing soils* for civil engineering purposes Soil strength tests Determination of the penetration resistance of a soil Test 6.5.2 Hand method using a dynamic cone penetrometer.
- Standards New Zealand. (1989) *NZS4431:1989 Code of Practice for Earth Fill for Residential Development.*
- Standards New Zealand (2011) *NZS3604:2011 Timber Framed Buildings*



Appendix A: Limitations

This report has been prepared solely for the benefit of our clients, Mike & Sonya Howland, as per our brief and an agreed consultancy agreement. The reliance by any other parties on the information or opinions contained in this report shall, without our prior agreement in writing, be at such parties' sole risk.

The conclusions and recommendations contained within this report are based on the investigations as described in detail above. The nature and continuity of subsoil conditions are inferred and it must be appreciated that actual conditions could vary considerably. Defects and unforeseen ground conditions may remain undetected which might adversely affect the stability of the site and the recommendation made herein.

This report has been prepared solely to address the issues raised in our brief, and shall not be relied on for any other purpose.

Where we have provided comments on aesthetic issues these need to be confirmed by an architect or other expert in the field.

In the event the third party investigation data has been provided to us, the client acknowledges that we have placed reliance on this information to produce our report and CGW will accept no liability resulting from any errors or defect in the third party data provided to us.



Appendix B: CGW Site Investigation Logs

Document Number: 21452-RPTGEO-001-B Issued: 16 July 2021

	Project Title: 12 Rawene Street, W		
CGW	Project Number: 21452	Client: Mike and Sonya Howland	SP01
Consulting Engineers	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 02/07/2021	Method: Machine Auger	Logged By: EC	Scale: 1:50 Sheet 1 Of 1



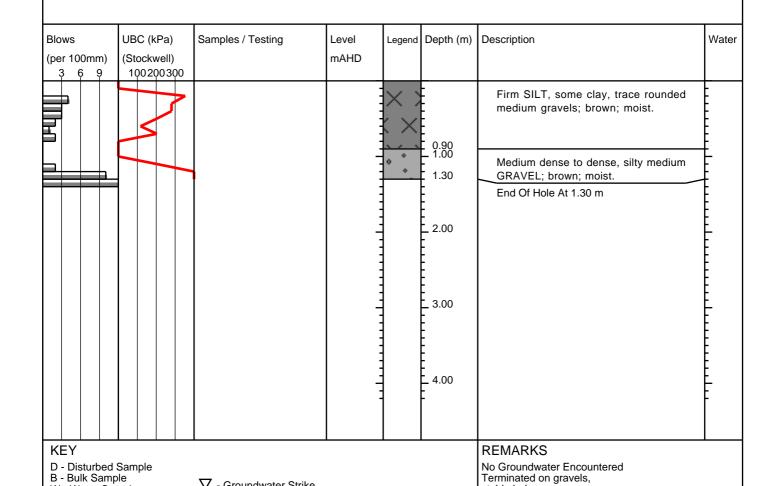
Blows			UBC (kPa)	Samples / Testing	Level	Logond	Depth (m)	Description	Water
per 10)0mm))	(Stockwell)	Samples / Testing	mAHD	Legend	Deptii (iii)	Description	vvale
3	69		100200300			.,,,			
						. *	0.40	SILT, minor organics, some clay; dark brown; moist. (Topsoil). Dense, silty GRAVEL; grey brown; moist. Gravels: medium, sub rounded. End Of Hole At 0.60 m	
							3.00		
KEY								REMARKS	

No Groundwater Encountered Stable, terminated on gravels

✓ - Groundwater Strike✓ - Groundwater Level

D - Disturbed Sample B - Bulk Sample W - Water Sample V - Hand Shear Vane kPa

	Project Title: 12 Rawene Street, W		
⋘ CGW	Project Number: 21452	Client: Mike and Sonya Howland	SP02
Consulting Engineers	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 02/07/2021	Method: Machine Auger	Logged By: EC	Scale: 1:50 Sheet 1 Of 1



stable hole

Printed By GeoLogs (www.GeoLogs.com)

V - Hand Shear Vane kPa

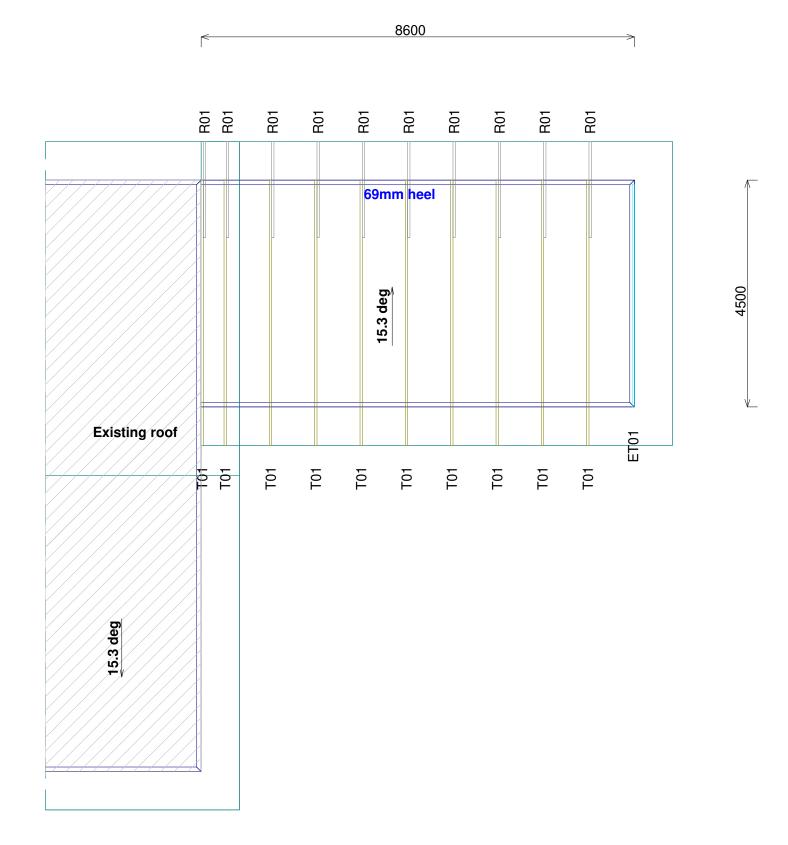
W - Water Sample

 ∇ - Groundwater Strike

▼ - Groundwater Level

BC210994 Received by Kapiti Coast District Council 8/11/21

Layout is null and void if trusses not supplied by PlaceMakers





Mike & Sonya Howland
12 Rawene Street
Waikanae
Waikanae

For Building Consent Buildable Truss Layout

 Dulluable
 Truss Layout

 Date:
 Sep 23,2021
 Drawn: Phung Huynh

 Scale:
 1:75
 System: MiTek 20/20

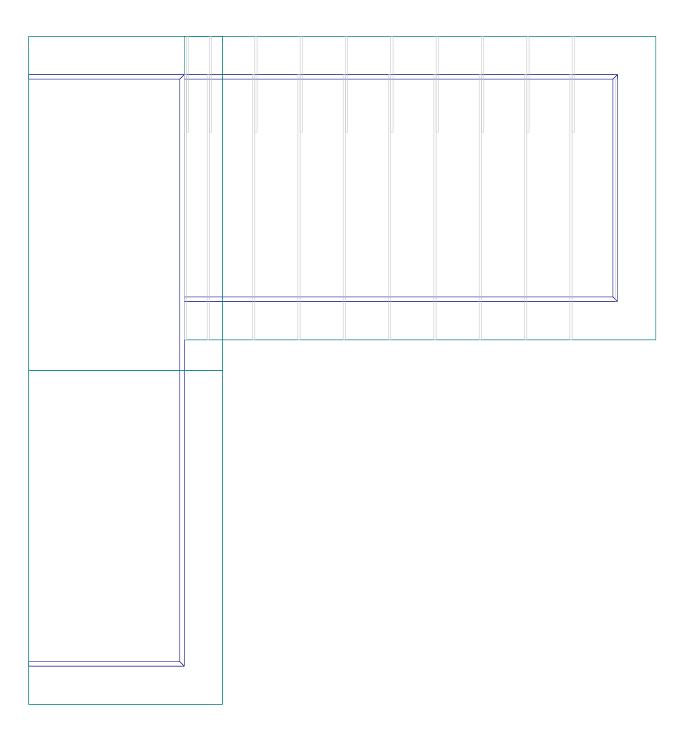
Roof Pitch : 15.3 Deg
Roof Material : Longrun Iron .55mm

Ceiling Material : Gib Board 10mm

Wind Zone : High Roof Snow Load : 0.000 kPa Truss Centres : 900 mm
Roof Live Load : 0.250kPa
Floor Live Load : kPa
Wind Speed : 44.0 m/s



Layout is null and void if trusses not supplied by PlaceMakers



TIMBER SUB FLOOR



Mike & Sonya Howland
12 Rawene Street Waikanae Waikanae

For Building Consent Slab Thickening

Date: Sep 23,2021 Drawn: Phung Huynh Scale: 1:75 System : MiTek 20/20

Job Details: Roof Pitch

:15.3 Deg Roof Material : Longrun Iron .55mm Ceiling Material : Gib Board 10mm

Wind Zone : High Roof Snow Load: 0.000 kPa Truss Centres : 900 mm Roof Live Load : 0.250kPa Floor Live Load: Wind Speed : 44.0 m/s

PrimeCad v4.7.346 Job Title : BL213173

Lintel Fixing

TYPE E 1.4kN

TYPE F 4.0kN

TYPE G

TYPE H 13.5kN

NOTES:

Compliance 2018 Edition

Table 8.14 & Figure 8.12)



7.5kN

Refer to: Lintel Fixing Schedule 01/2018 pages 73 & 74, Structrual Fixings On-site Guide for Buildng Code

(Alternative to NZS 3604:2011



Mike & Sonya Howland 12 Rawene Street Waikanae Waikanae

For Building Consent Lintel Fixing

Sep 23,2021 Drawn: Phung Huynh Scale: 1:75 System : MiTek 20/20

Job Details: :15.3 Deg Roof Pitch : Longrun Iron .55mm Roof Material Ceiling Material: Gib Board 10mm

Wind Zone : High Roof Snow Load: 0.000 kPa Truss Centres : 900 mm Roof Live Load: 0.250kPa Floor Live Load:

Wind Speed : 44.0 m/s

PrimeCad v4.7.346 Job Title : BL213173 Sheet:

Existing window Existing door **Existing window** Type F

Layout is null and void if trusses not supplied by PlaceMakers

Stud to top plate fixing details

Type A is minimum fixing required unless specified otherwise



2/90x3.33 plain steel wire nails driven vertically into stud.





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

Plus 2x LUMBERLOK CPC40



OR

Plus LUMBERLOK 6 kN Stud Anchor (CPC80)



Recommended for internal wall options to avoid lining issues.

Plus LUMBERLOK Stud Strap (One face only)



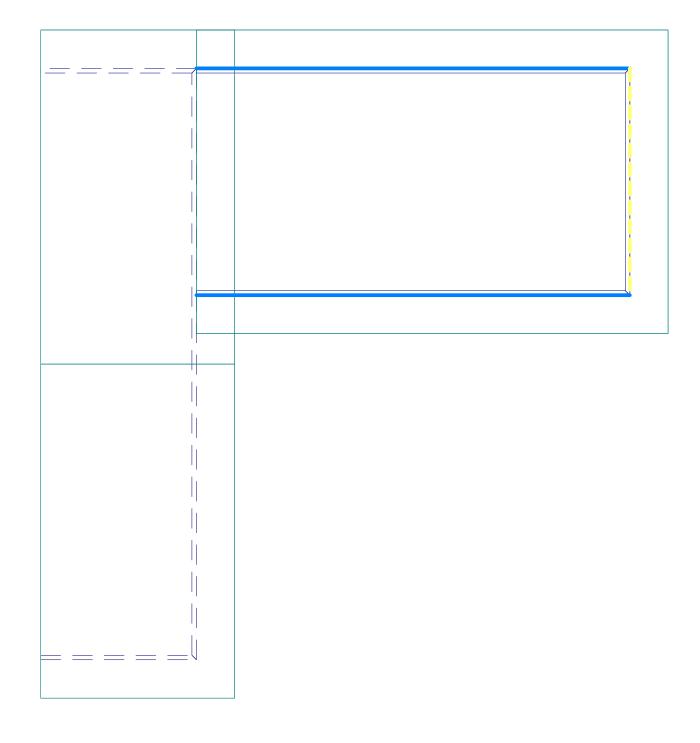
NOTES:

Refer to:

LUMBERLOK Wall Fixing Chart - Stud to Top Plate Fixing Schedule 09/2011

(Alternative to NZS3604:2011 Table 8.18)

Layout is null and void if trusses not supplied by PlaceMakers





Mike & Sonya Howland 12 Rawene Street Waikanae Waikanae

For Building Consent Stud To Top Plate Fixing

Date: Sep 23,2021 Drawn: Phung Huynh Scale: 1:75 System : MiTek 20/20

Job Details:

Roof Pitch

:15.3 Deg

Roof Material : Longrun Iron .55mm Ceiling Material: Gib Board 10mm

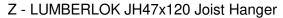
Wind Zone : High Roof Snow Load: 0.000 kPa Truss Centres : 900 mm Roof Live Load: 0.250kPa Floor Live Load:

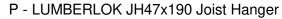
Wind Speed : 44.0 m/s

PrimeCad v4.7.346 Job Title : BL213173 4



X - LUMBERLOK JH47x90 Joist Hanger





E - LUMBERLOK JH95x165 Joist Hanger

O - Pair of LUMBERLOK CT200 Ceiling Ties

H - LUMBERLOK CT400 Cyclone Tie

B - LUMBERLOK CT600 Cyclone Tie

M - Pair of LUMBERLOK Multi Grips



NP - LUMBERLOK Nailon Plate



K - LUMBERLOK TTP 16kN Truss to Top Plate set

G - LUMBERLOK TTP 9kN Truss to Top Plate set

Truss Fixings





















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

Refer to:

LUMBERLOK Timber Connectors Characteristic Loadings Data brochure 03/4



Mike & Sonya Howland 12 Rawene Street Waikanae Waikanae

For Building Consent Truss Fixings

Sep 23,2021 Drawn: Phung Huynh Scale: 1:75 System : MiTek 20/20

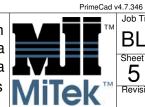
:15.3 Deg Roof Pitch Roof Material : Longrun Iron .55mm Ceiling Material: Gib Board 10mm

Wind Zone : High Roof Snow Load: 0.000 kPa

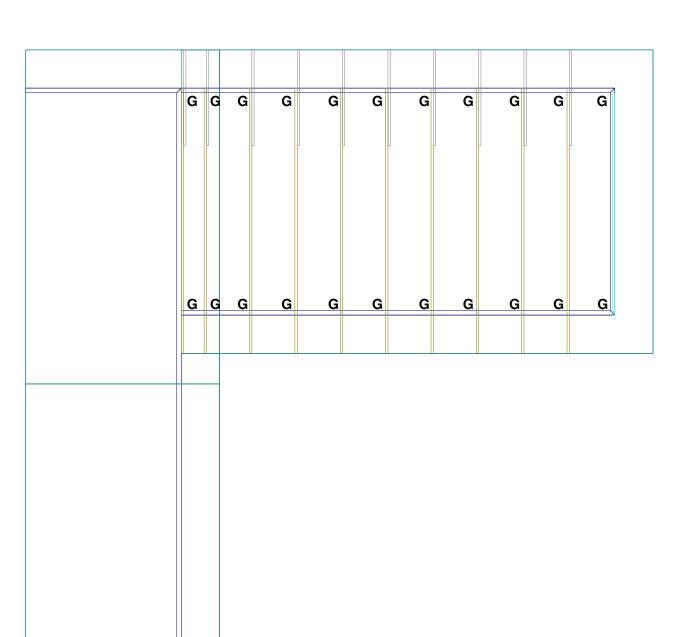
Job Details:

Truss Centres : 900 mm Roof Live Load: 0.250kPa

Floor Live Load: Wind Speed : 44.0 m/s







Layout is null and void if trusses not supplied by PlaceMakers

Heavy Roof



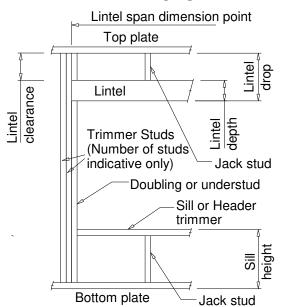
LINTEL FIXING SCHEDULE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

NOTE:

- All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist horizontal loads.
- These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- All fixings assume bottom plate thickness of 45mm maximum. Note: TYLOK options on timber species.
- Wall framing arrangements under girder trusses are not covered in this schedule.
- All timber selections are as per NZS 3604:2011

DEFINITIONS



Lintel Supporting Girder Trusses:

Roof Tributary	Light Roof			Heavy Roof		
Area	W	ind Zor	ne	Wind Zone		ie
Area	L, M,	VH	EH	L, M,	VH	EH
	H			H		
8.6 m ²	G	G	Н	G	G	Н
11.6 m ²	G	Н	Н	G	G	Н
12.1 m ²	G	Н	Н	G	Н	Н
15.3 m ²	Н	Н	-	G	Н	Н
19.1 m ²	Н	-	-	G	Н	-
20.9 m ²	Н	-	-	Н	Η	-
21.8 m ²	Н	-	-	Ĥ		-
34.3 m ²	-	-	-	H	-	-

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

SELECTION CHART FOR LINTEL FIXING

Lintel Loaded Light Roof

Span	Dimension			d Zo				Win			
Эрап	(See Fig. 1.3 NZS 3604:2011)	_	_	H	_		_			VH	
1.0	2.0	E	M	E	VΗ	EH	E	M	H	VH E	EH F
1.0	3.0	È	눝	F	F	F	눝	눝	÷	F	F
	4.0	Ē	F	F	F	G	Ē	Ē	F	F	F
	5.0	Е	F	F	G	G	ш	Е	F	F	G
	6.0	E	F	<u>F</u>	G	G	E	E	F	F	G
1.2	2.0	Ē	Ę	F	F	Ę	E	E	_E_	F.	F
	3.0	Ē	E	F	F	F	Ę	Ę	Ę	Ę	F
	4.0 5.0	F	F	F	G	G	E	E	F	F	G
	6.0	F	F	G	G	G	듣	듣	F	G	G
1.5	2.0	Ė	F	F	F	F	È	È	F	F	F
1.0	3.0	Ē	F	F	F	Ġ	Ē	Ē	F	F	F
	4.0	E	F	F	G	Ğ	E	E	F	F	G
	5.0	F	F	G	Ğ	H	Е	Е	F	G	Ğ
	6.0	F	F	G	Н	Н	Е	E	F	G	Н
2.0	2.0	E	F	F	F	G	E	E	F	F	F
	3.0	E	Ę	F	G	G	E	Ē	Ę	F	G
	4.0	<u>F</u>	Ę	G	G	H	Ę	Ę	F	G	G
	5.0	F	F G	G	H	H	투	F	FG	G H	H
2.4	6.0			F					F	F	G
۷.4	2.0 3.0	<u>E</u>	F	G	G	G H	E	E	F	G	G
	4.0	Ė	F	G	Н	Н	È	늗	÷	Ğ	H
	5.0	Ė	G	Ğ	H	H	Ē	F	Ġ	H	Ĥ
	6.0	F	Ğ	H	H	-	E	F	Ğ	Ĥ	H
3.0	2.0	Е	F	F	G	G	Е	Е	F	F	G
	3.0	F	F	G	Н	Н	Е	Е	F	G	Н
	4.0	F	G	G	Н	Н	Е	F	G	Н	Н
	5.0	Ę.	G	H	H	-	Ę	F	G	H	Н
0.0	6.0	ᆠ	G	H	-	-	╞	上	G	H	-
3.6	2.0 3.0	F	F	G	G	Н	Ę	E	F	G	G
	4.0	F	F	G	H	<u>H</u>	E	F	G	G	H
	5.0	F	G	H	<u>H</u>	-	눝	F	<u>G</u> G	H	H -
	6.0	G	H	H	-	-	卡	Ė	H	-	-
4.2	2.0	F	F	G	G	Н	Ē	F	F	G	G
	3.0	F	Ġ	H	H	-	Ē	F	G	H	H
	4.0	F	Ğ	H	-	-	Е	F	G	H	-
	5.0	G	Н	Н	-	-	Е	F	Η	-	-
4 =	6.0	G	Н	-	-	-	트	L <u>E</u>	Н.	-	-
4.5	2.0	Ę	F	G	H	Н	투	E	F	G	Н
	3.0	F	G	H	H	-	Ę	F	G	H	H
	3.4 4.0	F	G	H	H		투	F	G	H	Н
	5.0	G	Н	-	-	-	둗	F	G H	-	-
	6.0	Ğ	H	-	-	-	Ē	F	H	-	-
4.8	2.0	F	F	G	Н	Н	E	Е	F	G	Н
	3.0	F	G	Н	H	-	Ē	F	G	Н	Н
	3.2	F	G	Н	Н	-	Е	F	G	Н	Н
	4.0	F	G	Н	-	-	톧	F	4	Н	-
	5.0	G	H	-	-	-	Ę	F	H	-	-
5.1	6.0 2.0	G	H		_		듣	F	H		
J. I	3.0	F	F G	G H	H	H -	E	F	GG	G H	H
	3.5	F	G	H	-	-	듣	F	G	H	-
	4.0	G	G	H	-	-	눝	F	H	H	-
	5.0	Ğ	H	-	-	-		F	H	-	-
	6.0	G	Η	-	-	-	E	G	Ή	-	-
5.4	2.0	F	F	G	Н	Н	Ε	F	G	G	Н
	2.8 3.0	F	G	Н	Н	-	Е	F	G	Н	Н
	3.0	F	G	Н	-	-	E	F	G	Н	-
	4.0	G	Н	Н	-	-	E	F	Н	-	-
	5.0	G	H	-	-	-	Щ	Ę	4	-	-
	6.0	G	Н	-	-	-	E	G	Н	-	-

MiTek New Zealand Limited

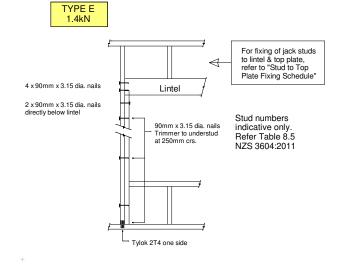
PO Box 58-014, Botany 2163 ne: 09-274 7109 MiTek Fax: 09-274 7100

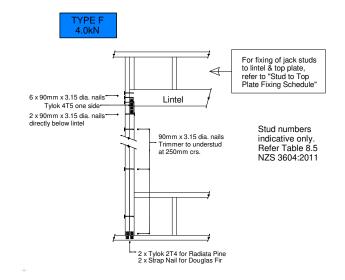
GANG-NAIL® LUMBERLOK® BOWMAC®

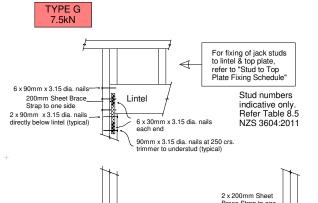
PO Box 8387, Riccarton 8440 Phone: 03-348 8691 Fax: 03-348 0314

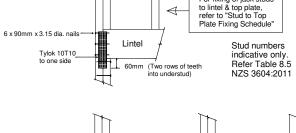
© Copyright 2010 MiTek Holdings, Inc. All rights reserved

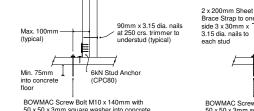
LINTEL FIXING OPTIONS

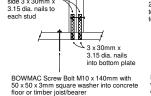


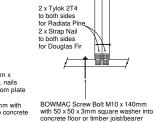


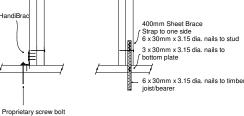








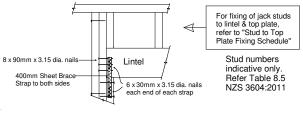


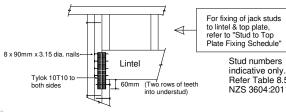


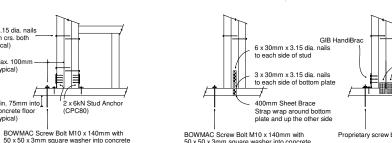
For fixing of jack studs

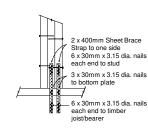


90mm x 3.15 dia. nails @ 250mm crs. both sides (typical)













MiTek 20/20 Engineering 4.7.346.0

MiTek New Zealand Limited

Correspondence from : AUCKLAND

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

Phone: 09 274 7109 Fax: 09 274 7100

CHRISTCHURCH

14 Pilkington Way, Wigram 8042 PO Box 8387, Riccarton 8440

Phone: 03 348 8691 Fax: 03 348 0314

www.miteknz.co.nz

Printed: 16:29:42 29 Sep 2021

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

ISSUED BY: MiTek New Zealand Limited

TO: Placemakers National Estimating Unit (NEU)

IN RESPECT OF: MiTek® Truss Designs

BC210994 Received by

Kapiti Coast District Council

8/11/21

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **BL213173** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

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

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

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

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

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

On behalf of MiTek New Zealand Limited, Date: Wednesday, 29 September 2021

hhipky

In Ling Ng, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)

TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited



Placemakers National Estimating Unit (NEU)

Description:

Job

BL213173 Building Consent No.: MiTek 20/20 Engineering 4.7.346.0 Client Phone

Waikanae Waikanae MiTek New Zealand Limited

Mike & Sonya Howland 12 Rawene Street

Phone:

Fabricator Design Statement : Page 1

Printed: 16:29:42 29 Sep 2021

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator Placemakers National Estimating Unit (NEU), being licensed to use the MiTek 20/20° software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details Importance Level: 2 Design Working Life: 50 years

Roof Truss NEU-H1.2 Pitch: 15.300 deg Nominal Overhang: 760 mm Timber Group: Roof Ceiling Wind

Material: Longrun Iron .55mm Material: Gib Board 10mm High (44.0 m/s) Area: Dead Load: 0.210 kPa Dead Load: 0.200 kPa Pressure Coeff: Cpe = varies; Cpi = -0.30, 0.20

Restraints: 900 mm centres Restraints: 400 mm centres Live Load: Qur = 0.250 kPaLive Load: Qc = 1.400 kNQc = 1.100 kN

The minimum timber treatment for these MiTek® trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003. The timber for these MiTek * trusses shall be graded to the requirements of NZS 3603:1993. Proprietary fixings and timber connectors shall be selected in accordance with NZS3604:2011 Section 4 - Durability.

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
ET01	1	4411	15.300	900
*R01	10	1900	15.300	900
T01	10	4500	15 300	900

Total quantity: 21

The computer design input has been carried out by:

Date: ...Wednesday, 29 September 2021.... Signed:

Qualifications and Title:

On behalf of: Placemakers National Estimating Unit (NEU)

Name of Detailer: Phung Huynh

25 Vickery St, Te Rapa, Hamilton, Phone:









Date printed: 29 September 2021

Page 1 of 2

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 LVL Limited (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope of NZS 3604.

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

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

Futurebuild LVL and SG8 components, when used and treated to the required treatment levels prescribed in NZS 3602 and NZS 3604, as modified by Acceptable Solution B2/AS1, will comply with the requirements of the NZBC (Acceptable Solution B2/AS1, 3.2).

References

- 1. NZS 3603:1993 Timber Structures Standard.
- 2. NZS 3604:2011 Timber-framed buildings.
- 3. AS/NZS 1170:2002 Structural design actions, Parts 0 and 1.
- 4. AS/NZS 1170:2011 Structural design actions, Part 2: Wind actions.
- 5. AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.
- 6. AS 1720.1:2010 Timber structures. Part 1: Design methods.
- 7. AS 1720.3:2016 Timber structures. Part 3: Design criteria for timber-framed residential buildings.

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

Version date: 1 July 2021

For further information or advice contact: Carter Holt Harvey LVL Limited,

173 Captain Springs Road, Onehunga. Auckland

Telephone: 0800 808 131 Email: designit@futurebuild.co.nz Web: https://futurebuild.co.nz/

Specifier details:

Specifier:	Phung Huynh
Business name:	NEU PLACEMAKERS
Email:	neuadmin@placemakers.co.nz

Project & site details:

Project:	21-00213173
Site address:	12 Rawene Street, Waikanae, Waikanae
Design wind zone	High
Snow loading	Design snow zone: N0

MEMBER DESIGN DETAILS

Member 1

1) Member code and description L1 - Lintels - In single or upper storey load bearing walls

2) Date prepared 23 September 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

4) Design inputs





Date printed: 29 September 2021

Page 2 of 2

Span 0.8 m Roof load width 'RLW' 3.1 m

Roof type and mass Light roof and ceiling - 40 kg/m²

Nominal wall thickness 90 mm

5) Member specification

Size, stress grade/product Use 150 x 90 hy90

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
Long term load - G + Ψ _L Q [*]	2.7 mm	0.1 mm (long term)	20.5
Live load - Ψ _s Q	3.2 mm	0.0 mm	81.0
Wind load - Ws	4.0 mm	0.1 mm	33.5

^{*}Critical serviceability load case

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

7) Reactions

		Limit States Design Reaction ^{2,3}
Load case	k1 ¹	End kN ⁴
1.35G	0.60	-1.5
1.2G + 1.5Q	0.80	-2.3
1.2G + W _u + Ψ _c Q	1.00	-3.3
0.9G + Wu	1.00	2.1

8) Installation requirements

· Provide at least 30 mm bearing at end supports

Notes for interpretation of serviceability data

- 1. 'average deflection' is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS 1170 and AS 1720.
- 2. 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 SG grades - mechanically graded to AS/NZS 1748

GL grades for glulam to AS 1328

LVL to AS/NZS 4357 (includes hySPAN and hyJOIST)

Average + 100%

Average + 43%

Average + 33%

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!

- 3. The limits referred are those specified in AS 1720.3 for the stated load case.
- 4. 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements detailed.

Notes for interpretation of reaction data

- 1. Duration of load factor 'k1' for strength as per NZS 3603:1993
- 2. Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support
- 3. Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
- 4. End reaction includes allowance for overhang/cantilever where one has been designed

8/11/21



Liquefaction Assessment Report

12 Rawene Street, Waikanae

Mike & Sonya Howland c/ Box Architecture Ltd

Document Number: 21452-RPTGEO-001-A

Date: 16 July 2021

Prepared by

Emma Cody PhD

Engineering Geologist

Emma lodg

BSc, MSc, MEngNZ

Reviewed by

Martin Williams

Principal Geotechnical Engineer

office@cgwl.co.nz • www.cgwl.co.nz

MSc, CMEngNZ, CPEng

Consulting Civil, Structural, Environmental & Geotechnical Engineers

Directors: V.J. Anderson BE C&M • R.A. Puklowski NZCE (Civil) REA MEngNZ • C.F. Short BBS PG Dip Man • A.R. Wilton BE CMEngNZ CPEng IntPE DipMS









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Executive Summary

Table 1: R	Table 1: Report Summary				
t	Site Address		12 Rawene Street, Waikanae		
Project		Consent Application	Building Consent		
<u>م</u>		Consent Authority	Kapiti Coast District Council		
		Liquefaction Risk	TC1		
		Lateral Spreading Risk	None		
ų.	Geotechnical	Slope Stability Risk	None		
Site Assessment	Hazard Assessment	Groundwater Level	Groundwater was not encountered during testing		
e Asse		Site Subsoil Classification	Class D – Deep Soils Site		
Sit		AS2870:2011 Expansive Soils Classification	Class A – Non Expansive		
		HAIL Assessment	Not part of CGW scope		
	If fill present, is the fill engineered and to what depth		None		
ndati n ssm	Geotechnical Ultimate Bearing Capacity 300 kPa Depth Foundation Recommendations		On shallow gravels >1.0 m bgl		
Foun o Asse			SED, shallow piles embedded into gravels		



1. Introduction

CGW Consulting Engineers (CGW) have been engaged by Mike & Sonya Howland (clients) c/ Box Architecture Ltd to undertake a liquefaction assessment for a proposed extension to the existing property at 12 Rawene Street, Waikanae (site).

This report summarises our findings and recommendations and may be used to support a building consent application to Kapiti Coast District Council (KCDC). Our geotechnical limitations are presented within Appendix A of this report.

2. Proposed Development

It is understood the clients are proposing to construct an extension at the rear of the existing property at 12 Rawene Street. The addition will be approximately 41 m² and include a master bedroom and ensuite. A number of internal changes will be made to walls within the existing property.

It is anticipated the development may include minor earthworks, however at this stage CGW have not been provided with a proposed earthworks plan.



Figure 1: Development plan as supplied by Box Architecture Ltd (Sheet A1.0) showing the rear extension with master bedroom and ensuite.



3. Scope of Works

Our scope of works, as per the short form agreement dated 14/06/2021, are as follows:

- Service clearance;
- 1x test pit to confirm gravels in front yard;
- Prepare a qualitative liquefaction assessment report to support a building consent application to Kapiti Coast District Council (KCDC).

4. Site Information

4.1 Site Description

The site, 12 Rawene Street, Waikanae, is located approximately 1.0 km west of Waikanae town centre and is legally described as Lot 9 DP 22673 (Fig. 2).

The site slopes slightly from RL 9 m at the road to RL 8 m at the rear. Mature trees line the boundary of the property with the remainder grassed or paved.

The main structure on the site is a single storey residential dwelling of approximately 130 m² with a detached single car garage and car port along the western boundary. A deck extends off the back of the property in the area in which the extension is proposed.



Figure 2: Photo of site looking northeast from the rear of the property. The extension will adjoin the right had side of the house.

4.2 Published Geology

From GNS mapping of the Kapiti region (2008), the site is underlain by alluvial deposits (Q1a), described as "well sorted floodplain gravels".



According to the GNS Science Active Fault Database, the site lies 3 km west of the Northern Ohariu Fault, a strike slip fault which has a recurrence interval of 2000 – 3500 years. The site has a moderate seismic shaking hazard.

There is no mapped slope stability hazard.

4.3 NZGD Review

A review of the New Zealand Geotechnical Database (NZGD) identified no previous geotechnical investigations within close proximity (200 m) of the site.

CGW has completed several nearby investigations (100 to 150 m north) in similar alluvial deposits. These investigations have found well sorted fine to moderate, dense gravels from depths of 0.5 m bgl.

4.4 Historical Aerial Photography Review

A review of historic aerial photography sourced from Google Earth and RetroLENS shows the site to be located within an abandoned river channel, now infilled, with the river terrace located 300 m north of the site.

The original house can be seen on the site from 1964. By 1973 the surrounding area had been developed and mature trees can be seen on the imagery.

4.5 Council Information

A review of the KCDC hazard mapping and GIS database indicate the following:

- The site is zoned as residential:
- Liquefaction mapping of the area by Greater Wellington Regional Council (GWRC) shows the site to be at low risk of liquefaction. Generally speaking liquefaction occurs in saturated (i.e. below the groundwater table) cohesionless fine grained sediments, typically silts and sands;
- The site is within a ponding hazard area and Rawene Street is mapped as an overflow pathway.

5. CGW Site Walkover and Investigation

A CGW Engineering Geologist attended the site on 02/07/2021 and undertook a site walkover and site specific investigations.

5.1 CGW Site Walkover

During the site walkover the following were observed:

- The site is relatively flat and drops slightly at the back at a gentle gradient to the southern end of the section;
- No wet areas or areas of ponding were noted;



- The site was grass covered with mature trees and established garden along the boundaries;
- The area of development was currently gravel covered and included a small vegetable garden along the eastern boundary of the section;
- The house and detached garage were closely spaced with only walking space between.

5.2 CGW Site Specific Investigations

The following site investigations were undertaken by CPT Elite under the supervision of a CGW engineering geologist:

- 2 machine augered holes at the rear of the site to 0.6 and 1.1 m bgl;
- 2 scala penetrometer tests to between 0.8 and 1.1 m;

Due to the presence of shallow gravels, it was not possible to undertake a Cone Penetrometer Test (CPT), which would have refused at shallow depth.

The site investigations were undertaken by a CGW Engineering Geologist who set out the investigation locations, supervised the sub-contractors and carried out insitu testing.

A visual tactile classification of the soils encountered during the investigation was carried in accordance with the NZGS guidelines (2005). Scala penetrometer testing was completed in accordance with NZS 4402:1988 Test 6.5.2.



Figure 3: Site testing locations relative to approximate build location.



6. Ground Model

Ground conditions are summarised from the CGW investigations at the site, as follows.

CGW Site Investigation logs can be found in Appendix B.

6.1 Subsurface Conditions

Table 2 below presents the soils conditions encountered at the site, as indicated by test pitting.

Table 2: Site Ground Model					
Soil Type	Depth to base of layer (m bgl)	Thickness (m)	Relative Density / Consistency		
Fine sandy SILT - TOPSOIL	0.3	0.3			
SILT – some clay and fine sand, trace gravel	0.5 – 1.0	0.2 – 0.7	Firm		
GRAVEL – silty, fine to medium, sub rounded	>1.0		Dense to very dense		

6.2 Groundwater

Groundwater was not encountered during the CGW investigations.

It should be noted that groundwater levels may vary in response to environmental factors including seasonal variation and weather events.

6.3 Site Subsoil Classification

We consider that the site subsoil category in terms of NZS1170.5 Clause 3.1.3 is Class D (Deep soils) based on the following:

- Site specific investigations indicate alluvial/fluvial gravels;
- Geology mapping of the Wellington region (2002);
- Clause 3.1.3 and Table 3.2 of NZS1170.5:2004.

7. Liquefaction Risk

Although not developed for non-residential building or construction outside of Canterbury, the MBIE Canterbury earthquakes guidance provides a useful benchmark in classifying the liquefaction risk to a property and is now being used more widely across New Zealand.

The MBIE Guidelines provide broad classifications of land for future land performance based on index values of expected settlements.



The site investigation by CGW has identified gravels from 0.3 m at the site. These gravels extend to at least 1.1 m bgl as identified through test pitting where refusal was met. In consideration of the fluvial environment and river terraces of the Waikanae River, it is likely that the gravels extend to considerable depth.

Based on observations of soils at the site we do not consider the site to be at risk of liquefaction and consequently assess the site as TC1 (low risk) classification as per the MBIE guidelines. This concurs with the GWRC mapping.

8. Geotechnical Engineering Recommendations

The following geotechnical recommendations are for the proposed development mentioned above in this report. If alternative development is proposed for the site, then further site investigations may be required to be undertaken.

8.1 Earthworks and Site Preparation

We anticipate that minor earthworks may be undertaken at the site. However, at this stage CGW have not been provided with proposed earthworks plans.

All earthworks across the site should be undertaken in accordance with NZS4431:1989.

Site preparation should generally include the following procedures:

- Remove vegetation, topsoil and soil containing significant amounts of organic material from beneath building slabs, shallow foundations and proposed fill areas;
- Remove any existing 'uncontrolled' fill materials, if encountered, from beneath building footprints and fill areas;
- Excavate where required to the design foundation and roading levels;
- Proof roll and compact the exposed subgrade materials using a heavy roller to reveal soft or loose areas and to densify the subgrade soils. Soft or loose areas which do not improve with compaction should be over excavated and replaced with compacted engineered fill;

8.2 Foundations

The scala tests indicate the site does not consistently meet NZS3604:2011 'good ground' requirements. An ultimate bearing capacity (UBC) of 300 kPa is expected from 0.4 m to 1.2m bgl.

The site has been classified as TC1 regarding liquefaction risk (refer Section 7.3), which does not require any specific foundation precautions.



Shallow foundations are suitable for the site, however specific design is required with foundations taken down to the gravels, which provide an UBC of 300kPa.

8.2.1 **Geotechnical Inspections**

It is recommended that foundation excavations be inspected by a geotechnical engineer to confirm that founding conditions are consistent with those on which the design recommendations are based.

9. References

- Begg, J.G.; Johnston, M.R. (compilers) 2000: Geology of the Wellington area: scale 1:250,000. Lower Hutt: Institute of Geological & Nuclear Sciences. Institute of Geological & Nuclear Sciences 1:250,000 geological map 10. 64 p. + 1 folded map
- Ministry of Business, Innovation & Employment (2012) *Repairing and Rebuilding Houses Affected by the Canterbury Earthquakes.*
- Ministry of Business, Innovation & Employment. (2016) Earthquake
 Geotechnical Engineering Practice Module 3: Identification, Assessment and
 Mitigation of Liquefaction Hazards.
- Ministry of Business, Innovation & Employment. (2018) Earthquake
 Geotechnical Engineering Practice Module 1: Overview of the guidelines.
- New Zealand Geotechnical Society (2005) Field Description of Soil and Rock.
 Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes.
- Standards New Zealand. (1988) NZS4402.6.5.2:1988 Methods of testing soils for civil engineering purposes Soil strength tests Determination of the penetration resistance of a soil Test 6.5.2 Hand method using a dynamic cone penetrometer.
- Standards New Zealand. (1989) *NZS4431:1989 Code of Practice for Earth Fill for Residential Development.*
- Standards New Zealand (2011) *NZS3604:2011 Timber Framed Buildings*



Appendix A: Limitations

This report has been prepared solely for the benefit of our clients, Mike & Sonya Howland, as per our brief and an agreed consultancy agreement. The reliance by any other parties on the information or opinions contained in this report shall, without our prior agreement in writing, be at such parties' sole risk.

The conclusions and recommendations contained within this report are based on the investigations as described in detail above. The nature and continuity of subsoil conditions are inferred and it must be appreciated that actual conditions could vary considerably. Defects and unforeseen ground conditions may remain undetected which might adversely affect the stability of the site and the recommendation made herein.

This report has been prepared solely to address the issues raised in our brief, and shall not be relied on for any other purpose.

Where we have provided comments on aesthetic issues these need to be confirmed by an architect or other expert in the field.

In the event the third party investigation data has been provided to us, the client acknowledges that we have placed reliance on this information to produce our report and CGW will accept no liability resulting from any errors or defect in the third party data provided to us.

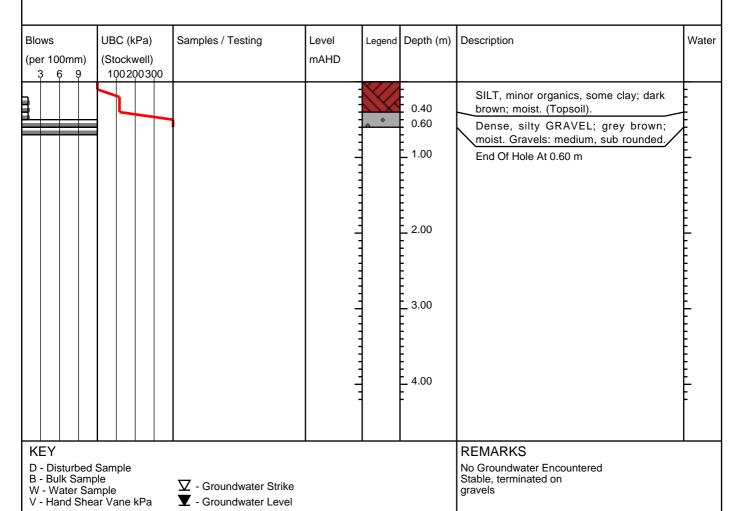


Appendix B: CGW Site Investigation Logs

Document Number: 21452-RPTGEO-001-B Issued: 16 July 2021

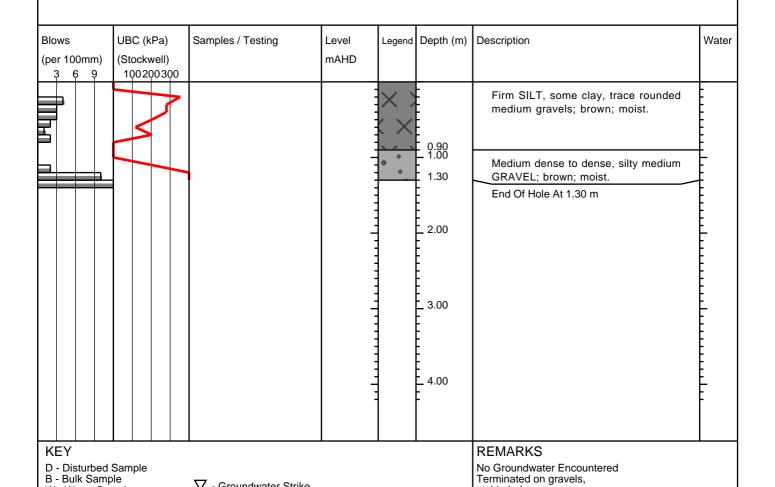
	Project Title: 12 Rawene Street, W		
⋘ CGW	Project Number: 21452	Client: Mike and Sonya Howland	SP01
Consulting Engineers	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 02/07/2021	Method: Machine Auger	Logged By: EC	Scale: 1:50 Sheet 1 Of 1





 ∇ - Groundwater Strike ▼ - Groundwater Level

	Project Title: 12 Rawene Street, W		
CGW	Project Number: 21452	Client: Mike and Sonya Howland	SP02
Consulting Engineers	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 02/07/2021	Method: Machine Auger	Logged By: EC	Scale: 1:50 Sheet 1 Of 1



stable hole

V - Hand Shear Vane kPa

W - Water Sample

 ∇ - Groundwater Strike

▼ - Groundwater Level

BC210994 Received by Kapiti Coast District Council 8/11/21

ALTERATIONS

12 RAWENE STREET, WAIKANAE

Manufacturers Supporting Documentation

Version: Rev_

Phase: BUILDING CONSENT

Date: OCTOBER 2021

Job Number: 20-005

Manufacturer Documents Index

4161T	Thermakraft Underlays, Foils, DPC, DPM, & Tapes	2
4231HL	James Hardie® Linea™ Cladding	24
5113G	GIB Plasterboard Linings	76
5431KF	Kopine Particleboard Floors	95
5438H	James Hardie® Fibre Cement Interior Flooring	114
6221A	ARDEX Tiling Solutions	131
7123B	Buteline Hot & Cold Water System	140

BC210994 Received by Kapiti Coast District Council 8/11/21

4161T Thermakraft Underlays, Foils, DPC, DPM, & Tapes



Thermakraft Ltd

+64 09 2733727 info@thermakraft.co.nz www.thermakraft.co.nz

SUPPORTING DOCUMENTS

BRANZ Appraisal 695 - Watergate Plus Wall Underlay

Ref 33246. Uploaded 21 Sep 2021
Purpose: Installation

Branz Appraisal Supercourse 500 Damp Proof Course and Concealed Flashing

Ref 33900. Uploaded 30 Sep 2021
Purpose: Performance

Thermakraft 215 - Data Sheet

Ref 14026. Uploaded 2 Oct 2020
Purpose: Performance

Thermakraft 215 - Installation Guide

Ref 14027. Uploaded 2 Oct 2020
Purpose: Installation

Watergate Plus - Installation Guide

Ref 33245. Uploaded 21 Sep 2021 Purpose: Installation



Appraisal No. 695 [2017]

WATERGATE PLUS WALL UNDERLAY

Appraisal No. 695 (2017)

Amended 15 September 2021

This Appraisal replaces BRANZ Appraisal No. 695 (2010)

BRANZ Appraisals

Technical Assessments of products for building and construction.



Thermakraft Limited

PO Box 58 112 Greenmount Auckland

Tel: 09 273 3727

Fax: 09 273 3726

Free phone: 0800 806 595 www.thermakraft.co.nz



BRANZ

1222 Moonshine Rd, RD1, Porirua 5381 Private Bag 50 908 Porirua 5240, New Zealand Tel: 04 237 1170 hranz.co.nz





Product

Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel-framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

- Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed
 - the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
 - · with direct fixed absorbent and non-absorbent wall claddings; or,
 - · with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
 - · with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or to NASH Building Envelope Solutions for steel-framed buildings; and,
 - situated in NZS 3604 Wind Zones up to, and including, Very High.

Use over Rigid Wall Underlay

- Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
 - the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel-framed buildings; 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 NASH Building Envelope Solutions for steel-framed buildings; and,
 - · situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Appraisal No. 695 [2017]

WATERGATE PLUS WALL UNDERLAY

Specific Design

2.3 Watergate Plus 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 Watergate Plus into their design in accordance with the declared properties and the instructions of Thermakraft Limited.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Watergate Plus, 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. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement.

Technical Specification

- 4.1 Watergate Plus is a white, 105 g/m² non-woven, microporous polyolefin fabric underlay.
- 4.2 The product is supplied in various sizes. Refer to Table 1. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Table 1: Roll Dimensions

Width (mm)	Length (m)	Coverage (m²)
1,370	18.5	25
1,370	37	50
1,370	73	100
2,740	18.5	50
2,740	36.5	100

Accessories

- 4.3 Accessories used with Watergate Plus which are supplied by the installer are:
 - Fixings 6-8 mm staples, large head clouts minimum 20 mm long, self-drilling screws, proprietary underlay fixings, double sided tape (for steel framing) or other temporary fixings to attach the wall underlay to the framing.
 - Wall underlay restraint (timber frame) polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
 - Wall underlay restraint (steel frame) polypropylene strap, 75 mm galvanised mesh or galvanised
 wire, or vertical cavity battens where required to restrain the wall underlay in accordance with
 NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in
 accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

WATERGATE PLUS WALL UNDERLAY

Handling and Storage

5.1 Handling and storage of the product, whether on-site 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 Watergate Plus. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

- 7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or 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. Refer to Table 2 for material properties.
- 7.2 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.
- 7.3 Watergate Plus must not be exposed to the weather or ultraviolet (UV) light for a total of more than 90 days before being covered by the wall cladding.
- 7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 [c].
- 7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber framing or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel framing. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel framing only).

Table 2: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m²	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear (Average): Machine direction = 77 N Cross direction = 56 N Tensile strength (Average): Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m³	Pass. Watergate Plus can be used as an air barrier.



BRANZ Appraisal

Appraisal No. 695 (2017) 21 September 2017 WATERGATE PLUS WALL UNDERLAY

Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings and NASH Building Envelope Solutions Table 23 on steel-framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

- 7.7 Watergate Plus 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 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The 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.
- 7.8 Watergate Plus 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 9.3.3.1 b) for timber framing or NASH Building Envelope Solutions, Paragraph 9.3.3.1 b) for steel framing.

Structure

Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

9.1 Watergate Plus meets code compliance with NZBC Clause B2.3.1 (a) not less than 50 years for wall underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b) 15 years for wall underlays used where the cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or UV 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, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

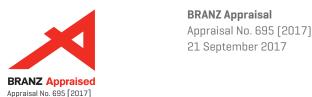
10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.
- 12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.



WATERGATE PLUS WALL UNDERLAY

Installation Information

Installation Skill Level Requirements

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

- 14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with clouts, staples, self drilling screws or proprietary underlay fixings. For steel framing, double-sided tape may be used which is applied to each stud in continuous strips. The underlay must be pulled taut over the framing before fixing.
- 14.2 Watergate Plus 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 150 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 underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.
- 14.4 Watergate Plus 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 for timber framing or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.
- 14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.
- Any damaged areas of Watergate Plus, 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 Watergate Plus installations.

Basis of Appraisal

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

Tests

- 15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to UV light.
- 15.2 The flammability index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.





BRANZ Appraisal

Appraisal No. 695 (2017) 21 September 2017

WATERGATE PLUS WALL UNDERLAY

Other Investigations

- 16.1 A durability opinion has been given by BRANZ technical experts.
- 16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.
- 16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.
- 16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

- 17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.
- 17.2 The quality of supply to the market is the responsibility of Thermakraft Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Thermakraft Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

Sources of Information

- AS 1530.2:1993 Test for flammability of materials.
- AS/NZS 1301.421s:1998 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.
- NASH Building Envelope Solutions: 2019 Light steel-framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- Ministry of Business, Innovation and Employment Record of Amendments Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.





BRANZ Appraisal Appraisal No. 695 (2017) 21 September 2017

WATERGATE PLUS WALL UNDERLAY

Amendments

Amendment No. 1, dated 30 November 2018

This Appraisal has been amended to change the Appraisal name to Watergate 295 Synthetic Underlay and to update Table 1.

Amendment No. 2, dated 15 February 2019

This Appraisal has been amended to change the Appraisal name to Watergate Plus Wall Underlay.

Amendment No. 3, dated 26 February 2020

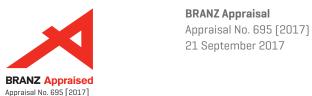
This Appraisal has been amended to change the Appraisal name to Watergate Plus, include roll size of 3.0 m x 30 m, update Table 1 and update NZBC referenced documents.

Amendment No. 4, dated 01 March 2021

This Appraisal has been amended to update the roll sizes available. Refer Table 1.

Amendment No. 5, dated 15 September 2021

This Appraisal has been amended to increase the maximum exposure period to 90 days.



WATERGATE PLUS WALL UNDERLAY



The Appraisal is issued only to Thermakraft 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. Thermakraft 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 Thermakraft 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 Thermakraft Limited or any third party.

For BRANZ

Chelydra Percy Chief Executive

Date of Issue:

21 September 2017



SUPERCOURSE 500 DAMP-PROOF COURSE AND CONCEALED FLASHING

Appraisal No. 329 (2016)

This Appraisal replaces BRANZ Appraisal No. 329 [2005]

Amended 09 July 2021



Technical Assessments of products for building and construction.



Thermakraft Limited

PO Box 58 112 Greenmount Auckland

Tel: 09 273 3727

Fax: 09 273 3726

Free phone: 0800 806 595 www.thermakraft.co.nz



BRANZ

1222 Moonshine Rd, RD1, Porirua 5381 Private Bag 50 908 Porirua 5240, New Zealand Tel: 04 237 1170 branz co. pz



Product

Supercourse 500 is a single layer black polyethylene film, embossed on both faces to produce a small diamond pattern. It is for use as a general damp-proof course (DPC), and also as a concealed flashing for masonry veneer cladding.

Scope

- 2.1 Supercourse 500 has been appraised for use as a DPC for separating timber, wood-based products and metal from concrete, masonry or clay brick in accordance with NZS 3604.
- 2.2 Supercourse 500 has also been appraised for use as a DPC and flashing in masonry veneer walls in accordance with NZBC Acceptable Solution E2/AS1.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Supercourse 500 Damp-Proof Course and Concealed Flashing, 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 and B2.3.2. Supercourse 500 meets these requirements. See Paragraph 8.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2 and E2.3.3. When used as a flashing as part of a masonry veneer cladding system, Supercourse 500 will contribute to meeting the requirements of E2.3.2. When used as a DPC, Supercourse 500 will meet the requirements of E2.3.3. See Paragraphs 11.1 and 11.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Supercourse 500 meets this requirement.





BRANZ Appraisal

Appraisal No. 329 (2016) 22 December 2016 SUPERCOURSE 500 DAMP-PROOF COURSE AND CONCEALED FLASHING

Technical Specification

- 4.1 Supercourse 500 is a 0.5 mm thick, extruded polyethylene film. It consists of a single layer of black polyethylene, embossed on both faces to produce a small diamond pattern. The total thickness of the product after embossing is 0.75 mm. Supercourse 500 is supplied in rolls 30 m long and is available in widths of 50, 75, 90, 100, 140, 150, 200, 250, 300 and 1,000 mm. Other widths are available upon request.
- 4.2 Each roll is labelled with the product name, dimensions, standards reference, and manufacturer's information.

Handling and Storage

5.1 Handling and storage of the product, whether on-site or off-site, is under the control of the installer. The rolls must be protected from damage and weather and must be stored under cover, in clean, dry conditions.

Technical Literature

Refer to the Appraisals listings on the BRANZ website for details of the current Technical Literature for Supercourse 500. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Supercourse 500 exceeds the vapour resistance requirements of NZBC Acceptable Solution E2/AS1, Table 23 for DPCs and is a suitable moisture impermeable alternative to bituminous DPCs.
- 7.2 Supercourse 500 is intended for use as a DPC separating timber, wood-based products and metal from concrete or masonry elements, or where required, timber jack studs or bearers from concrete or timber piles, e.g. where required by NZS 3604, Paragraph 2.3.3 and Figure 6.3. When used as a DPC, the roll width selected must enable the Supercourse 500 to extend at least 6 mm beyond each face of the timber in accordance with the requirements of NZS 3604, Paragraph 2.3.3 b).
- 7.3 Supercourse 500 is also intended for use as a flashing material with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.2.4 and also as a DPC in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.2.5.

Timber Treatment

7.4 Supercourse 500, when used as a DPC or flashing, is suitable for use in contact with timber treated with light organic solvent preservative (LOSP) or water-based timber preservatives. The solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of Supercourse 500.

Exposure Zone Fixing Selection

7.5 Where Supercourse 500 is used as a flashing behind masonry veneer, fixings shall be hot-dip galvanised clouts in Exposure Zones B and C, and stainless steel clouts in Exposure Zone D.

Durability

Serviceable Life

8.1 Supercourse 500 is expected to have a serviceable life in excess of 50 years when it is installed in accordance with the requirements of this Appraisal and the Technical Literature, provided it is not exposed to the weather or ultraviolet (UV) light for a total of more than 30 days, and is never exposed to chemicals, or solvents that will degrade polyethylene.





BRANZ Appraisal

Appraisal No. 329 (2016) 22 December 2016 SUPERCOURSE 500 DAMP-PROOF COURSE AND CONCEALED FLASHING

Control of Internal Fire and Smoke Spread

Damp-proof courses and flashings are exempt from the surface finish requirements of NZBC Acceptable Solutions C/AS1 and C/AS2 by NZBC Acceptable Solution C/AS1, Paragraph 4.3 e], and NZBC Acceptable Solution C/AS2, Paragraph 4.17.6 e].

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Supercourse 500 from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 11.1 Supercourse 500, when installed as a flashing in accordance with the Technical Literature and this Appraisal, will assist in the masonry veneer cladding system meeting the performance requirements of NZBC Clause E2.3.2.
- 11.2 Supercourse 500, when used as a DPC in accordance with this Appraisal, prevents walls, floors and structural elements in contact with the ground from absorbing or transmitting moisture in quantities that could cause undue dampness or damage to building elements to meet the performance requirements of NZBC Clause E2.3.3.

Installation Information

Installation Skill Level Requirements

12.1 Installation must always be carried out in accordance with the Technical Literature and this Appraisal, by competent tradespersons with an understanding of DPC and flashing installation.

Supercourse 500 Installation

General

13.1 Strips of Supercourse 500 may be cut to length with a sharp knife.

DPC Installation

- 13.2 The surfaces to be separated must be smooth and flat, free from projections such as small stones or sharp ridges that may puncture the membrane when pressure is applied.
- 13.3 When used to separate timber and wood-based products from concrete or masonry, Supercourse 500 should be temporarily held in place with small hot-dip galvanised clouts or zinc plated staples. The strip of DPC must be wide enough to fully protect the width of the material in contact with the concrete or masonry. Refer also to Paragraph 7.2.
- 13.4 When used under timber plates fixed over concrete floor slabs and foundation walls, a small slit should be made in the material before pushing down over the bolts or fixings. Alternatively, a small hole can be formed by gently tapping the product resting on top of the bolt until a puncture is formed.

Flashing Installation

- 13.5 Supercourse 500 must be fixed in place to framing members at maximum 300 mm centres with small hot-dip galvanised clouts.
- 13.6 Horizontal and vertical joints 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 flashing.
- 13.7 At the sill/jamb junction, the jamb flashing must overlap the sill flashing.





Appraisal No. 329 (2016) 22 December 2016 SUPERCOURSE 500 DAMP-PROOF COURSE AND CONCEALED FLASHING

Basis of Appraisal

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

Tests

14.1 The following tests have been carried out on Supercourse 500: water permeability, thickness, mass per unit area, pigment, impact resistance, and labelling, all in accordance with AS/NZS 2904 and AS/NZS 4347. The test results have been reviewed by BRANZ experts and found to be satisfactory.

Other Investigations

- 15.1 Durability and weathertightness opinions were given by BRANZ technical experts.
- 15.2 The practicability of installation has been assessed by BRANZ and found to be satisfactory.
- 15.3 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

- 16.1 The manufacture of Supercourse 500 has not been examined by BRANZ, but details of the quality and composition of the materials used were obtained and found to be satisfactory. BRANZ undertakes an ongoing review of product quality on an inwards goods basis.
- 16.2 The quality of supply to the market is the responsibility of Thermakraft Limited.
- 16.3 Building designers are responsible for the design of the building, and for the incorporation of Supercourse 500 into their design in accordance with the instructions of Thermakraft Limited.
- 16.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

Sources of Information

- AS/NZS 2904:1995 Damp-proof courses and flashings.
- AS/NZS 4347:1995 Damp-proof courses and flashings Methods of test.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4229:2013 Concrete masonry buildings not requiring specific engineering design.
- Ministry of Business, Innovation and Employment Record of amendments Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 23 February 2017

This Appraisal has been amended to update the Appraisal Holder.

Amendment No. 2, dated 09 July 2021

This Appraisal has been amended to add a roll width of 140 mm.



Appraisal No. 329 (2016) 22 December 2016 SUPERCOURSE 500 DAMP-PROOF COURSE AND CONCEALED FLASHING



In the opinion of BRANZ, Supercourse 500 Damp-Proof Course and Concealed Flashing 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 Thermakraft Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

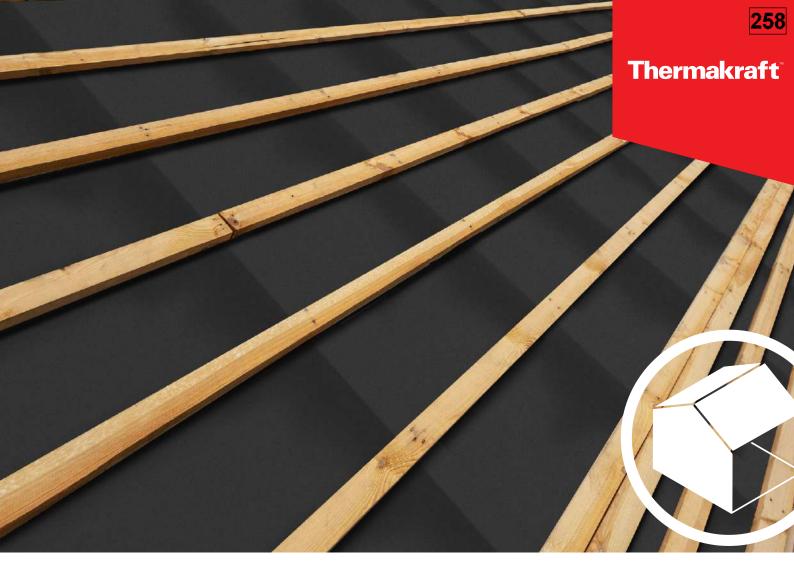
- 1. This Appraisal:
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 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
- 2. Thermakraft Limited:
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 - b) shall notify 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:
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 - 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 Thermakraft 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 Thermakraft Limited or any third party.

For BRANZ

Chelydra Percy Chief Executive

Date of Issue:

22 December 2016



Product Data Sheet

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as "Building Paper" Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

Thermakraft 215 comes in two roll sizes:

1250mm wide	20m long	25m² coverage*
1250mm wide	40m long	50m² coverage*

^{*} **Note:** m2 is the roll size for actual coverage, allow for laps and joins.





Thermakraft 215

Self-supporting bituminous wall and roof underlay

Scope of Use (Roof Application)

- Suitable with masonry tile, metal tile and profiled metal roof cladding.
- Direct fix or cavity fix.
- Can be used on roofs up to and including NZS 3604 'Extra High' wind zones.
- Refer to installation guide regarding underlay support requirements.
- Will provide temporary weather protection during construction (maximum 7 days), same day coverage recommended.

Scope of Use (Wall Application)

- Suitable for use with both timber and steel framing, either direct fix or in conjunction with an 18mm minimum drained cavity.
- Can be used with absorbent wall claddings (e.g. timber, brick or fibre cement) or non-absorbent wall claddings (e.g. metal or plastic).
- Can be used with masonry veneer in accordance with NZS 3604.
- Suitable for buildings situated in NZS3604 Building Wind Zones up to and including 'Very High'.
- Thermakraft 215 can be used as an air barrier to reduce wind entry and is highly water resistant.
- Will provide temporary weather protection during construction (maximum 28 days).

General

Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.

Limitations

- In roofing applications must NOT be exposed to the weather or UV for more than 7 days.
- In wall applications must NOT be exposed to the weather or UV for more than 28 days.
- Must NOT be used under translucent sheeting.
- Is not fire retardant.
- Not suitable for School Property, please refer to Ministry of Education; Weather-Tightness & Durability requirements for School Property.

Compliance

Thermakraft 215 meets the requirements of NZBC Acceptable Solutions E2/AS1, Table 23 and NZS 2295:2006 for both wall & roof underlay.

Durability

Meets the Performance Requirements of NZBC Clause B2, Durability B2.3.1 (a) 50 years and B2.3.1 (b) 15 years, E2 External Moisture providing:

- It is installed in accordance to Thermakraft Installation Guide.
- Run length is no greater than 10 meters.
- Is NOT left exposed to the weather or UV for more than 7 days on roof.
- Is NOT left exposed to the weather or UV for more than 28 days on walls.
- Is installed by or under guidance of Licensed Building Practitioners.
- Is installed in accordance with the MRM Code of Practice.
- Is compatible with the cladding system used.*
- * **Note:** roof cladding system compatibility testing must be done first before installation.

Property Performance

NZBC E2/AS1 Wall Underlay Requirements					
NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	Absorbency	Vapour Resistance	pH of Extract	Shrinkage	Water Resistance
Property Performance Requirement	≥ 150gsm	≤7 MN.s/g	≥ 5.5 and ≤ 8	≤ 0.5%	100mm for 24 hrs
Property Performance	Pass	Pass	Pass	Pass	Pass

NZS2295:2006 Classification			
NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	Flammability Index	Wind Zone	NZS2295:2006 Index
Property Performance Requirement		R2	R2
Property Performance	Non-Fire Retardant	Up to Extra High	Self - Support



Thermakraft 215

Self-supporting bituminous wall and roof underlay

Control of Condensation

In climatic regions where condensation risks are high, such as cold or high humidity areas, care needs to be taken in specifying the correct design and installation method to prevent moisture build-up in the roof cavities. Factors which adversely affect the condensation risk in roofing systems include:

- Humid, and/or cold climatic regions.
- Warm/Skillion roof construction.
- Low roof cavity air volume and restricted air movement.
- Omitting Vapour Control Layers.
- Occupancy activities which have high moisture loading on conditioned spaces.
- Ceiling penetrations and entry of warm air into roof cavities.
- · Low pitched roof.
- Bulk insulation.
- Building structures ability to naturally dry construction moisture.

Skillion and Warm Roof Construction are particularly sensitive to moisture accumulation and the design and installation of roof construction needs to take into account the higher condensation risks. Refer to MRM Code of Practice for details.

For passive ventilation of the roof space, it is recommended that all roof underlays are terminated at the ridge, and if not it should be slit or slotted to allow for passive ventilation. (For further information refer to the NZ MRM Roofing Code of Practice).

Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Thermakraft Limited / 0800 806 595

Smarter products. Better buildings.







THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as "Building Paper" Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

Smarter products. Better buildings. **thermakraft.co.nz**





Application Method (Roofing)

Thermakraft 215 is a bituminous building underlay used on roofs in residential buildings.

- Thermakraft 215 can be used in direct fix or cavity fix for roof construction.
- Run NO longer than 10m.

Long-run metal roofing/vertical or horizontal installation method

- Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings on timber framed structure. Fixing at 300mm centres. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.
- Refer to table below to determine underlay support requirements.

Roof		Underlay Support Required		
Pitch	Span	Horizontally Vertical Installed Installe		
≥ 10°	> 1200mm	Yes	Yes	
	≤ 1200mm	No	No	
< 10°	> 1200mm	Yes	Yes	
(Min 3°)	≤ 1200mm	No	Yes	

 Thermakraft 215 upper sheet lapped over lower sheets (shiplap) to ensure water is shed to the outer face.

Note: Thermakraft 215 can move downwards. To prevent this, it must be "Captured" by the fastenings at each purlin. Horizontal fix must not be used on purlin distance greater than 1100mm to allow for 150mm laps.

- Must be laid firmly (tight/taut) without creases. All laps either vertical or horizontal must be a minimum of 150mm lap.
- When underlay support is required, Thermakraft recommend using AUSMESH Safety Mesh, AUSNET hexagonal netting or Thermastrap 201.
- Thermakraft 215 can be installed above the battens or purlins for profiled metal roof claddings and otherwise in accordance with NZBC E2/AS1.
- If required to achieve a lap seal (refer to NZ Metal Roofing Code of Practice), use Thermakraft Aluband window sealing tape or Thermakraft White General Purpose Tape.

- Thermakraft 215 will provide temporary weather protection during construction, same day coverage recommended. DO NOT over expose the product to the weather or UV for more than 7 days in any roof applications.
- Thermakraft 215 may be unwound to the full length from the gutter to the ridge. However, when ridge ventilation is required Thermakraft 215 may be terminated or slit at the ridge purlin to allow a free passage of air.
- Thermakraft 215 must NOT overhang the gutter line by more than 20 mm, or if eaves flashings are used, terminate on the upper side of the flashing. More details can be found in the MRM Code of Practice.
- Flue penetrations must have a minimum distance of 50mm from Thermakraft 215 (refer to NZ Metal Roof and Wall Cladding Code of Practice 10.11.5).
- Thermakraft 215 must be free of tears and punctures, fit tightly and be lap taped around all penetrations (except flue penetrations), to provide drainage for any condensation, or surface water from leaks.

Note: Do not use Aluband on penetrations where Polybutene water pipes have been installed. Refer Pipe Manufacturers for instructions on sealing penetrations.

Concrete/Metal tile roofing

- Thermakraft 215 must be laid over rafters prior to fixing the tile battens. The maximum span between rafters for Thermakraft 215 is 1200mm. Masonry tile roofs must have antiponding boards in accordance with NZBC E2/AS1 Paragraph 8.2.5.
- Installed Thermakraft may be laid over the top of the antiponding boards and draped into the gutter by no more than 20mm. Antiponding boards must be treated in accordance with NZS 3604.
- Do NOT Run Thermakraft 215 longer than 10m in length.

Application Method (Wall)

- Fix Thermakraft 215 underlay with printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Thermakraft 215 underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.

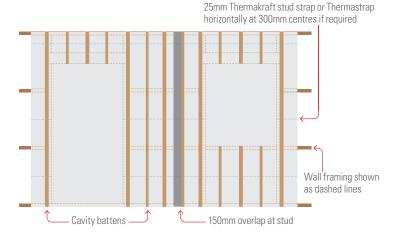


- When fixing Thermakraft 215 underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Thermakraft 215 underlay.
- It is recommended that the Thermakraft 215
 underlay is not cut and prepared for window
 installation until the arrival of the windows. minimum
 of 150mm lap is required at joins, all vertical laps
 must be made over studs. Horizontal laps to be laid
 ship lap style allowing water to be shed to the outer
 face of the membrane.
- When windows and doors are ready for installation, the Thermakraft 215 underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.

Note: In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft stud strap run horizontal at 300 centres is an acceptable means of prevention.

- Once installed, Thermakraft 215 must not be left exposed to the weather or UV for a maximum of 28 days. Thermakraft 215 underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.
- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.

- For wall cavity systems where stud spacings are greater than 450mm centres, another means of restraint is required on the flexible underlay to prevent insulation bulge (refer to E2/AS1).
- Thermakraft 215 underlay must be installed by a licensed building practitioner.



Application Tips

 Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area.
 Recommended minimum 7 days.

Handling and Storage

Thermakraft 215 underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.



WATERGATE PLUS

New Zealand's premium all-purpose, fire retardant wall wrap.

Watergate Plus is specifically designed as a wall underlay for use behind exterior wall cladding. Made from synthetic materials Watergate Plus is fire retardant, water resistant and vapour permeable. The water vapour transfer rate of the product has been optimised to minimise condensation risk in homes without compromising its primary water barrier properties.

Watergate Plus is part of the Thermakraft One Wrap System. Its unique construction allows for easier installation while maintaining best in class performance qualities.

Smarter products. Better buildings. **thermakraft.co.nz**









Application Method

- Fix Watergate Plus underlay with printed side facing the exterior and run horizontally.
- Fix to all exterior walls from below bearers to the top plate. Watergate Plus underlay is available in widths of 2740mm and 1370mm. The 2740mm width product is generally wide enough to cover from below the bottom plate to the top plate.
- **Timber Framing:** Pull the Watergate Plus underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically.
- **Steel Framing:** Ensure frame is free from oil, dust and dirt. Fix securely using construction grade double-sided tape or adhesive or galvanized flat head screws that are appropriate for external framing and roofing use, at 300mm centres.

Note: Check adhesive compatibility with Watergate Plus and the steel framing materials before use.

If using a tape: Apply double-sided tape onto steel frame studs and only peel off the forward-facing liner once Watergate Plus is ready to be installed. When ready, peel off approximately 2m of tape liner at a time and press Watergate Plus firmly onto tape, ensuring it is taut.

Note: The double-sided tape is to temporarily hold the Watergate Plus in place until the batten and/or cladding is installed. The screws used to fix these are the permanent fixings for Watergate Plus.

- Minimum of 150mm lap is required at joins. All vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of Watergate Plus.
- Cover all windows and door openings with Watergate
 Plus underlay. It is recommended that the Watergate Plus
 underlay is not cut and prepared for window installation
 until the arrival of the windows.
- When windows and doors are ready for installation, the Watergate Plus underlay covering the openings should be cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.

Note: In accordance with NZBC Acceptable Solution E2/AS1 and NASH Building Envelope Solutions: 2019 (E2/AS4), wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm, Thermakraft stud strap or Thermastrap run horizontally at 300 centres is an acceptable means of prevention.

 Once installed, Watergate Plus must not be left exposed to the weather or UV for a maximum of 90 days.
 Watergate Plus underlays will provide temporary weather

- protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZBC B2 Durability.
- Repair small damaged areas with any Thermakraft window flashing tape or Thermakraft Premium Joining Tape. Any large areas which require repair may be covered with a second layer of underlay with a lap of 150mm and then taping.
- Watergate Plus underlay must be installed by, or under the guidance of a licensed building practitioner.





to the frame.

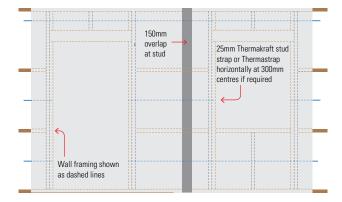




On arrival of doors and windows, cut Watergate at each opening on a 45° angle away from each corner. Pull the Watergate flaps inside and fasten to the inside of frame.

Application Tips

Watergate Plus is unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent to flash off in a well-ventilated area. Recommended minimum 7 days.



Handling and Storage

Watergate Plus underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

Thermakraft Limited / 0800 806 595

4231HL James Hardie® Linea™ Cladding



James Hardie

+64 0800 808868 info@jameshardie.co.nz www.jameshardie.co.nz

SUPPORTING DOCUMENTS

BRANZ Appraisal 897 - Linea™ Oblique™ Weatherboard (Vertical) Cavity Cladding

Ref 10598. Uploaded 12 Aug 2020
Purpose: Performance

Linea Oblique Weatherboard Vertical Installation Technical Specification - Jul 2018

Ref 10431. Uploaded 30 Jul 2020
Purpose: Installation

Linea Weatherboard Product Warranty

Ref 10423. Uploaded 30 Jul 2020 Purpose: Warranty



LINEA® OBLIQUE WEATHERBOARD (VERTICAL) CAVITY CLADDING

Appraisal No. 897 (2015)
Amended 15 December 2015



Technical Assessments of products for building and construction.



James Hardie New Zealand

PO Box 12 070

Penrose

Auckland

Tel: 0800 808 868 Fax: 0800 808 988

Web: www.jameshardie.co.nz



BRANZ

1222 Moonshine Rd, RD1, Porirua 5381 Private Bag 50 908 Porirua 5240, New Zealand Tel: 04 237 1170 branz.co.nz





Product

- 1.1 Linea® Oblique Weatherboard (Vertical) Cavity Cladding is a cavity-based fibre cement weatherboard wall cladding. It is designed to be used as an external cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 Linea® Oblique Weatherboard (Vertical) Cavity Cladding consists of Linea® Oblique Weatherboard, which is a rusticated profile fibre cement weatherboard, fixed vertically over ventilated 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.

Scope

- 2.1 Linea® Oblique Weatherboard (Vertical) 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,
 - 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® Oblique Weatherboard (Vertical) Cavity Cladding has also been appraised for weathertightness and structural wind loading when used as an external vertically fixed wall cladding 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 subject to specific engineering design; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.
- 2.3 Linea® Oblique Weatherboard must only be installed vertically on vertical surfaces.
- 2.4 Linea® Oblique Weatherboard (Vertical) Cavity Cladding is appraised for use with aluminium window and door joinery that is installed with vertical jambs and vertical heads and sills. (Note: The Appraisal of Linea® Oblique Weatherboard (Vertical) Cavity Cladding relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.)

[Note: Linea® Oblique Weatherboard [Vertical] Cavity Cladding can be used to provide fire resistance rated construction, but this aspect has not been assessed by this Appraisal and is outside its scope.]



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Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Linea® Oblique Weatherboard (Vertical) 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. Linea® Oblique Weatherboard [Vertical] Cavity Cladding meets the requirements for loads arising from self-weight, wind, impact and creep [i.e. B1.3.3 [a], [h], [j] and [q]]. See Paragraphs 9.1 - 9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years, B2.3.1 (c) 5 years and B2.3.2. Linea® Oblique Weatherboard (Vertical) Cavity Cladding meets these requirements. See Paragraphs 10.1 - 10.4.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.7 (a). Linea® Oblique Weatherboard (Vertical) Cavity Cladding meets this requirement. See Paragraph 12.1.

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

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Linea® Oblique Weatherboard [Vertical] 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.

Technical Specification

- 4.1 Linea® Oblique Weatherboards are rusticated profile weatherboards. The weatherboards are pre-primed with an acrylic primer on the front face and edges. Linea® Oblique Weatherboards are 16 mm thick and are available 200 and 300 mm wide. The boards are supplied 2700 and 4200 mm long.
- 4.2 Linea® Oblique 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 rusticated profile is machined on the top edge of the front face, and a rebated lap is machined on the bottom of the back face of the weatherboard. The front edge at the bottom of the board and the board ends are finished square. Linea® Oblique Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

Accessories

- 4.3 Accessories used with Linea® Oblique Weatherboard (Vertical) Cavity Cladding which are supplied by James Hardie New Zealand are:
 - James Hardie horizontal cavity battens 45 x 20 mm thick Radiata pine batten treated to
 Hazard Class H3.1. The top edge is bevelled with an 18° slope. The back face is grooved with 50
 mm wide x 6 mm deep rebates at 150 mm centres, and the front face is grooved with 5 mm wide
 x 5 mm deep rebates at 150 mm centres. The grooves are offset on each face.
 - Oblique Trimline joint flashing extruded aluminium in 3000 mm lengths.
 - **Trimline jointers** aluminium horizontal, internal corner and external corner jointers to cover joints in the Trimline joint flashing.
 - External and internal corner mouldings 90° anodised aluminium external box corner available in 2700 and 4000 mm lengths, and 90° internal corner 'W' mould, available in 2700 mm lengths.
 - Cavity vent strip uPVC, available in 3000 mm lengths.
- 4.4 Accessories used with Linea® Oblique Weatherboard (Vertical) 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.





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- Flexible wall underlay support polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible wall 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 James Hardie Rigid Air Barriers covered by BRANZ Appraisal No. 611 [2011].
- 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 batten fixings 40 x 2.8 mm flat head hot-dip galvanised nails.
- Linea® Oblique Weatherboard fixings (with flexible wall underlays) 65 x 2.87 mm D-head or RounDrive hot-dip galvanised or stainless steel ring shank nails.
- Linea® Oblique Weatherboard fixings (with rigid wall underlays up to 10 mm thick) 75 x 3.06 mm D-head or RounDrive hot-dip galvanised or stainless steel ring shank nails.

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

- Joinery head flashings extruded or 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.
- 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.

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 Linea® Oblique Weatherboard 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. Linea® Oblique 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.

Technical Literature

Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Linea® Oblique Weatherboard (Vertical) 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.



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Design Information

Framing

Timber Treatment

7.1 Timber wall framing behind Linea® Oblique Weatherboard (Vertical) 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. Nogs/dwangs must be in a continuous line and be fitted flush between the studs at maximum 600 mm centres.
- 7.3 Timber framing must have a maximum moisture content of 24% at the time of the cladding application. [Note: 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® Oblique Weatherboard (Vertical) 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 and rebates in the cavity batten provide a minimum ventilation opening area of 1000 mm² per lineal metre of wall. (Note: James Hardie horizontal cavity battens do not provide vermin proofing to the bottom of the cavity and an additional cavity vent strip must be used.)
- 8.3 At ground level the bottom edge of Linea® Oblique 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 Linea® Oblique 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.
- 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 RAB® Board, 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 weatherboard 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 Linea® Oblique Weatherboard (Vertical) 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.



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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 200 mm wide Linea® Oblique Weatherboard when installed on the wall is 20.6 kg/m² at equilibrium moisture content (EMC) and the mass of the 300 mm wide board is 19.7 kg/m² at EMC. Linea® Oblique Weatherboard (Vertical) Cavity Cladding is therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

9.2 Linea® Oblique Weatherboard (Vertical) 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 Linea® Oblique Weatherboard (Vertical) 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

10.1 Linea® Oblique Weatherboard (Vertical) Cavity Cladding meets the performance requirements of NZBC Clause B2.3.1 (b), 15 years for the Linea® Oblique Weatherboards, flashings and cavity system, and the performance requirements of NZBC Clause B2.3.1 (c), 5 years for the exterior paint system.

Serviceable Life

- 10.2 Linea® Oblique Weatherboard (Vertical) 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 Linea® Oblique Weatherboards and fixings remain dry in service. Linea® Oblique Weatherboards must be painted within 3 months of fixing.
- 10.3 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, Linea® Oblique Weatherboards must be fixed with stainless steel fasteners. Fasteners outside Zone D may be hot-dip galvanised steel.
- 10.4 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 Linea® Oblique 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.



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Maintenance

- 11.1 Regular maintenance is essential for Linea® Oblique Weatherboard (Vertical) 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. (Note: Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of Linea® Oblique Weatherboard (Vertical) Cavity Cladding.)

Control of External Fire Spread

12.1 Linea® Oblique 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. Linea® Oblique Weatherboard is also suitable for use where a non-combustible material is specified. When Linea® Oblique 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 Linea® Oblique Weatherboard is considered a non-combustible material and need not be separated from heat sources such as fire places, heating appliances, flues and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1.

External Moisture

- 14.1 Linea® Oblique Weatherboard (Vertical) 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 Linea® Oblique Weatherboard (Vertical) 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 Linea® Oblique Weatherboard (Vertical) 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.



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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 Linea® Oblique Weatherboard (Vertical) 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 Information

Installation Skill Level Requirements

16.1 Installation of Linea® Oblique Weatherboard and accessories supplied by James Hardie New Zealand and the building contractor must be carried out by, or under the supervision of a Licensed Building Practitioner with the relevant Licence Class, in accordance with instructions given within the Linea® Oblique Weatherboard (Vertical) Cavity Cladding Technical Literature and this Appraisal.

System Installation

Wall underlay and Flexible Sill and Jamb Tape Installation

17.1 The selected wall 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 Linea® Oblique Weatherboard (Vertical) Cavity Cladding system. Flexible wall underlay must be installed vertically and be continuous around corners. Underlay must be lapped 75 mm minimum at vertical joints and 150 mm minimum over studs at vertical joints. James Hardie Rigid Air Barriers must be installed in accordance with the instructions of James Hardie New Zealand. Particular attention must be paid to the installation of the wall 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.

James Hardie Horizontal Cavity Battens

- 17.2 James Hardie horizontal cavity battens must be installed over the wall underlay to the wall framing [nogs/dwangs] at maximum 600 mm centres. The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with 40 x 2.8 mm hot-dip galvanised flat-head nails at maximum 800 mm centres to temporarily fix the battens in place prior to installation of the cladding.
- 17.3 A wall underlay support must be installed over flexible wall underlay at maximum 300 mm horizontal centres.

Linea® Oblique Weatherboard Installation

- 17.4 Linea® Oblique 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 Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner. The necessary flashings, including window flashings, must be installed before commencing weatherboard fixing and the cavity vent strip must be installed continuously around the bottom of the cavity.
- 17.7 Linea® Oblique weatherboards must be installed starting at the corner of the wall being clad. The first weatherboard must be installed plumb to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50 mm. The weatherboards should be installed with the lap facing away from the prevailing winds.



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CAVITY CLADDING

- 17.8 Linea® Oblique Weatherboard laps are pre-determined by the machined joint detail.
- 17.9 200 mm wide Linea® Oblique Weatherboards must be fixed to each framing member (nog/dwang) using one 65 x 2.87 mm D-head or RounDrive hot-dip galvanised or stainless steel ring shank nail depending on the location see Paragraph 10.3. The nails must be positioned 100 mm in from the over lapping edge of the weatherboard. The 65 x 2.87 mm D-head nails must be punched a maximum of 2 mm below the surface of the board. Nails must not be closer than 12 mm to the end of the board.
- 17.10 300 mm wide Linea® Oblique Weatherboards must be fixed to each framing member (nog/dwang) using one 65 x 2.87 mm D-head or RounDrive hot-dip galvanised or stainless steel ring shank nails depending on the location see Paragraph 10.3. The nail must be positioned 150 mm in from the over lapping edge of the weatherboard. The 65 x 2.87 mm D-head nails must be punched a maximum of 2 mm below the surface of the board. Nails must not be closer than 12 mm to the end of the board.

Aluminium Joinery Installation

17.11 Aluminium joinery and associated head and sill flashings must be installed by the building contractor in accordance with the Technical Literature. An 8 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.

Finishing

17.12 All punched fixings must be filled. The paint coating manufacturer's instructions must be followed at all times for application of the paint finish. Linea® Oblique Weatherboards and trim must be clean and dry before commencing painting.

Inspections

17.13 The Technical Literature must be referred to during the inspection of Linea® Oblique Weatherboard [Vertical] Cavity Cladding installations.

Health and Safety

- 18.1 Cutting of Linea® Oblique 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 to minimise the amount of dust generated.
- 18.3 Safe use and handling procedures for Linea® Oblique Weatherboard and the components that make up the cladding system are provided in the relevant manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

- 19.1 BRANZ expert opinion on NZBC E2 code compliance for Linea® Oblique Weatherboard (Vertical) Cavity Cladding was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Linea® Oblique Weatherboard (Vertical) Cavity Cladding was tested to NZBC Verification Method E2/VM1. 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, internal and external corners and James Hardie horizontal cavity battens. 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.
- 19.2 Uniform wind face load tests to simulate wind pressures on Linea® Oblique Weatherboards were carried out by a James Hardie NATA accredited laboratory. The testing determined design wind suction pressures, and by comparing these pressures with the NZS 3604 and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber framed walls. The test methods and results have been reviewed by BRANZ and found to be satisfactory.



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- 19.3 Cone Calorimeter testing to determine the peak rate of heat release and total heat release of Linea® Oblique Weatherboard was completed by BRANZ. The testing was carried out in accordance with AS/NZS 3837.
- 19.4 Linea® Oblique Weatherboards have been tested by a James Hardie NATA accredited laboratory in accordance with AS/NZS 2908.2 and ISO 8336. 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.

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 Linea® Oblique 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 wall underlay, cavity battens, Linea® Oblique Weatherboard and accessories in accordance with the instructions of James Hardie New Zealand.
- 21.5 Building owners are responsible for the maintenance of Linea® Oblique Weatherboard (Vertical) 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.
- ISO 8336: 2009 Fibre-cement flat sheets -- Product specification and test methods.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 2011 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 (Amendment 6, 14 February 2014).
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 15 December 2015.

This Appraisal has been amended to remove rigid wall underlay complying with NZBC Acceptable Solution E2/AS1.



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In the opinion of BRANZ, Linea® Oblique Weatherboard (Vertical) 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.

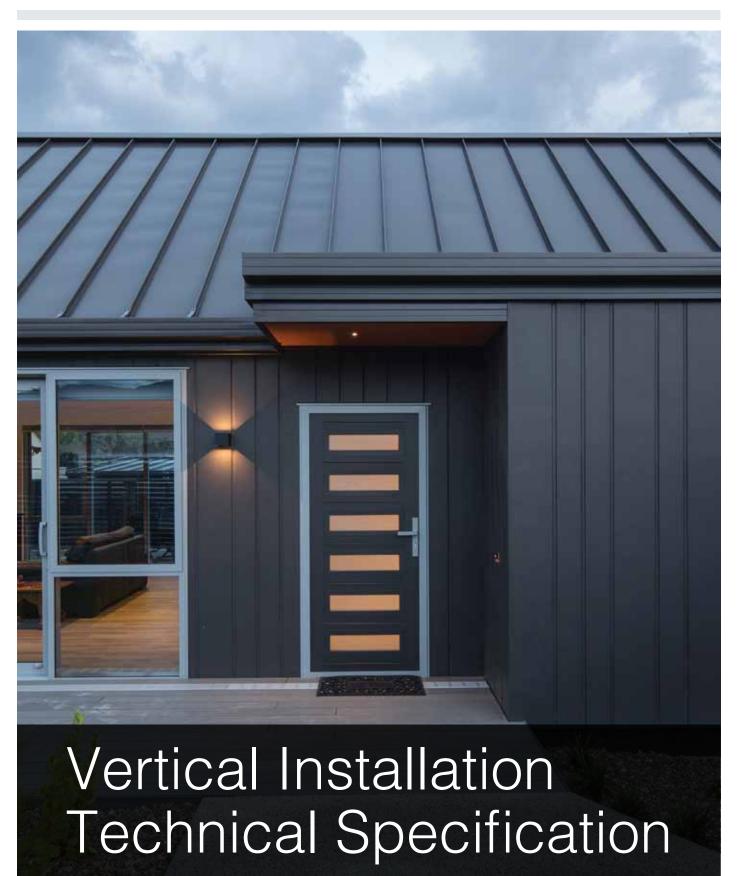
For BRANZ

Chelydra Percy Chief Executive

Date of Issue:

20 November 2015





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WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

Ask James Hardie™

literaturefeedback@jameshardie.co.nz

Application and scope

1.1 APPLICATION

Linea™ Oblique™ Weatherboard installed as per this specification gives a vertical rusticated profile weatherboard appearance. Linea Oblique Weatherboard can be fixed to timber-framed external walls. A wide range of colours can be used, varying from light to dark. Linea Oblique Weatherboard is available in 200mm or 300mm wide x 4200mm or 2700mm lengths and is 16mm thick.

Specifiers

If you are a specifier or other responsible party for a project ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

Installers

If you are an installer ensure that you follow the design, moisture management principles, associated figures and material selection provided by the designer and this James Hardie Technical Specification. All of the details provided in this document must be read in conjunction with the project specification.

Make sure your information is up to date

When specifying or installing James Hardie products, ensure that you have the current manual. Additional installation information, warranties and warnings are available at www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

1.2 SCOPE

This specification covers the installation of Linea Oblique Weatherboard fixed vertically over James Hardie horizontal cavity battens on buildings that fall within the scope limitation of NZS 3604 and E2/AS1 of the New Zealand Building Code (NZBC).

This specification also covers the installation of Linea Oblique Weatherboard on projects, which are subject to specific engineering design (SED) up to a wind pressure of 2.5kPa (ULS).

1.3 DETAILS

Various typical Linea Oblique Weatherboard vertical construction details are provided in the Details section of this document. These details are available in dwg, dxf, jpg and pdf file format and can be downloaded from our website at www.jameshardie.co.nz.

All dimensions shown are in millimetres unless noted otherwise.

1.4 SPECIFIC DESIGN

For use of Linea Oblique Weatherboard in a specific engineering design (SED) project that is outside the scope of this literature, the designer, architect or engineer must ensure that applicable clauses of the NZBC have been considered and a specific design has been undertaken.

Linea Oblique Weatherboard is suitable for use in SED project up to a wind pressure of $2.5 \mathrm{kPa}$ (ULS).

2 Design

2.1 COMPLIANCE

Linea Oblique Weatherboard has been isued a CodeMark certification number GM-CM30059 which confirms Linea Oblique Weatherboard is deemed to comply with the requirements of the NZBC. Please refer to our website www.jameshardie.co.nz for a copy of the CodeMark certificate. Linea Oblique Weatherboard has been appraised by BRANZ as an alternative solution and found to meet the required provisions of the NZBC when installed in accordance with this Linea Oblique Weatherboard Vertical Installation technical specification. BRANZ Appraisal number 897 (2015) at www.branz.co.nz or www.jameshardie.co.nz.

2.2 RESPONSIBILITY

The specifier or other party responsible for the project must ensure that the information and details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this technical specification. For applications outside the scope of this literature and details, which are not provided herein, the architect, designer or engineer must undertake specific design and it should be ensured that the intent of their design meets the requirements of the NZBC.

All New Zealand Standards referenced in this document are current editions and must be complied with.

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

2.3 SITE AND FOUNDATION

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 'Surface Water'. Foundation design must comply with the requirements of NZS 3604 'Timberframed Buildings' or be as per specific engineering design. The grade of adjacent finished ground must slope away from the building to avoid any possibility of water accumulation in accordance with the NZBC requirements.

2.4 SURFACE CLEARANCES

The clearance between the bottom edge of the cladding and paved/unpaved ground must comply with section 9.1.3 of E2/AS1. The finished floor level must also comply with these requirements. These clearances must be maintained throughout the life of the building.

Linea Oblique Weatherboard must overhang the bottom plate by a minimum of 50mm, as required by E2/AS1.

Linea Oblique Weatherboard must maintain a minimum clearance of 100mm from paved ground, and 175mm from unpaved ground.

On roofs and decks, the minimum clearance must be 50mm.

Do not install external cladding such that it may remain in contact with water or ground, refer to Figure 3.

2.5 MOISTURE MANAGEMENT

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design.

Wall construction design must effectively manage moisture, considering both interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration. The building should also be ventilated sufficiently to control moisture accumulation due to condensation, especially in artificially cooled/heated buildings.

Walls must include those provisions as required by the NZBC Acceptable Solution Clause E2/AS1. In addition, all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashings for waterproofing. The other materials, components and installation methods used to manage moisture in external walls, must comply with the requirements of relevant standards and the NZBC. For further guidance on designing for weathertightness, refer to BRANZ Ltd. and the Ministry of Business Innovation and Employment (MBIE) updates on the following websites respectively, www.branz.co.nz and www.building.govt.nz.

In addition, the following issues must also be considered:

- Sealant must be installed where detailed in this literature
- Where the walls are higher than two storeys, it is necessary to provide a horizontal flashing at the second floor level to drain the cavity
- · The installation of smoke chimneys, pipe penetrations and other fixtures etc. must not track moisture into the wall or restrict the drainage of moisture to the exterior

2.6 STRUCTURE

2.6.1 Timber Framing

Timber-framed buildings must either be in accordance with NZS 3604 (Timber-framed Buildings) or designed as per specific engineering design. For a building requiring a specific engineering design, the framing stiffness must be equivalent to, or more than, the stiffness requirements of NZS 3604.

For specific design projects, the timber framing must be designed in accordance with the requirements of NZS 3603 and AS/NZS 1170.

For timber frame walls longer than 12m, it is best practice to allow for construction joints to accommodate movements generated due to timber shrinkage or deflections generated by loadings etc.

2.6.2 Wind Pressures

Linea Oblique Weatherboard is suitable for use in wind zones up to and including EH as defined in NZS 3604.

Linea Oblique Weatherboard is also suitable for use in specific design projects up to wind pressures of 2.5kPa (ULS).

2.7 FIRE RATED WALLS

Linea Oblique Weatherboard when fixed over timber cavity battens to external walls can achieve fire ratings up to 60/60/60 to comply with Clause C/AS1 of the NZBC, when the walls are constructed in accordance with the current James Hardie 'Fire and Acoustic' Design Manual.

Linea Oblique Weatherboard is classified as a 'non-combustible' material suitable for use on walls close to a boundary.

2.8 STRUCTURAL BRACING

Linea Oblique Weatherboard installed as per this specification cannot be used to achieve structural bracing. However, bracing can be achieved by using a James Hardie rigid air barrier board installed direct to framing instead of a flexible underlay or by using the Villaboard™ Lining bracing system on the internal face of the wall. Refer to the James Hardie Bracing Design Manual for further information.

2.9 ENERGY EFFICIENCY

External walls constructed as per this technical specification using Linea Oblique Weatherboard and bulk insulation, where the area of glazing is 30% or less of the total wall area, complies with the insulation requirements for walls in the NZBC Acceptable Solution H1/AS1 (Energy Efficiency Clause H1), Table 1.

To meet thermal insulation requirements for the construction, the bulk insulation as specified in Table 1 must be used. This insulation may be substituted with insulations having higher R-values. The thermal insulation of a wall changes when the size or spacing of timber framing is increased or decreased. The calculation used in Table 1 is based on a timber framing size 90 x 45mm and using an internal lining material such as Villaboard Lining or a 10mm plasterboard.

Table 1

Insulation capability			
Climate zone	R-value requirement	Minimum cavity insulation infill requirement	
1 and 2	1.9 m ² °C/W	R2.0*	
3	2.0 m ² °C/W	R2.2*	

Total construction R-value depends on the insulation material used and the framing ratio. The insulation material R-values specified in this table are for studs spaced at 600mm centres and nogs spaced at 600mm centres.

* To achieve higher R-values of construction the wall insulation material must be replaced with an insulation material having higher R-values to suit the requirements.

For further guidance on insulation requirements refer to the current edition of 'House Insulation Guide' published by BRANZ.

3 Framing

3.1 GENERAL

Linea Oblique Weatherboard can be fixed either to a timber-frame or steel-frame.

For fixing to a steel frame Ask James Hardie on 0800 808 868 for specific requirements.

For Linea Oblique Weatherboard Vertical Installation:

- Studs must be provided at 600mm centres maximum
- Nogs must be provided at 600mm centres maximum

Note: For fixing Linea Oblique Weatherboard, fastener spacing is provided in Section 5.

3.2 TIMBER FRAMING

3.2.1 Dimensions

A 90 x 45mm minimum framing size is required.

3.2.2 Structural Grade

Timber grade used must be in accordance with timber grades specified in NZS 3604.

3.2.3 Durability

The external framing timber must be treated to a minimum H1.2 treatment. Higher treatment levels may be used, but check for the compatibility of treatment chemicals with other materials. Refer to the NZBC Acceptable Solution B2/AS1 Durability for further information about the durability requirements.

For timber treatment and allowable moisture content information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round Sawn Timber) for minimum timber treatment selection and treatment requirements.

Also refer to the framing manufacturer's literature for further guidance on timber selection. Framing must be protected from moisture at the site in accordance with the framing manufacturer's recommendations.

3.2.4 Frame Construction

Use of timber framing must be in accordance with NZS 3604 and the framing manufacturer's specifications. The framing must be rigid and must not rely on the cladding for stability. Timber framing sizes and its set-out must comply with NZS 3604 and as specified in this technical specification.

The following framing is required:

- Studs must be provided at 600mm centres maximum
- Nogs must be provided at 600mm centres maximum
- An extra stud is required in internal corners
- For specific design projects exposed to wind speeds higher than 55m/sec the stud size and spacing must be as per the design requirements but not exceeding 600mm maximum

In case of gable end trusses sitting on top plates of the external wall frame, the frame size must be in accordance with truss design and specification supplied by the frame and truss manufacturer/supplier supported by an independent design producer statement.

3.3 SPECIAL FRAMING REQUIREMENTS

The following are special framing requirements for both timber and steel framing:

- Double studs are required at internal corners, refer to Figure 10
- Extra packers may be required at external corners

3.4 TOLERANCES

In order to achieve the required performance and an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with Table 2.1 of NZS 3604 and the manufacturer's specifications. All framing shall be made flush.

4 Preparation

4.1 FLEXIBLE UNDERLAY/HOMERAB PRE-CLADDING

Flexible underlay/HomeRAB $^{\rm TM}$ Pre-Cladding must be provided as per the requirements of External Moisture Clause E2 of the NZBC. The flexible underlay selected for use must comply with Table 23 of E2/AS1.

The flexible underlay must be fixed in accordance with section 9.1.7 of E2/AS1 and the underlay manufacturer's recommendations.

Walls which are not lined on the inside face (e.g. garage walls or gable ends), must include a rigid sheathing or an air barrier behind the cladding which complies with Table 23 of E2/AS1. For attached garages, flexible underlays must be selected in accordance with the NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. James Hardie HomeRAB Pre-Cladding complies with these requirements and is suitable for use in this situation. It must be installed in accordance with the James Hardie Rigid Air Barriers installation manual.

4.2 RAB BOARD

For EH wind zone or for specific engineering design (SED) projects where the wind pressure is higher than 1.5kPa, James Hardie RAB™ Board must be used.

To achieve temporary weathertightness using James Hardie RAB Board, windows/doors need to be temporarily installed. Refer to the James Hardie Rigid Air Barriers installation manual for further information regarding its installation.

4.3 CAVITY CLOSURE/VENT STRIP

The James Hardie uPVC cavity vent strip must be installed at the bottom of all walls and above all openings constructed using the drained and ventilated cavity construction method. It is important that the openings in the cavity closure/vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. James Hardie cavity closure/vent strip has an opening area of 1000mm²/m length.

4.4 CAVITY BATTENS

Linea Oblique Weatherboard must be installed on a cavity. The battens provide ventilation and drainage between the frame and the weatherboard and are considered a "packer" only in this specification.

The James Hardie horizontal cavity battens are H3.1 treated in accordance with NZS 3640 (Chemical preservation of rough and sawn timber) to comply with the durability requirements of B2/AS1.

James Hardie horizontal cavity battens meet the requirements of F2/AS1 and:

- Are minimum 20mm thick and 45mm wide
- Fixed horizontally to nogs
- Fixed vertically to studs at corners and openings
- Must be fixed by the cladding fixings to the main framing over the flexible underlay. Therefore until claddings are fixed the battens only need to be tacked to framing by 40 x 2.8mm or longer nails at 800mm centres
- Permit air circulation and water drainage

4.5 INTERMEDIATE SUPPORT

Where studs are at 600mm centres an intermediate means of restraining the flexible underlay and insulation from bulging into the cavity shall be installed. An acceptable method to achieve this is using one of the following options:

- 75mm galvanised mesh; or
- Polypropylene tape at 300mm centres fixed horizontally and drawn taut

No intermediate supports are required:

- When studs are spaced at 400mm centres; or
- · When rigid air barriers are used

4.6 FLASHINGS

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to Linea Oblique Weatherboard installation. Refer to moisture management requirements in Clause 2.5. The flexible underlay/rigid air barrier must be appropriately incorporated with penetration and junction flashings using flashing tapes. Materials must be lapped in such a way that water tracks down to the exterior on the face of the flexible underlay or rigid air barrier board.

The selected flashing materials must comply with the durability requirements of the NZBC. For information refer to Table 20 of E2/AS1.

When using James Hardie rigid air barrier boards the entire framing around openings must be protected with a flashing tape. The tape must be finished over the face of the rigid air barrier. Ensure to check the compatibility of flashing tapes and sealants with their manufacturers. Refer to the James Hardie Rigid Air Barriers installation manual for further information.

4.7 JUNCTIONS AND PENETRATIONS

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. For an example of window details for Linea Oblique Weatherboard which meet the performance requirements of E2 External Moisture, an approved document of the NZBC, refer to Figures 11 to 13.

Installation

5.1 GENERAL

Linea Oblique Weatherboard must be installed vertically using the cavity construction method as per the details and information published in this manual.

The two widths of Linea Oblique Weatherboard can be mixed to create the desired look.

Linea Oblique Weatherboard must be kept under cover whilst in storage or at sites and they must be dry at the time of their installation. All site-cut board edges must be sealed with Dulux Acraprime 501/1, Dulux 1 Step, Resene Quick Dry or a similar sealer compatible with the finish coat before installation.

Linea Oblique Weatherboard must be fully supported and fixed through James Hardie horizontal cavity battens. Ensure that cladding is hard against the battens to avoid drumminess.

This technical specification only covers the vertical installation of Linea Oblique Weatherboard. Refer to the Linea Oblique Weatherboard horizontal installation technical specification for horizontal installation.

5.2 FASTENER DURABILITY

Fasteners must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixing materials to be used in relation to exposure conditions and are summarised in Table 2.

Fasteners must be fully compatible with the other materials that they are to be in contact with, to ensure the durability of the complete assembly.

Table 2

NZS 3604	Exposure conditions	s and nail	selection	prescribed	by
	NZS 3604				

NAIL MATE	RIAL	
Zone D	Zone C* outside sea spray zone, Zone B and geothermal hot spots	Bracing - all zones
Grade 316 Stainless	Hot-dipped galvanised or Grade 316 Stainless	Grade 316 Stainless

*Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made. Microclimate conditions as detailed in NZS 3604, Paragraph 4.2.4 require SED.

Also refer to the NZBC Acceptable Solution E2/AS1 Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

5.3 FASTENER - SIZE AND LAYOUT

Linea Oblique Weatherboard must be fixed vertically to framing using fixings as specified in Table 3 below and follow the edge distance required for nails as shown in the details.

Table 3

Weatherboard fixing up to and including VH wind zone

CAVITY CONSTR	UCTION OVER FLE	XIBLE UNDERLAY
Linea Oblique	65x2.87mm D head	Fix one nail 100mm
Weatherboard 200	nail or 65x2.87mm RounDrive ring shank nail or 60x3.15mm HardieFlex nail	from bottom edge of board per nog/plate, refer to Figure 6
Linea Oblique Weatherboard 300	65x2.87mm D head nail or 65x2.87mm RounDrive ring shank nails or 60x3.15mm HardieFlex nail	Fix one nail 150mm from bottom edge of board per nog/plate, refer to Figure 7

Weatherboard fixing up to and including VH wind zone

CAVITY CONSTRUCTION OVER HOMERAB PRE-CLADDING/RAB BOARD

Linea Oblique	75x3.06mm D head	Fix one nail 100mm
Weatherboard 200	nail or 75x3.15mm	from bottom edge of
	RounDrive ring	board per nog/plate,
	shank nail or	refer to Figure 6
	75x3.15mm	
	HardieFlex nail	
Linea Oblique	75x3.06mm D head	Fix one nail 150mm
Weatherboard 300	nail or 75x3.15mm	from bottom edge of
	RounDrive ring	board per nog/plate,
	shank nail or	refer to Figure 7
	75x3.15mm	
	HardieFlex nail	

Weatherboard fixi	ng EH wind zone a	nd SED projects				
CAVITY CONSTR	CAVITY CONSTRUCTION OVER RAB BOARD					
Linea Oblique Weatherboard 200	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail 100mm from bottom edge of board per nog/plate Refer to Figure 8				
Linea Oblique Weatherboard 300	75x3.06mm D head nail or 75x3.15mm RounDrive ring shank nail or 75x3.15mm HardieFlex nail	Fix one nail at 150mm from bottom edge of board per nog/plate. Refer to Figure 9				

For other fixing options Ask James Hardie on 0800 808 868.

- When fixing the weatherboards using nail guns, refer to the nail gun manufacturer for information about nails and the type of nail gun to be used
- D head nails finish nails 2mm below weatherboard surface
- RounDrive nails finish nails flush with weatherboard surface
- HardieFlex nails finish nails flush with weatherboard surface

6 Joints

6.1 VERTICAL JOINT

Linea Oblique Weatherboard vertical joint shall be formed using the ship lap edge of the Linea Oblique Weatherboard. Ensure that the Linea Oblique Weatherboards are securely interlocked before nailing, refer to Figures 6 to 9.

6.2 HORIZONTAL JOINT

Linea Oblique Weatherboard can run continuously over floor joists without a flashed horizontal joint when LVL timber floor joists or engineered joist are used, refer to Figure 17.

When using a solid timber joist, a horizontal joint or a movement joint must be formed at floor joist, refer to Figure 19.

6.3 DRAINAGE JOINT

After every two floors a horizontal drainage joint flashing is required as per E2/AS1, refer to Figure 22.

6.4 EXTERNAL CORNER

An external box corner flashing is used to fix the external corners, refer to Figure 11. Alternatively an Axent™ Trim external boxed corner can also be formed, refer to Figure 12.

6.5 INTERNAL CORNER

An internal corner flashing is to be used to form an internal corner joint, refer to Figure 10.

An extra stud is required in internal corners.

Note: All joint mouldings to be fixed at 400mm centres both sides.

7 Finishes

7.1 PREPARATION

The D head nail must be finished 2mm below the weatherboard surface. The nail holes must be filled with an exterior grade two part builders fill, ie. CRC ADOS Builders Fill or similar two part external grade filler. The RounDrive nail heads must finish flush with weatherboard surface.

7.2 PAINTING

Linea Oblique Weatherboard is pre-primed and is suitable for site applied acrylic paints.

In order to seal cut edges or sanded patches, Dulux 1 Step, Acraprime 501/1. Resene Quick Drv. Taubmans Underproof Acrylic Primer Undercoat or a similar product should be applied. The primer should be compatible with the paint to be used.

Painting of Linea Oblique Weatherboard is mandatory to meet the durability requirements of the NZBC and the 25 year James Hardie product warranty. Linea Oblique Weatherboard must be dry and free of any dust or grime before painting. The weatherboards must be painted within 90 days of their installation. There is no restriction on the LRV of paint to be applied on the Linea Oblique Weatherboard.

James Hardie recommends a minimum of two coats of exterior grade acrylic paint. Follow the paint manufacturer's recommendations to prepare the surface and to adequately cover and conceal the weatherboard fixings.

7.3 FLEXIBLE SEALANT

Sealant used must comply with the relevant requirements of the NZBC. Their application and usage must be in accordance with the manufacturer's instructions. Check with the sealant manufacturer prior to coating over sealant. Some sealant manufacturers do not recommend coating over their product.

8 Storage and handling

When storing Linea Oblique Weatherboard, they must be laid flat on a smooth level surface. Edges and corners must be protected from chipping.

To ensure optimum performance, store weatherboards under cover and keep dry prior to fixing. If the weatherboards become wet, allow them to dry thoroughly before fixing.

Do not carry weatherboards on the flat, carry on edge to avoid excessive bending.

Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements to maintain the effectiveness of the cladding. The extent and nature of maintenance required will depend on the geographical location and exposure of the building.

As a guide, it is recommended that the basic normal maintenance tasks shall include, but not be limited to:

- Washing down exterior surfaces every 6-12 months*
- Re-coating exterior protective finishes**
- · Regular inspection and repair if necessary of the cladding joints, sealants, nail head fillers
- · Cleaning out gutters, down pipes and overflow pipes as required
- Pruning back vegetation which is close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained, especially where gardens are concerned
- The clearance between the bottom edge of the Linea Oblique Weatherboard and the finished/unfinished ground must always be maintained

*Do not use a water blaster to wash down the cladding. In extreme coastal conditions or sea spray zones, wash every 3-4 months.

**Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.

10 Product information

10.1 MANUFACTURING AND CLASSIFICATION

Linea Oblique Weatherboard is an advanced lightweight cement composite cladding, manufactured using James Hardie formulation. Basic composition is Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Linea Oblique'.

Linea Oblique Weatherboard is manufactured to Australian/New Zealand Standard AS/NZS 2908.2 'Cellulose-Cement Products' (ISO 8336 'Fibre-Cement Flat Sheet').

Linea Oblique Weatherboard is classified Type A, Category 2 in accordance with AS/NZS 2908.2 "Cellulose-Cement Products".

For Safety Data Sheets (SDS) visit www.jameshardie.co.nz or Ask James Hardie on 0800 808 868.

10.2 PRODUCT MASS

Linea Oblique Weatherboard is manufactured in 16mm thickness and has a mass of $20.57 kg/m^2$ for 200 mm and $19.67 kg/m^2$ for 300 mm.

Linea Oblique Weatherboard is defined as a Light Weight Wall Cladding (not exceeding 30kg/m²) as per NZS 3604.

10.3 DURABILITY

Linea Oblique Weatherboard and James Hardie rigid air barrier installed and maintained as per this technical specification will meet the durability requirement for cladding as per the NZBC clause B2 Durability.

10.3.1 Resistance to Moisture/Rotting

Linea Oblique Weatherboard is resistant to permanent moisture induced deterioration (rotting) and meets the requirements of the following tests in accordance with the AS/NZS 2908.2:

- Heat Rain (Clause 6.5)
- Water Permeability (Clause 8.2.2)
- Warm Water (Clause 8.2.4)
- Soak Dry (Clause 8.2.5)

10.3.2 Control of External Fire Spread

Linea Oblique Weatherboard meets the requirements of Appendix C C7.1.1 and is classified as 'Non-Combustible Material' which is suitable for use as external wall cladding and complies with the requirements of Paragraph 5.4 of the NZBC Acceptable Solution C/AS1 and Paragraph 5.8.1 of Acceptable Solutions C/AS2 to C/AS6 of the NZBC.

10.3.3 Alpine Regions

In regions subject to freeze/thaw conditions, Linea Oblique Weatherboard and James Hardie rigid air barrier must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions must be protected where snowdrifts over winter are expected.

These products meet the requirements of the AS/NZS 2908.2 Clause 8.2.3.

11 Safe working practices

11.1 STAY HEALTHY WHEN WORKING WITH BUILDING PRODUCTS CONTAINING CRYSTALLINE SILICA

Crystalline Silica

What is it? Why and when is it a health hazard?

Crystalline Silica is

- · Commonly known as sand or quartz
- Found in many building products e.g. concrete, bricks, grout, wallboard, ceramic tiles, and all fibre cement materials

Why is Crystalline Silica a health hazard?

- Silica can be breathed deep into the lungs when present in the air as a very fine (respirable) dust
- Exposure to silica dust without taking the appropriate safety measures to minimise the amount being breathed in, can lead to a potentially fatal lung disease - silicosis - and has also been linked with other diseases including cancer. Some studies suggest that smoking may increase these risks
- The most hazardous dust is the dust you cannot see!

When is Crystalline Silica a health hazard?

- It's dangerous to health if safety protocols to control dust are not followed when cutting, drilling or rebating a product containing crystalline silica
- Products containing silica are harmless if intact (e.g. an un-cut sheet of wall board)

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS AND INSTALLATION INSTRUCTIONS WHEN **WORKING WITH JAMES HARDIE PRODUCTS MAY LEAD** TO SERIOUS PERSONAL INJURY OR DEATH.

11.2 AVOID BREATHING IN CRYSTALLINE SILICA DUST!

Safe working practices

- NEVER use a power saw indoors or in a poorly ventilated area
- NEVER dry sweep
- ALWAYS use M Class extractor unit as a minimum and always hose down with water/wet wipe for clean up
- NEVER use grinders
- ALWAYS use a circular sawblade specifically designed to minimise dust creation when cutting fibre cement preferably a sawblade that carries the HardieBlade™ logo or one with at least equivalent performance
- ALWAYS follow tool manufacturers' safety recommendations
- ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ALWAYS wear an approved properly-fitted, approved dust mask (P1 or P2) or respirator

Use one of the following methods based on the required cutting rate:

BEST

- HardieKnife™
- Hand guillotine
- Fibreshear

BETTER

 Dust reducing circular saw equipped with HardieBlade™ Saw Blade and M Class extractor unit.

Working outdoors

- Make sure you work in a well ventilated area
- Position cutting station so wind will blow dust away from yourself and others in the working area
- Cut products with either a HardieKnife™ or fibre cement shears or, when not feasible, use a HardieBlade™ Saw Blade (or equivalent) and a dust-reducing circular saw attached to a M Class extractor unit
- When sawing, sanding, rebating, drilling or machining fibre cement products, always:
 - Wear your P1 or P2 mask (correctly fitted in accordance with manufacturers' instructions) and when others are close by, ask them to do the same
 - If you are not clean shaven, then use a powered air respirator with a loose fitting head top
 - Wear safety glasses
 - Wear hearing protection
 - When others are close by, ask them to do the same

Working indoors

- Never cut using a circular saw indoors
- Position cutting station in a well ventilated area
- Cut ONLY using a HardieKnife™, hand guillotine or fibreshears (manual, electric or pneumatic)
- Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class extractor unit

IF CONCERN STILL EXISTS ABOUT EXPOSURE LEVELS OR YOU DO NOT COMPLY WITH THE ABOVE PRACTICES, YOU SHOULD ALWAYS CONSULT A QUALIFIED INDUSTRIAL HYGIENIST.

Working Instructions

• Refer to Recommended Safe Working Practices before starting any cutting or machining of product



HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut

Hole-Forming

For smooth clean cut circular holes:

- Mark the centre of the hole on the sheet
- Pre-drill a 'pilot' hole
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill

For irregular holes:

- Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face
- Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported

11.3 STORAGE AND DELIVERY

Keeping products and people safe Off loading

- James Hardie products should be off-loaded carefully by hand or by forklift
- James Hardie products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

James Hardie products should be stored:

- In their original packaging
- Under cover where possible or otherwise protected with a waterproof covering to keep products dry
- Off the ground either on a pallet or adequately supported on timber or other spacers
- Flat so as to minimise bending

James Hardie products must not be stored:

- Directly on the ground
- In the open air exposed to the elements

JAMES HARDIE IS NOT RESPONSIBLE FOR DAMAGE DUE TO IMPROPER STORAGE AND HANDLING.

11.4 TIPS FOR SAFE AND EASY **HANDLING**

Weatherboard products

- Do not lift planked products flat and in the middle
- Carry the products on the edge
- If only one person is carrying the product, hold it in the middle and spread arms apart to better support the product
- If two people are carrying the plank, hold it near each end and on edge
- Exercise care when handling weatherboard products to avoid damaging the edges/corners

Sheet products

- Carry with two people
- Hold near each end and on edge
- Exercise care when handling sheet products to avoid damaging the edges/corners

12 Product and accessories

Product	Description	Size (mm)	Size (mm)		
	Thickness	Length	Width	Code	
	Linea Oblique Weatherboard A 16mm profiled weatherboard for residential cladding. Factory sealed on all six sides. Each weatherboard has	10	2700	200 300	404855 404856
	a manila white colour primer applied on its face, which accepts a wide range of paint finishes.	16	4200	200 300	404849 404848

Note: All dimensions and masses provided are approximate only and are subject to manufacturing tolerances.

Accessories/to	ools supplied by James Hardie		
Accessories	Description	Size	Code
LI	James Hardie Horizontal Cavity Batten 20mm H3.1 Timber treated batten the cladding is fixed over	2700mm long	305862
1	Oblique Trimline Joint Flashing Aluminium extrusion used behind cladding at horizontal joints.	3000mm long	305826
1	JH Weatherboard Internal 'W' Corner Anodised aluminium extrusion used to create internal corners.	2700mm long	300386
A	Linea Oblique Weatherboard External Box Corner Anodised aluminium extrusion used to create external corners.	2700mm long 4000mm long	305825 305873
1	uPVC Vent Strip PVC moulding used as vermin proofing.	3000mm long	302490
1	Trimline Horizontal Jointer A jointer to cover the butt joint of Oblique Trimline Joint Flashing	100mm long	305871
	Trimline External Corner Jointer Joins Trimline Joint Flashing at an external corner		305870
	Trimline Internal Corner Jointer Joins Trimline Joint Flashing at an internal corner		305872
	Linea Oblique Plug To fill recess in Linea Oblique Weatherboard		305930
Tools			
	HardieBlade™ Saw Blade Diamond tip fibre cement circular saw blade. Spacers not included.	184mm 254mm	300660 303375

Accessories/tools not supplied by James Hardie

James Hardie recommends the following products for use in conjunction with Linea Oblique Weatherboard and James Hardie rigid air barrier. James Hardie does not supply these products and does not provide a warranty for their use. Please contact component manufacturer for information on their warranties and further information on their products.

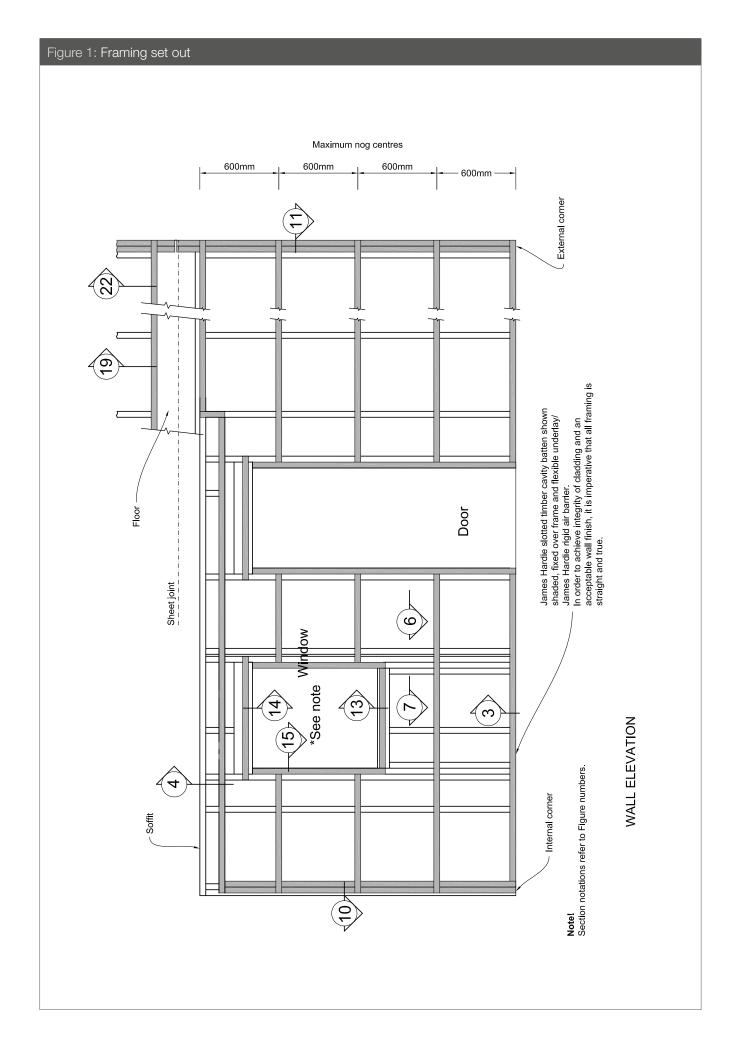
Product	Description
	Flexible underlay Must comply with Table 23 of E2/AS1.
	Flexible window opening flashing tape A flexible self-adhesive tape used in preparation of a window. Refer to the window installation section in this manual for more information. e.g. Protecto or SUPER-STICK Building Tape® by Marshall Innovations or 3M [™] All Weather Flashing Tape 8067 by 3M [™] Marshall Innovations: 0800 776 9727 3M [™] : 0800 474 787
	Rigid air barrier vertical joint sealing tape The tape to be used to seal James Hardie rigid air barrier vertical joints. SUPER-STICK Building Tape® by Marshall Innovations or 3M™ All Weather Flashing Tape 8067 by 3M™ Marshall Innovations: 0800 776 9727 3M™: 0800 474 787
Sealant	Flexible Sealant Bostik Seal N Flex-1, Sikaflex AT Facade, Sikaflex MS or similar.
	65 x 2.87mm 'D' head nail or 65 x 2.87 RounDrive nail (ring shank hot dipped galvanised/stainless steel) For fixing Linea Oblique Weatherboard.
 	75 x 3.06mm 'D' head nail or 75 x 3.15 RounDrive nail (hot dipped galvanised or ring shank stainless steel) For fixing Linea Oblique Weatherboard.
	40 x 2.8mm or longer HardieFlex™ nail. For fixing timber cavity battens and aluminium flashings.
	Meter box Refer electrical suppliers.
	Head flashing Required over window heads to be supplied by window installer. Material must comply with Table 20 and 21 of E2/AS1.
	Exterior grade filler CRC ADOS Builders Fill or similar two part filler to fill over nail holes

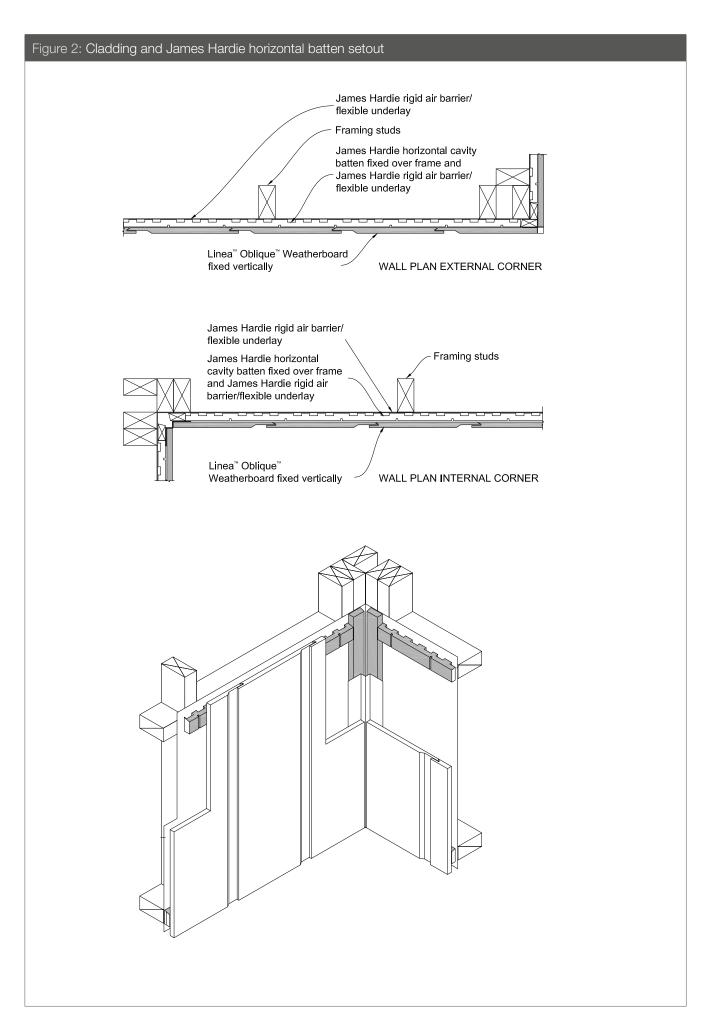
13 Details

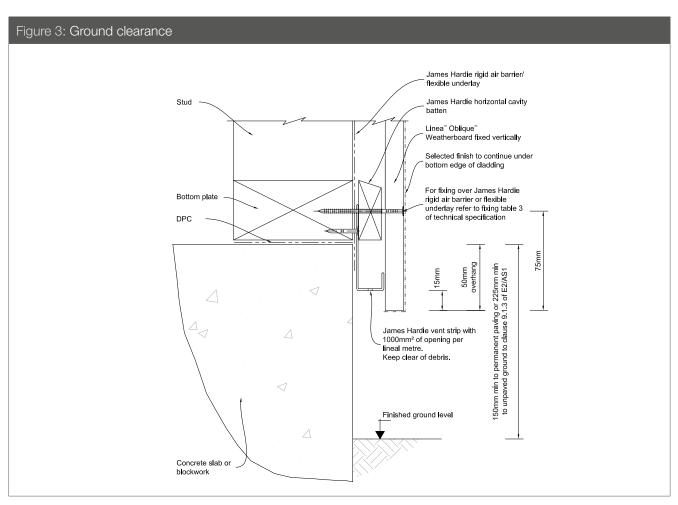
The following generic details have been provided in this document for cavity construction methods.

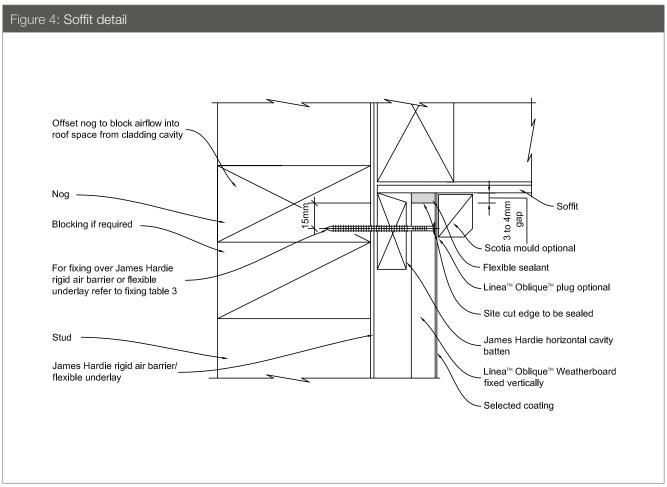
Table 5

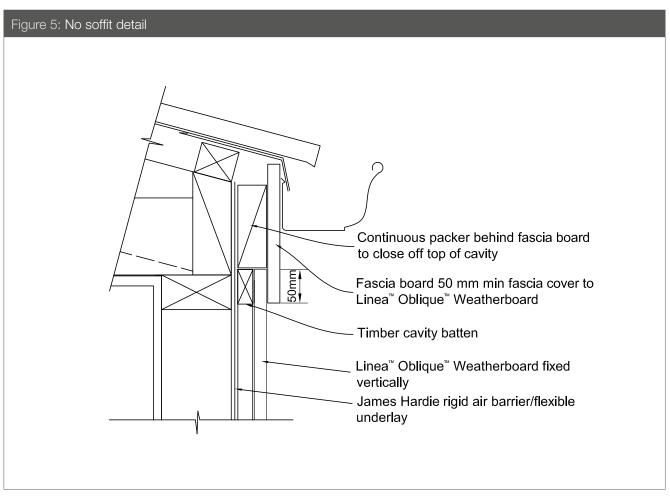
Details				
Description	Cavity Construction			
Description	Figure No.	Page No.		
Framing set out	Figure 1	15		
Cladding and James Hardie horizontal batten setout	Figure 2	16		
Ground clearance	Figure 3	17		
Soffit detail	Figure 4	17		
No soffit detail	Figure 5	18		
Vertical joint 200mm weatherboard width up to VH wind zone	Figure 6	18		
Vertical joint 300mm weatherboard width up to VH wind zone	Figure 7	19		
Vertical joint 200mm weatherboard width EH wind zone and SED	Figure 8	19		
Vertical joint 300mm weatherboard width EH wind zone and SED	Figure 9	20		
Internal corner	Figure 10	20		
External aluminium box corner	Figure 11	21		
External box corner	Figure 12	21		
Window sill	Figure 13	22		
Window head	Figure 14	22		
Window jamb	Figure 15	23		
Window jamb flashing	Figure 16	23		
Over joist at floor level	Figure 17	24		
Butt jointing of Vertical Linea Oblique Weatherboard	Figure 18	25		
Trimline flashing joint at floor level	Figure 19	25		
Trimline flashing joint external corner	Figure 20	26		
Trimline joint	Figure 21	27		
Drained flashing joint at floor level	Figure 22	28		
Drained flashing joint at floor joist	Figure 23	29		
Apron flashing detail	Figure 24	30		
Parapet flashing	Figure 25	30		
Roof to wall junction detail	Figure 26	31		
Meter box at sill	Figure 27	31		
Meter box at jamb	Figure 28	32		
Meter box at head	Figure 29	32		
Enclosed deck	Figure 30	33		
Pipe penetration	Figure 31	34		
Cladding installed	Figure 32	35		
Garage head	Figure 33	36		
Garage jamb	Figure 34	36		

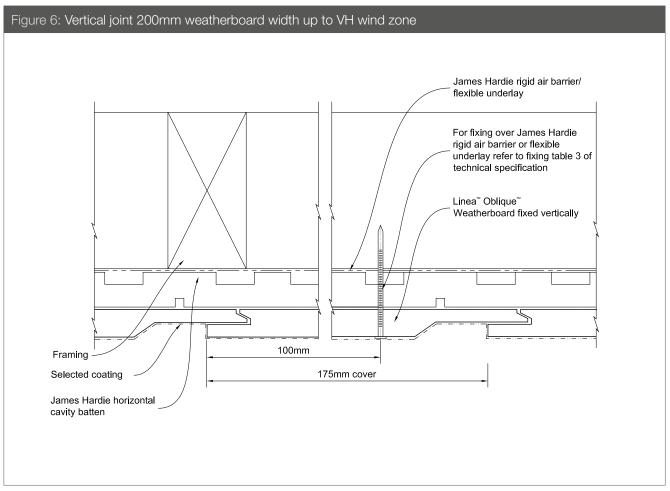


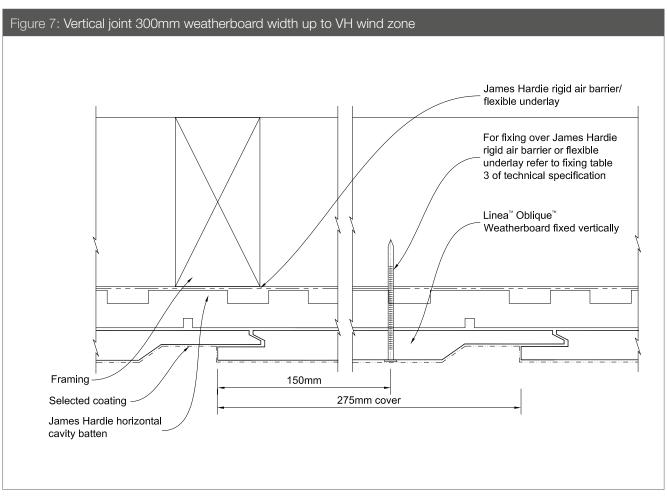


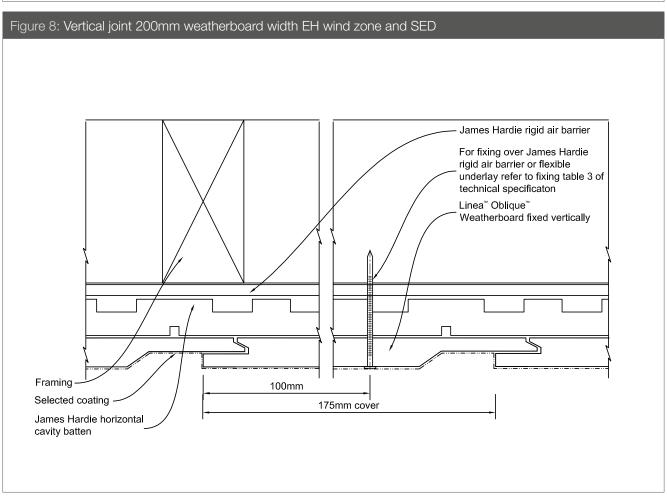


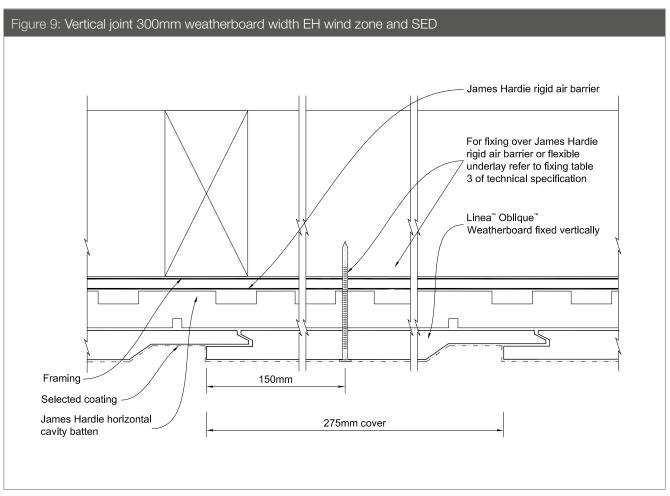


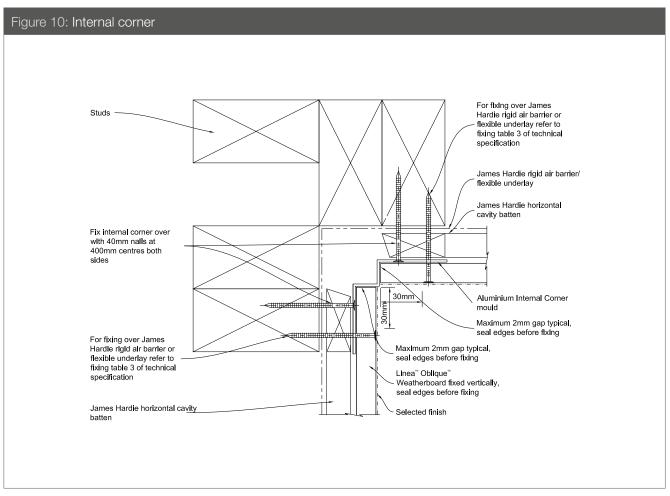


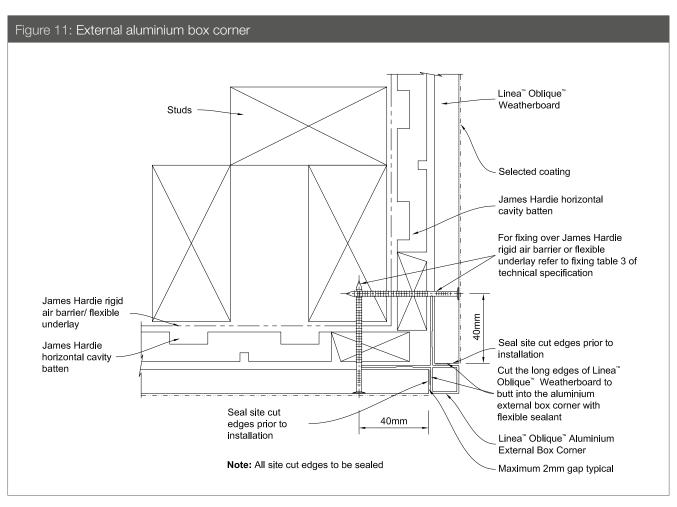


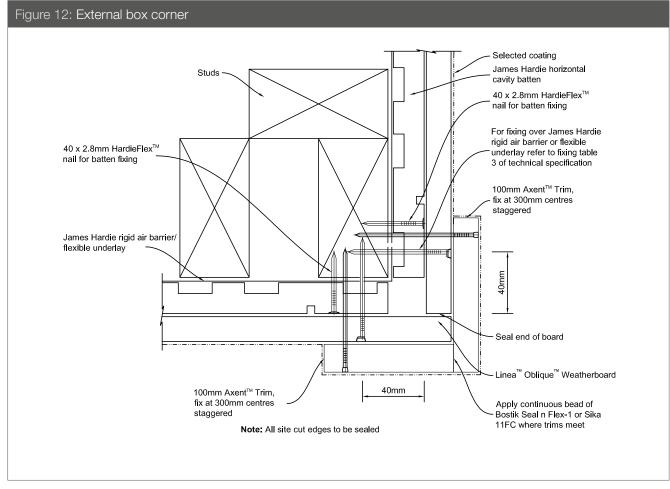


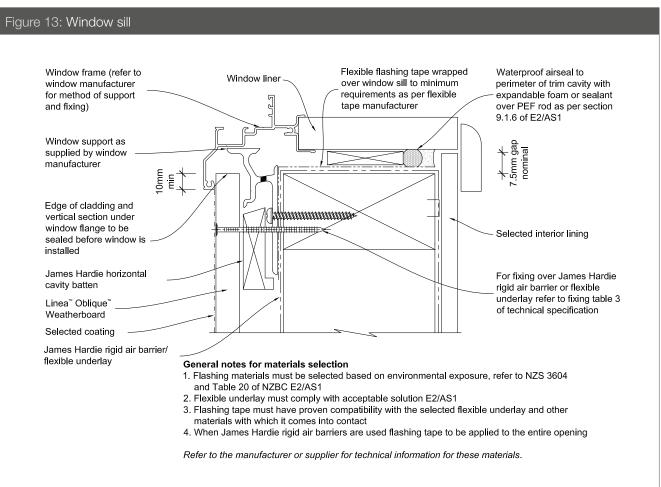


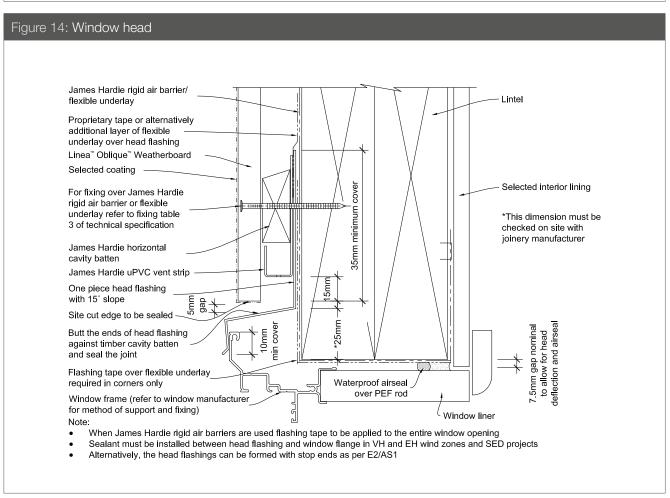


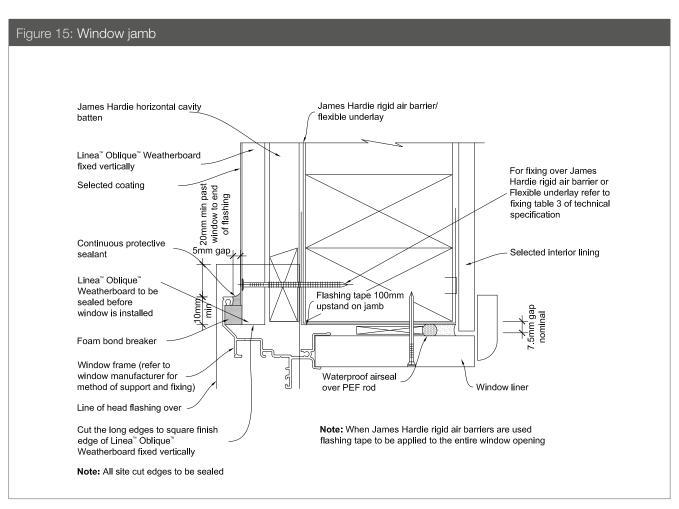


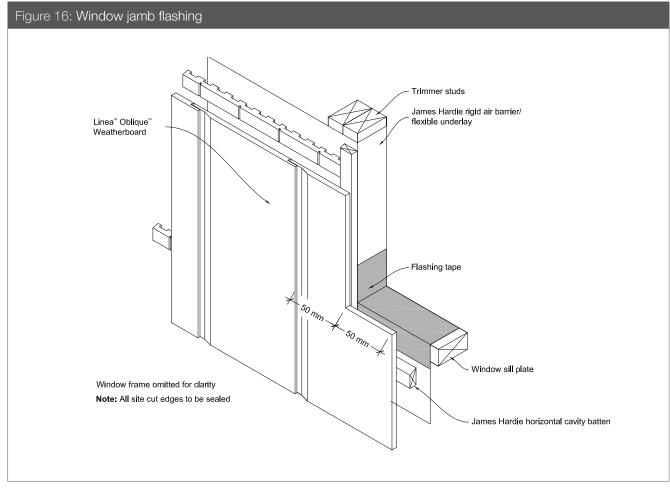


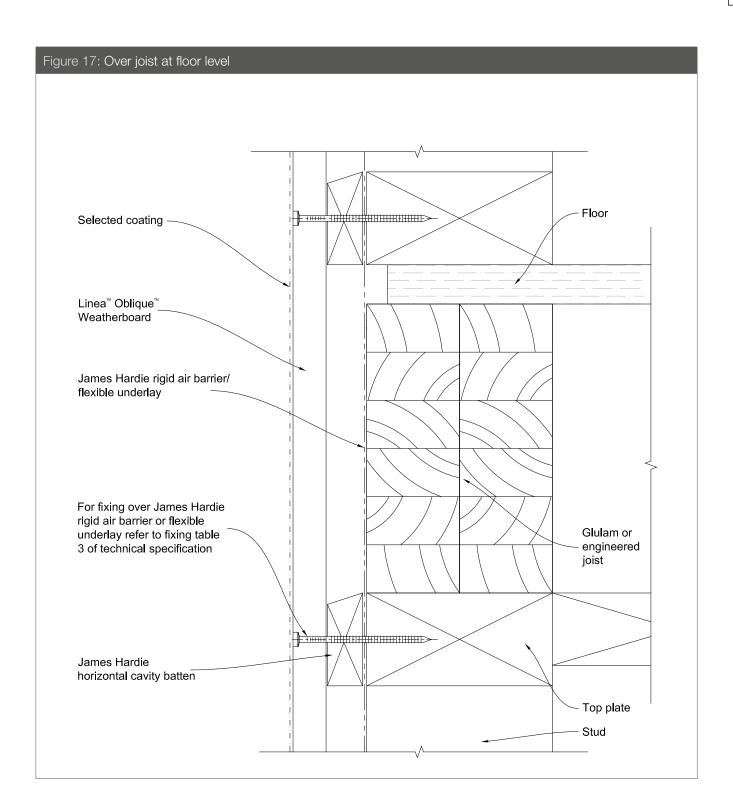


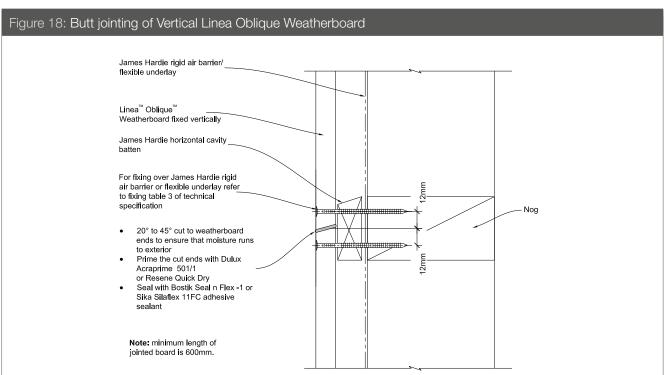


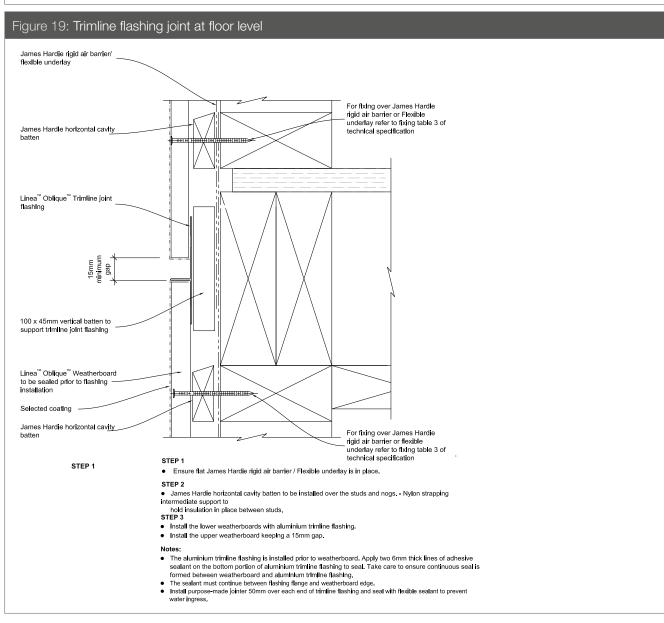


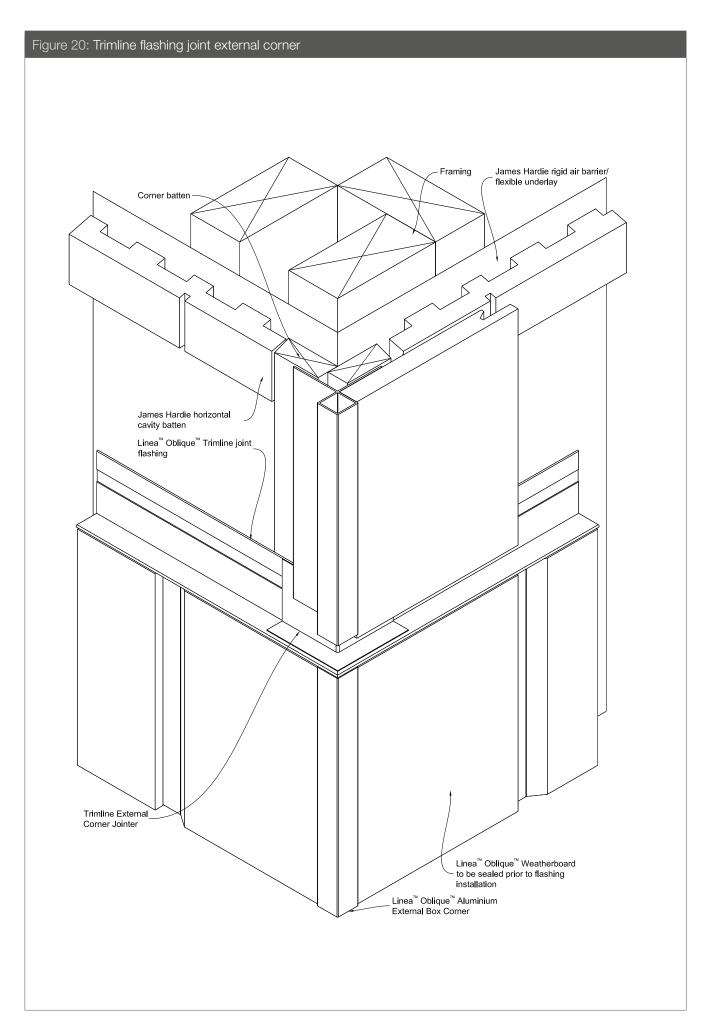












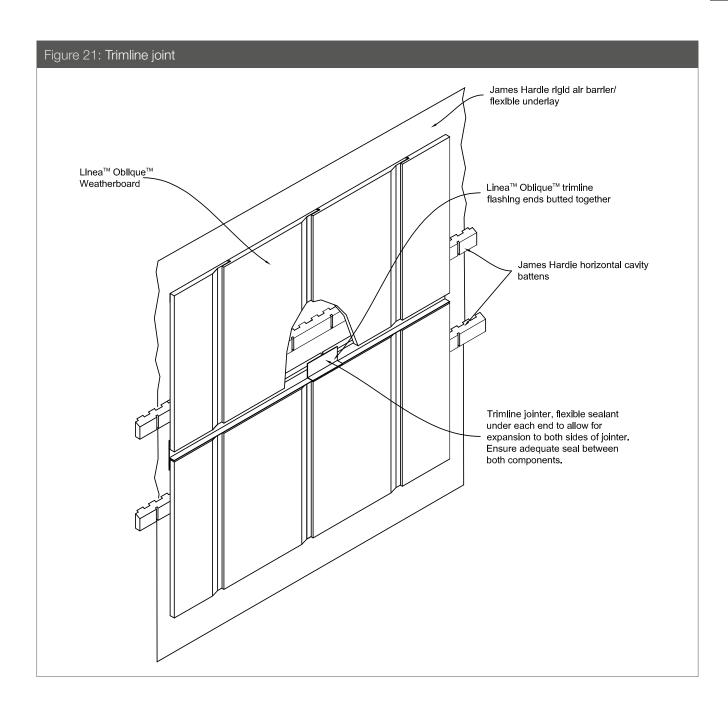
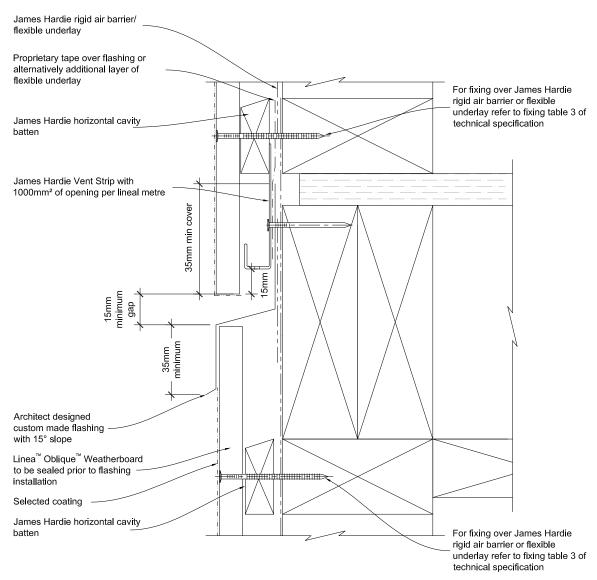


Figure 22: Drained flashing joint at floor level



Note:

This detail is required to limit cavities to a maximum of 2 stories or 7 metres Refer to E2/AS1 clause 9.1.9.4

STEP 1

• Check architect's plans for the type of flashing to be used

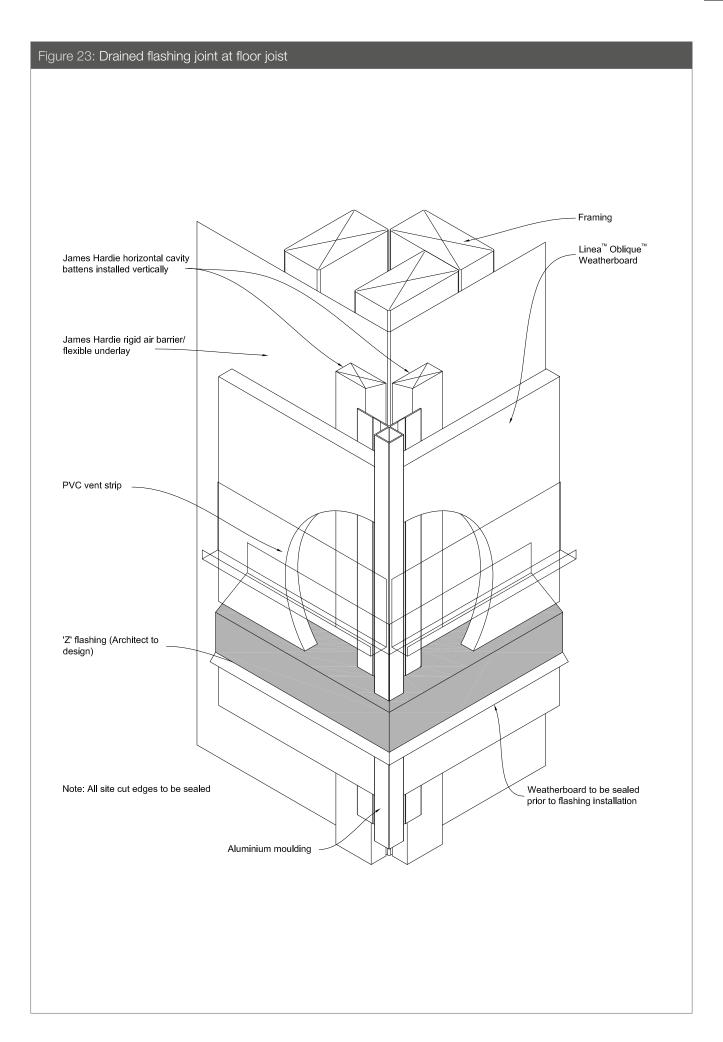
- Check fixing centres and edge distances
- If top fixings are to be hidden by the Z flashing they will need to be fixed and sealed before the Z flashing is installed
- Cut edges need to be primed with Acraprime sealer or similar

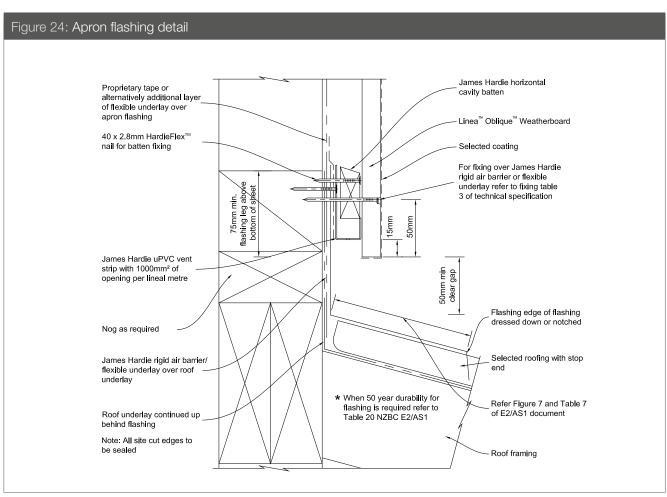
STEP 3

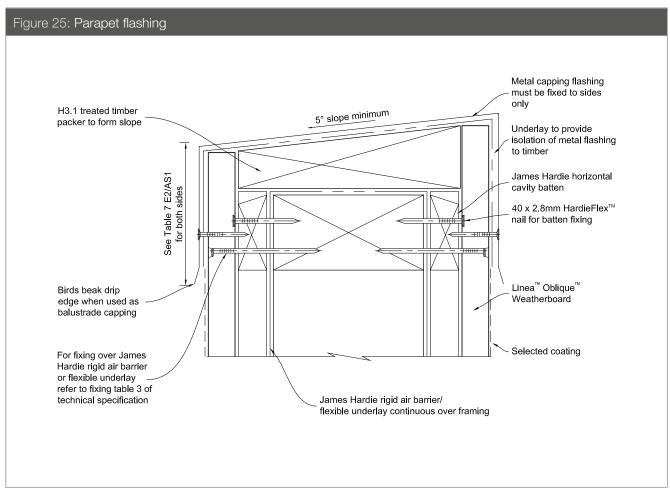
When 50 year durability is required refer Table 20 E2/AS1

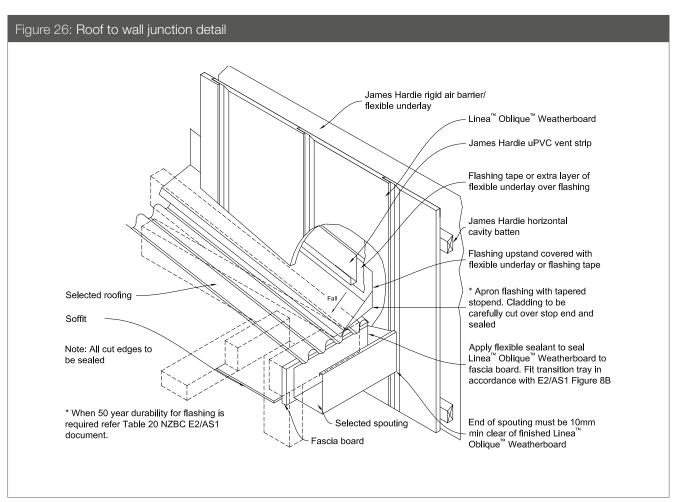
STEP 4

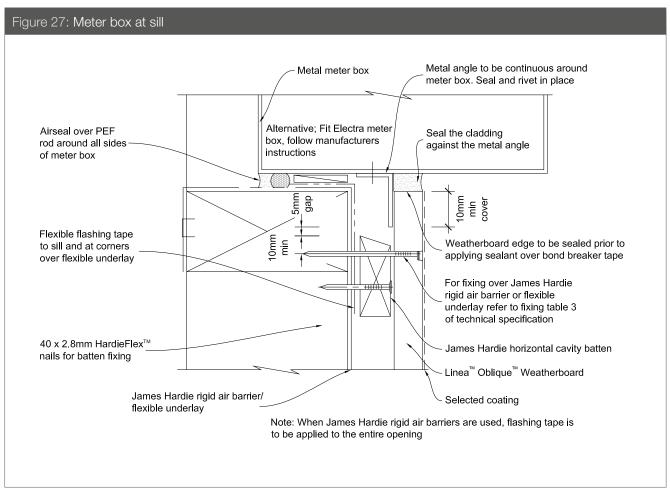
The flashing to be placed in the centre of the floor joists. Do not fix James Hardie horizontal cavity batten or cladding into floor joists

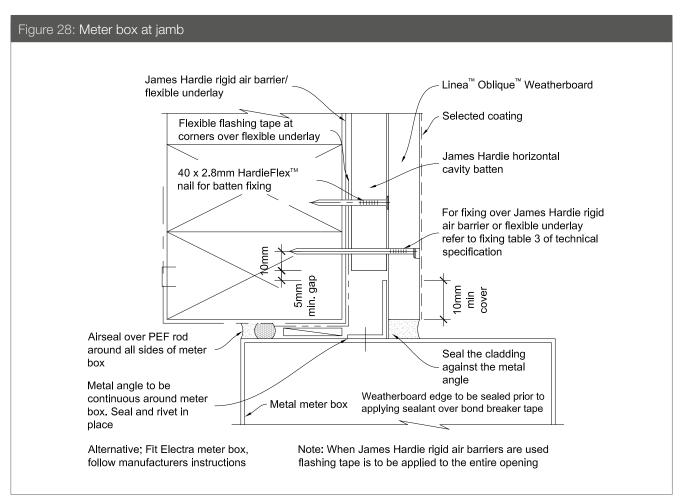


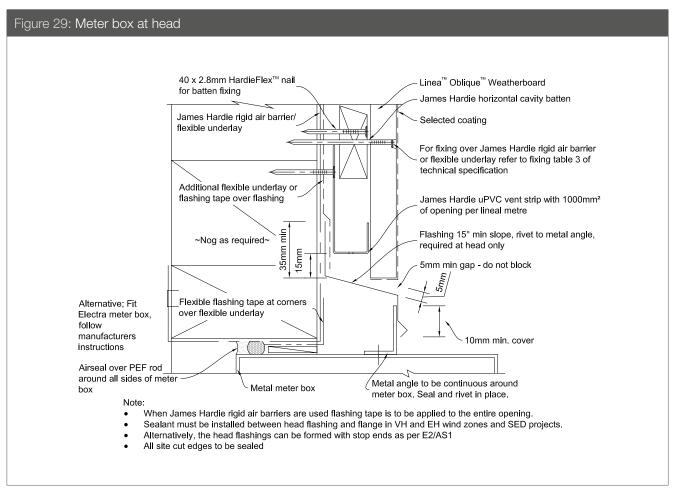


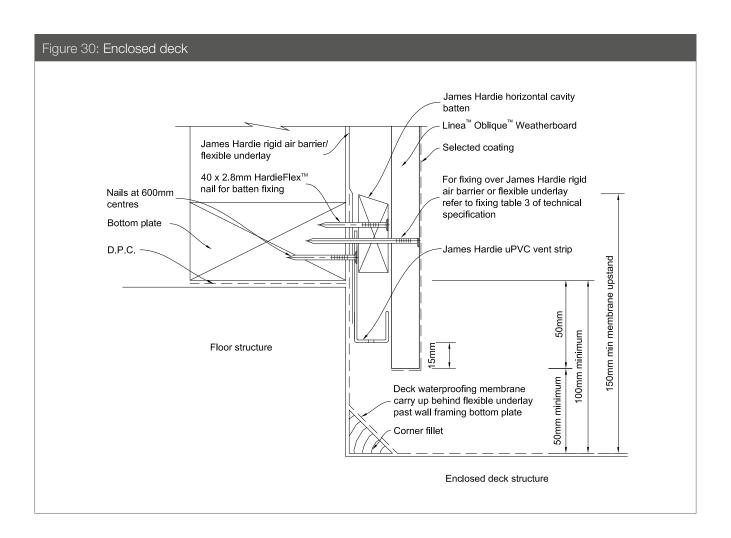


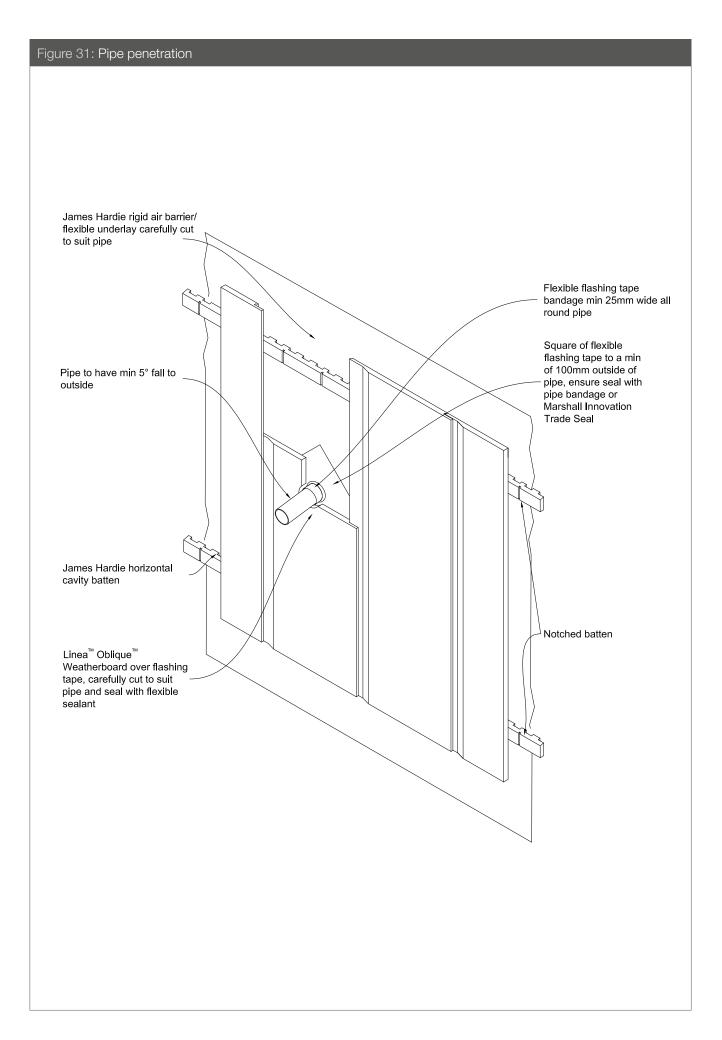


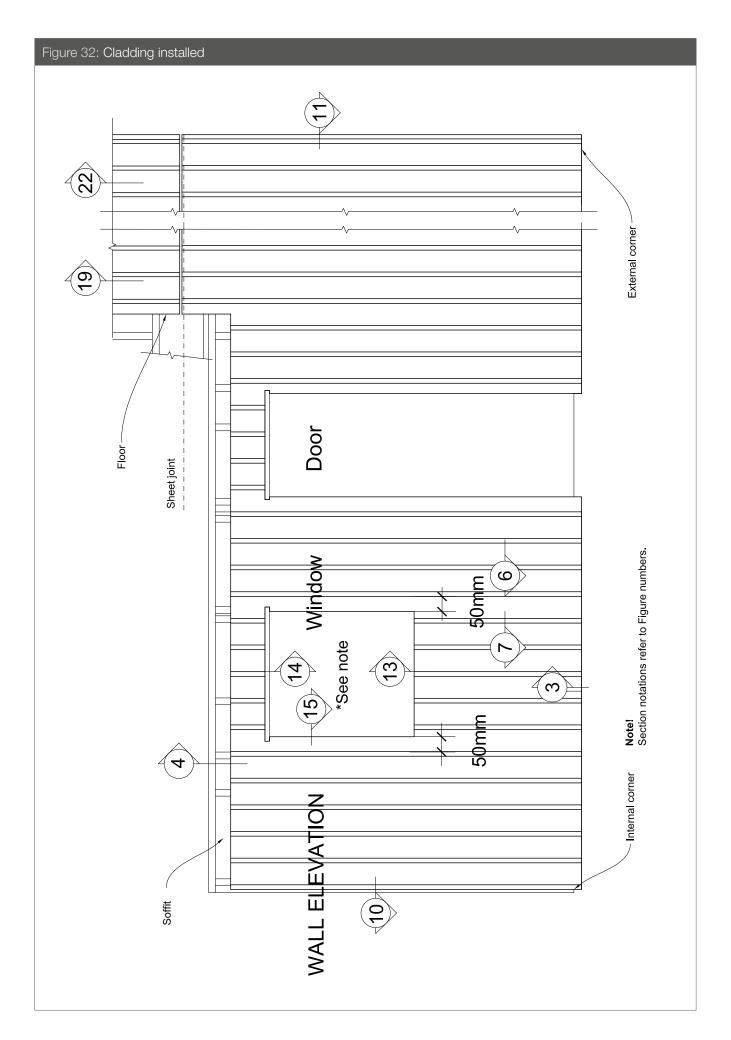


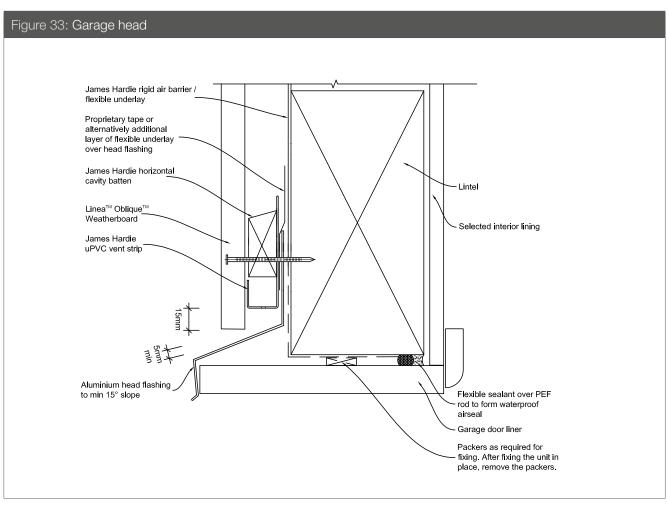


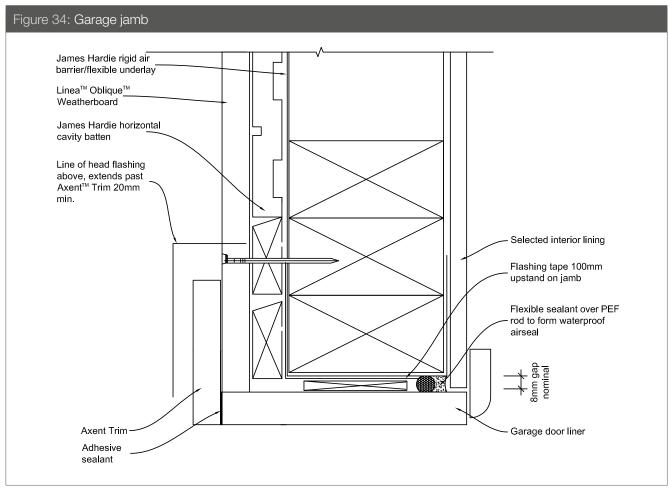














Notes

Notes

Product Warranty Linea™Oblique™



James Hardie New Zealand Limited ("James Hardie") warrants for a period of 25 years from the date of purchase that the Linea™ Oblique™ Weatherboard (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:

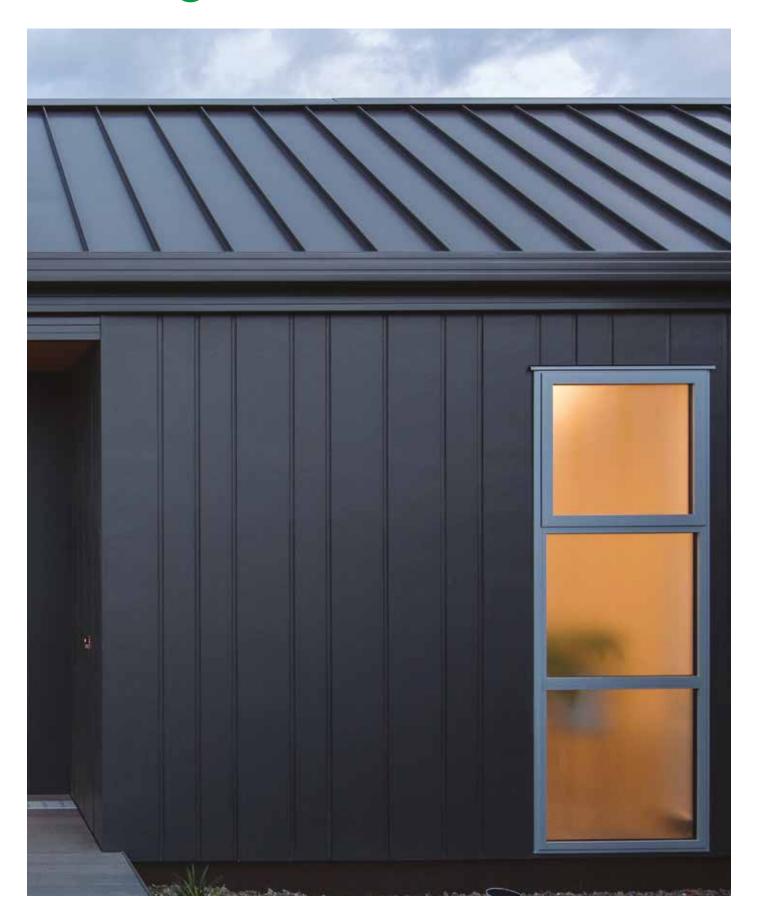
- James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior 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;
- the claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply e) 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);
- all warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent g) allowed by law;
- if meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the h) 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. Linea™ Oblique™ Weatherboard has been appraised by BRANZ as an alternative solution and found to meet the required provisions of the NZBC when installed in accordance with the Linea™ ObliqueTM Weatherboard Vertical Installation technical specification. 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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James Hardie 🍿





Product Warranty

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 25 years from the date of purchase that the LineaTM Weatherboard (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 Axent™ Trim and 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:

- 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 ("The 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).
- All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to g) the fullest extent allowed by law.
- If meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences h) 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 Linea™ Weatherboard when installed in accordance with the appropriate Linea Weatherboard (cavity or direct fixed) technical specifications, 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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BC210994 Received by Kapiti Coast District Council 8/11/21

5113G GIB Plasterboard Linings



Winstone Wallboards Ltd

+64 09 6330100 info@gib.co.nz www.gib.co.nz

SUPPORTING DOCUMENTS

BRANZ Appraisal 427 (2021) GIB® Wet Area Systems

Ref 20082. Uploaded 10 Feb 2021
Purpose: Performance

BRANZ Appraisal 928 (2016) GIB Ezybrace® Systems 2016

Ref 10727. Uploaded 17 Aug 2020
Purpose: Performance



GIB® WET AREA SYSTEMS

Appraisal No. 427 (2021)

This Appraisal replaces BRANZ Appraisal No. 427 (2007)

BRANZ Appraisals

Technical Assessments of products for building and construction.



Winstone Wallboards Ltd

PO Box 12 256
Penrose
Auckland 1642
Tel: 09 633 0100
Email: info@gib.co.nz
Web: www.gib.co.nz



BRANZ

1222 Moonshine Rd, RD1, Porirua 5381 Private Bag 50 908 Porirua 5240, New Zealand Tel: 04 237 1170 branz.co.nz





Product

GIB® Wet Area Systems are for the interior lining of timber and steel-framed walls and ceilings in wet areas such as bathrooms, laundries, kitchens and toilets where a water-resistant lining material is desirable.

Scope

- 2.1 GIB® Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:
 - on timber-framed walls and ceilings within the scope limitations on NZS 3604; or,
 - · on steel-framed walls and ceilings within the scope limitations of NASH Standard Part 2, or,
 - on timber and light gauge steel-framed walls and ceilings subject to specific design.

Building Regulations

New Zealand Building Code (NZBC)

In the opinion of BRANZ, GIB® Wet Area Systems, 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 B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GIB® Wet Area Systems meet the requirements for loads arising from self-weight and impact [i.e. B1.3.3 [a] and [j]]. See Paragraphs 8.1-8.3.

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB® Wet Area Systems meet these requirements. See Paragraphs 9.1–9.5.

Clause E3 INTERNAL MOISTURE: Performance E3.3.4 and E3.3.5. GIB® Wet Area Systems meet these requirements. See Paragraphs 12.1-12.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB® Wet Area Systems meet this requirement.

Technical Specification

The GIB® plasterboards and accessories used in GIB® Wet Area Systems, and supplied by Winstone Wallboards Ltd are as follows:

GIB® Plasterboards

- GIB Aqualine® is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. It is available in 10 and 13 mm sheet thicknesses. Sheets are available in various edge profiles and lengths from 2,400 mm to 4,800 mm. Refer to Table 1. The nominal sheet weights are 8 kg/m² and 11 kg/m² for 10 mm and 13 mm thick sheets respectively. GIB Aqualine® face paper is green in colour.
- GIB Toughline® Aqua is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. It is available in a sheet thickness of 13 mm. Sheets are available in various edge profiles and lengths from 2,400 mm to 3,000 mm. Refer to Table 1. The nominal sheet weight is 11.4 kg/m². GIB Toughline® Aqua face paper is mauve in colour.
- GIB Weatherline® is an exterior-grade, glass-fibre fleece-wrapped modified-gypsum core sheet material. The product is available in 10 mm and 13 mm thicknesses and a board width of 1,200 mm. Standard sheet lengths are 2,450, 2,700 and 3,000 mm. Custom sheet lengths are also available. The nominal sheet weights are 9 kg/m² and 11.5 kg/m² for 10 mm and 13 mm thick sheets respectively.

Table 1: GIB® Wet Area Plasterboard Available Sheet Sizes

Plasterboard Type	Sheet	Sheet	Sheet	Sheet Length (mm)					
	Thickness	Edge	Width	2,400	2,450	2,700	3,000	3,600	4,800
	(mm)	Profile	(mm)	·		·			
GIB Aqualine®	10	TE/TE	1,200	✓		✓	✓	✓	
		TE/SE	1,200	✓					✓
		TE/SE	1,350	✓				✓	
	13	TE/TE	1,200	✓		✓	✓	✓	
GIB Toughline® Aqua	13	TE/TE	1,200	✓		✓	✓		
GIB Weatherline®	10	SE/SE	1,200		✓	✓	✓		
	13	SE/SE	1,200			✓	✓		

TE = Tapered Edge SE = Square Edge

Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber: 6 g x 25 mm and 32 mm.
- GIB® Grabber® Self Tapping Drywall screws for fixing to light gauge steel: 6 g x 25 mm and 32 mm.

Adhesive and Sealants

- · GIBFix® One (Acrylic).
- GIBFix® All-Bond (Solvent).

GIB® Accessories

• Corner Support Angle - GIBFix® Angle or GIB® Rondo® NZ18. Minimum 32 x 32 x 0.55 mm galvanised metal angle.

GIB® Jointing Compounds

• As specified in the GIB® Wet Area Systems and GIB® Site Guide Technical Literature.



4.2 System components and accessories for the GIB® Wet Area Systems, which are supplied by the building contractor are:

Waterproofing

· A waterproofing system complying with AS/NZS 4858.

Finishes

• Finishes such as tiling, flexible sheet vinyl, paints and wallpapers have not been assessed and are outside the scope of this Appraisal.

Handling and Storage

- 5.1 The best results are achieved when GIB® plasterboards are treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.
- 5.2 All accessories must be kept dry.

Technical Literature

Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for GIB® Wet Area Systems. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 GIB® Wet Area Systems provide a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, toilets, laundries and kitchens. The typical finishes are ceramic tiles and flexible sheet vinyl to walls, and paint and wallpaper to walls and ceilings. [Note: GIB Weatherline® is a suitable substrate for ceramic tiles and sheet vinyl. For paint or wallpaper finishes use GIB Aqualine® or GIB Toughline® Aqua.]
- 7.2 GIB® Wet Area Systems must not be used in the following situations:
 - For bracing applications in shower areas or adjacent baths (See Paragraphs 7.4 and 8.2).
 - In areas of high humidity (above 90% RH) or continually wet areas such as group showers, steam rooms, or swimming pools.
 - Installed over a vapour barrier.
 - Applied directly to masonry, concrete or solid plaster.
 - Applied over other sheet lining materials.
 - · Used externally of the building envelope.
 - Exposed to temperatures of 52°C or greater for prolonged periods. (Refer to appliance and fitting manufacturers for installation details.)
- 7.3 GIB Aqualine® may be substituted for some other GIB® plasterboard products in specific GIB® Bracing Systems, GIB® Fire Rated Systems and GIB® Noise Control Systems. Refer to the relevant systems technical literature for details.



Wet Areas

- 7.4 Wet areas are spaces where sanitary fixtures and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:
 - Water Splash These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
 - Shower Areas These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.
- 7.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. In addition, shower areas must be waterproofed. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finishes, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

Intertenancy Walls - Wet Areas

7.6 Intertenancy construction that incorporates fire resistance and noise control must be protected from water splash. In shower areas, GIB® Wet Area plasterboards must not be substituted for other GIB® plasterboards but must be an extra lining layer. Refer to the Technical Literature.

Tiling

- 7.7 GIB® Wet Area Systems are suitable as a substrate for tiling up to the following weights:
 - 10 mm GIB Aqualine® and GIB Weatherline® up to 26 kg/m².
 - 13 mm GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® up to 40 kg/m².

[Note: Most ceramic and porcelain wall tiles weigh less than 20 kg/m². For further information on tiling consult the BRANZ Good Practice Guide – Tiling.]

Framing

- 7.8 Supporting framing must comprise one of the following, subject to the minimum sizes, dwang centres and all other frame requirements of GIB® Wet Area Systems Technical Literature:
 - Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170. Refer to Paragraph 15.2 regarding recommended moisture content of timber framing.
 - Steel framing must be designed and constructed in accordance with NASH Standard Part 2, or to a specific design in accordance with AS/NZS 1170.

Structure

Bracing

- 8.1 GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline®can be used in GIB EzyBrace® Systems. Refer to BRANZ Appraisals Nos. 928 (2016) and 1048 (2019).
- 8.2 GIB Wet Area Systems must not be used for bracing in shower areas or behind baths.

Impact Resistance

8.3 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications. GIB Toughline® Aqua is recommended by Winstone Wallboards Ltd where higher impact resistance is desired.



Durability

Serviceable Life

9.1 GIB® Wet Area Systems have a serviceable life of at least 15 years as a fully protected shower or water splash lining. As a general wall and ceiling lining, GIB® Wet Area Systems will have a serviceable life in excess of 50 years. The ability of GIB® plasterboards to remain durable is dependent on being protected and remaining dry in service, and being maintained in accordance with this Appraisal.

Maintenance

- 9.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.
- 9.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the GIB® plasterboard substrate must be checked for defects and repaired or replaced, as required.
- 9.4 For flexible sheet vinyl, particular attention must be paid to joints, especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.
- 9.5 Impact damage to GIB® plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from Winstone Wallboards Ltd.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to the GIB® Wet Area Systems from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

Control of Internal Fire and Smoke Spread

- 11.1 The gypsum plasterboard used in GIB® Wet Area Systems without an applied paint or wallpaper finish has been tested in accordance with ISO 5660 and achieved a Material Group Number of 1-S.
- 11.2 The gypsum plasterboard used in GIB® Wet Area Systems with an untested applied finish of a waterborne or solvent borne paint coating ≤ 0.4mm thick achieves a Material Group Number of G2-S in accordance with Table A1 of NZBC Verification Method C/VM2.
- 11.3 A lower Material Group Number may be achieved when used with a tested finishing system. The Material Group Number for the complete lining system must be obtained from the supplier of the finish product or system.

Fire Resistance Ratings (FRRs)

11.4 GIB® Wet Area plasterboards, when used as part of GIB® Fire Rated Systems, can be used to provide FRRs as determined by NZBC Acceptable Solutions C/AS1 and C/AS2 and NZBC Verification Method C/VM2. Refer to BRANZ Appraisal No. 289 (2018) and relevant technical literature.

Internal Moisture

- 12.1 When installed in accordance with this Appraisal, GIB® Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.
- 12.2 The construction methods in the Technical Literature meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.
- 12.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.



Airborne and Impact Sound

13.1 GIB® Wet Area plasterboards, when used as part of GIB® Noise Control systems, can be used to provide acoustic ratings as required by NZBC Acceptable Solution G6/AS1. Refer to BRANZ Appraisal No. 394 [2017] and relevant technical literature.

Installation Information

Installation Skill Level Requirement

14.1 Installation of GIB® Wet Area Systems must be completed by, or under the supervision of, a Licensed Building Practitioner with the relevant Licence Class, in accordance with the Technical Literature and this Appraisal.

General

15.1 GIB® Wet Area Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Framing

15.2 To achieve an acceptable decorative finish, the walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallboards Ltd recommend a moisture content of 8–12% where buildings are to be air conditioned or centrally heated.

Cutting

15.3 GIB® Wet Area plasterboards are easily cut by scoring the face paper with a sharp short-bladed trimming knife, and then snapping the plasterboard away from the cut face and cutting the back paper or by sawing. Use of a metal straightedge facilitates clean straight cuts. Cut edges can be tidied up by using a knife. Paper dags should be removed.

Fixing Sheets

Non-Tiled Areas

16.1 GIB® Wet Area plasterboards may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 300 mm centres around the perimeter of the sheet, and with GIBFix® adhesive on all intermediate studs and dwangs. Adhesive must not be used under fasteners. A 5-10 mm gap must be left between the floor and the bottom of the sheet.

Tiled Areas

- 16.2 Control joints must be provided at maximum 4 m centres.
- 16.3 Internal corners in shower areas must be reinforced with a minimum 32 x 32 x 0.55 mm galvanised metal angle (i.e. GIBFix® Angle or GIB® Rondo® NZ18) prior to lining the walls.
- 16.4 GIB® Wet Area plasterboards may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 150 mm centres to the perimeter of wall and to all intermediate studs. Adhesive must not be used in place of screws.

Ceilings

- Supports of timber or steel battens or ceiling joists must be 450 mm centres for 10 mm GIB Aqualine®, or 600 mm centres for 13 mm GIB Aqualine® or GIB Toughline® Aqua.
- 16.6 GIB Aqualine® and GIB Toughline® Aqua sheets must be fixed with GIB® Grabber® screws at 600 mm centres around the perimeter of the ceiling and at 200 mm centre along supports. Alternatively, sheets are screw fixed at 600 mm centres along the supports and GIBFix® adhesive placed at 200 mm centres between the screws.



Penetrations and Sealants

- 17.1 All cut-outs for pipe penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the pipe.
- 17.2 A bead of sealant must be placed to the full thickness of the plasterboard sheet around all pipe penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.
- 17.3 In tiled areas, a bead of sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

Jointing and Finishing

- 18.1 Jointing must be carried out in accordance with GIB® Site Guide Technical Literature.
- 18.2 Tiled shower areas must incorporate a waterproofing membrane over GIB® Wet Area Systems. Waterproofing membranes are outside the scope of this Appraisal and must otherwise be specified and approved.

Health and Safety

19.1 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.

Basis of Appraisal

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

Tests

- 20.1 Winstone Wallboards Ltd GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, edge hardness, water resistance, hard and soft body impact tests and humidified deflection.
- 20.2 Cone calorimeter tests to ISO 5660 have been carried out by BRANZ.

Other Investigations

- 21.1 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.
- 21.2 Site inspections were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.
- 21.3 The GIB® Wet Area Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.

Quality

- 22.1 Winstone Wallboards Ltd's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.
- 22.2 The quality management systems of Winstone Wallboards Ltd have been assessed and registered by TELARC as meeting the requirements of ISO 9001: 2015, Registration No. 581.
- 22.3 Winstone Wallboards Ltd is responsible for the quality of the product supplied.
- 22.4 The quality of the application and finish on site is the responsibility of the installation, stopping and finishing contractors.
- 22.5 Designers are responsible for the design of buildings.
- 22.6 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Ltd.



Sources of Information

- AS/NZS 1170: 2002 Structural design actions General principles.
- AS/NZS 2588: 2018 Gypsum plasterboard.
- BRANZ Good Practice Guide: Tiling (3rd edition), April 2015.
- ISO 5660-1:2002 Reaction-to-fire tests Heat release, smoke production and mass loss rate Part 1: Heat release rate (cone calorimeter method).
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of Amendments Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.





In the opinion of BRANZ, GIB® Wet Area Systems are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Winstone Wallboards 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. Winstone Wallboards 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 Winstone Wallboards 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.
- BRANZ provides no certification, guarantee, indemnity or warranty, to Winstone Wallboards Ltd or any third party.

For BRANZ

Chelydra PercyChief Executive
Date of Issue:

15 February 2021



GIB EZYBRACE® SYSTEMS 2016



Appraisal No. 928 (2016)

BRANZ Appraisals

Technical Assessments of products for building and construction.



Winstone Wallboards Ltd

P 0 Box 12 256 Penrose Auckland 1642

Tel: 09 633 0100

Fax: 09 633 0101

Helpline Tel: 0800 100 442

Helpline Fax: 0800 229 222

Web: www.gib.co.nz

Email: info@gib.co.nz



BRANZ

1222 Moonshine Rd, RD1, Porirua 5381 Private Bag 50 908 Porirua 5240, New Zealand Tel: 04 237 1170 branz.co.nz



Product

GIB EzyBrace® Systems 2016 are a range of wall and ceiling bracing systems based on the use of GIB® Standard, GIB Braceline® and other GIB® plasterboards. GIB EzyBrace® Systems 2016 are used to resist earthquake and wind loads on timber frame buildings designed and constructed in accordance with NZS 3604 and the GIBFix® Framing System. The GIB EzyBrace® Bracing Software provides an electronic means of calculating bracing demand and resistance.

Scope

2.1 GIB EzyBrace® Systems 2016 and the GIB EzyBrace® Bracing Software have been appraised for the design and use of interior wall and ceiling bracing systems in buildings within the scope limitations of NZS 3604.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the GIB EzyBrace® Systems 2016, 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. GIB EzyBrace® Systems 2016 meet the requirements for loads arising from self-weight, earthquake, wind and impact [i.e. B1.3.3 [a], [f], [h] and [j]]. See Paragraphs 8.1 - 8.10.

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years. GIB EzyBrace® Systems 2016 meet this requirement. See Paragraphs 9.1 - 9.4.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB EzyBrace® Systems 2016 meet this requirement and will not present a health hazard to people.

- 3.2 The bracing demand calculation and bracing distribution rules contained in the GIB EzyBrace® Bracing Software are in accordance with Section 5 of NZS 3604. Bracing resistance is provided by bracing element ratings determined in accordance with NZS 3604, Paragraph 8.3.1.2.
- 3.3 NZS 3604 is an Acceptable Solution for compliance with New Zealand Building Code Clause B1 Structure.



Technical Specification

The GIB® plasterboards and accessories used with the GIB EzyBrace® Systems 2016, and supplied or specified by Winstone Wallboards Ltd are as follows:

GIB® plasterboards

BRANZ Appraisal Appraisal No. 928 (2016) 05 September 2016

- GIB® Standard GIB® Standard plasterboard is a paper-bound fibreglass reinforced gypsumplaster core sheet lining material. GIB® Standard plasterboard is available in 10 mm and 13 mm thicknesses and a sheet width of 1200 mm and 1350 mm (GIB® Wideline). The sheets have a taper on the two long sheet edges. The 10 mm thick sheets are also available with a square edge. Sheets are available in various lengths from 2400 mm to 6000 mm. The nominal sheet weight is 6.5 kg/m² for 10 mm thick sheets and 8.5 kg/m² for 13 mm thick sheets. GIB® Standard plasterboard face paper is a light buff colour.
- GIB Braceline® GIB Braceline® is a high-density fibreglass reinforced paper-bound gypsumplaster core sheet lining material. GIB Braceline® is available in 10 mm and 13 mm thicknesses. The sheets have a taper on the two long sheet edges. GIB Braceline® has a sheet width of 1200 mm and 1350 mm, and is available in lengths of 2400 mm, 2700 mm, 3000 mm, 3600 mm and 4800 mm. The nominal sheet weight is 9 kg/m² for 10 mm thick sheets and 12.5 kg/m² for 13 mm thick sheets. GIB Braceline® face paper is a light blue in colour.
- Alternative GIB® plasterboards In certain situations, as specified in the Technical Literature, substitution is permitted with GIB Aqualine®, GIB Fyreline®, GIB Toughline® and GIB Ultraline®.

Components and Accessories

• GIB® Accessories and GIB® Jointing Compounds - As specified in the GIB® Site Guide Technical Literature.

Fasteners

- GIB Grabber® High Thread Screws for fixing directly to timber 32 mm x 6g.
- GIB Nail 30 x 2.8 mm.
- GIB Grabber® screws for fixing to light gauge steel battens 32 mm x 6g.

· Adhesive and Sealants

- GIBFix® One an off-white acrylic adhesive supplied in 375 ml cartridges and 600 ml
- GIBFix® All-Bond a green solvent-based adhesive supplied in 375 ml cartridges and 600 ml sausages.

GIBFix® Framing Components

- GIBFix® Angle 45 x 45 x 0.55 mm galvanised steel angle with a knurled surface. Supplied in lengths of 2.4 and 2.7 m.
- GIB Grabber® Dual Thread Screws for fixing to timber through GIBFix® Angle 32 mm x 7g needle-point screw with coarse thread lower section and fine thread upper section.

· Fasteners, Anchors and Connections

- GIB® HandiBrac® a one-piece, 2 mm thick, galvanised-steel angle bracket approximately 95 mm high, 65 mm long and 54 mm wide. The bracket is supplied with 5 Type 17 screws 14 q x 35 mm.
- BOWMAC® screw bolt M10 x 140 mm screw anchor, with a blue painted hex-head.
- Coach screws 12 mm x 150 mm and 50 x 50 x 3 mm washer hot-dipped galvanised for fixing to timber floors.
- Cast-in bolts M12 x 150 mm minimum and 50 x 50 x 3 mm washers for fixing to concrete
- Shot fired fasteners minimum 75 mm x 3.8 mm with 16 mm discs for fixing GS1-N, GS2-N and GS2-NOM internal line bracing elements to concrete slabs.
- Galvanised or stainless steel strap 25 x 0.9 mm top and bottom plate connections.
- Strap fixings 30 x 2.5 mm hot-dipped galvanised or stainless-steel flat-head nails. Note: For corrosion protection requirements refer to NZS 3604: 2011 Section 4.



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- Ceiling Diaphragms Ceiling diaphragms are constructed using timber ceiling battens, or GIB® Rondo® or similar metal ceiling batten systems.
- Plywood
 - Plywood minimum of 7 mm thick complying with AS/NZS 2269 D-D Structural Grade.
 - Plywood fixings 50 x 2.5 mm hot-dipped galvanised or stainless-steel annular-grooved, flat-head nails.

Handling and Storage

- 5.1 The best results are achieved when GIB® plasterboards are treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.
- 5.2 All accessories must be kept dry.

Technical Literature

Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for GIB EzyBrace® Systems 2016. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 NZS 3604 provides methods to distribute the bracing elements in walls to resist forces. The use of ceiling diaphragms is defined in the Technical Literature.
- 7.2 GIB EzyBrace® Systems 2016 are for use in dry, internal situations only.
- 7.3 GIB EzyBrace® Systems 2016 must not be exposed to temperatures of 52°C or greater for prolonged periods. Refer to appliance and fitting manufacturers for installation details.

GIB EzyBrace® Bracing Software

- 7.4 The GIB EzyBrace® Bracing Software contains design procedures and an electronic calculation method for bracing demand calculated in accordance with NZS 3604: 2011, Section 5. Floor loadings can be selected in accordance with either NZS 3604, Bracing Demand Tables 5.5 5.10 for 2 kPa floor loads or less, or Tables 14.1 14.3 for 3 kPa floor loads.
- 7.5 The bracing demand calculations contained in the GIB EzyBrace® Bracing Software are based on first principles engineering and calculate wind and earthquake demand based on the building parameters entered. Resulting bracing demand calculations are project specific and can differ from values derived using NZS 3604 wind and earthquake demand tables. The GIB EzyBrace® Bracing Software has been assessed as part of this Appraisal.
- 7.6 The bracing ratings for GIB EzyBrace® Systems 2016 are embedded in the GIB EzyBrace® Bracing Software.

GIBFix® Framing System

- 7.7 The GIBFix® Framing System utilises GIBFix® Angles fixed at internal corners and at wall/ceiling junctions to reduce the potential for fastener 'popping' and joint cracking due to timber framing movement. The GIBFix® Framing System also offers an alternative arrangement of studs at corners and at intersecting walls to improve insulation and to reduce thermal bridging compared to traditional wall framing layouts. Refer to the Technical Literature for full details.
- 7.8 Where walls intersect, noggings are required at maximum 900 mm centres to enable fixing of the end stud of the intersecting wall to the main wall framing.
- 7.9 The GIBFix® Framing System permits the use of a single panel hold-down (e.g. GIB® HandiBrac®) at wall corners and T-intersections for both the across and along bracing directions.



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Framing

- GIB EzyBrace® Systems 2016 can be installed using conventional timber framing layouts or by 7.10 using the layouts provided in the GIBFix® Framing System. The bracing ratings embedded in the GIB EzyBrace® Bracing Software are equally applicable to both framing options.
- 7.11 Timber framing grade, spacing and construction must comply with NZS 3604. Timber treatment must comply with NZBC Acceptable Solution B2/AS1.
- 7.12 Winstone Wallboards Ltd recommends the use of kiln-dried stress-graded framing timber. The minimum actual framing dimensions are 90 x 45 mm for external walls and 75 x 45 mm for internal
- 7.13 Joints in the top plates of bracing panels must be tied together with 3 kN and 6 kN top plate connectors using 25 x 0.9 mm hot-dip galvanised mild steel strap, 3 nails each side of joint for 3 kN and 6 nails each side of joint for 6 kN.

Bracing System GS2-NOM

- Most GIB EzyBrace® Systems require additional fasteners at the corners to achieve the published bracing ratings. The GS2-NOM system only requires fixings at 300 mm centres around the sheet perimeter.
- 7.15 Where internal doors penetrate a GS2-NOM bracing element and recessed door jambs are used, the sheets may be adhesive fixed around the door opening with GIBFix® All-Bond, instead of screw fixing. This is designed to reduce fastener 'popping' around internal doors when using grooved door frames. Screw fixing should be used where door frames are to be finished with architraves and the architrave will cover the screws. The adhesive fix option around door openings must not be used with any other GIB EzyBrace® Systems 2016.

Alternative GIB® plasterboards

7.16 On occasions, properties additional to bracing may be required of the plasterboard lining. Refer to Table 1.

BOWMAC Screw Bolts

When BOWMAC Screw Bolts are used as fixings for external walls with concrete masonry header block foundations, the minimum grout/concrete strength must be as specified in NZS 3604. BOWMAC Screw Bolts may be used in Corrosion Zones B and C as defined in NZS 3604. BOWMAC Screw Bolts may only be used in NZS 3604 Corrosion Zone D where the minimum concrete cover to the bolt is 60 mm. This cannot be achieved with standard 90 mm wide timber framing. An alternative option in this scenario is to use 140 mm wide framing.

Table 1: Permitted Alternatives in GIB EzyBrace® Systems

PERMITTED GIB® plasterboard ALTERNATIVES IN GIB EZYBRACE® SYSTEMS 2016 GIB Ezybrace® Systems 2016 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 alternative options. Darmitted alternative CID® pleaterheard products

Sресіпеа	Permitted alternative GIB® plasterboard products								
GIB®	GIB®	GIB	GIB	GIB	GIB	GIB Fyreline®			
plasterboard	Standard	Ultraline®	Braceline/ Noiseline®	Aqualine®	Toughline®	10mm	13mm	16mm	19mm
GIB® Standard	N/A	✓	✓	✓	✓	✓ NOTE 1	~	NOTE 1 and	3
GIB Braceline®	X	X	N/A	✓ NOTE 2	✓	Х	√N	OTES 1, 2 an	d 3

- NOTE 1: The fastener type and length and must be as required for the relevant FRR, system but the fixing pattern must be as required for bracing elements.
- NOTE 2: The bracing element must be 900 mm or longer. Fasteners must be at maximum 100 mm centres to the perimeter of the bracing element. The bracing corner fastening pattern applies to all four corners of the element.
- NOTE 3: Specify traditional wall framing layout where a Fire Resistance Rating (FRR) is required. See Paragraph 11.4.



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Structure

Bracing

- 8.1 The bracing unit (BU) ratings embedded in the GIB EzyBrace® Bracing Software and vary with the wall length.
- 8.2 The Technical Literature provides comprehensive construction and panel hold-down details. These include bottom plate fixings using anchor screws and cast-in bolts (concrete), coach screws (timber), GIB® HandiBrac® or nailed stud-to-plate straps.
- 8.3 The bracing units are derived from BRANZ P21 test method based on a wall height of 2.4 m. For greater wall heights the bracing rating is calculated by multiplying the appropriate bracing rating shown in Table 1 by a factor f=2.4 and divided by the wall height in metres. Walls lower than 2.4 m shall be rated as if they were 2.4 m high.
- 8.4 NZS 3604 limits wall bracing elements to a maximum of 120 BU/m for timber-framed floors and 150 BU/m for concrete floors.

Ceiling Diaphragms

- 8.5 GIB® ceiling diaphragms are used to space bracing lines further apart than 6 m. The basic shape of a ceiling diaphragm must be square or rectangular and the length must not exceed twice the width.
- 8.6 For ceiling diaphragms not steeper than 15° and not exceeding 7.5 m in length, any GIB® plasterboard may be used provided the perimeter fixing are at 150 mm centres.
- 8.7 For ceiling diaphragms not steeper than 45° and not exceeding 7.5 m in length, and for diaphragms not steeper than 25° and not exceeding 12 m in length, any GIB® plasterboard may be used provided the perimeter fixings are at 100 mm centres.

Openings in Bracing Elements

8.8 Small openings of 90×90 mm or less may be placed anywhere except within 90 mm of the edge of the bracing element.

Shower Areas

8.9 GIB EzyBrace® Systems 2016 must not be located in shower cubicles or behind baths and the like. GIB EzyBrace® Systems 2016 may be used in water-splash areas provided they are protected as required by NZBC Clause E3 Internal Moisture. Refer GIB Aqualine® Wet Area Systems.

Impact Resistance

8.10 GIB® plasterboards provide adequate resistance to soft body impact, based upon history of use in domestic and light commercial applications.

Durability

9.1 GIB EzyBrace® Systems 2016, including linings and their fixings have a serviceable life of at least 50 years. The ability of the systems to remain durable is dependent on them remaining dry in service, and being maintained in accordance with this Appraisal.

Maintenance

- 9.2 The building must be maintained weatherproof and GIB® plasterboards must be protected from external and internal moisture in accordance with NZBC Clauses E2 and E3.
- 9.3 Holes resulting from damage to the lining, up to 100 x 100 mm square, will have no significant effect on the performance of the bracing panel. Such holes may be repaired by patching, stopping and finishing as appropriate. Independent expert advice must be sought to assess the effect and repair of larger areas of damage.
- 9.4 Bracing elements require no ongoing maintenance, apart from decoration and the repair of any damage.



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Prevention of Fire Occurring

10.1 Separation or protection must be provided to GIB® plasterboard 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.

Fire Affecting Areas Beyond the Fire Source

For Internal Surface Finish properties and Fire Resistance Ratings, refer to BRANZ Appraisal No. 289 [2012] GIB® Fire Rated Systems.

Internal Moisture

12.1 GIB® plasterboard must be used in dry internal situations, and must not be used where likely to be exposed to liquid water, or where extended exposure to humidity above 90% RH is expected, e.g., such as may be expected in sauna rooms, commercial kitchens and the like.

Installation Information

Installation Skill Level Requirement

13.1 Installation of GIB EzyBrace® Systems 2016 must be completed by, or under the supervision of a Licensed Building Practitioner with the relevant Licence Class, in accordance with the Technical Literature and this Appraisal.

General

14.1 GIB EzyBrace® Systems 2016 must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Framing

- 14.2 To achieve an acceptable decorative finish, the GIB® Site Guide specifies that walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallboards Ltd recommends a moisture content of 12% or less where buildings are to be air conditioned, centrally heated or have heat pumps installed.
- 14.3 Where the GIBFix® Framing System is used, GIBFix® Angles are tacked to the framing with flathead clouts prior to installation of the GIB® plasterboard.

Cutting

14.4 GIB® plasterboard is easily cut by scoring the face paper with a sharp short-bladed trimming knife, and then snapping the plasterboard away from the cut face and cutting the back paper or by sawing. Use of a metal straightedge facilitates clean straight cuts. Cut edges can be tidied up by using a knife. Paper dags should be removed.

Hold-downs

- 14.5 GIB EzyBrace® Systems 2016 which require hold-downs must either have a GIB® Handibrac® fitted to each end of the bracing element or alternatively a metal stud-to-plate strap and hold-down anchor may be used. Refer to the Technical Literature for full installation details. Where a metal stud-to-plate strap is used, the hold-down anchor must be placed no more than 80 mm from the end of the bracing element.
- 14.6 Where the GIBFix® Framing System is used, a single hold-down located at a wall intersection may be used to provide the hold-down in both the across and along bracing directions.



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Plasterboard Sheet Fixing

- 14.7 Corner fixings must be 50 mm away from the sheet corner. Fixings must be no closer than 12 mm from the paper-bound sheet edge, and no closer than 18 mm from a cut edge, and driven at right angles to the sheet until the head is seated in a slight dimple just below the surface of the paper liner. Fixings must not be over-driven.
- 14.8 Wall bracing plasterboards (except for those used with the GS2-NOM system) are fixed at 150 mm centres around the perimeter framing of the bracing element (Note variation for GIB Aqualine® and GIB Fyreline® see Table 1). At the corners of the wall bracing elements, a special fastening pattern is required with fasteners spaced at 50 mm, 100 mm, 150 mm, 225 mm and 300 mm from the corner and there-after at 150 mm centres. Fixing to other framing is either mechanical or by using GIBFix® adhesives.
- 14.9 When installing GS2-NOM bracing elements, the GIB® plasterboard is fixed to framing around the bracing element perimeter and at sheet joints with fasteners at maximum 300 mm centres. Where recessed door jambs are used on internal door frames, the GIB® plasterboard may be fixed to the framing around the door opening with GIBFix® All-Bond. See Paragraph 7.15.
- 14.10 Where GIB Aqualine® or GIB Fyreline® substitutes for GIB Braceline®, bracing elements must be longer than 900 mm and the bracing element perimeter fasteners must be spaced at 100 mm centres and the corner pattern described in Paragraph 14.8 used.
- 14.11 Full sheets must be used wherever possible.

Fire Resistance Rated Bracing Elements

14.12 Where a bracing element is also used as a fire-rated element, the method of fixing (including the length of the fixing specified) for the fire-rated element must be used, but the perimeter fixings of the bracing element must be at 150 mm centres and fixings at corners of the bracing element must be fixed as described in Paragraph 14.8. In two-layer systems the inner layer must be used for bracing.

Plywood Fixing

14.13 Plywood is nail fixed at 150 mm centres around the perimeter of each sheet and at 300 mm centres to intermediate framing.

Ceiling Diaphragms

- 14.14 All GIB EzyBrace® System 2016 ceiling diaphragms require fixings around the perimeter at 100 or 150 mm centres, depending on the ceiling pitch and length. See Paragraphs 8.4 to 8.6 and refer to the Technical Literature.
- 14.15 The perimeter of the ceiling diaphragm is fixed to GIBFix® Angles, GIB® Rondo® perimeter channels, or alternatively, to an additional ex 150 x 40 mm timber plate fixed to the top plate.

Jointing and Finishing

14.16 All bracing element joints must be reinforced with GIB® tape and finished in accordance with the GIB® Site Guide.

Health and Safety

15.1 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.





Basis of Appraisal

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

Tests

16.1 Bracing tests were carried out by Winstone Wallboards Ltd in accordance with BRANZ Technical Paper P21 to determine the performance of GIB EzyBrace® Systems 2016 when the building is subjected to lateral wind or earthquake loading. Nail and screw slip tests were carried out by BRANZ and Winstone Wallboards Ltd. The Winstone Wallboard's test facilities, procedures and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 17.1 The GIB EzyBrace® Bracing Software has been assessed by BRANZ and found to be satisfactory.
- 17.2 The GIB EzyBrace® Systems 2016 and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.
- 17.3 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.
- An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.
- The properties of Winstone Wallboards Ltd GIB® plasterboards have been assessed for the 17.5 following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, hard and soft body impact tests.

Quality

- Winstone Wallboards Ltd's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.
- 18.2 The quality management systems of Winstone Wallboards Ltd have been assessed and registered by TELARC as meeting the requirements of ISO 9001, Registration No. 581.
- 18.3 Winstone Wallboards Ltd is responsible for the quality of the product supplied.
- 18.4 The quality of the application and finish on site is the responsibility of the installation and stopping
- 18.5 Designers are responsible for the design of buildings.
- 18.6 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Ltd.

Sources of Information

- AS/NZS 2269.0:2012 Plywood Structural Specifications
- AS/NZS 2588: 1998 Gypsum plasterboard.
- BRANZ Technical Paper P21: 2010 A wall bracing test and evaluation procedure.
- NZS 3604: 2011 Timber-framed buildings.
- · Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.





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In the opinion of BRANZ, GIB Ezybrace® Systems 2016 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 Winstone Wallboards 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. Winstone Wallboards 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 Winstone Wallboards 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.
- BRANZ provides no certification, guarantee, indemnity or warranty, to Winstone Wallboards Ltd or any third party.

For BRANZ

Chelydra Percy Chief Executive

Date of Issue:

05 September 2016

BC210994 Received by Kapiti Coast District Council 8/11/21

5431KF Kopine Particleboard Floors

New Zealand Panels GROUP

NZ Panels Group Ltd

+64 9 2713526 marketing@nzpanels.co.nz www/.nzpanels.co.nz

SUPPORTING DOCUMENTS

Kopine Installation Guide

Ref 10851. Uploaded 20 Aug 2020
Purpose: Installation

Kopine Technical Bulletin Wet Area Installation

Ref 10856. Uploaded 20 Aug 2020 Purpose: Installation



AND TECHNICAL SPECIFICATIONS



ULTRA LOCK 12





338





ULTRA TONGUE & LOCK® GROOVE®

KOPINE FLOORING SYSTEMS INCLUDE BOTH ULTRALOCK12 AND TONGUE & GROOVE12 HIGH-DENSITY PARTICLEBOARD FLOORING.

- Codemark compliant
- 12 week exposure time
- Meets AS/NZS1860 Standard
- Adhesive provided at no extra cost
- Easy to install no nogs or dwangs required
- Moisture-resistant joints
- 2-hour walk on time
- Environmental Choice NZ
- Low formaldehyde emission (E1)
- 20mm thick
- Two panel sizes 2400 x 1200mm and 3600 x 1200mm
- Made right here in New Zealand at Kopu near Thames.
- Using sustainable NZ grown Radiata pine

WHAT'S IN THIS GUIDE

- 1. How to install Ultralock12
- 2. How to install Tongue & Groove12
- 3. Technical Specifications



HOW TO INSTALL ULTRALOCK12

Kopine Ultralock[™]12 is a high-density particleboard flooring that uses a patented system to bond the panel edges together for a seamless finish. You don't need nogs or dwangs and the Gorilla Grip glue (provided at no extra cost when you buy the board) provides an effective moisture seal and an excellent strong joint when set.



WHAT YOU NEED BEFORE YOU START

- Holdfast Gorilla Grip supplied when you buy the panels and the only one tested with our board for Codemark compliance.
- No. 8 gauge x 50mm countersunk screws (recommended).

0R

A minimum of 65mm x 2.8mm hot-dipped galvanised annular grooved flooring nails if you've got a nail gun and know how to use it.

OR

A minimum of 60 x 2.8mm hot-dipped galvanised jolt head nails or 60 x 3.15mm hot-dipped galvanised csk annuler grooved flooring nails (if you're old school and using a hammer).

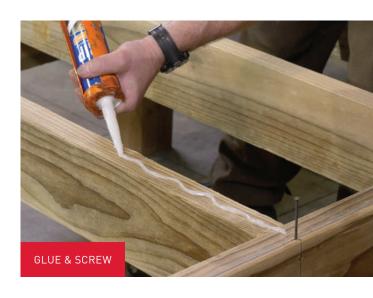
STEP 1 JOIST SPACING

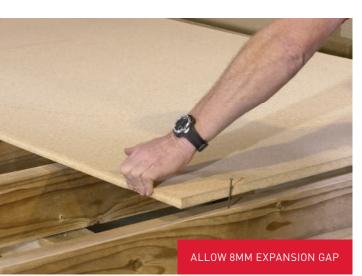
- Joist spacing should be no more than 600 mm centres. The closer the joists the more rigid the floor.
- > Before you lay your first panel, put some nails into the joist to hold it in place.
- Irrespective of the size of the floor allow for an 8mm expansion gap between the panel edges and any fixed elements i.e. masonry walls, bottom plates etc.



STEP 2 GLUE THE JOISTS

Before you put down your first panel, apply a continuous bead of glue to the top of the joists it's going to sit across, and then all subsequent joists as you lay further sheets.







STEP 3 LAYING THE FIRST SHEET

- Make sure the panel edges are square, and free from dirt and grease.
- > Take a straight, square line from one corner of the floor and lay the first panel down this line, across the glued joists.
- Screw the first panel down.
- Nails or screws should be spaced at 150mm centres along the short edge of the panels and around the perimeter edge of the entire floor, and at 200mm centres along intermediate joists.
- Nails or screws must be a minimum of 10mm from the edge.
- Completely fix panels when you lay them down corner fixing only is not good practice and not enough to hold the panels while the glue cures.

Using screws? Use a lower torque setting to reduce the risk of overdriving and tearing the threads loose in the timber. Overdriven screws must be removed and set in a new position. Screw fixing gives the tightest result of all the methods.

Using a nail gun? A depth adjuster attachment should be used on the nail gun and adjusted to ensure that the nails do not penetrate more than 2 mm below the surface of the panel. Do not rely on the nails to pull panels down tight on the joists – panels must be in contact with the joist before the nail is fired.

Using a hammer? Drive nails at a slight angle (alternating) and parallel to the sheet edge for improved lateral holding. Nail vertically at corners. Nails should be hammered flush when laying, then punched below the surface just before sanding.

STEP 4 GLUEING THE PANELS

Note: Gorilla Grip adhesive works best in conditions above 10C. Do not use below 5C. It's the ONLY adhesive tested and recommended for use with Kopine flooring to achieve Codemark compliance.

- Apply the glue bead to all edges of the first panel in a continuous run of at least 5mm diameter – more is better!
- The glue should squeeze out of the top of the joint when you push the panels together.
- Lay panels in a staggered, brick-like pattern with panels at right angles to the joists, making sure you glue all edges and the joists underneath – this will help stop the squeaking and peaking.
- Gorilla Grip cures fast so don't mess about. Fix the panels within 15 minutes of the glue being applied.
- If you move the panels apart after 15 minutes, you'll need to put some fresh glue on before you rejoin them.





STEP 5 AVOID THE PANELS FOR TWO HOURS

- Clean any excess glue off the joints with a scraper.
- Don't walk on the joints for a minimum of two hours after you've glued – especially if joists are at 600mm centres or in cold conditions.
- If you have to walk over it, lay planks across or walk across the joists only.



HOW TO INSTALL TONGUE & GROOVE12

Kopine Tongue & Groove12 is a high-density particleboard flooring that uses black plastic tongues with a grooved edge to provide a super tough join. You don't need nogs or dwangs and the glue (provided when you buy the board at no extra cost) provides an effective moisture seal to minimise joint peaking.



WHAT YOU NEED BEFORE YOU START

- Holdfast Gorilla Grip -the only one tested with our board for Codemark compliance.
- No. 8 gauge x 50mm countersunk screws (recommended).
- > A rubber mallet.

OR

A minimum of 65mm x 2.8mm hot-dipped galvanised annular grooved flooring nails if you're using a nail gun.

OR

A minimum of 60 x 2.8mm hot-dipped galvanised jolt head nails or 60 x 3.15mm hot-dipped galvanised csk annuler grooved flooring nails (if you're old school and using a hammer).

STEP 1 JOIST SPACING

- Joist spacing should be no more than 600 mm centres. The closer the joists the more rigid the floor.
- Before you lay your first panel, put some nails into the joist to hold it in place.
- Irrespective of the size of the floor allow for an 8mm expansion gap between the panel edges and any fixed elements i.e. masonry walls, bottom plates etc.





STEP 2 GLUE THE JOISTS

Before you put down your first panel, apply a continuous bead of glue to the top of the joists it's going to sit across, and then all subsequent joists as you lay further sheets.

STEP 3

LAYING THE FIRST SHEET

- Make sure the panel edges are square, and free from dirt and grease.
- Take a straight, square line from one corner of the floor and lay the first panel down this line, across the glued joists.
- > Screw the first panel down, ensuring screws (or nails) are a minimum of 15mm from the edge to avoid the plastic tongue.
- Nails or screws should be spaced at 150mm centres along the short edge of the panels and around the perimeter edge of the entire floor, and at 200mm centres along intermediate joists.
- Completely fix panels when you lay them down corner fixing only is not good practice and not enough to hold the panels while the glue cures.

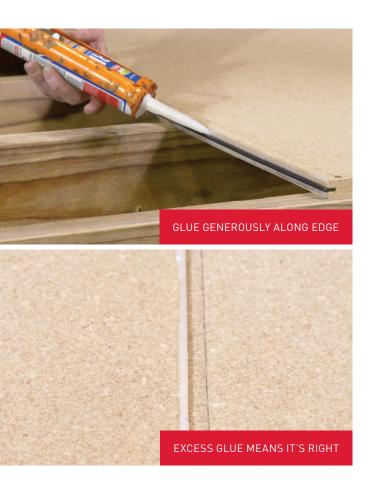
Using screws? Use a lower torque setting to reduce the risk of overdriving and tearing the threads loose in the timber. Overdriven screws must be removed and set in a new position. Screw fixing gives the tightest result of all the methods.

Using a nail gun? A depth adjuster attachment should be used on the nail gun and adjusted to ensure that the nails do not penetrate more than 2 mm below the surface of the panel. Do not rely on the nails to pull panels down tight on the joists – panels must be in contact with the joist before the nail is fired.

Using a hammer? Drive nails at a slight angle (alternating) and parallel to the panel edge for improved lateral holding. Nail vertically at corners. Nails should be hammered flush when laying then punched below the surface just before sanding.







STEP 4 GLUEING THE PANELS

Note: Gorilla Grip adhesive works best in conditions above 10C. Do not use below 5C. It's the ONLY adhesive tested and recommended for use with Kopine flooring to achieve Codemark compliance.

- Apply the glue bead to all edges of the first panel (including the top and bottom of the tongue) in a continuous run of at least 5mm diameter – more is better!
- > The glue should squeeze out of the top of the joint when you push the panels together. You'll need to use the rubber mallet to join the panels tightly.
- Lay panels in a staggered, brick-like pattern with panels at right angles to the joists, making sure you glue all edges and the joists underneath – this will help stop the squeaking and peaking.
- Gorilla Grip cures fast so don't mess about. Fix the panels within 15 minutes of the glue being applied.
- > If you move the panels apart after 15 minutes, you'll need to put some fresh glue on before you rejoin them.

STEP 5 AVOID THE PANELS FOR TWO HOURS

- > Clean any excess glue off the joints with a scraper.
- Don't walk on the joints for a minimum of two hours after you've glued – especially if joists are at 600mm centres or in cold conditions.
- If you have to walk over it, lay planks across or walk across the joists only.





TECHNICAL SPECS

Ultralock[™]12 and Tongue & Groove12 are high-density particleboard flooring systems made here in New Zealand by Kopine. Strong and fast to install, with water-resistant joints, both flooring systems are quiet, cost-effective and will stand the test of time.

The specifications here cover both systems – where differences occur they are clearly identified.

Both flooring products have been tested to AS/NZ 1860 and have Codemark Certification and Environmental Choice NZ certification.



Kopine Ultralock[™]12 system uses a patented system to glue the grooved panel edges together in a continuous flooring membrane. The adhesive, which is supplied at no extra cost when you buy the board, eliminates the need for nogs or dwangs, saving time and money.

The glue also provides an effective moisture seal at the joints, significantly reducing the chance of edge peaking that requires additional sanding.



Kopine Tongue & Groove12 is a traditional method of jointing but uses a glue bond in addition to the black PVC tounge to produce a strong joint which significantly reduces edge peaking compared to glueless systems.

PRODUCT DESCRIPTION

Kopine Ultralock[™]12 and Kopine Tongue & Groove12 flooring systems are reconstituted wood panels manufactured by bonding radiata pine wood particles with a melamine urea formaldehyde resin using a combination of heat and pressure.





PROPERTIES OF KOPINE FLOORING SYSTEMS

	Dimensions			Tolerances		
Size (mm) 2400 x 1200 36		3600 x 1200	Board squareness	Length of sheet diagonals does		
	Nominal Thickness(mm)	20 mm	20 mm	board squareness	not differ more than 1.5 mm	
	Sheets per pack	50	20	Thickness	+/ – 0.4 mm	
	Sheet weight (kg)	41	61	Length and width	+/ – 1.5 mm	
		'	'	Sheet edges	2.0 mm max. deviation from	
				Sileet edges	line	

Physical properties of Kopine particleboard

Density	> 670 kg/m3
Internal bond ¹	> 500 kPa
Modulus of rupture ¹	> 17 MPa
Modulus of elasticity ¹	> 2650 MPa
Moisture content (at dispatch)	5 – 13 %
Surface water absorption ¹	< 210 g/m2
Thickness swell (24 hour soak) ¹	< 14 %
Extractable formaldehyde	E1:≤1.5 mg/L when tested in accordance with AS/NZS 4266.16.
Surface	Upper surface is sanded, underside is sanded
Thermal insulation	R = 0.13 m2 C/W
	•

¹ Physical properties based on lower 5th percentile values in relation to particleboard flooring panels when tested internally (based on the procedures stated in AS/ NZS 4266).

BUILDING MATERIALS FOR USE WITH KOPINE® FLOORING SYSTEMS

Holdfast Gorilla Grip Adhesive

Holdfast Gorilla Grip is a fast curing, one component, polyurethane-based adhesive with high bond strength. It bonds deeply into the panel fibres, even on damp surfaces. Holdfast Gorilla Grip cures to a transparent glue line and gives added protection against moisture penetration into the joint significantly decreasing the risk of edge swell or peaking. The glue is temperature resistant to 100°C.

For more information contact Holdfast on 0800 701 080.

Construction adhesives are supplied in 310 ml cartridges and will fit any standard glue gun. Cartridges are included at no extra cost as part of the Kopine Ultralock™12 and Tongue & Groove12 flooring systems.

Sustainability

Kopine Ultralock™12 and Tongue & Groove12 are made from radiata pine shavings and chips. New Zealand plantations are managed in compliance with the New Zealand Forest Accord.

Kopine Flooring Systems have Environmental Choice NZ accreditation under the Floor Coverings category.

Joists

The choice of joists will play a part in determining the performance of the flooring system. Moisture content of the joists must be less than 18%. It is highly recommended that joists be either Machine Stress graded, high temperature kiln dried timber such as laser frame, OR where longer spans and higher performance is required, use LVL (laminated veneer lumber) joists.

The benefits are a stiffer, more level floor than one laid with conventional wet, visual graded joists. This will result in reduced vibration, transmitting less sound above and below the floor.

Note: Kopine Flooring systems provides maximum performance using the specified components only when used in accordance with the installation instructions at the front of this brochure. Substitute components have not been tested and may not perform to the same standard and are not recommended.

DESIGN CONSIDERATIONS

Design responsibility

The specifier for the project must ensure that the details in the specification are appropriate for the intended application and that additional detailing is provided for specific design or any areas that fall outside the scope and specifications of this literature.

Ground clearance

A minimum clearance of 550 mm must be provided between the underside of the flooring and the surface of the ground. Refer NZS 3604:2011. Inspection access is also required.

Heavy loadings

For concentrated loads over 180 kg or uniformly distributed loads over 200 kg/m2, a structural engineer should be consulted. Joints must be supported by nogs/dwangs beneath heavy loads.

Floor frame spacings

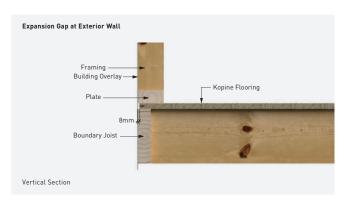
Kopine Ultralock^M particleboard flooring is suitable for residential flooring applications with a maximum frame spacing of 600 mm for a maximum 1.8 kN live load. Live loads above 2.0 kPa / 1.8 kN are required to be specifically designed using Kopine flooring properties outlined earlier in this technical section.

For greater strength and stiffness consider a frame spacing of 400 mm centres or 450 mm centres where $3600 \times 1200 \text{ mm}$ sheets are used.

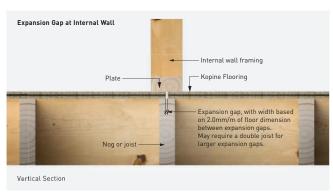
Expansion gaps

Regardless of the size of the floor, an 8 mm expansion gap must be provided between the panel edges and any fixed elements e.g. masonry walls, bottom plates etc. This is important to allow for any linear expansion and applies whether pre or post laying.

Where the effects of expansion in the flooring may be critical with respect to achieving the desired floor or wall finishes, then it is recommended that expansion joints be incorporated into the design. Allow expansion of 2.0 mm/m of floor dimension utilising the details given under 'Large Floor Areas' section.







Large floor areas

As with all wood products, particleboard floors will expand and contract with changes in moisture content of the panels. For large floor areas, provision must be made for expansion of the panels in addition to the perimeter gaps. It is recommended that expansion joints should be designed into the floor at a minimum of 20 mm per 10 metre of floor at a maximum of 10 metre spacing's or smaller gaps with closer spacing to give an equivalent space.

Where floors are laid in wet conditions, consideration should be given to decreasing the distance between expansion joints.

Exposure to weather

- > Kopine flooring systems may be exposed to weather for up to three months. For best results keep exposure to a minimum.
- > Pre laying make sure the building is closed in within three months, preferably sooner. Post lay if there is a risk of over-exposure.
- > Clear surface water from the floor quickly do not allow to pond.
- > To allow moisture to evaporate freely, do not apply sealer's, tape or other impervious sheet material to pre laid floor while it is exposed.
- Xopine flooring panels are designed to be laid across joists and glued together at the edges. This continuous glue bond eliminates the need for further edge support such as timber nogging. All end joints (short edges) must be made over a joist and glued.

Floor diaphragms

Kopine Ultralock[™]12 and Kopine Tongue & Groove12 are suitable for use as a floor diaphragm within the scope of NZS 3604.

Ventilation

Cross-flow ventilation must comply with NZS 3604 6.14 Prevention of Dampness. Ventilation openings must be evenly distributed around the entire perimeter – in the foundation and/or substructure walling.

A ground cover vapour barrier must be installed in sub-floor areas where:

- > The ground will be permanently or seasonally damp.
- > The airflow is obstructed by party walls, internal foundation walls or attached terraces.
- > Points on the ground are greater than 7.5 metres from a ventilation opening.

Refer to NZS 3604 - 6.14.3.

Underside coating

The underside of Kopine flooring panels facing the ground must not be coated with any form of sealant and only perforated foil or other approved product is to be used as insulation.

This allows the sheet to breathe.

Insulating with foil

Under floor insulation must meet the requirements of clause H1 of the New Zealand Building Code. If foil is used and you intend glue fixing to the joists, the foil will need to be cut to allow daubs of glue to be applied.

Surfacing for wet areas

In water-serviced areas such as laundries, bathrooms, toilets and showers the floor must be covered with a moisture-impervious membrane, coved at the walls, extending under toilet pans. Vinyl tiles, carpet or clear coatings must not be used in these areas. Refer Acceptable Solution E3/AS1. 2.12

Spread of fire

Kopine Flooring Systems can be used where the NZ Building Code requires no specific fire protection criteria.

Heat and fire safety

The floor must be protected from heat sources such as free-standing heaters, space heaters, hot air ducts and pipes containing hot water or steam. Floor temperature must not be allowed to exceed 35°C for prolonged periods.

NZ Building Code C1.3.2 specifies how the floor must be separated from fireplaces, flues, chimneys and fuel burning appliances. Consult appliance manufacturers to determine minimum clearances which will ensure the floor does not exceed 50° C for short periods or 35° C for longer.

Floor Heating Systems

Over Floor Heating Systems

Over floor heating e.g. under carpet or tiles, may be used with Kopine Flooring Systems , provided the floor surface temperature does not exceed 35° C.

Care must be taken to ensure that the floor temperature is normally maintained at or less than the recommended long-term maximum of $35\,^{\circ}$ C. In these applications, care must be taken to ensure that flooring is laid over dry framing and is well protected from the weather until the building is closed in. Laying of the flooring after close in is recommended. Any failure of the heating system is the responsibility of the floor heating system manufacturer.

Under Floor Heating Systems

Under NO CIRCUMSTANCES should any floor heating system be attached to the underside of Kopine flooring panels or be attached or placed between joists or any cavities of the floor framing.

Insects - fungus

The risk of damage from insects such as borer or termites is very low. For best results ensure the moisture content does not exceed 18% for prolonged periods and install in accordance with the ventilation requirements of NZS 3604.

Structure

Kopine® Flooring Systems are manufactured to AS/NZS 1860 and as such comply with B1 of the NZ Building Code. The long-term performance of the floor depends almost entirely on the dryness and flatness of the subfloor and the standard of fixing.

Durability

When used in accordance with the instructions and recommendations in this guide and in accordance with NZS 3602, Kopine Ultralock™12 and Kopine Tongue & Groove12 flooring will meet the durability performance requirements of NZ Building Code. Both flooring systems carry Codemark accreditation, meeting the requirement for 50 years durability under the code and this includes the supplied adhesive.

HEALTH & SAFETY

Kopine Flooring Systems should be handled as per the Particleboard Material Safety Data Sheet (MSDS) downloadable from **www.kopine.co.nz**

Storage and work areas should be well ventilated and dust cleared regularly by vacuum or wet sweeping methods.

If skin irritation occurs, wear long-sleeved shirts, trousers and comfortable work gloves.

For respiratory protection, wear dust masks which comply with AS/NZS 1715 and AS/NZS 1716, EN 143:2000 and EN 149:2001, ANSI 288 or national equivalent.

For eye protection wear safety glasses which comply with AS/NZS 1337.

Holdfast Gorilla Grip Adhesive: Observe normal industrial hygiene measures and for further information refer to the MSDS sheet available from Holdfast Manufacturing, 0800 701 080.

STORAGE & HANDLING

Kopine® Ultralock™12 & Tongue & Groove12 Flooring:

- May be exposed to weathering for up to 12 weeks during the construction process. It must not be exposed for longer periods and should be protected from extreme weather during construction.
- > Must not be installed over timber supports with moisture content over 18%.
- > Is not suitable for use as a substrate for roofing or decking membranes.
- > Interior surfaces must be sealed with polyurethane or covered with carpet or sheet vinyl prior to occupation of the building.

Before Installation

- > Protect the panels from weather and keep dry before laying. Store the pack clear of the ground on level bearers.
- A breather-type cover must be supported clear of the panel surface allowing air to circulate freely around the pack.

Handling

> Use gloves when handling product to avoid splinters.

After Installation

- > Kopine flooring may be exposed to weather for up to 12 weeks. For best results keep exposure to a minimum.
- > Clear surface water from the floor quickly do not allow it to pond. Remove the bottom plate from doorways to make clearing easier.
- > To allow moisture to evaporate freely, do not apply sealers, tape or other impervious sheet materials to a pre-laid floor while it is exposed.

 $Dimensional\ changes\ of\ up\ to\ 0.2\%\ in\ panel\ length\ and\ width\ may\ occur\ in\ response\ to\ humidity\ changes.$

Adhesive fastening where foil is used

In ground floor applications where foil insulation is used, apply adhesive to the floor joists through 25 mm square cut outs in the foil at 300 mm centres. Cut outs can be made by taping two builder's knives together and making two cuts along and across the top of the joist, through the foil.

For upper floors that do not require foil or similar insulation, apply a 10 mm bead of Holdfast Gorilla Grip to the joists, covering the whole length of the joist. Fasten sheets fully within 15 minutes of applying the adhesive to ensure a tight bond to the joists. Refer to manufacturer's instructions for more detail.

FINISHING

CLEAR FINISHING PREPARATION

If clear finishing is planned, to avoid colour variation do not mix batches of sheets. To prevent stains, avoid prolonged contact with sawdust piles, stacked timber, steel scaffolding, cement, strapping or nails especially if rusting is likely. Avoid spills of tea, coffee, paint or cement. Keep the period of exposure short.

Kopine flooring panels must be sealed with polyurethane or covered with carpet or sheet vinyl before the building is occupied. Lightly sand with 40-80 grit paper before laying floor coverings or clear finishing.

Do not over-sand. Excessive sanding can reduce structural strength and lead to colour variation, visible when the floor is clear finished.

Clear finishing

- > Punch nails then carefully sand the entire floor.
- > Remove dust from the floor and skirtings with a broom and vacuum cleaner.
- > Apply the first polyurethane coat, following manufacturer's instructions.
- > Fill nail holes with a filler such as DAP wood dough.
- > Apply further coats, lightly sanding between each coat.
- > Follow manufacturer's instructions to complete.

Glue-fixed floor coverings

Refer to floor covering manufacturer's specific requirements.

Maintenance

Regular underfloor inspections must be made. Any sign of moisture or mould on the floors or lower parts of walls must be investigated and corrective action taken. Plumbing leaks, moisture migration or leakage from external sources must be rectified. Moisture concentration in wall cavities must be repaired and recurrence prevented.

Keep vents in the perimeter foundation walls clear of vegetation and other obstructions to allow proper subfloor ventilation at all times. Keep subfloor vapour barriers and insulation foil in a serviceable and effective condition.

Floor coverings and coatings must protect the whole floor surface. In water-serviced areas the moisture-impervious floor covering or coating must be maintained so water cannot reach the particleboard.

Floor wastes must be kept unobstructed and drain to the outside of the building.

After flooding

Dry the floor quickly. Lift carpets and slit insulation foil drapes so all water drains.



NOVEMBER 2018

Kopine® is a registered trade mark of Kopine Ltd, a business unit of New Zealand Panels Group.

This guide contains important information on the installation and maintenance of the Kopine Ultralock™ & Tongue & Groove flooring systems. The information contained in this guide is current as at November 2018 and replaces all previous publications relating to the Kopine Ultralock™ and Tongue & Groove flooring systems. Kopine reserves the right to revise this brochure without any notice.

Kopine has used its reasonable endeavours to ensure the accuracy and reliability of the information contained in this brochure, and to the extent permitted by law, will not be liable for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information. When specifying or installing Kopine Flooring Systems visit www.kopine.co.nz or call 0800 866 678 to ensure you have the current specification material.



TECHNICAL BULLETIN WET AREA INSTALLATION



MAY 2019

INTRODUCTION

This bulletin is intended to give guidance on the use of Kopine particleboard flooring in designated wet areas such as bathrooms, laundries, kitchens and toilets to meet the requirements of the New Zealand Building Code.

CODEMARK

The use of Kopine Flooring Systems in residential and commercial buildings as flooring is supported by a CodeMark Certificate, (Refer Certificate Number AQ-220917-CNNZ), which certifies that the Kopine Flooring System conforms with the Building Code of New Zealand for B1 Structure, B2 Durability and F2 Hazardous Building Material.

The CodeMark Certificate confirms that the Kopine flooring system is suitable for use in wet and splash areas subject to the following conditions and limitations specifically regarding those areas:

"The flooring must be protected by a membrane or other impervious finish when installed in wet or splash areas."

COMPLIANCE DOCUMENTS

Wet area durability and protection from moisture are covered in B2/AS1 and reference's both E3/AS1 (Internal Moisture) NZS 3602:2003 (Timber and Wood-Based Products used in Building) and NZS3604.

E3/AS1 3.0 refers to "Watersplash" areas.

E3/AS1 3.1.1

The following linings and finishes to floors satisfy the performance for impervious and easily cleaned surfaces in areas exposed to watersplash:

(f) A timber or timber-based product such as particleboard sealed with waterproof applied coatings.

NZS 3602 Table 1 E.7 states that: Timber and wood-based products used for interior flooring does not require treatment.

NZS 3602 110.3.1 States that: Flooring in "wet areas" such as laundries, bathrooms, kitchens and toilets shall be as set out in E3/AS1. Where maintenance of an impervious coating cannot be assured in wet areas, plywood flooring treated to a minimum H3 should be used.

CONCLUSIONS AND RECOMMENDATIONS

Kopine Particle Board is suitable for installation in designated "wet splash" areas such as laundries, bathrooms, kitchens and toilets when coated with an impervious coating or waterproof membrane.

Suitable coatings and membranes include a full polyurethane coating system, impervious vinyl floor covering with welded joints or a waterproof membrane complying with AS/NZS 4858.

Where permanent fixtures and fixture occur, waterproof membranes should be continuous under such fixtures.

Where Kopine flooring is used in a designated shower or on floors adjacent to showers not fully enclosed, a waterproof membrane must be used.

Where vinyl floor coverings are used it is recommended that coving is applied up the walls to a height of 150mm and where accidental flooding of wet areas might occur a floor waste should be installed in accordance with E3/AS1.

As with most wood-based products, short term or occasional wetting will not unduly affect the integrity of particleboard provided it can dry. However, long term moisture inclusion will ultimately have a significant effect and needs to be considered in the design stages of a project.

It is the designer's or end user's responsibility to ensure that the product is fit for purpose and meets the requirements of the applicable provisions of the New Zealand Building Code.

For further information please contact Kopine.



5438H James Hardie® Fibre Cement Interior Flooring



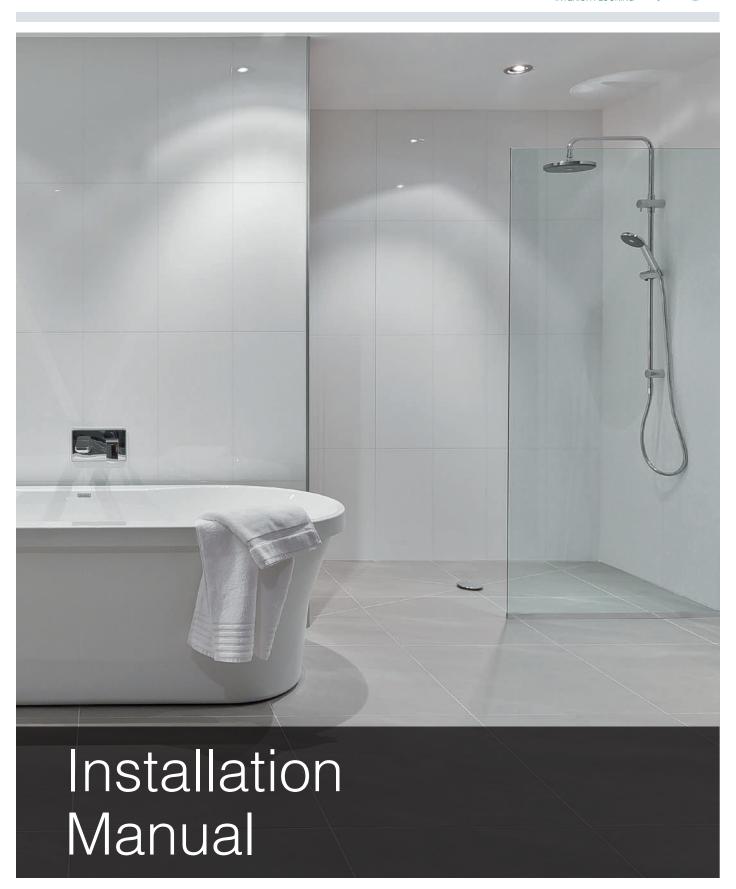
James Hardie

+64 0800 808868 info@jameshardie.co.nz www.jameshardie.co.nz

SUPPORTING DOCUMENTS

Secura Interior Flooring Installation Manual July 2020

Ref 10546. Uploaded 11 Aug 2020
Purpose: Installation



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WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

Ask James Hardie[™]

literaturefeedback@jameshardie.co.nz

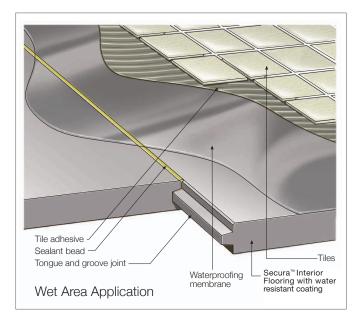
1 Introduction

Secura[™] Interior Flooring is a substrate which has been specifically engineered for use in internal wet and dry areas such as bathrooms, toilets and laundries to overlay with tiles, heavy grade vinyl or carpeting. Secura Interior Flooring provides a durable, stable and moisture resistant substrate.

Secura Interior Flooring is manufactured using James Hardie's unique advanced lightweight fibre cement composite technology, making it easier to cut and gun nail.

Secura Interior Flooring is a 19mm thick structural tongue and groove flooring which is an alternative to timber, particle board or plywood flooring. It's lighter than traditional James Hardie 18mm HardiePanel™ Compressed Sheet thus making it easier to handle and install.

The 19mm thickness and tongue and groove joining means Secura Interior Flooring is compatible with other 19mm flooring products on the market and eliminates the need for timber blocking along the tongue and groove joint. The moisture-resistant sealer on all six sides combined with the high strength technology makes it suitable for use in wet and dry areas. Tiles and heavy grade vinyl linings can be directly fixed to this substrate without the need for an underlay sheet.



The specifier or other responsible party for the project must ensure the information and details in this manual are appropriate for the intended application and specific design and detailing is undertaken for areas which fall outside the scope of this documentation. This manual must be read in conjunction with the New Zealand Building Code (NZBC) and other relevant standards/regulations relating to wet/dry area construction.

Note: Secura Interior Flooring is not suitable for exterior flooring applications.

Scope

This installation manual covers the use of Secura Interior Flooring in wet and dry areas of buildings within the scope of NZS 3604 or specific engineering design (SED) projects where the loading concentrations do not exceed those specified in NZS 3604 or mentioned in section 3.2.

Make sure your information is up to date

When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or you need more information, visit www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

Table 1

James Hardie product information					
Product	Description	Size (mm)	Code		
	A structural flooring product sealed on all six sides for both tiled or heavy grade vinyl covered internal wet area flooring applications	2700 x 600	404260		
	Long edges have a tongue and groove for easy jointing across the joists.				
19mm J Tiled Application Vinyl Application	Tiled applications: Install sheet with label 'This side down for Tiles' facing down				
Long Edge Sheet Join Options	Vinyl or Carpet applications: Install sheet with label 'This side UP for Vinyl' facing up				

All dimensions provided are approximate only and subject to manufacturing tolerances

Table 2

Accessories supplied by James Hardie				
Accessories	Description			
	HardieBlade™ Saw Blade	300660		
	HardieBlade Saw Blade 184mm diameter			
	Used to cut Secura Interior Flooring			

Accessories not supplied by James Hardie

James Hardie recommends the following products for use in conjunction with its flooring products. James Hardie does not supply these products and does not provide a warranty for their use. Please contact the component manufacturer for information on their warranties and further information on their products.

Accessories	Description	Accessories	Description
	Backing rod PEF backing rod to be used with sealant in control joints.		Waterproofing membrane Used over the Secura Interior Flooring in wet areas. Use the recommended products and applications. Refer table 4.
	Sealant Sealant used in v joint in tiled applications, Ensure the sealant is compatible with the waterproofing membrane system selected.	5	Adhesive Adhesive used over joists prior to installation of Secura Interior Flooring. Bostik Seal 'n' Flex 1 Sika Sikaflex 11FC Bostik No more nails Gorilla Grip
	Level/straight edge For checking straightness of underlying flooring.	Эшинишиниз	Screws for timber 10g x 40mm wood thread self embedding screws.
	Paslode Impulse FrameMaster or	Summunin in.	Screws for steel 8-10g x 40-45mm wing tek min. class 3 coating.
	Paslode Pneumatic Nailer		50 x 2.87mm stainless steel ring RounDrive nail 50 x 2.87mm Dekfast HD galvanised RounDrive nail

2 Safe working practices

WARNING - DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

James Hardie products contain sand, a source of respirable crystalline silica. May cause cancer if dust from product is inhaled. Causes damage to lungs and respiratory system through prolonged or repeated inhalation of dust from product.

Intact fibre cement products are not expected to result in any adverse toxic effects. The hazard associated with fibre cement arises from the respirable crystalline silica present in dust generated by activities such as cutting, rebating, drilling, routing, sawing, crushing, or otherwise abrading fibre cement, and when cleaning up, disposing of or moving dust.

When doing any of these activities in a manner that generates dust, follow James Hardie instructions and best practices to reduce or limit the release of dust.

If using a dust mask or respirator, use an AS/NZS 1716 P1 filter and refer to Australian/New Zealand Standard 1715:2009 Selection, Use and Maintenance of Respiratory Protective Equipment for more extensive guidance and more options for selecting respirators for workplaces. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie. CO.nz.

FAILURETO ADHERETO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

Crystalline Silica is

- · Commonly known as sand or quartz
- Found in many building products e.g. concrete, bricks, grout, wallboard, ceramic tiles, and all fibre cement materials

Why is Crystalline Silica a health hazard?

- Silica can be breathed deep into the lungs when present in the air as a very fine (respirable) dust
- Exposure to silica dust without taking the appropriate safety measures to minimise the amount being breathed in, can lead to a potentially fatal lung disease - silicosis - and has also been linked with other diseases including cancer. Some studies suggest that smoking may increase these risks
- The most hazardous dust is the dust you cannot see!

When is Crystalline Silica a health hazard?

- It's dangerous to health if safety protocols to control dust are not followed when cutting, drilling or rebating a product containing crystalline silica and when cleaning up
- Products containing silica are harmless if intact (e.g. an un-cut sheet of wall board)

Avoid breathing in crystalline silica dust

Safe working practices

- X NEVER use a power saw indoors or in a poorly ventilated area
- X NEVER dry sweep
- ✓ ALWAYS use M Class or higher vacuum or damp down dust before sweeping up
- X NEVER use grinders
- ✓ ALWAYS use a dust reducing circular saw equipped with a sawblade specifically designed to minimise dust creation when cutting fibre cement - preferably a sawblade that carries the HardieBlade™ logo or one with at least equivalent performance - connected to an M Class or higher vacuum
- ✓ Before cutting warn others in the area to avoid dust
- ✓ ALWAYS follow tool manufacturers' safety recommendations
- ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ✓ ALWAYS wear a properly-fitted, approved dust mask or respirator P1 or higher in accordance with applicable government regulations and manufacturer instructions
- ✓ Consider rotating personnel across cutting tasks to further limit respirable silica exposures.

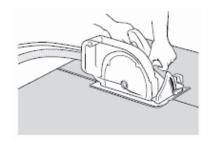
When cutting Secura Interior Flooring

- ✓ Work outdoors only
- ✓ Make sure you work in a well ventilated area
- ✓ Position cutting station so wind will blow dust away from yourself and others in the working area
- ✓ Rotate employees across cutting task over duration of shift
- ✓ Cut products with a HardieBlade Saw Blade (or equivalent) and a dust reducing circular saw connected to a M Class or higher vacuum
- ✓ When sawing, sanding, rebating, drilling or machining fibre cement products, always:
 - Wear your P1 or higher (correctly fitted in accordance with manufacturers' instructions), ask others to do the same.
 - Keep persons on site at least 2 metres and as far as practicable away from the cutting station while the saw is in
 - If you are not clean shaven, then use a powered air respirator with a loose fitting head top
 - Wear safety glasses
 - Wear hearing protection
 - When others are close by, ask them to do the same
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

Working instructions

HardieBlade™ Saw Blade

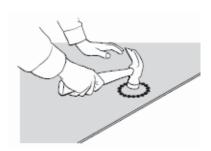
The HardieBlade Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust collector connected to a M Class or higher vacuum. When sawing, clamp a straight edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.



Hole forming

For smooth clean cut circular holes:

- Mark the centre of the hole on the sheet
- Pre-drill a 'pilot' hole
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill



For irregular holes:

- Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face
- Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported

2.1 STORAGE AND DELIVERY

Keeping products and people safe

Off loading

- James Hardie products should be off-loaded carefully by hand or by forklift
- James Hardie products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

James Hardie products should be stored:

- ✓ In their original packaging
- ✓ Under cover where possible or otherwise protected with a waterproof covering to keep products dry
- ✓ Off the ground either on a pallet or adequately supported on timber or other spacers
- ✓ Flat so as to minimise bending.

James Hardie products must not be stored:

- X Directly on the ground
- X In the open air exposed to the elements

James Hardie is not responsible for damage due to improper storage and handling.

2.2 TIPS FOR SAFE AND EASY HANDLING OF SECURA INTERIOR FLOORING

- ✓ Carry with two people
- ✓ Hold near each end and on edge
- ✓ Exercise care when handling sheet products to avoid damaging the edges/corners

3 Design

3.1 **GENERAL**

All construction must be carried out in accordance with the relevant building regulations and standards.

Prior to installation of Secura Interior Flooring, ensure the supporting framing is suitable and is in accordance with this manual.

A solvent free waterproofing membrane must be applied over the Secura Interior Flooring in internal wet areas prior to the installation of tiles.

3.2 LOADING CONSIDERATION

Secura Interior Flooring in this manual has been designed to satisfy the requirements for wet and dry areas for buildings within the scope of NZS 3604, 'Timber-framed Buildings', NASH 3405 'An Alternative Solution for Steel Framed Buildings' and load specified under domestic and residential activities of Table 3.1, (Category A) of AS/NZS 1170.1 'Structural Design Actions - Permanent, Imposed and Other Actions'.

Note: The Standard AS/NZS 1170 also specifies higher loads for areas in public buildings which are subject to crowd loading, storage of materials and heavy wheel loadings. For these applications James Hardie HardiePanel Compressed Sheet shall be used. Refer to Flooring Installation Manual.

If in doubt, contact your builder, designer or engineer or Ask James Hardie 0800 808 868.

Notes:

- Secura Interior Flooring must NOT to be used on concrete slabs. To build up height of concrete, purpose-made concrete levelling compounds are more suitable
- For tiling of walls use Villaboard™ Lining

3.3 FRAMING

3.3.1 Timber frame

Timber floor joists must either be in accordance with NZS 3604: 'Timber Framed Buildings' or be specifically designed as per NZS 3603 'Timber Structure Standard' considering the maximum loading specified in AS/NZS 1170 'Structural Design Actions' as explained above.

Floor joists must be 45mm minimum wide. The joist spacing must not exceed those given in Table 3.

Table 3

Secura Interior Flooring Fixing			
JOIST SPACING CENTRES (MAXIMUM)	FASTENER MAXIMUM SPACING CENTRES		
450mm	200mm		

In addition to any lateral support required, the floor joists must also be supported by continuous blocking or strutting as per section 7 of NZS 3604.

Moisture content in timber floor joists must not exceed 20% at the time of installation of Secura Interior Flooring.

For further timber treatment and allowable moisture content information refer to NZS 3602 'Timber and Wood-Based Products for use in Buildings' and NZS 3640 'Chemical Preservation of Round Sawn Timber' for minimum timber treatment selection and treatment requirements. Also refer to framing manufacturer's literature for further guidance on timber selection. Framing must be protected from moisture on site in accordance with the recommendations of the framing manufacturers.

Note: Tiles, tile grouts and adhesives can be detrimentally affected by even small deflections. Therefore it is recommended that for tiled applications reduce joist spans by 20% as specified in the NZS 3604.

3.3.2 Steel Frame

The use of steel framing must be in accordance with NASH 3405 Steel Frame Guide and the framing manufacturers' specifications. Framing members must be 0.75mm to 1.9mm BMT.

Steel frame must have appropriate level of coating to meet the durability requirement of Clause B2 of the NZBC.

3.4 SUB FLOOR VENTILATION

Check that adequate ventilation exists under all framed floors (especially new floors) and that the sub floor area is free from dampness. Refer to the NZS 3604 for ventilation requirements.

3.5 FASTENER DURABILITY

Fasteners must meet the minimum durability requirements of the NZBC. Contact fastener manufacturers/suppliers for more information.

4 Installation

For floor joist spacing and sizes refer to Section 3.

4.1 PANEL LAYOUT

Secura Interior Flooring must always be installed across the floor joists with short sheet edges fully supported on joists. Secura Interior Flooring must be laid in staggered pattern. See Figure 1. No blocking is required under the tongue and groove joints.

When using the site cut sheet pieces, the minimum length of the cut sheet to be used must be 900mm or more.

All site cut sheets must be sealed with an acrylic sealer, Dulux Acraprime 501/1, Dulux 1 Step or similar that is compatible with the waterproofing membrane.

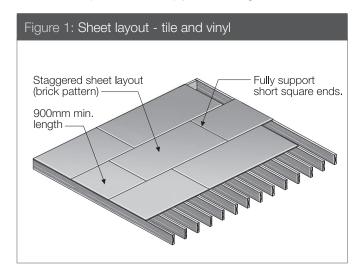
Tile and Vinyl Applications.

The sheets are laid in a staggered pattern. Ensure the sheets are facing the correct way down depending on the final finish ie. tiles or vinyl.

Note:

- 1. Install sheet with label 'This side down for tiles' facing down.
- 2. Install sheet with label 'This side up for vinyl' facing up.

Being 19mm thick, Secura Interior Flooring can easily be combined with traditional particle board or plywood flooring substrates.



Fixings to be 50 x 2.87mm RounDrive nails at 200mm maximum centres. Refer Table 3.

4.2 Installation Steps

You must ensure the product is of acceptable quality prior to installation.

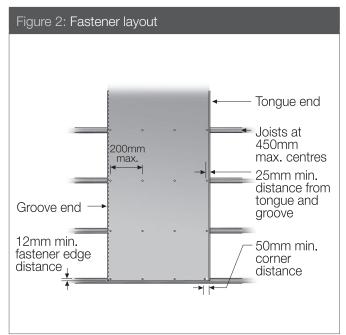
The sheet is multi-purpose and depending on the finish, ensure sheet is laid with correct face upwards for the final desired finish.

The Secura Interior Flooring must not be exposed to exterior elements for more than 90 days.

4.3 CONTROL JOINTS

4.3.1 Tiled Floors

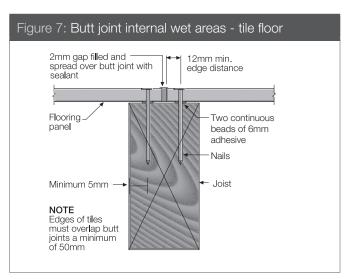
Control joints in Secura Interior Flooring sheets and the tiles are required in wet and dry areas where floor dimensions exceed 4.05m in the long sheet direction and where existing structural joints are located. Position joints symmetrically about the centre of the floor as shown in Figure 9. Additional control joints in the tiles may be required, refer to the current Good Tiling Practice Guide by BRANZ for more information available at www.branz.co.nz.

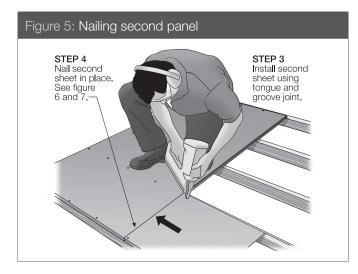


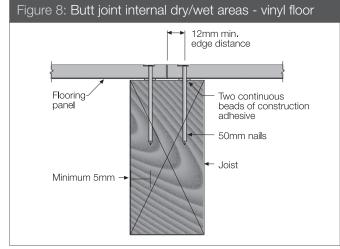


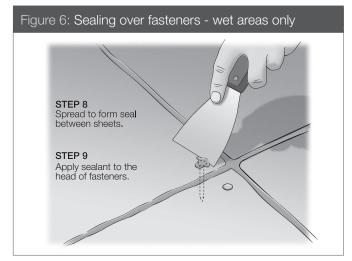


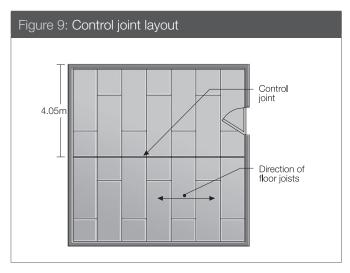
Fixings to be 50 x 2.87mm RounDrive nails at 200mm maximum centres



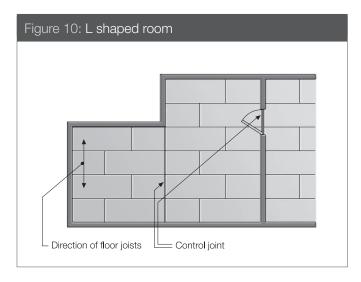








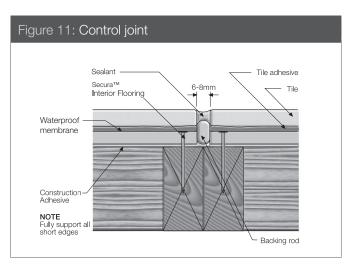
Also provide control joints where there are changes of direction, such as an L-shaped room, and at doorways where the tiled surface is carried through to the next room as shown in Figure 10.

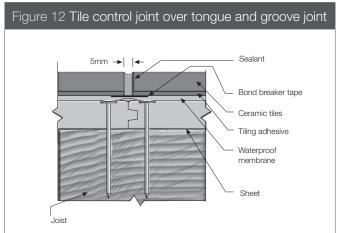


Place a 6-8mm diameter polyethylene backing rod in the bottom of the joint between the sheets and fill the joint with a suitable flexible sealant. All square edges must be fully supported as per Figure 11.

It is important that the control joints be carried through to the top of the floor surface i.e. they should not be covered OVER by tiles.

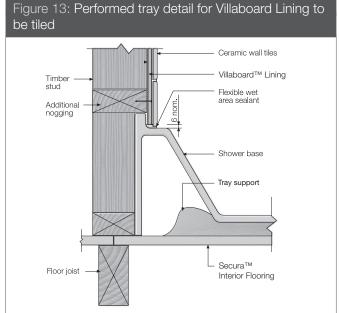
Note: No control joints are required in the flooring sheets when finishing with vinyl unless there is an existing structural joint or otherwise specified by relevant code and regulation.





4.4 PREFORMED TRAYS AND BASES

Preformed trays and bases must be installed to manufacturer's instructions.



5 Waterproofing Membrane

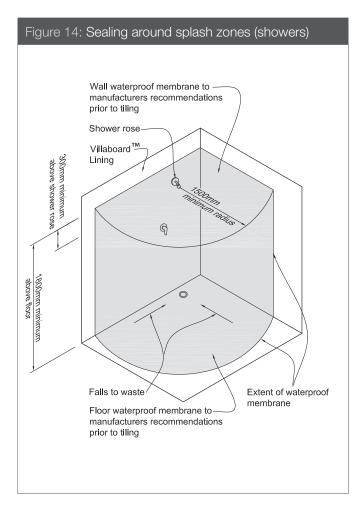
All Secura Interior Flooring under showers (wet areas) must be waterproofed prior to tiling. Refer to clause E3 Internal Moisture of the NZBC and AS 3740 for further guidance regarding the definition of wet areas.

All sheet fixing must be completed as per this installation manual before the primer and the solvent free waterproofing membrane is applied.

Ensure the sheet is dry and free from surface dust and dirt before applying the primer.

The primer and waterproof membrane can be applied directly over the flush nail heads. Ensure compatibility of sealants with waterproofing membranes.

Only water based waterproofing membranes/chemicals must be used with Secura Interior Flooring. Follow the manufacturer's instructions for coverage areas, and specific instructions. For suitable Waterproofing Manufacturers refer to Table 4.



Prime sheet and apply coat of selected waterproof membrane with associated mesh as per waterproof manufacturers' recommendations.



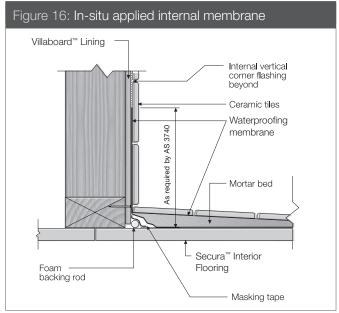


Table 4

. 6.6.76
Recommended waterproofing membranes/tile adhesives
ASA Waterproofing Membrane Dampfix 2 from Bostik
Mapegum WPS and Mapelastic from Mapei NZ Ltd.
Superflex® Ardex Liquid Membranes' from Ardex NZ Ltd
Flexi-Seal® from Flexco (NZ) Ltd
Gripset 38® and Gripset2P® from Waterproofing Systems Ltd
Gripset 38® and Gripset2P® from Waterproofing Systems Ltd

All waterproofing membranes specified above are water based membranes. Use only water based membranes over Secura Interior Flooring.

For coverage information of the selected waterproof membrane refer to manufacturer's recommendations.

Waterproofing membranes must be applied in accordance with their manufacturer's requirements.

Note: Refer to AS 3740 for further guidance on waterproofing requirements.

6 Finishes

6.1 GENERAL

Secura Interior Flooring must be finished with a suitable floor covering to suit the intended application. For the suitability and installation requirements of floor coverings, check with the manufacturer.

6.2 PREPARATION

Where minor height variations (3mm or less) occur at butt joints, these may be levelled out by filling with self levelling compounds eg. Ardex Feather Finish or equivalent. Ensure final finish is compatible with all components eg. vinyl adhesive with leveling compound.

Sanding of the Secura Interior Flooring is not recommended.

6.3 VINYL

As the sheets are supplied fully sealed, only water based vinyl adhesives must be used for this application.

Allow the adhesive to air dry before the vinyl is applied. Refer to a reputable vinyl manufacturer for suitable products and installation instructions.

6.4 SCREEDS

Where the application requires the flooring to have falls created, a mortar bed screed may be used. The surface of the flooring must be thoroughly clean and dry prior to applying the screed as per manufacturer's instructions. To prevent cracking of floor tiles, the mortar bed must be reinforced over all joints in flooring sheets.

6.5 SELECTION OF TILES

The following brief notes do not cover all aspects of tiling. Further advice should be sought from specialists in these areas.

The importance of choosing the proper tile for a given environment cannot be stressed enough. Manufacturer's catalogues indicate the recommended uses and limitations of their products and should be consulted when unsure.

6.6 TILE ADHESIVES

Because of possible differential movement between tiles and the Secura Interior Flooring only approved flexible adhesive and grouts must be used.

Refer to the adhesive manufacturers' specifications for sheet preparation before applying the flexible tile adhesive.

The recommended brands of waterproof membranes and tile adhesives are shown in Table 4. It is essential that all tile systems such as primers, waterproofing membranes, flexible adhesives and grouts are all supplied by the same manufacturer to ensure compatibility of products and warranty protection.

6.7 TILING

Tiles should be applied with proprietary adhesive that conform to AS 2358 and installed in accordance to the AS 3958.1 and to tile and adhesive manufacturer recommendations. Use a flexible tile adhesive recommended for internal wet area applications and compatible with all other materials.

It is recommended that tiles are laid from the control joint out and the edges of tiles must overlap butt joints a minimum of 50mm.

Ensure the tile adhesive used is suitable and compatible with adjoining surfaces for the intended application.

Refer to the waterproofing and tile manufacture and relevant tiling standards for maximum tile control joint spacing, product suitability and compatibility including grout, tile adhesive, tile and waterproofing warranty and maintenance requirement.

The waterproofing requirements of the AS 3740 and clause E3 of the NZBC must be met. Once Secura Interior Flooring has been fixed in place, install flooring material in accordance with manufacturer's specifications within three months of Secura Interior Flooring installation.

6.8 TILING PRACTICE

Refer to the selected tile manufacturer for complete details regarding the laying and fixing of the ceramic tiles, marble, slate and granite stone. Reference can also be made to the BRANZ publication "Good Tiling Practice" available at www.branz.co.nz.

7 Maintenance

Regular cleaning, checks and maintenance of the finished surface, joints, junctions, penetrations, sealant, grout etc must be carried out at regular intervals and as per manufacturers' recommendations.

Maintain waterproofing membranes to meet the objectives of Clause B2 of the NZBC and as per the requirements of the relevant component manufacturer.

8 Product information

8.1 GENERAL

Secura Interior Flooring is an advanced lightweight cement composite building product. The basic composition is Portland cement, ground sand, cellulose fibre and water.

Secura Interior Flooring is manufactured to AS/NZS 2908.2 'Cellulose- Cement Products Part 2: Flat Sheets' (ISO 8336 'Fibre Cement Flat Sheets').

Secura Interior Flooring is a classified Type B, Category 2 in accordance with AS/NZS 2908.2 'Cellulose-Cement Products'.

8.2 PRODUCT MASS

Based on equilibrium moisture content the approximate mass of:

■ Secura Interior Flooring is 24.5kg/m².

8.3 DURABILITY

Resistance to moisture/rotting

Secura Interior Flooring has demonstrated resistance to permanent moisture induced deterioration (rotting) by having passed the following tests in accordance with the AS/NZS 2908.2:

- Heat rain (Clause 6.5)
- Water permeability (Clause 8.2.2)
- Warm water (Clause 8.2.4)
- Soak dry (Clause 8.2.5)

8.4 FIRE PROPERTIES

Secura Interior Flooring is classified as a 'non-combustible material'.



Notes

Product Warranty



James Hardie New Zealand Limited ("James Hardie") warrants for a period of 15 years from the date of purchase that the SecuraTM Interior Flooring (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 12 months 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 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 the Secura Interior Flooring when installed in accordance with the Secura Interior Flooring Installation Manual, 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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BC210994 Received by Kapiti Coast District Council 8/11/21

6221A ARDEX Tiling Solutions



ARDEX New Zealand Limited

+64 03 3736900 specifications@ardexnz.com www.ardex.co.nz

SUPPORTING DOCUMENTS

BRANZ Appraisal 472 - ARDEX Undertile Internal Liquid Waterproofing Membranes

Ref 10480. Uploaded 7 Aug 2020

Purpose: Performance



ARDEX UNDERTILE INTERNAL LIQUID WATERPROOFING MEMBRANES

Appraisal No. 472 (2017)

This Appraisal replaces BRANZ Appraisal No. 472 (2011)

BRANZ Appraisals

Technical Assessments of products for building and construction.



ARDEX New Zealand

Limited

15 Alfred Street

Onehunga

Auckland

Tel: 09 636 0005

Web: www.ardex.co.nz



BRANZ

1222 Moonshine Rd, RD1, Porirua 5381 Private Bag 50 908 Porirua 5240, New Zealand Tel: 04 237 1170 branz.co.nz





Product

1.1 ARDEX Undertile Liquid Membranes are premixed and two-part liquid-applied waterproofing membranes for use under ceramic or stone tile finishes in internal wet areas.

Scope

- ARDEX Undertile Liquid Membranes have been appraised for use as waterproofing membranes for the 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 ARDEX Undertile Liquid 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 the membrane and tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and is 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 installers, approved by ARDEX New Zealand Limited.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, ARDEX Undertile Liquid 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 and B2.3.2. ARDEX Undertile Liquid Membranes meet these requirements. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Internal wet area floors and walls incorporating **ARDEX Undertile** Liquid Membranes meet this requirement. See Paragraphs 11.1-11.6.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. ARDEX Undertile Liquid Membranes meet this requirement and will not present a health hazard to people.



BRANZ Appraisal Appraisal No. 472 (2017) 17 January 2018 ARDEX UNDERTILE INTERNAL LIQUID WATERPROOFING MEMBRANES

Technical Specification

- 4.1 Materials supplied by ARDEX New Zealand Limited are as follows:
 - ARDEX WPM 001 is a one part, polymer-based, ready-to-use, liquid-applied membrane containing micro-fibres. It is supplied as a light blue thixotropic paste 20 kg (approximately 15 litres) pails.
 - ARDEX WPM 002 is a fast drying, two part, flexible, cementitious-based, liquid applied membrane
 containing micro-fibres. It is supplied as ARDEX WPM 002 Part A Liquid in 20 kg pails and
 ARDEX WPM 002 Part B Powder in 10 kg multi-wall bags. When dry, the membrane is light grey
 in colour.
 - ARDEX WPM 155 Rapid is a one part, water-based polyurethane-acrylic, ready-to-use, liquid
 applied, rapid setting membrane. It is supplied as blue/grey colour in 4 and 15 litre pails.
 - ARDEX STB Tape is an uncured butyl tape with a fleece layer that is used in the ARDEX WPM 155
 Rapid under tile waterproofing system.
 - ARDEX Multiprime is a water-based primer used to seal substrates and enhance the adhesion
 of the membranes. It is supplied as a red coloured liquid in 1, 4 and 20 litre plastic containers.

Handling and Storage

All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and 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.

Technical Literature

Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the ARDEX Undertile Liquid 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.

Design Information

General

- 7.1 ARDEX Undertile Liquid 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 ARDEX WPM 002 and ARDEX WPM 155 Rapid are designed to be used where a quicker curing time is required, such as in cool or humid conditions.
- 7.3 The membrane must be protected from physical damage by the application of ceramic or stone tile finishes.
- 7.4 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.
- 7.5 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases, framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met 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%.



BRANZ Appraisal

Appraisal No. 472 (2017) 17 January 2018 ARDEX UNDERTILE INTERNAL LIQUID WATERPROOFING MEMBRANES

Substrates

Plywood

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

Fibre Cement Compressed Sheet/ Fibre Cement Sheet Tile Underlay

8.3 Fibre cement compressed sheet and tile underlay must be manufactured to comply with the requirements of AS/NZS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area membrane substrate. Installation must be carried out in accordance with the instructions of the manufacturer.

Particleboard

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

Concrete and Concrete Masonry

8.5 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 or NZS 4229, and concrete masonry to NZS 4229 and NZS 4230.

Wet Area Wall Linings

- 8.6 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588 and be suitable for use in internal wet areas.
- 8.7 Fibre cement sheet must be suitable for use in wet areas and comply with AS/NZS 2908.2.
- 8.8 Installation of plasterboard or fibre cement wall linings must be carried out in accordance with the instructions of the manufacturer.

Durability

Serviceable Life

9.1 ARDEX Undertile Liquid 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 serviceable life of 15-25 years.

Maintenance

- 10.1 No maintenance of the membrane 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, grout and sealant.
- 10.2 In the event of damage to the membrane, 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 tile finishes must be kept clean.



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ARDEX UNDERTILE INTERNAL LIQUID WATERPROOFING MEMBRANES

Internal Moisture

- 11.1 ARDEX Undertile Liquid Membranes are impervious to water, and when appropriately designed and installed will prevent water from penetrating behind linings or entering concealed spaces.
- Surfaces must be finished with ceramic or stone tiles. A means of compliance with 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].
- 11.3 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.
- 11.4 ARDEX Undertile Liquid Membranes are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of compliance for overflow is given in NZBC Acceptable Solution E3/AS1, Section 2.
- 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 the flooring and wall lining manufacturers.
- 11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must overlap the membrane a minimum of 30 mm.

Installation Information

Installation Skill Level Requirement

- 12.1 Installation of the membranes must be completed by trained installers, approved by ARDEX New Zealand Limited.
- 12.2 Installation of substrates must be completed by, or under the supervision of, licensed Building Practitioners with the relevant Licence Class, in accordance with instructions given within the ARDEX New Zealand Limited Technical Literature and this Appraisal.

Preparation of Substrates

- 13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.
- 13.2 The relative humidity of concrete substrates must be 75% or less before membrane application. The concrete can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 585.
- 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 reinforcements installed as set out in the Technical Literature.
- 13.4 Substrates must be primed with ARDEX Primer and allowed to dry fully before the membrane is installed.



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Membrane Installation

- 14.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.
- 14.2 ARDEX WPM 002 liquid and dry components must be mixed and left to stand for 5 minutes before re-mixing, then applying. ARDEX WPM 001 and ARDEX WPM 155 Rapid 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 finished thickness of 1.0 1.5 mm. Subsequent coats must be applied at an opposite direction to the previous coat.
- 14.4 Application can be made by roller (medium/long nap), brush (long bristle), or a flat steel trowel.
- 14.5 Reinforcement fabric is bedded into the wet layer between coats to provide movement protection at wall/wall and wall/floor junctions, and at any other areas such as joints in the flooring substrate, floor cracks or around penetrations in the membrane. ARDEX STB Tape must be used with ARDEX WPM 155 to take advantage of the rapid/fast drying features.
- 14.6 Clean up may be undertaken with water.

Tiling

- 15.1 The membrane must be fully cured before tiling. The cured membrane 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 Practice Guide Tiling. The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or ARDEX New Zealand Limited.

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 supplier'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 membrane are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.



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Basis of Appraisal

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

Tests

- 18.1 The following testing of ARDEX WPM 001 and ARDEX WPM 002 has been undertaken by ARDEX Australia Pty Ltd research and development laboratory: water vapour transmission; water absorption; tensile strength and elongation before and after UV exposure, immersion in bleach, immersion in industrial detergent and immersion in water. Test methods and results were reviewed by BRANZ and found to be satisfactory.
- 18.2 The following testing of ARDEX WPM 001 was undertaken by the Commonwealth Scientific Industrial Research Organisation (CSIRO) Australia:
 - In accordance with ANSI A118.10 for ICBO Evaluation Service dimensional stability; waterproofness; shear strength to ceramic tile and cement mortar; and fungal and microorganism resistance.
 - In accordance with AS 1145 behaviour under cyclic strain.
- 18.3 Testing of ARDEX WPM 001 and ARDEX WPM 002 has been undertaken by BRANZ for low temperature flexibility and peel adhesion after heat/humidity aging.
- 18.4 The following testing of ARDEX WPM 155 Rapid was undertaken by various organisations:
 - Durability testing to AS/NZS 4858 Appendix A including effect of heat aging, bleach, detergent and water on tensile strength and elongation.
 - Cyclic movement resistance requirements of AS/NZS 4858:2004 Appendix B.
 - Water Vapour Transmission using both wet and dry cup methods from ASTM E96.
 - Water transmission behaviour following the procedures of AS/NZS 4858 Appendix C.
- 18.5 The above 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 the ARDEX Undertile Liquid Membranes by BRANZ technical experts.
- 19.2 Site inspections have been 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 membrane 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 membrane's manufacturer has been assessed and found to be satisfactory.
- 20.3 The quality of supply of the membrane system materials to the market is the responsibility of ARDEX New Zealand 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 substrate.
- 20.5 Quality on site is the responsibility of the trained installers, approved by ARDEX New Zealand Ltd.
- 20.6 Building owners are responsible for the maintenance of the ceramic or stone tiles in accordance with the instructions of ARDEX New Zealand Ltd.





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ARDEX UNDERTILE INTERNAL LIQUID WATERPROOFING MEMBRANES

Sources of Information

- AS 3740 2010 Waterproofing of wet areas within residential buildings.
- AS 3958.1: 2007 Ceramic Tiles Guide to the installation of ceramic tiles.
- AS/NZS 1170: 2002 Structural design actions
- AS/NZS 2908.2: 2000 Cellulose-cement products flat sheet.
- AS/NZS 4858 2004 Wet area membranes.
- AS/NZS 2269: 2012 Plywood Structural.
- Good Practice Guide Tiling, BRANZ, April 2015.
- NZS 3101: 2006 Concrete Structures Standard.
- NZS 3602: 2003 Timber and wood-based products for use in buildings.
- NZS 3604: 2011 Timber framed buildings.
- NZS 4229: 2013 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230: 2004 Code of practice for the design of masonry structures.
- Ministry of Business, Innovation and Employment Record of amendments Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ AppraisalAppraisal No. 472 [2017]
17 January 2018

ARDEX UNDERTILE INTERNAL LIQUID WATERPROOFING MEMBRANES



In the opinion of BRANZ, ARDEX Undertile Internal Liquid 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 ARDEX New Zealand 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. ARDEX New Zealand 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;
 - 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 ARDEX New Zealand 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 ARDEX New Zealand Limited or any third party.

For BRANZ

Chelydra Percy Chief Executive Date of Issue:

17 January 2018

7123B Buteline Hot & Cold Water System



Buteline NZ Ltd

+64 09 2735800 paul.carrington@buteline.com www.buteline.com/nz/

SUPPORTING DOCUMENTS

Rheem - HWC

Ref 35928. Uploaded 29 Oct 2021
Purpose: Installation

Rheem MPSSCOIL-SDoC

Ref 35927. Uploaded 29 Oct 2021
Purpose: Performance

320297A Feb 2018



INSTALLATION INSTRUCTIONS & OWNER'S GUIDE

RHEEM STAINLESS STEEL COILED ELECTRIC WATER HEATERS

Congratulations for choosing a Rheem Water Heater

It is important that you take a few minutes to read this booklet as this will help you get a long, safe and trouble-free life from your water heater.

If you require any further information or your water heater needs to be serviced, please contact

Rheem Service on 0800 657 335 or your local plumber.

Important to the Installer

This water heater must be installed and serviced by a qualified person.

Do not leave this booklet inside the element cover after installation. Please leave the booklet with the householder or owner.

www.rheem.co.nz

IMPORTANT INFORMATION

GENERAL

The information contained in this guide, and all other information or advice given at any time by Rheem New Zealand Limited in connection with the purchase, installation or use of a Rheem water heater, is given in good faith. Subject to any rights the owner may have under the "Consumer Guarantees Act 1993", Rheem New Zealand Limited will not be liable to any person for any inaccuracy or omission in the information or advice arising through the fault or negligence of Rheem New Zealand Limited or any other person or through any other cause whatsoever.

This water heater is designed for use in a single family domestic dwelling for the purpose of heating potable water. Its use in an application other than this may shorten its life.

Warning: This water heater is only intended to be operated by persons who have the experience or knowledge and capabilities to do so. This water heater is not intended to be operated by persons with reduced physical, sensory or mental capabilities i.e. the infirm, or by children.

ABOUT YOUR WATER HEATER

DOES THE WATER QUALITY AFFECT THE WATER HEATER?

Your water heater is suitable for most public water supplies, however, some water qualities may have a detrimental effect on it. If you are in a known harsh water area please read pages 8 and 9.

HOW HOT SHOULD THE WATER BE?

For reasons of safety and economy, we recommend the thermostat is adjusted to the lowest setting that meets your needs. Some models require an authorised person to make any temperature adjustments. The New Zealand Building Code requires a temperature setting of not less than 60°C within the tank to protect against Legionella.

Regulations require an approved temperature limiting device (tempering valve) be fitted into the hot water pipe work to the bathroom(s) and ensuite(s) to provide safety protection from potential scalding. This will keep the hot water supply temperature to the bathroom(s) and ensuite(s) below 55°C which will reduce the risk of scald injury whilst still allowing hotter water (60°C+) to the kitchen and laundry.

To minimise scalding, especially for those people in high scald risk categories i.e. young children, people with potentially incapacitating medical conditions, elderly people etc, this water heater must be installed in accordance with AS/NZS 3500.4.

Children should be supervised to ensure that they should not play with the appliance.

Water temperatures within the tank of 85°C or higher are possible if the water heater is connected to solar panels or any other secondary sources (refer page 6).

Warning: This water heater can deliver water at temperatures which can cause scalding. Always check the water temperature before use, such as when entering a shower or filling a bath or basin, to ensure it is suitable for the application and will not cause a scald injury.

HOW DO I KNOW IF THE WATER HEATER IS INSTALLED CORRECTLY?

Refer to the installation requirements on page 5.

HOW LONG WILL THE WATER HEATER LAST?

There are a number of factors that affect the life of the water heater. These include; the water quality, water pressure, water temperature and the usage pattern, however, your Rheem water heater is supported by a comprehensive warranty (refer to page 10).

HOW THE WATER HEATER WORKS

SINGLE AND TWIN ELEMENT MODELS

Water stored within the water heater is heated by the electric heating element. The thermostat controls the electricity supply to the heating element so that a constant water temperature is maintained. As the cold water is heated it expands approximately 1/50 of its volume and as a result, a small amount of water is discharged from the cold water expansion valve.

MODELS WITH ADDITIONAL CONNECTIONS OR COIL(S)

In addition to electric heating elements, models with additional sockets may be connected to alternative energy sources such as heat pump water heaters or solar panels to heat the water stored within the water heater. Models with 'direct' connections allow hot and cold water to be circulated directly to and from the volume inside the water heater. Models with coils allow heat transfer to occur to and from non-potable fluids being circulated through the coil(s).

Warning: MAX 3.5kW Wetback Output for Coils. Connection to this water heater of any external heating source must be designed and installed by qualified and authorised persons in accordance with relevant regulations and standards. Failure to comply may cause a dangerous situation and void the warranty.

SAFETY

On all models, a Temperature and Pressure Relief valve is supplied with each water heater. It can be found inside the front cover and must be fitted to the appropriate socket on the top side of the water heater. Also fitted to the water heater is a thermostat which incorporates an over-temperature thermal cut-out device.

Warning: The thermostat installed with the water heater is NOT resettable, but a 'one-shot' device. Should the thermostat not operate or fail it is due to a non-operational element that will require the services of an authorised service person.

Warning: These safety devices must not be tampered with, or removed, and under no circumstances operate the water heater unless both devices are fitted.

REGULAR CARE

MANUALLY OPERATING THE TEMPERATURE AND PRESSURE RELIEF VALVE:

Valve manufacturers recommend that you operate the easing lever (see diagram 1) on the Temperature and Pressure Relief valve once every six months. It is very important that you raise and lower the lever gently.

Warning: To ensure the relief valve is working correctly, operate the relief valve easing lever at least every six months. Failure to operate the reliefvalve at least once every six months may result in the water heater exploding.

DIAGRAM 1

Lift until water flows from the drain line – lower gently

Drain line



If water does not flow freely from the drain line or the valve fails to completely close and water continues to be discharged, contact Rheem Service on **0800 657 335**, or your local plumber.

Warning: Continuous leakage of water from the valve may indicate a problem with the water heater. The pressure-relief valve is to be operated regularly to remove lime deposits and to verify that it is not blocked. The water may drip from the discharge pipe of the pressure-relief device and that this pipe must be left open to the atmosphere.

GOING ON HOLIDAYS:

If you plan to be away from home for one or two nights, we suggest that you leave the water heater switched on. However, if you plan to stay away more than a few nights, you can conserve energy by switching the water heater off at the isolating switch, or at the main switchboard. In locations where freezing could occur, you should leave the water heater turned on.

Where alternative energy sources are in use, consult the user manual for the energy source for instructions to switch off the system when going on vacation.

SAVE A SERVICE CALL

Check the items below before making a service call. You may be charged for service if the fault is not related to the water heater manufacture or parts supplied with the water heater by Rheem.

WATER DISCHARGING FROM CONTROL VALVES

It is normal for the cold water expansion valve to discharge a small quantity of cold water during the heating cycle. If a cold water expansion valve is not fitted, then the Temperature and Pressure Relief (TPR) valve may discharge a small quantity of hot water. If either of these valves discharges more than a bucket full of water in 24 hours, one of the following may be the cause.

- Continuous dribble from valve, vent or drain line
 - Try gently raising the easing lever on the TPR valve for a few seconds. This may dislodge small particles of foreign matter and clear the fault.
- Heavy flow of hot water discharging from valve, vent or drain line
 Immediately turn off the electricity supply to the water heater. Call Rheem Service or your local plumber to arrange an inspection.
- A steady flow of water (often at night) from vent or drain line.

This may indicate that your cold water pressure sometimes rises above the design pressure of your water heating system. A Pressure Limiting valve should be installed, or if one is installed, it may need replacing.

NOT ENOUGH HOT WATER (or no hot water)

- Is the electricity turned on?
 - Check the switch marked 'water heater' at the switchboard and the water heater isolating switch. Check the fuse or circuit breaker marked 'water heater'.
- Where the water heater is connected to an off peak (night rate) electrical tariff, the supply may not be available at certain times of the day.
- Do you have the correct size heater for your requirements?

Refer to the sizing guide in the Rheem sales literature or the Rheem website.

Is one outlet (especially the shower) using more hot water than you think?

Carefully review the family's hot water usage and if necessary check the shower flow rate. For optimum hot water usage we recommend the shower flow rate is between 8 to 10 litres per minute. This can be achieved by either a flow restrictor or a flow control valve.

HIGH ELECTRICITY BILLS

- Is one outlet (especially the shower) using more hot water than you think? (see above)
- Is there a leaking hot water pipe, dripping hot water tap, etc?

Even a small leak will waste a surprisingly large quantity of hot water and energy. Service dripping taps, and have your plumber rectify any leaking pipe-work.

- Are either of the expansion valves discharging too much water? (see above)
- Consider recent changes to your hot water usage pattern and check if there has been an increase in energy tariffs since your previous account.

INSTALLATION

Please take careful notice of the advice given as Rheem New Zealand Limited will not be liable for any loss or damage suffered as a result of the incorrect installation of the water heater, or any failure to check the capability of the electrical supply and wiring to the water heater.

This water heater is supplied with blanking plug(s) and a TPR valve. The blanking plugs are for spare inlets or outlets (if any) and as such vary in quantity for each model.

The water heater must be installed and serviced by a certified person or registered plumber and the installation must comply with the New Zealand Building Code, Rheem Installation Instructions, AS/NZS 3000 Electrical Installations and all local codes and regulatory authority requirements. Please note also that no warranty costs will be payable where the water heater is located in a position that does not comply with the Rheem water heater installation instructions or relevant statutory requirements, causing the need for major dismantling or removal of cupboards, doors or walls, or use of special equipment to bring the water heater to floor or ground level or to a serviceable position.

WATER HEATER LOCATION

Rheem electric water heaters with a galvanised outer casing are only suitable for <u>indoor</u> installations, whereas water heaters with a factory painted casing are suitable for both indoor and outdoor installations.

Clearance must be allowed for servicing and removal of the water heater and it must be accessible without the use of a ladder or scaffold. Adequate clearance must be provided for: TPR valve removal, element cover and element removal, and anode removal and replacement. Also, the information on the rating label must remain readable once installed.

If the base of the water heater is higher than the lowest hot water outlet by 2.0m or more, the tank may be subject to a negative pressure (partial vacuum) which can cause damage to the water heaters storage cylinder. In this instance, an approved vacuum break valve (RMC #AV50A or equivalent) must be installed at the highest point in the hot water line. Damage to the cylinder caused by incorrect installation is not covered by the Rheem warranty.

WATER SUPPLY PRESSURE

This water heater must be installed with a 500kPa or less pressure limiting valve and appropriate cold water expansion valve. The supplied TPR valve must be fitted and sealed with Teflon tape. Do not use paste and hemp.

CONNECTION SIZES

Hot, cold and alternative energy source connections:
 Relief valve connection:
 Coil connections
 RP ½" / 20mm
 RP ½" / 15mm
 RP 1" / 32mm

INLET/OUTLET CONNECTIONS

Unions must always be provided at the cold water inlet, hot water outlet and at any additional connections to allow for removal of the water heater should it be required. All connection sockets on the water heater are parallel threaded and therefore tapered brass nipples must be used to ensure watertight connections. Parallel brass nipples must not be used and could invalidate warranty.

NON RETURN VALVE

A non return valve must be installed on the cold water line to the water heater.

PIPE SIZES

The cold water line to the water heater should be the same size or bigger than the hot water line from the water heater. For best results, choose the most suitable pipe size for each individual application.

COLD WATER EXPANSION VALVE

A cold water expansion valve must be fitted to the cold water line to the water heater.

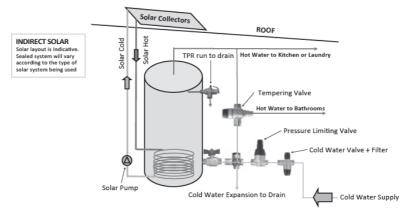
TEMPERATURE AND PRESSURE RELIEF VALVE

When fitting the temperature and pressure relief valve, ensure the probe has not been bent. Seal the thread with PTFE tape, or similar, as recommended by the valve manufacturer and screw the valve into the socket provided. Do not use a wrench on the valve body — use the spanner flats provided. Drain from the TPR valve with a pipe the same size as the valve outlet. The drain must run downwards to a visible point outside the house, and must comply with the NZ Building Code. In locations where the pipe exceeds 3 metres unbroken length, or freezing could occur, an air break must be provided within 300 mm of the TPR valve. A discharge pipe connected to the pressure-relief device is to be installed in a continuously downward direction and in a frost-free environment.

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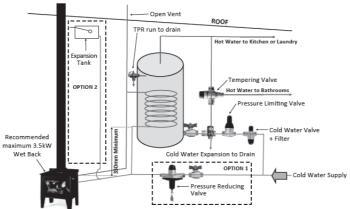
Warning: The drain line from the TPR valve must be in copper. A Rheem mains pressure water heater must <u>not</u> be installed and operated without a suitable temperature and pressure relief valve that complies with AS 1357.1. Under no circumstances block the outlet of this valve or its drain pipe.

DIAGRAM 2 - Solar Coil (Typical Installation)



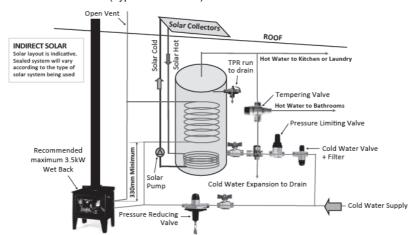
Please refer to New Zealand Building Code Clause G12 for Compliance requirements

DIAGRAM 3 – Wetback Coil - Valve Tank Supply (Typical Installation)



Please refer to New Zealand Building Code Clause G12 for Compliance requirements.

DIAGRAM 4 – Wetback Solar (Typical Installation)



Please refer to New Zealand Building Code Clause G12 for Compliance requirements.

PRESSURE LIMITING VALVE

This water heater must be installed with a 500kPa or less pressure limiting valve and appropriate cold water expansion valve. The supplied TPR valve must be fitted and sealed with Teflon tape. Do not use paste and hemp.

SAFE TRAY

The water heater must be installed with a properly drained safe tray (which is mandatory in the New Zealand Building Code G12), where there is the possibility of water damage to furniture, carpets or building. Failure to do so may jeopardise any warranty claim.

EARTHQUAKE RESTRAINTS

All water heaters must be restrained to protect against seismic forces. Refer to the New Zealand Building Code for acceptable solutions.

CONNECTIONS - ELECTRICAL

The electrical installation must be completed in accordance with AS/NZS 3000. All water heaters are designed for 230 VAC, 50 Hz mains operation and a means of disconnection from the power supply must be incorporated in the fixed wiring during installation.

A flexible 20 mm conduit is required for the electrical cable to the water heater. The conduit is to be connected to the unit with a 20 mm plain to screw adaptor. Connect the power supply wires directly to the terminal block and earth tab connection, ensuring there are no excess wire loops inside the front cover. For details, refer to the wiring diagram on the inside of the element cover. A separate heating element earth wire is not required because the element earths by the flange being in contact with the element socket.

ELEMENT WIRING

All Rheem SS Coiled 356 model series are pre-wired for standard installations where the bottom element only is connected to the mains supply. For alternative energy configurations that require a smaller hot water boost volume, the upper element may be connected instead. The upper element is not factory fitted. For alternative energy installations the following element kitsets are available:

KITSET	DESCRIPTION	FOR MODELS:
# 417026	PC Booster Element & T/stat (MPSS)	356 250/300XXXX

CONNECTIONS – ALTERNATIVE ENERGY SOURCES

TEMPERATURE SENSOR TUBE

All models include provision for temperature sensors used in alternative energy source water heater products that may be connected to this cylinder. Ensure that any additional sensor wiring is routed away from mains wiring and in accordance with the instructions provided by the manufacturer.

TEMPERATURE CONTROL DEVICES AND SETTINGS

The temperature of the water heated by alternative/ supplementary energy sources connected either directly or indirectly (through coils) is controlled exclusively by that energy source controller (e.g. Heat Pump water heater or Solar water heater) not the supplied thermostat. The over-temperature cut out in the supplied thermostat will only activate if the element is being powered at the time of an over temperature event above 85°C.

Warning: The connection of any alternative energy source to this water heater could create a dangerous situation and may jeopardise the water heater warranty. Water heater system design must be carried out by licensed competent persons. For further advice contact Rheem. For uncontrolled heat source, such as wetback heaters or some solar systems, the coil(s) of the water heater must be open vented.

COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

Marning: The power supply to the water heater must not be switched on until the water heater is filled with water and an "Earth Continuity Test", as outlined in Annex A of AS/NZS 60335.1, has been carried out. Failure to do so will damage the element and shorten its life and may create a dangerous situation.

- Open all of the hot water taps in the house (don't forget the shower). Open the cold water isolation valve fully to the water heater to force the air out of the taps. As water flows freely from each tap, close it. Check the pipe-work for leaks.
- Switch on the electrical supply at the isolating switch to the water heater.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater on completion of the installation, such as on a building site or where the premises is vacant, then;

- Switch off the electrical supply at the isolating switch to the water heater.
- Close the cold water isolation valve at the inlet to the water heater.

DRAINING THE WATER HEATER

- Switch off the electrical supply at the isolation switch to the water heater.
- Close the cold water isolation valve.
- Operate the relief valve easing lever to release the pressure in the water heater.
- Drain the water heater through the drain valve or plug.
- Undo the top outlet union or operate the relief valve easing lever again to let air into the water heater and allow the water to drain.

WHAT YOU NEED TO KNOW ABOUT WATER QUALITY

WATER SUPPLY CHEMISTRY

Water quality can have a detrimental effect on water heater operation, components and life expectancy and may affect warranty.

<u>M</u> warning

Warning: This water heater must be installed in accordance with this advice to be covered by the

Rheem warranty.

This water heater is manufactured to suit the water conditions of most public reticulated water supplies. However, there are some known water chemistries which can have detrimental effects on the water heater and its operation and/or life expectancy. This water heater must only be connected to a water supply which complies with these specifications for the Rheem warranty to apply. If you are unsure of your water chemistry, you may be able to obtain information from your local water supply authority or you can contact Rheem and we will provide you with contact details of a suitable agency capable of testing your water for compliance with Rheem standards. Water quality tests must be carried out at the owner's cost.

Water Chemistry Levels Affecting Warranty

The Rheem warranty of this Stainless Steel water heater will not cover resultant faults on components including the storage cylinder where water stored in the storage cylinder exceeds at any time any of the following levels:

Total dissolved solids
Total hardness
Chloride
Magnesium

600 mg/Litre
200 mg/Litre
250 mg/Litre
10 mg/Litre

pH 8.5 (and not less than 6.5)

 Calcium
 20 mg/Litre

 Sodium
 150 mg/Litre

 Iron
 1 mg/Litre

Note on Total Dissolved Solids (TDS)

The Rheem warranty will not cover resultant faults to the storage cylinder if this water heater is connected at any time to a water supply where the TDS content of the water exceeds 600 mg/L. Some water analysis reports may state the conductivity of the water rather than the level of total dissolved solids. Conductivity, measured in microsiemens per centimetre (μ S / cm), is directly proportional to the TDS content of the water. TDS, in mg/L, is approximately 70% of the conductivity in μ S / cm.

In locations where TDS approaches 600 mg/L, e.g. due to sediment, we strongly recommend fitting an appropriate filter to ensure water entering, or in the water heater, does not exceed this level at any time i.e. due to sediment build up.

Scaling Water

Scaling water is water that contains levels of calcium carbonate (total hardness in excess of 200 mg/Litre at any time when the water heater is operating). Scaling water can block and prevent the pressure & temperature relief valve from operating, resulting in damage to the water heater storage cylinder and water heater components.

An expansion control valve must be fitted in ALL areas with scaling water to assist in preventing blockage of the pressure and temperature relief valve.

Marning: Failure to install an expansion control valve where scaling water conditions occur may result in the water heater storage cylinder failing, or under certain circumstances, exploding.

To avoid damage to the storage cylinder and water heater components, Rheem strongly recommends scaling water be treated before entering the water heater by fitting appropriate water filters/conditioners etc. Refer to your Local Water Authority for information on water in your area. A build up of white sediment on hot water taps or shower roses can be indicative of scaling water. Contact Rheem if this condition is observed.

Warning: Damage caused by scaling water can affect the Rheem warranty.

Spring, Dam, Bore & River Water Supplies

The Rheem warranty of this water heater will not cover resultant faults on components including the storage tank due to the effects of sludge and/or sediment as a result of connection to a water supply from silted or treated sources i.e. springs, dams, bores, rivers or towns supplied from a bore.

SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties. In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. When scaling water has a saturation index greater than +0.40 an expansion control valve must be fitted on the cold water line after the non-return valve.

Where the saturation index exceeds +0.80, low watts density elements should be used. Where the saturation index is less than -1.0, a corrosive resistant heating element should be used.

Contact Rheem Service for further information.

RHEEM WARRANTY

Mains Pressure Electric Water Heater Product Warranty --- New Zealand ONLY --

In addition to your legal rights, in New Zealand, Rheem New Zealand Limited makes the following promise to the owner. We will repair or, if necessary, replace a defective water heater or part of it, which has failed due to faulty manufacture on the following terms and conditions:

1. THE RHEEM WARRANTY - GENERAL

- 1.1 This warranty is given in respect of sales in New Zealand by Rheem New Zealand Ltd, Company number 1175771, 475 Rosebank Road, Avondale, Auckland.
- 1.2 Rheem offer a trained and qualified national service network that will repair or replace components at the address where the water heater is installed subject to the terms of the Rheem warranty. In New Zealand contact your Rheem Service Centre on 0800 657 335.
- 1.3 For details about this warranty, you can contact us in New Zealand at rheem@rheem.co.nz or phone your Rheem Service Centre on 0800 657 335.
- 1.4 The terms of this warranty are set out in Section 2 and apply to water heaters manufactured after 1st February 2018.
- 1.5 If a subsequent version of this warranty is published, the terms of that warranty will apply to water heaters manufactured after the date specified in the subsequent version.

2. TERMS OF THE RHEEM WARRANTY AND EXCLUSIONS TO IT

- 2.1 The decision of whether to repair or replace a faulty component is at Rheem New Zealand's sole discretion.
- 2.2 Where a failed component or cylinder is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new Rheem New Zealand Limited warranty.
- 2.3 Where the water heater is installed outside the boundaries of a metropolitan area as defined by Rheem New Zealand Limited or further than 25 km from an Rheem New Zealand Limited Accredited Service Centre's office, the cost of transport, insurance and travelling between the Rheem New Zealand Limited Accredited Service Centre's office and the installed site shall be the owner's responsibility.
- 2.4 Where the water heater is installed in a position that does not allow safe or ready access, the cost of that access, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility. In other words, the cost of dismantling or removing cupboards, doors or walls and the cost of any special equipment to bring the water heater to floor or ground level, or to a serviceable position is not covered by this warranty.
- 2.5 This warranty only applies to the original and genuine Rheem New Zealand Limited's water heater in its original installed location and any genuine Rheem replacement parts.
- 2.6 The Rheem New Zealand Limited warranty does not cover faults that are a result of:
 - a) Accidental damage to the water heater or any component (for example:
 - (i) Acts of God such as floods, storms, fires, lightning strikes and the like; and
 - (ii) Third party acts or omissions).
 - b) Misuse or abnormal use of the water heater.

- c) Installation or use not in accordance with the Owner's Guide and Installation Instructions or with relevant statutory and local requirements (including failure to install a properly drained safe tray where required by the Owner's Guide and Installation Instructions).
- d) Connection at any time to a water supply that does not comply with the water supply guidelines as outlined in the Owner's Guide and Installation Instructions, or poor water quality outside the limits specified in the Owner's Guide and Installation Instructions.
- e) Service or repair work, attempts to repair or modifications to the water heater by a person other than Rheem Service or a Rheem Accredited Service Centre.
- f) Faulty plumbing or faulty power supply.
- g) Failure to maintain the water heater in accordance with the Owner's Guide and Installation Instructions.
- h) Transport damage.
- i) Fair wear and tear from adverse conditions (for example, corrosion).
- Cosmetic defects.
- 2.7 If you require a call out and we find that the fault is not covered by the Rheem warranty, you are responsible for the Rheem Service Centre's call out cost. If you wish to have the relevant component repaired or replaced by Rheem, that service will be at your cost.
- 2.8 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims however arising, including under contract or tort, for damage to furniture, carpet, walls, foundations or any other consequential loss or incidental expenses either directly or indirectly due to leakage from the Rheem water heater, or due to leakage from fittings and/ or pipe work of metal, plastic or other materials caused by water temperature, workmanship or other modes of failure that were not reasonably foreseeable as liable to result from the failure.
- 2.9 This warranty excludes to the extent permissible all implied warranties set out in the Sale of Goods Act 1908 (New Zealand) and all guarantees set out in the Consumer Guarantees Act 1993 (New Zealand) to the extent that the goods are acquired for the purpose of resupply in trade, consumption in the course of a process of production or manufacture or repairing or treating in trade other goods or fixtures on land.

3. WHAT IS COVERED BY THE RHEEM WARRANTY FOR THE WATER HEATERS DETAILED IN THIS DOCUMENT

3.1 Rheem will repair or replace a faulty component of your water heater if it fails to operate in accordance with its specifications as follows:

Warranty Cover	The period from date of installation, in which the fault must appear, in order to be covered		*Domestic use is defined as; when the appliance is installed in a single family domestic dwelling.
What components are covered	Domestic use*	Non-domestic use*	What coverage you receive
All components	1	1	Repair or replacement of failed component, or if necessary, replacement of the complete water heater, free of charge, including labour.
Cylinder only	3	1	Repair or replacement of the complete water heater, free of charge, including labour.
Cylinder only	10	3	Repair or replacement of the complete water heater, free of charge. Installation and labour cost are the responsibility of the owner.

4. ENTITLEMENT TO MAKE A CLAIM UNDER THIS WARRANTY

- 4.1 To be entitled to make a claim under this warranty you need to:
 - a) Be the owner of the water heater or have consent of the owner to act on their behalf
 - b) Contact Rheem Service without undue delay after detection of the defect and, in any event, within the applicable Rheem warranty period.
- 4.2 You are **not** entitled to make a claim under this Rheem warranty if your water heater:
 - a) Does not have its original serial numbers or rating labels.
 - b) Is not installed in New Zealand.

5. HOW TO MAKE A CLAIM UNDER THIS WARRANTY

- 5.1 If you wish to make a claim under this warranty, you need to:
 - a) Contact Rheem on 0800 657 335 and provide owner's details, address of the water heater, a contact number and date of installation of the water heater or if that's unavailable, the date of manufacture and serial number (from the rating label on the water heater)
 - b) Rheem will arrange for the water heater to be assessed on-site and may require the unit to be removed and returned to the factory for further testing.
 - c) If Rheem determines that you have a valid warranty claim, Rheem will repair or replace the water heater in accordance with this warranty
- 5.2 Any expenses incurred in the making of a claim under this warranty will be borne by you.

6. THE CONSUMER GUARANTEES ACT 1993 (NEW ZEALAND)

- 6.1 Our goods come with guarantees that cannot be excluded under the Consumer Guarantees Act 1993 (New Zealand). If the goods fail to comply with the applicable guarantees set out under the Consumer Guarantees Act 1993 (New Zealand) being the guarantee as to acceptable quality, the guarantee as to correspondence with description or the guarantee as to repair and parts, or if the goods fail to comply with any express guarantee given by Rheem, then you are entitled to a replacement or refund and for compensation for any other reasonably foreseeable loss or damage.
- 6.2 The Rheem warranty (set out above) is in addition to any rights and remedies that you may have under the Consumer Guarantees Act 1993 (New Zealand)

RHEEM NEW ZEALAND LTD

www.rheem.co.nz

FOR SERVICE TELEPHONE
0800 657 335 NEW ZEALAND
475 Rosebank Road, Avondale, Auckland

Note: Every care has been taken to ensure accuracy in preparation of this publication. No liability can be accepted for any consequences, which may arise as a result of its application.

Supplier Declaration of Conformity (SDoC) In accordance with ISO/IEC 17050-1:2004

Rheem New Zeal Telephone: +61 9 New Zealand Company Email Address: WWW	9 8290200 No. (if applicable): 1175 rheem.co.nz	e, type, rating, brand,	Contact Address: 475 Rosebank Road Avondale 1026 Auckland New Zealand model, batch numbers, and serial numbers, as applicable): Description
Rheem New Zeal Telephone: +61 S New Zealand Company Email Address: WWW. Medium Risk Article Model number 35625015ML 35625015MR 35625015LL	and Limited 9 8290200 No. (if applicable): 1175 .rheem.co.nz Details³ (Product name) 560W x 1725H	e, type, rating, brand,	475 Rosebank Road Avondale 1026 Auckland New Zealand model, batch numbers, and serial numbers, as applicable):
Telephone: +61 9 New Zealand Company Email Address: WWW. Medium Risk Article Model number 35625015ML 35625015MR 35625015LL	No. (if applicable): 1175 rheem.co.nz Details³ (Product name) Dimensions (mm) 560W x 1725H	e, type, rating, brand,	Avondale 1026 Auckland New Zealand model, batch numbers, and serial numbers, as applicable):
New Zealand Company Email Address: WWW. Medium Risk Article Model number 35625015ML 35625015MR	No. (if applicable): 1175 .rheem.co.nz - Details³ (Product nam) Dimensions (mm) 560W x 1725H	e, type, rating, brand,	Auckland New Zealand model, batch numbers, and serial numbers, as applicable):
New Zealand Company Email Address: WWW. Medium Risk Article Model number 35625015ML 35625015MR 35625015LL	No. (if applicable): 1175 .rheem.co.nz - Details³ (Product nam) Dimensions (mm) 560W x 1725H	e, type, rating, brand,	New Zealand model, batch numbers, and serial numbers, as applicable):
Medium Risk Article Model number 35625015ML 35625015MR 35625015LL	- Details³ (Product nam Dimensions (mm) 560W x 1725H	e, type, rating, brand,	model, batch numbers, and serial numbers, as applicable):
Medium Risk Article Model number 35625015ML 35625015MR 35625015LL	– Details ³ (Product nam Dimensions (mm) 560W x 1725H		
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	560W x 1725H		60x1725 3kW Lower Coil LHD, Rheem
75025015LIK	560W x 1725H		60x1725 3kW Lower Coil RHD, Rheem
35625015DL	560W x 1725H		60x1725 3kW Dower con Rrib, Rheem
35630015ML	560W x 2045H		60x2045 3kW Mid Coil LHD, Rheem
35630015MR	560W x 2045H		60x2045 3kW Mid Coil RHD, Rheem
35630015MR	560W x 2045H		
35630015LR	560W x 2045H	MPSS 300L Int 560x2045 3kW Lower Coil LHD, Rheem	
35630015LK	560W x 2045H	MPSS 300L Int 560x2045 3kW Lower Coil RHD, Rheem MPSS 300L Int 560x2045 3kW Dual Coil LHD, Rheem	
Standard title: "Household and si General requireme	milar electrical applia ents"	nces – Safety –	Standard title: "Particular requirements for storage water heaters"
AS/NZS ZZ modified Yes No No N/A		N/A 🔀	AS/NZS ZZ modified Yes No No N/A
OR Complies with the 0	Conformity Cooperation A	greement ⁵ Yes	No 🖂
lames and addresse	es of any testing organ	isation or body	
Name(s): UL Intern	ational NZ Ltd	Address(es):	21 Tarndale Grove, Albany, Auckland 0632, New Zealand
Name(s):		Address(es):	
	nt test reports/certificat		late that show how compliance is achieved Report Certification or Document Issue dates(s):
with cited standard is acl	nieved:	2014 11 12 2 11	reference N°(s):
AS/NZS60335.2.2 AS/NZS60335.1:2			12178454-SA00 04 April 2018
Reference to any manag	ement quality system involv	ved: IANZ	

SUPPLIER DECLARATION OF CONFORMITY (SDoC)

In accordance with ISO/IEC 17050-1:2004



I hereby declare that the above specified fittings or electrical app Regulations 2010.	liances comply with the requirements of Regulation 83 of the Electricity (Safety)
Signed for and on behalf of:	Issuer Identification (as affixed to the article)
Rheem New Zealand Limited Name and position as authorized by the issuer ⁷ : Stephen Bordon, R&D Manager Signature:	Date:
	18/04/18

Notes for completion

- 1. Every declaration of conformity should be uniquely identified.
- The responsible issuer must be unequivocally specified.
- The "Article" must be unequivocally described so that the declaration of conformity may be related to the article in question. For mass-produced-products, it is not necessary to give individual serial numbers. Where variants of an article are to be covered, these must be detailed.
- 4. The cited standard is the applicable specific safety standard exactly as it is cited in <u>Schedule 4 of the Electricity (Safety) Regulations 2010</u> or AS/NZS 3820, at the date that the declaration is signed. Where a valid Approval exists for a product issued by an Australian State Regulator Office (only), a copy of the Approval Certificate maybe used as evidence of compliance with the alternative AS/NZS 3820.
- 5. This is for products imported and offered for sale under the explicit control of the China "Conformity Cooperation Agreement" such product will be marked in accordance with that agreement and NZ suppliers of such product should obtain documentary evidence to support any claim that a product is covered by the agreement. Warning a product offered for sale that is marked in accordance with the CCA, that is not actually covered by the CCA is illegal and subject to a fixed Infringement Fee fine.
- Text should appear here only if any limitation on the validity of the declaration of conformity and/or any additional information are given.
- Full name and function of the signing person(s) authorised by the issuer's management to sign on its behalf should be given. The number of signatures, or equivalent, included will be the minimum determined by the legal form of the issuer's organisation.

Continuing validity of the declaration of conformity

The issuer of the declaration of conformity shall have procedures in place to ensure the continued conformity of the medium risk article, as delivered or accepted, with the stated requirements of the declaration of conformity.

The issuer of the declaration of conformity shall have procedures in place to re-evaluate the validity of the declaration of conformity, in the event of:-

- a) changes significantly affecting the article design or specification,
- b) changes to the standards which conformity of the article is stated,
- c) changes in the ownership or structure of management of the supplier,
- d) if relevant, or relevant information indicating that the article may no longer conform to the specified requirements.

Additional information regarding the declaration

"Issuer Identification" as affixed to the article: this marking should identify the issuer of the SDoC and may be for example in the form of a NZ GST N°, NZ Company N°, Unique NZ brand name or trademark, or SCN issued by Radio Spectrum Management (this number can be used, even if a C-tick is not required for the article), etc. Failure to mark a product with such unique identification may result in the issuer being held responsible for compliance of an article that may not have been supplied by the issuer, unless the issuer can prove otherwise! This is particularly relevant where the same or very similar model is or may be imported or manufactured, by other NZ suppliers.

A copy of the SDoC and test report(s) (certification) and/or other supporting compliance documentation must be available upon request. (Note: A copy of the SDoC and supporting documentation for a Medium risk declared article must be supplied within 10 working days of a request by Energy Safety. Also a copy of the SDoC must be supplied within 10 working days of a request by any potential purchaser of the Medium risk declared article).

A person who sells or offers for sale, a Medium risk declared article commits an offence, if at the time of sale or offer to sell, a valid declaration of conformity for the article has not been made, or the person cannot provide a copy of the declaration of conformity, within the time allowed. Penalties associated with a grade A offence are fines, not exceeding \$10,000 for an individual or \$50,000 for a body corporate (company) if successfully prosecuted, or a fixed infringement fee, of \$1,000 for an individual or \$3,000 for a body corporate (company).

SUPPLIER DECLARATION OF CONFORMITY (SDoC) In accordance with ISO/IEC 17050-1:2004

See listings of the current regulatory definitions for electrical equipment deemed to be medium risk articles, on the Energy Safety website www.energysafety.govt.nz.

This form can be edited to increase any text box size, in order to insert more detail, than the current space allows, if required.

This is an example ISO/IEC 17050-1 form for a recognised declaration of conformity; any other form complying with the requirements of ISO/IEC 17050-1:2004, may be used instead, for the purpose of Electricity Regulation 83.

Nothing prevents this form being extended to act as an SDoC, for other regulatory purposes.

This completed form remains with the issuer as part of the documentation required as evidence of compliance DO NOT submit a copy of this form to Energy Safety unless specifically requested to do so.

399

BC210994 Received by Kapiti Coast District Council 8/11/21

ALTERATIONS

12 RAWENE STREET, WAIKANAE

Architectural Specification

Version: Rev_

Phase: BUILDING CONSENT

Date: OCTOBER 2021

Job Number: 20-005

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1220 PROJECT

1. GENERAL

This general section describes the project including:

- A description of the work
- Design construction safety
- Principal's Health & Safety matters
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK

New master bedroom and ensuite extension and kitchen relocation.

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY

The project designers are unaware of unusual or atypical features, which a reasonably experienced contractor may not be aware of, that may present a hazard or risk during a typical construction process. The Contractor is still required to undertake there own assessment, to determine if they consider there are any further safety matters and provide for these in carrying out the construction of the work.

Site

1.5 SITE

The site consists of: Existing dwelling and separate garage with covered

carport.

As shown on drawing: Refer proposed site plan.

1.6 LEGAL DESCRIPTION

The site of the works, the street address and the legal description are shown on the drawings.

1.7 EXISTING BUILDINGS

Existing buildings consist of: Open plan living and dining area, kitchen, 3x bedrooms,

1x bathroom with separate WC and laundry. .

Refer drawing(s): Refer existing demolition plan

1.8 EXISTING SERVICES

The following are the network utility services:

Electrical: Existing
Communications: Existing
Water: Existing
Gas: n/a

Stormwater: On site soak pits

Foul water: To location authority laterals.

The services are also shown on the drawings.

1.9 SITE FEATURES

Established site within a ponding zone.

Site environment - Durability



1.10 EXPOSURE ZONE

The exposure zone is to $\underline{NZS~3604}$, Section 4 Durability, 4.2 Exposure zones and \underline{NZBC} E2/AS1.

The site zone is: Zone C

Site environment - Wind

1.11 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

The design wind pressures are to $\underline{NZS~3604}$, Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.

Building wind zone **High** (refer to NZS 3604, table 5.4)

Site environment - Seismic

1.12 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

The zone is to NZS 3604, Section 5 Bracing design, 5.3 Earthquake bracing demand.

The earthquake zone is: Zone 3



1232 INTERPRETATION & DEFINITIONS

1. GENERAL

This general section relates to definitions and interpretation that are used in this specification.

Definitions

1.1 DEFINITIONS

DELIMITIONS	
Hold point:	A stage of the construction where the contract administrator and any other nominated person requires notice to be given that particular work is to be carried out. Work may not proceed on that particular part until the contract administrator and any other nominated person has advised that work can continue. A notice period of 2 Working Days is required unless stated otherwise.
Notification point:	A stage of the construction where the contract administrator and any other nominated person requires notice to be given that particular work is to be carried out. Work may continue and the contract administrator and any other nominated person may choose whether or not they wish to witness the particular work being carried out. A notice period of 2 Working Days is required unless stated otherwise.
Product:	A thing or substance produced by natural process or manufacture.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Provide and fix:	"Provide" or "fix" or "supply" or "fix" if used separately mean provide and fix unless explicitly stated otherwise.
Required:	Required by the documents, the New Zealand Building Code or by a statutory authority.
Review:	Review by the contract administrator and other consultants is for general compliance only. Review does not remove the need for the contractor to comply with the stated requirements, details and specifications of the manufacturers and suppliers of individual components, materials and finishes. Neither can the review be construed as authorising departures from the contract documents.
Working day:	Working day means a calendar day other than any Saturday, Sunday, public holiday or any day falling within the period from 24 December to 5 January, both days inclusive, irrespective of the days on which work is actually carried out.
Workplace:	Workplace means the place where work is being carried out, or is customarily carried out, for a business or undertaking including any place where a worker goes, or is likely to be, while at work (under Health and Safety at Work Act 2015).

1.2 PERSONNEL

Principal: The person defined as "Principal" in the conditions of contract.

Contractor: The person contracted by the principal to carry out the contract.

Contract administrator:

The person appointed by the principal to administer the contract on the principal's behalf. Where no person has been appointed by the principal, it means the principal or the principal's representative.

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMA American Architectural Manufacturers Association

AS Australian Standard

AS/NZS Joint Australian/New Zealand Standard
ASTM American Society for Testing and Materials

AWCINZ Association of Wall and Ceiling Industries of New Zealand Inc.

BCA Building Consent Authority

BRANZ Building Research Association of New Zealand



BS British Standard COP Code of practice

CSIRO Commonwealth Scientific and Industrial Research Organisation

HERA Heavy Engineering Research Association

LBP Licensed Building Practitioner

MBIE Ministry of Business, Innovation and Employment MPNZA Master Painters New Zealand Association Inc

NZBC New Zealand Building Code
NZS New Zealand Standard

NZS/AS Joint New Zealand/Australian Standard

NZTA New Zealand Transport Agency

NUO Network Utility Operator

OSH Occupational Safety and Health

PCBU Person Conducting a Business or Undertaking (under <u>Health and</u>

Safety at Work Act 2015)

RBW Restricted Building Work

SARNZ Scaffolding and Rigging New Zealand Inc

SED Specific Engineering Design

TA Territorial Authority
TNZ Transit New Zealand

(Transit New Zealand is now New Zealand Transport Agency NZTA -

some specifications are still prefixed TNZ)

1.4 DEFINED WORDS

Words defined in the conditions of contract, New Zealand Standards, or other reference documents, to have the same interpretation and meaning when used in their lower case, title case or upper case form in the specification text.

1.5 WORDS IMPORTING PLURAL AND SINGULAR

Where the context requires, words importing singular only, also include plural and vice versa.



1234 DOCUMENTATION

1. GENERAL

This general section relates to documentation required by the Territorial Authority / Building Consent Authority for compliance with the <u>New Zealand Building Code</u>. It also includes documentation relating to:

- Substitutions
- Manufacturers' documents
- Branded work sections
- Care of construction documents
- Confidentiality of documents
- Receipt of construction documents

Building Consent Authority documentation

1.1 BUILDING CONSENT

Obtain the original building consent forms and documents from the owner and keep them on site, preserve the condition of consent forms and documents. Liaise with the building consent authority for all notices to be given and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

1.2 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004

- to carry out any work not in accordance with the building consent.
- to carry out Restricted Building Work by anyone other than a Licensed Building Practitioner licensed for that type of work.

The resolution of matters concerning building code compliance to be referred to the contract administrator for a direction and then if required to the BCA for consent.

Where any alteration is requested by the territorial authority or any other authority, do not undertake such alteration until the matter has been referred to the contract administrator for direction.

1.3 PROJECT PERSONNEL

Provide names and contact details of the contractor's key personnel and tradespersons who are involved with the project. Review the list once a month and reissue it if changes have been made.

Licensed Building Practitioner documentation

1.4 LICENSED BUILDING PRACTITIONERS

Provide LBP details. Provide names, LBP numbers, areas of practice and contact information. Provide this information to the BCA before commencing work on the Restricted Building Work in the form required by the BCA. Advise the BCA of any change to an LBP previously advised.

Include the following as applicable

- Carpenter
- Foundations 2 Concrete or timber pile foundations constructor
- Roofing 2 Profiled metal roofer and/or wall cladding installer

Also provide names and contact details of the following

- Registered drainlayer
- Registered plumber
- Registered electrician

1.5 RECORD OF WORK

Where Restricted Building Work is carried out by a LBP, on completion provide a Record of Work. Provide copies to both the BCA and the Contract Administrator.

Compliance information

1.6 DOCUMENTATION REQUIRED FOR CODE COMPLIANCE

Information may be required either as a condition of the contract documents or as a condition of the building consent. It may include the following:

- Applicators approval certificate from the manufacturer / supplier
- Manufacturer's / supplier's warranty
- Installer / applicator's warranty
- Producer Statement (PS1) Design
- Producer Statement (PS3) Construction from the applicator / installer
- Producer Statement (PS4) Construction review from an acceptable suitably qualified person

Refer to the general sections for the requirements for compliance information to be provided by the contractor.

Refer to the building consent for the requirements for compliance information to be provided by the contractor.

Obtain required documents from the relevant parties for delivery to the contract administrator after the final inspection has been carried out by the BCA.

1.7 PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the Building Consent Authority and the Contract Administrator. Provide producer statements in the form required by the BCA.

Residential building contract

1.8 CHECKLIST

If requested provide evidence of the prescribed checklist given to the residential client.

1.9 DISCLOSURE STATEMENT

If requested provide evidence of the disclosure statement given to the residential client.

1.10 BUILDING CONTRACT

If requested provide evidence of the written building contract that the residential customer has signed.

1.11 DOCUMENTATION REQUIRED ON COMPLETION

As soon as practicable after completion of the building work, provide in writing the following information and documentation to the client and the relevant territorial authority.

Information and documentation relating to:

- The identity of the building contractor and the subcontractors who carried out the work.
- Maintenance requirements for any products incorporated in the building.

If applicable also provide any guarantee or insurance obtained by the building contractor in relation to the building work.

Substitutions

1.12 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.13 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified products and systems listed in a section unless specified otherwise. If a product is not available then immediately contact the contract administrator for direction.



1.14 PROPOSED SUBSTITUTIONS

Substitution of products or systems contained within branded work sections is not allowed. The contractor may propose substitutions to products within non branded work sections, when the contractor has determined that the proposed substitution is an alternative to the specified product. The Contract administrator is not bound to accept any substitutions. Submit a draft proposal detailing the substitution to the contract administrator before proceeding with full notification.

1.15 NOTIFICATION OF SUBSTITUTIONS

Notify the contract administrator of proposed substitution of specified products. Notification to include but not be limited to:

- Product identification
- Manufacturer's name, address, telephone number, website and email address
- Detailed comparison between the properties and characteristics of the specified product and the proposed substitution
- Statement of NZBC compliance including durability
- Details of manufacturer warranties

Plus an assessment of:

- Any changes required to the programme including any extension of time required
- Any consequential effects of the proposed substitution
- Any effect the substitution may have on Health & Safety requirements
- Allowance for time and cost for re-design and documentation (if applicable)
- Allowance for time and cost for obtaining an amendment to the Building Consent (if applicable)
- Any change in cost associated with the proposed substitution

and if requested:

- All current manufacturer's literature on the product
- Accreditations and appraisals available
- Reference standards
- Product limitations
- Samples
- List of existing installations in the vicinity of the project

1.16 ACCEPTANCE OF SUBSTITUTIONS

Acceptance of any proposed substitutions will be given in writing by the contract administrator.

Amendments to issued Building Consent

1.17 CONTRACTOR AMENDMENTS TO BUILDING CONSENT

Where the contractor has sought acceptance of a substitution or a variation which is for the contractor's own convenience and the substitution or variation requires an amendment to the Building Consent, the contractor must apply for and obtain the required amendment.

The contractor must:

- Obtain approval for substitutions from the contract administrator.
- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

1.18 PRINCIPAL AMENDMENTS TO BUILDING CONSENT

Where the principal is proposing a substitution or a variation which requires an amendment to the Building Consent, the contractor must provide to the principal information that the contractor has that is required for the amendment.

The principal will:

- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

Manufacturer's documents

1.19 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

Manufacturer's and supplier's requirements, instructions, specifications or details mean those issued by them for their particular product, material or component and are the latest edition.

1.20 CONTRACTOR TO OBTAIN CURRENT DOCUMENTATION

Where manufacturer's installation, application and execution requirements are referred to in this specification, the Contractor must ensure they are fully aware of this documentation. Whenever necessary obtain and keep on site the relevant latest version of such documentation and make it available to workers carrying out that part of the work.

1.21 DOCUMENTATION PROVIDED FOR BUILDING CONSENT

Documentation including manufacturer's installation instructions, specification data sheets, producer statements, BRANZ and similar appraisals may be included in the issued Building Consent. These documents have been provided only to demonstrate compliance with the NZBC.

Branded work sections

1.22 BRANDED PRODUCTS / SYSTEMS

Where branded products and systems are specified, all products and components of the system must be as per the specification.

1.23 CROSS REFERENCED WORK SECTIONS

If any related work is cross referenced to a generic work section, but only the equivalent branded section is included in the specification, use that branded section. Confirm with the contract administrator if there is any doubt.

Care of construction documents

1.24 CONSTRUCTION ISSUE

Take receipt of the plans, specifications and other documents issued "for construction". Keep at least one copy on site available for use by all on site workers. Keep a record of copies provided to others including subcontractors. Protect the documents as appropriate. Obtain replacement copies for documents that have become damaged.

1.25 REVISIONS TO CONSTRUCTION ISSUE

Where revised plans and other documents are issued ensure that superseded documents are deleted from the working sets. Ensure that subcontractors are provided with amended documents. Delete superseded documents by either:

- removing them from the working copy of the construction issue; or
- marking them as superseded

1.26 RETURN DOCUMENTS ISSUED FOR CONSTRUCTION

On completion of the contract works:

- Keep such copies of the plans, specification and other documents as reasonably required for contractor's record purposes.
- Retrieve all other copies no longer required by parties.
- Agree method of disposal of such documents with the Contract Administrator.

The Contract Administrator will advise whether such documents shall be:

- delivered to the Contract Administrator/Owner; or
- disposed of by normal waste disposal methods; or
- disposed of by secure document disposal methods.

Confidentiality of documents

1.27 CONFIDENTIALITY OF DOCUMENTS

Documents shall not be given or copied to others who do not require them for carrying out services required for the construction of the works. Documents are only to be used for the contract. Maintain confidentiality of documents.

2. SELECTIONS

1237 WARRANTIES

1. GENERAL

This general section refers to the requirements for warranties/guarantees, referred to within this specification and referred to within separate specifications/documents relating to this project. It includes:

- Warranties for parts of the work required by the principal in a required form
- Installer/applicator warranties for parts of the work in the installer's/applicator's standard form
- Manufacturer/supplier warranties provided with products, appliances and the like in the manufacturer's/supplier's standard form
- Guarantees provided by contractor in the contractor's standard form

These guarantees/warranties are in addition to any warranties, implied warranties, or guarantees that are required by the Building Act, the Building Regulations, or the building consent.

1.1 SCHEDULE SECTION

Refer to 1237S1 SCHEDULE OF WARRANTIES for work sections contained in this specification that have requirements for warranties.

Warranties

1.2 PROVIDE WARRANTIES

Provide executed warranties in favour of the principal in respect of, but not limited to, materials, components, service, application, installation and finishing called for in that specified section of work. The terms and conditions of the warranty in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability under the terms of the warranty called for in that specified section of work.

- Conform to the WARRANTY AGREEMENT form included in the specification/conditions of contract.
- Commence warranties from the date of practical completion of the contract works (unless otherwise stated).
- Maintain their effectiveness for the times stated.
- Provide executed warranties prior to practical completion.

1.3 WARRANTIES - INSTALLER/APPLICATOR

Where installer/applicator warranties are offered covering execution and materials of proprietary products or complete installations, provide such warranties to the contract administrator. These warranties may be provided in lieu of the warranties that are otherwise required provided that these warranties are subject to similar conditions and periods.

Provide warranties in favour of the principal. The terms and conditions of such warranties in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

1.4 WARRANTIES - MANUFACTURER/SUPPLIER

Where warranties are offered covering materials, equipment, appliances or proprietary products, provide all such warranties to the contract administrator.

Provide warranties in favour of the principal. The terms and conditions of such warranties in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

Submission

1.5 REVIEW BY CONTRACTOR

Obtain the warranties from the installers, applicators, manufacturers and suppliers at the earliest possible date and review to ensure that they are correctly filled out and executed. Where warranties are executed as a deed, ensure that a duplicate copy is provided for execution by the owner/principal. Keep safe and secure until required for submission.

1.6 WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY Obtain copies of warranties required as a condition of the building consent in the form required for submission to the BCA. Keep safe and secure until required at the time of the BCA final inspection and Code Compliance Certificate.

1.7 WARRANTIES - REQUIRED BY CONTRACT

Obtain copies of warranties listed in the contract documents. Provide all warranties at the same time. If the project has an operations and maintenance documentation provision, present the warranties with the operations and maintenance information. If no operations and maintenance documentation provision exists, present the warranties to the contract administrator in a loose-leaf binder with a contents index suitably labelled and including the project name and details. Provide a title on the binder edge "Warranties for (project name)"

1.8 WARRANTIES - SUBMISSION NZS3902:2004 CONTRACT
Refer to NZS 3902 Housing, alterations and small buildings contract. Submit warranties to the owner no later than the time the builder gives Notice of final completion to the owner.

2. SELECTIONS

Project warranties / guarantees

Weathertightness and watertightness warranty

2.1 WEATHERTIGHTNESS AND WATERTIGHTNESS WARRANTY

A warranty is required from the contractor for a minimum period of 2 years, covering the weathertightness of the complete building envelope and the watertightness of all liquid supply and disposal systems and fittings. This general warranty is in addition to any specific warranties required.

Provide this warranty in favour of the principal. The terms and conditions of this warranty in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

- Conform to the standard form WARRANTY AGREEMENT included in the contract documents.
- Commence the warranty from the date of Practical Completion.
- Maintain its effectiveness for the time stated.

1237S1 SCHEDULE OF WARRANTIES

1. GENERAL

This schedule section identifies work sections in the specification that have requirements for warranties.

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1237 WARRANTIES
- Identified Work Sections

Warranties

1.2 WARRANTIES

Refer to the following sections:

4161T Thermakraft Underlays, Foils, DPC, DPM, & Tapes
4231HL James Hardie® Linea™ Cladding
5431KF Kopine Particleboard Floors
5438H James Hardie® Fibre Cement Interior Flooring
6221A ARDEX Tiling Solutions
6700R Resene Painting General

7123B Buteline Hot & Cold Water System 7411 Rainwater Spouting Systems

7701 Electrical Basic

1.3 PROJECT WARRANTIES

Refer to section 1237 WARRANTIES for project warranties.

1.4 WARRANTIES - ADDITIONAL ITEMS

Refer to separate documentation for warranties not contained within this specification.

1270 CONSTRUCTION

1. GENERAL

This GENERAL section relates to common requirements for construction issues including:

- Noise and nuisance
- Set-out and tolerances
- Common execution requirements
- Qualifications
- Common product requirements
- Common requirements for spare and maintenance products
- Cleaning during the works
- Removal of protection
- Completion requirements
- Commissioning
- Defects period submissions
- Completion submissions

Quality control and assurance

1.1 QUALITY ASSURANCE

Carry out and record regular checks of material quality and accuracy, including:

- Concrete quality and finish.
- Dimensional accuracy of structural column locations (following completion of foundations).
- All perimeter columns and frames for plumb.
- Levels of all floors relative to the site datum.
- Framing timber moisture content.

Where any material, quality or dimension falls outside specified or required tolerances, obtain written direction from the contract administrator. Where building consent approval is affected, confirm remedial action with the Building Consent Authority.

Provide all materials, plant, attendances, supervision, inspections and programming to ensure the required quality standards are met by all project personnel.

Noise and nuisance

1.2 LIMIT CONSTRUCTION NOISE

Minimise the effects of noise generation by including in the planning of the work such factors as placing of plant, programming the sequence of operations and other management functions. Limit construction noise to comply with the requirements of NZS 6803, the requirements of the Resource Management Act sections 326, 327 and 328 and the Health and Safety in Employment Regulations 1995 clause 11.

1.3 ACCEPTABLE NOISE LEVELS

Refer to NZS 6803 Tables 2 and 3 for the upper limits of construction work noise received in residential zones, dwellings in rural areas, industrial areas and commercial areas, note also the allowed adjustments. Do not exceed these limits or any limits imposed by regional councils or territorial authorities.

1.4 PROVIDE INFORMATION TO NEIGHBOURS

Provide information to neighbours of any noise generation from the site liable to constitute a problem. Explain to them the means being used to minimise excessive noise and establish with them the timings most suitable for the noise generating work to be carried on.

Discuss with any complainant the measures being used to minimise noise. Where possible modify these measures to accommodate particular circumstances. Finally, determine the sound level at the location under discussion using methods and observation reporting as laid down in NZS 6803. If the noise level is above the upper

limits of NZS 6803, table 2 and table 3, cease the noise generating operation and remedy the problem.

1.5 INCONVENIENCE TO OTHERS

When the works are to be carried out in or around occupied premises, ascertain the nature and times of occupation and use. Carry out the works in a manner to minimise inconvenience, nuisance and danger to occupants and users.

1.6 ROADWAY AND FOOTPATH

Keep the adjacent footpath and road clear at all times. Where work must be carried out in the roadway or footpath, obtain required consents from the territorial authority. Where temporary use is made of the footpath or roadway for deliveries and the like ensure that public safety is protected and the goods and materials moved as soon as practicable. Sweep, wash and otherwise clean the roadway/footpath and restore it to its previous condition.

1.7 VEHICLE CROSSING

Make good damage that has occurred as a result of carrying out the contract works. Where there has been significant damage, contact the territorial authority and obtain instructions for making good. Pay the territorial authority costs associated with making good.

1.8 TRAFFIC SAFETY

The management of traffic safety on-site and related traffic off-site, to <u>WorkSafeManaging Work Site Traffic - Good Practice Guidelines</u>. Movement on- and off-site also to territorial authority and/or NZTA requirements.

1.9 DIRT AND DROPPINGS

Remove dirt and droppings deposited on public or private thoroughfares from vehicles servicing the site to the satisfaction of the appropriate authorities and the contract administrator.

1.10 DAMAGE AND NUISANCE

Take precautions to prevent damage and nuisance from water, fire, smoke, dust, rubbish and all other causes resulting from the construction works.

1.11 SMOKE FREE REQUIREMENTS

In accordance with the Smoke Free Environments Act 1990 smoking is not allowed on site.

1.12 RESTRICTIONS

Do not:

- light rubbish fires on the site.
- bring dogs on to or near the site.
- bring radios/audio players on to the site.

Set-out and tolerances

1.13 SURVEY INFORMATION

Locate and verify survey marks and datum points required to set out the works. Where these do not exist or cannot be located advise the contract administrator who will arrange for the required points to be established.

Record and maintain their position. Re-establish and replace disturbed or obliterated marks.

1.14 DATUM

Establish a permanent site datum to confirm the proposed levels and their relationship to all other existing and new levels.

1.15 SET-OUT

Set out the work to conform with the drawings.

1.16 USE OF SET-OUT INSTRUMENTS

Permit without charge, the use of instruments already on site for checking, setting out and levels.

1.17 CHECK DIMENSIONS

Check all dimensions both on drawings and site, particularly the correlation between components and work in place. Take all dimensions on drawings to be between structural elements before linings or finishes, unless clearly stated otherwise.

1.18 TOLERANCES

All work to be level, plumb, and true to line and face. Unless otherwise specified in specific work sections of this specification, tolerances for structural work shall comply with the following:

Timber framing:	To NZS 3604 Timber-framed buildings
	Clause 2.2 Tolerances
	Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

Execution

1.19 EXAMINE PREVIOUS WORK

Before commencing any part of the work carefully examine the previous work on which it depends, to ensure it is of the required standard.

1.20 REPORT DEFECTIVE PREVIOUS WORK

Refer defects to the contractor to be remedied, if the remedy is outside the scope of the contract documents the contractor shall obtain direction from the contract administrator. Do not carry out work over previous work that is defective and will affect the required standard.

1.21 EXECUTION GENERALLY

Construct the work in accordance with the documents issued for construction including any direction that may have been given by the contract administrator that varies the construction document.

1.22 EXECUTION - NO DETAIL IS PROVIDED

The documents issued for construction will not include all details relating to every material, junction and interface with other materials.

Where the detail provided is of a general nature, or where no detail is provided, refer to the manufacturer's documents for information relating to installation and execution of that part of the work.

Where there is more than one method or detail appropriate to the part of the work in question, refer the options to the Contract Administrator for direction as to which detail or method to use.

1.23 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

Where a NZBC Acceptable Solution is referred to in the specification but not shown on the plans, obtain a copy of that Acceptable Solution and make it available to the workers carrying out that part of the work.

1.24 MINIMISE DELAYS DUE TO WEATHER

Use appropriate techniques and methods to prevent damage and minimise delays due to weather.

Defective or damaged work

1.25 DEFECTIVE OR DAMAGED WORK

Repair defective, damaged and marked elements, or replace them where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Refer to individual work sections for any special requirements.

Qualifications

1.26 QUALIFICATIONS GENERALLY

The work is to be carried out by workers and / or supervisors who are experienced, competent and familiar with the materials and the techniques specified. Workers must also be familiar with the manufacturers' and suppliers' installation and application instructions and standard details provided by them in relation to the use of the products for this project. If requested provide evidence of qualification / experience.

1.27 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

Where restricted building work (RBW) forms part of the contract works, workers, or supervisors of that work must be licensed building practitioners (LBP) holding current licenses for the particular restricted building work.

For rare instances where non-RBW also requires an LBP refer to individual work sections for details.

- 1.28 QUALIFICATIONS WORKERS MANUFACTURER / SUPPLIER REQUIREMENTS Where required by a manufacturer or supplier, workers must be specifically trained /approved / accredited / registered / licensed / certified by them. Refer to individual work sections for details.
- 1.29 QUALIFICATIONS WORKERS LICENSED UNDER STATUTE
 Where workers and / or supervisors of work are required to be licensed, registered or similar under legislation, they must have a current license before they start the work and

maintain currency until their part of the work has been completed and all documentation that is required has been provided.

that is required has been provided

- 1.30 QUALIFICATIONS WORKERS INDUSTRY QUALIFICATION REQUIREMENTS
 Where workers and / or supervisors of work are required to be trained / licensed / certified or similar under industry rules or contractual requirements, they must have a current qualification before they start the work and maintain currency until their part of the work has been completed. Refer to individual work sections for details.
- 1.31 QUALIFICATIONS PRODUCER STATEMENTS

Where producer statements are required for parts of the work, ensure that person is suitably qualified and authorized to issue such producer statements.

1.32 REPLACEMENT OF PERSON

Should it be necessary to replace a person, ensure that records of work, producer statements, warranties and the like required for the part of the work they have carried out are obtained.

Ensure that the replacement person takes responsibility for the work they carry out and that they are able to provide such records of work, producer statements, warranties and the like required as a condition of the contract and the building consent.

Products

1.33 NEW PRODUCTS

Products to be new unless stated otherwise, of the specified standard, and complying with all cited documents.

1.34 COMPATIBILITY OF PRODUCTS

Ensure all parts of a construction or finish are compatible and their individual use approved by the manufacturers and suppliers of other parts of the system. Source all parts of a system from a single manufacturer or supplier.

1.35 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Protect products during transit and delivery on site and / or off site. Reject and replace goods that are defective or damaged or will not provide the required finish.

Handle products carefully to avoid damage and distortion and in accordance with codes of practice and the manufacturer's or supplier's requirements. Avoid any contact with potentially damaging surfaces or conditions.

Store products to avoid visual damage, environmental damage, mechanical damage and distortion. Store in accordance with codes of practice and the product manufacturer's or supplier's requirements. Maintain the proper condition of any protective packaging, wrapping and support.

Refer to individual work sections for any special requirements.

1.36 SUBSTRATE CONDITIONS

Ensure substrate conditions are within the manufacturer's or supplier's stated guidelines both before and during the installation of any material, product or system. Obtain written instructions on the necessary action to rectify unsatisfactory conditions.

1.37 INSTALLING PRODUCTS

Install in accordance with the manufacturer's or supplier's technical literature. Ensure that all installers are familiar with the required substrate conditions and the manufacturer's or supplier's specified preparation, fixing and finishing techniques.

1.38 COMPLY WITH STANDARDS

Comply with the relevant and/or cited Standard for any material or component. Obtain certificates of compliance when requested by the contract administrator.

1.39 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.40 INCOMPATIBLE PRODUCTS

Separate incompatible materials and metals with separation layers, sleeves or gaskets of plastic film, bituminous felt or mastic or paint coatings, installed so that none are visible on exposed surfaces.

Cleaning during the works

1.41 PERIODIC SITE CLEANING

Carry out periodic site cleaning during the contract period. Place waste material in appropriate storage pending removal from the site. Keep food waste separate from construction waste.

1.42 TRADE CLEANING

Keep the work area clean, remove of all debris, unused and temporary materials and elements from the site as work progresses and on completion. Refer to individual work sections for any specific requirements.

Remove protection

1.43 REMOVE PROTECTION

Remove all temporary markings, labels, packaging and coverings to products unless instructed otherwise, or where they are required for protection.

Maintain temporary protection until removal is required by the manufacturer/supplier, the execution of the work or the requirements of individual work sections. Re-establish protection as necessary.

Remove temporary protection and special protection immediately prior to practical completion or before when there is no further risk of damage.

Refer to individual work sections for any special removal requirements.

Completion

1.44 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.45 LEAVE WORK

Leave work to the standard required for the following procedures.

1.46 COMPLETION - TESTS & CERTIFICATION

Carry out tests as detailed in the work sections. If testing identifies a failure to meet performance requirements, notify the contract administrator and any nominated recipient, identify and correct the cause of failure and repeat the test. Submit test results and certification documentation to the contract administrator and any nominated recipient.

1.47 REMOVE CONSTRUCTION WASTE

Remove all debris, unused materials and the like from the site. Arrange for material to be recycled to be collected or delivered to the recycler.

1.48 COMPLETE ALL SERVICES

Ensure all services are complete and operational, with all temporary labelling removed, required labelling fixed and service instructions provided.

1.49 CLEANING BY CONTRACTOR

Clear the contract works of all construction materials, waste, dirt and debris. Clean the contract works including:

- Wipe all surfaces to remove construction dust.
- Clean out all gutters and rainwater heads.
- Wipe dust from both sides of glass. Take particular care when removing paint or cementitious materials to not damage the glass. Do not use metal scrappers that may damage the glass.
- Remove adhesive residue left by labels and other temporary protection/markings.
- Clean out the interior of all cabinetry.
- Wash down external concrete including driveways and concrete masonry. Take care when water blasting to not cause damage to the surface or allow water to enter the building.
- Remove rubbish and building material from the area immediately adjacent to the contract works.

Commissioning

1.50 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.51 MOVING PARTS

Adjust, ease and lubricate all doors, windows, drawers, hardware, appliances, controls and all moving parts to give easy and efficient operation.

1.52 COMMISSIONING - TESTS & CERTIFICATION

Carry out tests as detailed in the work sections. If testing identifies a failure to meet performance requirements, notify the contract administrator and any nominated recipient, identify and correct the cause of failure and repeat the test. Submit test results and certification documentation to the contract administrator and any nominated recipient.

1.53 INSTRUCTION AND DEMONSTRATION

Provide instruction and demonstration to the owner/occupier to the extent that is listed below and as required for them to reasonably occupy and use the building. This is to include at least the following:

- Location and isolation of all services connections.
- Locking and security arrangements.
- Operation of basic building services.
- Special cleaning requirements and procedures.
- Any other features that the owner/occupier needs to know about.

1.54 FINAL COMPLETION - SUBMISSIONS

In addition to requirements in the contract and contained elsewhere in the specification provide:

- Contractors advice that all defects have been corrected and omissions and deferred work completed.
- All documents which the contractor has obtained on behalf of the owner/occupier.

2110 DEMOLITION WORKS

1. GENERAL

This section relates to the demolition of existing buildings and structures in whole or in part, to the extent necessary to carry out the new work.

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC F5/AS1 Construction and demolition hazards
NZS 6803 Acoustics - Construction noise

NZDAA Best practice guidelines for demolition in New Zealand
WorkSafe Management and Removal of Asbestos (Approved CoP)

Health and Safety at Work Act 2015

Health and Safety at Work (Asbestos) Regulations 2016

Requirements

1.2 QUALIFICATION

Carry out demolition only under the supervision of a suitably experienced person and using only experienced operators and drivers. Use only experienced, certified/licensed, construction blasters for explosives demolition.

1.3 NOISE

Refer to NZS 6803, tables 2 and 3 for the allowable upper limits of construction work noise in residential, commercial and industrial areas over the various time periods. Use silenced and noise insulated plant to ensure compliance with these requirements.

1.4 NUISANCE

Take all precautions necessary to minimise nuisance caused by dust, dirt, rubbish and water.

1.5 HEALTH AND SAFETY

Comply with the <u>Health and Safety at Work Act 2015</u> in general, <u>NZBC F5</u>/AS1 and <u>NZDAABest practice guidelines for demolition in New Zealand</u>, section 5 Demolition Safety.

1.6 BUILDING CONSENT REQUIREMENTS

Demolition work to be carried out to building consent requirements

1.7 INSPECTIONS

Inspection of the demolition work to take place at each of the stages as scheduled in the building consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection. Allow 48 hours advanced notice for the inspections.

Obtain and pay for any required inspections which are additional to the building consent.

1.8 SURVEY

Before commencing work, carry out a thorough survey and examination of all buildings or structures to be demolished in order to ensure the extent, sequence, technique and method of demolition proposed can be safely and efficiently carried out.

Take photographs of the works, adjacent buildings and sites, before commencing work. Provide a set of these photographs as a record of existing condition.

1.9 SERVICES

Before commencing demolition, arrange with all utility network operators to disconnect services and remove fittings and equipment. Pay all fees and charges for this work.

1.10 MATERIAL

Material from the demolition becomes the property of the contractor except where expressly provided otherwise. Remove redundant materials from the site as work proceeds.

1.11 SALVAGE

Designated items remain the property of the owner.

1.12 BURNING OF MATERIALS

Burning of materials is not permitted on site.

2. PRODUCTS

2.1 ELEMENTS FOR SALVAGE OR RE-USE

Carefully dismantle, remove and store on site where directed. Protect from damage and weather until required.

3. EXECUTION

3.1 DEMOLITION GENERALLY

Comply with the requirements of <u>NZDAABest practice guidelines for demolition in New Zealand</u>. Submit a written demolition plan to the requirements of section 4.7, Demolition plan (method statement).

3.2 PROTECT

Protect retained parts of existing buildings, the site and site structures, trees and shrubs. Take care in the cutting away and stripping out to reduce the amount of making good.

3.3 SUPPORT

Support and brace the existing structure during the cutting of new openings or the replacement of structural parts. Prevent debris from overloading any part of the structure. Do not remove supports until the new work is strong enough to support the existing structure. Ensure all work remains structurally stable and sound.

3.4 TEMPORARY SCREENS

Erect approved screens wherever penetration of weather, dust and dirt needs to be prevented. Adjust screens as work proceeds.

3.5 SITE SAFETY

Prevent access by unauthorised persons. Illuminate and protect all holes, unsafe buildings and other hazards. Leave site and buildings safe at the close of each day's work.

3.6 FLAMMABLE OR EXPLOSIVE CONDITIONS

Prevent fire or explosion and arrange to alert the appropriate authority where any danger exists.

3.7 DEMOLISH

Demolish buildings and structures down to the existing finished ground level. Do not remove support to adjacent properties or buildings.

3.8 DEMOLITION, ASBESTOS

Where demolition work includes contact with or removal of material containing asbestos, comply with, Health and Safety at Work (Asbestos) Regulations 2016, <u>WorkSafe</u> requirements including <u>WorkSafeManagement and Removal of Asbestos (Approved CoP)</u>, and <u>NZBC F5/AS1</u>.

3.9 DIG OUT

Dig out foundations, footings, basements, floor slabs, paths, drains, cesspits and manholes that are part of or service the demolished building. Do not backfill the resulting voids.

3.10 SALVAGE

Carefully dismantle and store safely all salvage items where directed; for removal, use on the site, or until completion of the works.

3.11 REINSTATE AND MAKE GOOD

Reinstate and make good demolition damage to adjoining properties, existing work, services, or property.

3.12 TAKE AWAY

Take away from the site all plant and equipment, temporary access works and demolished materials and elements. Leave the site completely clean and tidy.

4. SELECTIONS

- 4.1 ELEMENTS FOR DEMOLITION AND DISPOSAL Contractor to liaise with owner.
- 4.2 ELEMENTS FOR SALVAGE AND DISPOSAL BY CONTRACTOR Contractor to liaise with owner.

3821M MITEK TIMBER FRAMING

1. GENERAL

This section relates to the supply and erection of timber framing:

- as a framed structure
- as a partitioning system
- with MiTek® (GANG-NAIL®) timber/composite, lintels, beams, joists, rafters
- with MiTek® LUMBERLOK® timber connectors
- with MiTek® BOWMAC® structural brackets

1.1 RELATED WORK

Refer to 3811M MITEK (GANG-NAIL) PREFABRICATED TIMBER TRUSSES for prefabricated; roof trusses, floor trusses, rafter/purlin trusses.

Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays, foils and DPC.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

SG Structural grade (to NZS 3604, 1.3 **Definitions**)

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1 Durability

AS 1397 Continuous hot-dip metallic coated steel sheet and strip - Coatings of

zinc and zinc alloyed with aluminium and magnesium

AS/NZS 2904 Damp-proof courses and flashings

NZS 3602 Timber and wood-based products for use in building

NZS 3603Timber structures standardNZS 3604Timber-framed buildingsNZS 3622Verification of timber propertiesNZS 3631New Zealand timber grading rules

NZS 3640 Chemical preservation of round and sawn timber
AS/NZS 4347 Damp-proof courses and flashings - Methods of test

WorkSafe Guidelines for the provision of facilities and general safety in the

construction industry.

BRANZ BU 582 Structurally fixed cavity battens

*A copy of NZS 3604 Timber-framed building, must be held on site.

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

MiTek® (GANG-NAIL®) GANGLAM Manual

MiTek® Structural Fixings On-site guide for Building Code Compliance (2012)

MiTek® LUMBERLOK® Floor Joist Stiffener

For the latest version of the documents refer to the manufacturer's web site.

Manufacturer/supplier contact details

Company: MiTek NewZealand Limited

Web:www.miteknz.co.nzEmail:design@miteknz.co.nzTelephone:09 274 7109 or 03 348 8691

Requirements

1.5 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

Compliance information

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's, importer's or distributors warranty
- Installer's / applicator's warranty
- Producer Statement Construction from the applicator / installer
- Producer Statement Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance - Wind and Bracing (design by contractor)

1.8 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the manufacturer's requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

1.9 DESIGN PARAMETERS - BRACING

Design the system and its anchorages/fixings to the manufacturer's requirements and to resist the loads as appropriate for the projects wind zone and earthquake zone stated in the general section 1220 PROJECT.

2. PRODUCTS

Materials

2.1 DIMENSIONS

All timber sizes except for roof battens and other non-gauged timber are actual minimum dried sizes.

2.2 TIMBER FRAMING, TREATED

Species, grade and in service moisture content to <u>NZS 3602</u>, <u>NZBC B2</u>/AS1 and treatment to <u>NZS 3640</u>, <u>NZBC B2</u>/AS1. Structural grade (SG) to <u>NZS 3604</u>, <u>NZS 3622</u> with properties to NZS 3603.

2.3 APPEARANCE TIMBERS

Graded to $\underline{NZS\ 3631}$, treated where required by $\underline{NZBC\ B2}/AS1$, $\underline{NZS\ 3602}$, table 1, and treatment to $\underline{NZS\ 3640}$.

2.4 STRAPPING

Treated to NZBC B2/AS1, NZS 3602, table 1 and to NZS 3640, clause 6.3.1.

Species: Radiata pine

Grade: SG6

Size: 70mm x 45mm, 45mm x 45mm or 45mm x 19mm

2.5 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

If dwangs, nogs or blocking is required for exterior insulated walls, ensure they are not full depth of framing. Install flush with face of wall required, leaving a minimum 20mm or 45mm preferable gap to the other face to NZS 3604, 8.8. Dwangs and nogs if required to be at 1350mm centres maximum to NZS 3604, 8.8.

2.6 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Components

2.7 NAILS

Type to <u>NZS 3604</u>, section 4, **Durability**, and of the size and number for each particular types of joint as laid down in the nailing schedules of <u>NZS 3604</u>, sections 6-10.

2.8 BOLTS AND SCREWS

Bolts and screws of engineering and/or coach type complete with washers, to the requirements of <u>NZS 3604</u>, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10.

2.9 CONNECTORS

MiTek®**LUMBERLOK**® timberconnectors to suit application to <u>NZS 3604</u>. Refer to SELECTIONS for type and size.

2.10 BRACING

MiTek®**LUMBERLOK**® bracing connectors, angle bracing or strlp bracing to suit application to NZS = 3604; section 8, Walls and section 10, Roof Framing. Refer to SELECTIONS for wall, ceiling, roof truss and rafter bracing types.

2.11 HANGERS

MiTek®**LUMBERLOK**® brackets and hanger connectors. Refer to SELECTIONS for type and size.

2.12 TIE DOWN, STRAPS AND TIES

MiTek®**LUMBERLOK**® tie downs, straps and ties to suit application to <u>NZS 3604</u>; section 7, Floors and section 10, Roof framing. Refer to SELECTIONS for type and size.

2.13 SUBFLOOR FIXINGS

MiTek®**LUMBERLOK**® subfloor fixings and connectors to suit application to <u>NZS 3604</u>; section 6, Foundations and subfloor framing. Refer to SELECTIONS for type and size.

2.14 GENERAL FIXINGS

MiTek®**LUMBERLOK**® general fixings including **MiTek**®**LUMBERLOK**® nail plates to suit application to NZS 3604. Refer to SELECTIONS for type and size.

2.15 THREADED RODS

Use stainless steel threaded rods of the required length, with washers and nuts at both ends, when stainless steel bolts of the required length are not available.

2.16 POWDER ACTUATED FASTENERS

To type, size and charge required by the powder actuated tool manufacturer for each particular member and the substrate.

2.17 CORROSION RISKS

For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

3. EXECUTION

Conditions

3.1 PROTECT TIMBER

Protect all timber against damage and from inclement weather. Ensure that any variation in moisture content is kept to a minimum, before and after erection and before enclosure.

3.2 EXECUTION

Execution to comply with <u>NZS 3604</u>, except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the

National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.3 SEPARATION

Separate all timber framing timbers from concrete, masonry and brick by: -

- a full length polyethylene damp-proof membrane overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space

3.4 FRAMING MOISTURE CONTENT

Maximum allowable equilibrium moisture content (EMC) for non air-conditioned or centrally heated buildings, for framing to which linings are attached.

- At erection: 24% EMC maximum
- At enclosure: 20% EMC maximum
- At lining: 16% EMC maximum

3.5 TOLERANCES

Permissible deviations from established lines, grades and dimensions equal to or less than the following. Multiples of given limits are not cumulative.

- Deviation in plan, up to 10 metres, 5mm
- Deviation in plan, over 10 metres, 10mm total
- Deviation from horizontal and vertical, within openings, 3mm.
- Deviation from vertical position per 3 metres, 3mm
- Deviation from horizontal, over 10 metres, 10mm total
- Deviation from horizontal, up to 10 metres, 5mm

Application

3.6 SET-OUT

Set-out framing generally in accordance with the requirements of NZS 3604, to carry superimposed loads and as required to support sheet linings and claddings. When necessary, provide framing to suit any required cladding/lining control joints and sheet joints.

3.7 SET TIMBERS

Set timbers true to required lines and levels with mitres, butt joints, laps and housings cut accurately to provide full and even contact over the whole of the bearing surface.

3.8 TIMBER CUTTING

Select and cut spanning members to minimise allowable defects and avoiding knots and short grain on edges in the middle third, and shakes, splits and checks at mid-span and close to ends.

3.9 TIMBER PLATES AND FURRING

Fix to steelwork with bolts and washers or approved proprietary fastenings at 1 metre maximum spacing and not less than 2 fixings to each member, or to engineering specific design.

3.10 HOLES AND NOTCHES

Limit holes and notches, checks and half-housing for the structure to those allowable in NZS 3604. Neatly form holes and notches for services without lessening the structural integrity of the member.

3.11 CUTTING

Cutting for straightening to comply with NZS 3604, 8.5.3, **Straightening studs**.

3.12 EXPOSED TIMBER CONNECTORS AND FIXINGS

Do not use steel timber connectors and fixings on any structural framing exposed to view unless detailed on the drawings.

3.13 POWDER-ACTUATED FASTENING TOOLS

Comply with the requirements of <u>WorkSafe</u> and the <u>Health and Safety at Work Act 2015</u>. Powder-actuated fastening tool operators to have the appropriate current Certificate and/or Licence and tools to have the appropriate certificate of fitness if necessary.

3.14 ADDITIONAL FRAMING

Position and fix all necessary members for the fixing of all services, fittings, fixtures, edges of linings or claddings, and to provide lateral support to load carrying framing.

3.15 FORM NAILED JOINTS

Fully drive nails in all structural joints with the number and location for each particular joint, to the requirements of the nailing schedules of $\underline{NZS\ 3604}$. Where splitting could occur, pre-drill to 80% of nail diameter.

3.16 FORM BOLTED JOINTS

Drill for and set bolts to ensure full bearing and development of the joint strength, with tension to just set the washers into timber or to engineering specific design.

3.17 FIT CONNECTORS AND FIXINGS

Fit connectors and fixings to obtain full bearing over all contact surfaces and full development of the required loading capacity for that particular joint and in accordance with MiTek® requirements or to engineering specific design.

3.18 FIT JAMB BATTENS

For walls with direct fix cladding, fit 20mm (nominal) jamb battens over the wall underlay, to the jambs of window and door rough openings, to NZBC E2/AS1, fig 72A. Cut around sill flashings. Fix with 60 x 2.8 flat head galvanized nails at 300mm centres.

3.19 FIT BRACING

Fit and fix subfloor, wall and roof bracing elements to the requirements of MiTek® and to NZS 3604, to develop the full number of bracing units required.

3.20 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Completion

3.21 CLEAN UP

Clean up timber framing as the work proceeds so no offcuts, chips, sawdust or any other matter or items remain behind the claddings or linings.

3.22 LEAVE

Leave work to the standard required by following procedures.

3.23 REMOVE

Remove debris, unused materials and elements from the site.

4. SELECTIONS

4.1 SUB-FLOOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Bearers:	Radiata pine	SG8	H1.2
Ground floor joists:	Radiata pine	SG8	H1.2

4.2 FLOOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Mid floor joists:	Radiata pine	SG8	H1.2
Boundary joists:	Radiata pine	SG8	H1.2
Cantilevered joists enclosed decks and	Radiata pine	SG8	H3.2
balconies:			

4.3 EXTERIOR WALL FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Exterior walls:	Radiata pine	SG8	H1.2
Parapets:	Radiata pine	SG8	H1.2
Enclosed decks and balconies:	Radiata pine	SG8	H1.2
Posts for enclosed decks open under:	Radiata pine	SG8	H3.2
Nogs	Radiata pine	SG8	H1.2
Wall battens (not cavity):	Radiata pine	Merch	H1.2
Jamb battens	Radiata pine	Merch	H3.1

4.4 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Rafters:	Radiata pine	SG8	H1.2
Trusses (bolted):	Radiata pine	SG8	H1.2
Purlins:	Radiata pine	SG8	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merch	H1.2
Sarking:	Radiata pine	Merch	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

4.5 INTERIOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Non structural walls:	Radiata pine	SG8	H1.2
Structural and braced walls:	Radiata pine	SG8	H1.2

4.6 CEILING FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Ceiling joists:	Radiata pine	SG8	H1.2
Timber ceiling battens:	Radiata pine	SG8	H1.2

4.7 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

4161T THERMAKRAFT UNDERLAYS, FOILS, DPC, DPM, & TAPES

1. GENERAL

This section relates to the application of **Thermakraft Ltd**, DPC, DPM, Wall & Roof Underlays, Foils, Flashing Tapes, and accessories.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

NZMRM

New Zealand Metal Roofing Manufacturers Inc.

The following definitions apply specifically to this section:

Wall underlay the same meaning as defined in NZBC E2/AS1, covering kraft based

and synthetic wall underlays, sometimes called wall wraps, building

wraps or building papers.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2 Protection from fire NZBC E2/AS1 External moisture

AS 1530.2 Methods for fire tests on building materials, components and

structures - Test for flammability of materials

NZS 2295 Pliable, permeable building underlays AS/NZS 2904 Damp-proof courses and flashings

NZS 3604 Timber-framed buildings

NZS 4214 Methods of determining the total thermal resistance of parts of

buildings

AS/NZS 4389 Roof safety mesh

AS/NZS 4534 Zinc and zinc/aluminium-alloy coatings on steel wire NZMRM CoP NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Thermakraft documents relating to work in this section are:

Thermakraft product manual and technical data sheets.

BRANZ Appraisal 329 - Supercourse 500™ Damp-Proof Course and Concealed Flashing

BRANZ Appraisal 695 - Watergate Plus™ Wall Underlay

BRANZ Appraisal 878 - Thermakraft Aluband™ Window Flashing Tape

BRANZ Appraisal 942 - OneSeal™ Multi-Fit Pipe and Cable Penetration Seals

BRANZ Appraisal 962 - The Thermakraft One Wrap System™

BRANZ Appraisal 1029 - Thermakraft Ausnet™ Hexagonal Wire Mesh

BRANZ Appraisal 1122 - Thermaflash™ Flashing Tape

Manufacturer/supplier contact details
Company: Thermakraft Ltd
Web: www.thermakraft.co.nz
Email: info@thermakraft.co.nz

Telephone: 0800 806 595

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against failure of materials and execution. Thermakraft Ltd warrant performance of products if design and installation comply with relevant technical literature, NZBC, and recognised industry Codes of Practice. Copy of Thermakraft™ Product Warranty available on request.

Requirements

1.5 INSTALLATION SKILL LEVELS

Installers to be experienced in the installation of Thermakraft™ products and familiar with Thermakraft™ technical literature and the related documents listed in this design i.e. NZMRM CoP NZ Metal Roof and Wall Cladding Code of Practice.

1.6 QUALIFICATIONS WORKERS - LICENSED UNDER STATUTE

Workers and supervisors to be appropriately qualified to applicable legislative requirements. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified materials, or associated products, components or accessories.

Compliance information

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer / supplier warranty
- Installer / applicator warranty
- Producer Statement Construction from the applicator / installer
- Producer Statement Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance - general

1.9 SURFACE FIRE PROPERTIES FOR LININGS
Group Number to NZBC C/AS2, Table 4.3. Refer to SELECTIONS.

2. PRODUCTS

Materials

Damp Proof Course

2.1 SUPERCOURSE 500™ DPC

Supercourse 500[™], high-impact polyethylene film to <u>AS/NZS 2904</u> and embossed on both sides. Thickness 500 microns minimum, manufactured for use as a damp-proof course and concealed flashings around doors and windows and to <u>BRANZ Appraisal 329</u>. Refer to SELECTIONS for type of joining tape.

Wall underlays

Wall underlays - synthetic, fire-retardant, air barriers

2.2 WATERGATE PLUS ™ SYNTHETIC WALL UNDERLAY

Watergate $Plus^{TM}$, specifically designed as a wall underlay. Absorbent breathable spun bonded non-woven polyolefin type building membrane, coated with a water resistant vapour permeable film. A fire retardant membrane, with Flammability Index of ≤ 5 , when tested to AS 1530.2. The product has a <u>BRANZ Appraisal 695</u>, and is included in the Thermakraft One Wrap SystemTM <u>BRANZ Appraisal 962</u>.

Roof underlays

Roof underlays - bituminous, self-supporting

2.3 THERMAKRAFT 215™ BITUMINOUS ROOF UNDERLAY
Thermakraft 215™, bituminous self-supporting roof underlay to NZS 2295.

Window and joinery flashing tape

2.4 THERMAFLASH™ WINDOW FLASHING TAPE

Thermaflash™ is a self-adhesive synthetic flexible window flashing tape, with superior adhesion. can be used with rigid air barrier or rigid wall underlay products. Suitable for use as a flexible flashing around window and door joinery openings. On windows, the use of a Thermakraft Corner Mould™, is optional however butterfly strips must be applied. Available in widths of 75mm, 150mm and 200mm. Use in conjunction with air seals and joinery flashing systems around window and door joinery on timber, steel framed and medium rise buildings.

Compatible with a wide range of sealants but check compatibility. Exposure 180 days. NOT to be used as a flashing tape. <u>BRANZ Appraisal 1122</u>, and is included in the Thermakraft One Wrap System™ <u>BRANZ Appraisal 962</u>. Approved for use with the James Hardie™ RAB™ Board system, refer <u>BRANZ Appraisal 611</u>.

2.5 ALUBAND™ BITUMINOUS FLASHING TAPE

Thermakraft Aluband™ window flashing tape consists of synthetic faced reinforced bituminous window sealing tape, in widths of 75mm, 150mm and 200mm. Used to repair damaged bituminous underlays. Bitumen may react to sealants, always check compatibility. Thermakraft Corner Moulds must be used. Exposure 42 days. Install from 5°C. BRANZ Appraisal 878, and is included in the Thermakraft One Wrap System™ BRANZ Appraisal 962.

Joining tape

2.6 PREMIUM JOINING TAPE™

Thermakraft Premium Joining Tape™, an acrylic, reinforced tape with superior adhesion and tear resistance used to join laps of wall and roof underlays, plywood rigid underlay, OSB board, fibre cement and insulation panels, DPM and vapour control products such as foil underlays. Exposure 180 days, install from -10oC. Compatibility of the substrate with Premium Joining Tape must be checked by the designer or the installer prior to use. BRANZ Appraised and approved for use with the James Hardie™ RAB™ Board system, refer BRANZ Appraisal 611. NOT to be used as a flashing tape.

2.7 WHITE GENERAL PURPOSE TAPE™

Thermakraft White General Purpose Tape™ is a medium duty acrylic tape is commonly used on synthetic underlays, damp proof and for sealing edges of vapour control layers. NOT to be used as a flashing tape. Suitable for joining and sealing underlays, foils and membranes.

Penetration seal

ONESEAL™ MULTI-FIT SEALS FOR CABLE AND PIPE PENETRATIONS
Thermakraft OneSeal™, multi-fit pipe seals comprise a UV resistant EPDM material which forms a weathertight air seal for pipes and penetrations with a high strength acrylic adhesive suitable for use on all underlay systems. Available for use with pipes 15-110mm and cables 7-22mm both are pre-punched ensuring a tight accurate fit. No special tools required for installation. Approved for use with the James Hardie™ RAB™ Board system, refer BRANZ Appraisal 611. Included in the Thermakraft One Wrap System™ BRANZ Appraisal 962

Accessories

2.9 THERMASTRAP™ MEDIUM DUTY STUD STRAP Thermastrap™, 19mm wide blue polythene straps.

Suppport netting

2.10 AUSNET™ HEXAGONAL WIRE UNDERLAY SUPPORT NETTING
Thermakraft Ausnet 50mm and 75mm galvanized hexagonal wire netting to <u>AS/NZS</u>
4534.

3. EXECUTION

Conditions

3.1 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Carry out remedial work identified before laying underlay.

Moisture content: 20% maximum

3.2 GENERAL REQUIREMENTS

Design application and installation of Thermakraft Building products to NZBC E2/AS1, BRANZ Appraisals, Thermakraft Technical Literature and Industry Codes of Practice.

Application generally

3.3 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application DPC

3.4 DPC TO LOSP/CCA TREATED TIMBER

Lay Supercourse 500™ DPC under LOSP or CCA treated bottom plate of all timber framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

3.5 DPC TO TIMBER / STEEL

Lay Supercourse 500™ under the bottom plate of all timber / steel framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier. Refer to SELECTIONS for type.

3.6 DPC TO MASONRY AND BRICK VENEER

Lay Supercourse 500™ along based of cavity and fix top edge to studs with galvanized clouts. Turn DPC out over concrete rebate under bottom course of veneer.

Application - wall underlay

3.7 WALL UNDERLAY

Fix horizontally to outside face of framing in true alignment, with succeeding sheets overlapping 150mm to NZBC E2/AS1, 9.1.7, Wall underlay, and refer to Thermakraft for requirement for fastenings. Fix to Thermakraft Technical Data specifications. Scribe neatly around penetrations and openings to leave no gaps. Flash all openings and tape all penetrations in accordance with Thermakraft Installation Guides. Keep clean, undamaged and without visible weather deterioration until closed in.

3.8 INSTALL STUD STRAPS

Over underlay, install stud straps horizontally at 300mm centres, draw taut and fix to studs with stainless steel staples.

3.9 METAL CLADDING ON TIMBER CAVITY BATTENS

Fix strip of DPC Thermakraft Supercourse 500™ as a separator between the timber and metal cladding.

Application - roof underlay

3.10 HEXAGONAL WIRE MESH

Run Thermakraft Ausnet™ hexagonal wire mesh continuously across roof rafters, top truss chords or purlins and fix in place with 25mm long stainless steel staples, galvanized flathead clouts or fencing batten staples onto timber framing or stainless steel self-tapping screws onto steel framing. The installation direction of Ausnet hexagonal wire mesh must be the same as the underlay direction.

3.11 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixings. Lay underlay to avoid excessive dishing between purlins. When

used vertically, limit individual runs to 10 metres for bituminous underlays. Do not lay vertically on roof pitches under 10° without support.

Horizontally lay across the rafter/trusses starting at the gutter line with succeeding sheets in true alignment and lapping 150mm. Scribe around and fit neatly to all penetrations and avoid prolonged exposure by installing the roof immediately.

4. SELECTIONS

For further details on selections go to www.thermakraft.co.nz.

Substitutions are not permitted to the following, unless stated otherwise.

Performance

Damp Proof Course

4.1 THERMAKRAFT SUPERCOURSE 500™ DPC

Location: Between concrete and timber.

Type: Supercourse 500™

Wall underlays - synthetic, fire-retardant, air barriers

4.2 THERMAKRAFT WATERGATE PLUS™ WALL UNDERLAY

Location: New external wall framing, refer drawings.

Type: Thermakraft Watergate Plus™

Joining tape: Thermakraft White General Purpose Tape™ or Thermakraft Premium

Joining Tape™

Flashing tape: Thermakraft Thermaflash™ joinery and flashing tape or Thermakraft

Aluband™ flashing tape

Accessories: Thermakraft Oneseal™ penetration seal

Roof underlays - bituminous, self-supporting

4.3 THERMAKRAFT 215™ BITUMINOUS ROOF UNDERLAY

Location: New roof

Type: Thermakraft 215™

Joining tape: Thermakraft White General Purpose Tape™

Flashing tape: Thermakraft White General Purpose Tape™ or Thermakraft Premium

Joining Tape™

Window and joinery flashing tape

4.4 THERMAKRAFT THERMAFLASH™ FLASHING TAPE

Location: Exterior door and window openings

Sill/head tape: 150mm Thermakraft Thermaflash™ (for 90mm framing)

200mm Thermakraft Thermaflash™ (for 140mm or 150mm framing)

Sill second layer: 75mm Thermakraft Thermaflash™ (on top of sill over first layer)

Sill corners: Thermakraft Thermaflash™

Head corners: 75mm Thermakraft Thermaflash™ butterfly corners

Accessories: Thermakraft Corner Mould™

Joining tape

4.5 THERMAKRAFT PREMIUM JOINING TAPE™

Location: Exterior wall and roof underlay jointing
Joining tape: 75mm Thermakraft Premium Joining Tape™

4.6 THERMAKRAFT WHITE GENERAL PURPOSE TAPE™

Location: Exterior wall and roof underlay jointing

Joining tape: 60mm Thermakraft White General Purpose Tape™

Penetration seals

4.7 THERMAKRAFT ONESEAL™ PENETRATION SEAL

Location: Pipe and cable wall penetrations

Type: Thermakraft OneSeal™

Stud straps

4.8 THERMAKRAFT THERMASTRAP™ STUD STRAPS

Location: Behind wall underlay at 300mm crs. between dwangs

Type: Thermakraft Thermastrap™ 25mm

Support netting

4.9 THERMAKRAFT AUSNET™ SUPPORT NETTING

Location: To support new roof underlay.

Type: Thermakraft Ausnet™ Hexagonal Wire Mesh 75mm

4230 WALL CLADDING

1. GENERAL

This section relates to the supply and installation of exterior cladding, including:

- associated flashings
- timber fascias
- timber barges
- timber trims
- timber beads
- timber facings

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays, foils and DPC. Refer to 4231HL James Hardie® Linea™ Cladding for vertical cladding.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1 Durability

NZBC E2/AS1 External moisture

AS/NZS 1491 Finger jointed structural timber
AS/NZS 2269.0 Plywood - Structural - Specification
Cellulose-cement products - Flat sheets

NZS 3602 Timber and wood-based products for use in building

NZS 3604 Timber-framed buildings

NZS 3617 Profiles of weatherboards fascia boards and flooring

New Zealand timber grading rules

BRANZ BU 601 Sealants for cladding joints

Performance

1.3 PERFORMANCE

Accept responsibility for the weathertight performance of the completed cladding system, including all penetrations.

Requirements

2. PRODUCTS

2.1 WALL UNDERLAYS

For flexible wall underlays, rigid wall underlays and rigid air barriers, refer to the appropriate separate section(s).

2.2 TIMBER WEATHERBOARD

Dressing grade to <u>NZS 3631</u>, to <u>NZS 3617</u> for profile and treated to <u>NZS 3602</u>, table 2, reference 2.A1, Requirements for wood-based building components to achieve a 15-year durability performance.

2.3 FIBRE-CEMENT SOFFIT LINING

Cellulose cement autoclaved sheets to AS/NZS 2908.2.

2.4 TIMBER FASCIAS AND BARGE BOARDS

Dressing grade to NZS 3631 and treated to NZS 3602, table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance. Finger jointed timber to AS/NZS 1491.

2.5 PVC JOINTERS

To suit sheet thickness.

2.6 NAILS, SCREWS AND FASTENINGS

Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4, Durability.

2.7 FLASHINGS

To <u>NZBC E2</u>/AS1, 4.0 **Flashings**. Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

3. EXECUTION

3.1 MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602 for:

Equilibrium moisture content (EMC)

- Framing: 20% at closing in
- Weatherboards: 14% at time of fixing
- Exterior joinery and trim: 14%

3.2 EXECUTION METHODS AND PRACTICES

To NZS 3604 except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.3 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall underlay/rigid air barrier to openings finished and dressed off with flashing tape ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

3.4 PRIME OR SEAL TIMBER WEATHERBOARDS AND TRIM

Prime or seal all front and back faces, edges and end grain before fixing weatherboards and exterior trim, to the finish and quality specified in painting sections.

3.5 FIXINGS TO TIMBER CLADDINGS

75x3.15mm galv. steel JH nail, 35mm minimum framing penetration. Single fixing 10mm above top of lower board.

3.6 INSTALL TIMBER WEATHERBOARDS

Install level, true to line and face, to $\underline{\mathsf{NZBC}}$ E2/AS1: 9.4 Timber weatherboards. Refer to $\underline{\mathsf{NZS}}$ 3604 for fixings durability requirements for specific provisions.

3.7 INSTALL FIBRE CEMENT SOFFITS WITH JOINTERS AND CAPPING MOULDS
Cut sheets dry and scribe fit to fully support all edges and joints. Nail and drill for and
insert fasteners to the sheet manufacturer's requirements. Fit complete with jointers and
capping moulds. Refer to the cladding manufacturer's literature for fixing details and NZS
3604 for fixings durability requirements for specific provisions.

3.8 INSTALL FLUSH JOINTED FIBRE CEMENT SOFFIT SHEETS

Cut sheets dry, and scribe fit to fully support all edges and joints. Fit expansion joints to limit finished areas to 9 metre x 6 metres maximum, confirm with the sheet manufacturer's requirements. Flush joints with bedding compound reinforcing tape and finishing compound to flush width of 150mm. Refer to the sheet manufacturer's requirements and details.

3.9 INSTALL EXTERIOR TIMBER FINISHINGS

Install timber fascias, barge boards, facings, beads, trim and enclosures level, true to line and face, with all end grain sealed and joints mitred.

3.10 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1.

3.11 USE OF SEALANTS

Selection and use of sealants to follow BRANZ BU 601: Sealants for cladding joints.

3.12 COMPLETE

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

3.13 REPLACE

Replace damaged or marked elements. Remove unused materials from the site.

4. SELECTIONS

4.1 TIMBER WEATHERBOARD

Location: Refer drawings

Size/profile: 6"x1" (existing bevel back weatherboard) new weatherboards to

match size & profile.

Species and grade: Pinus Radiata

Treatment H3.1
Priming Pre-primed

4.2 FIBRE-CEMENT SOFFIT LINING

Brand/type: James Hardie / HardieFlex

Thickness: 4.5mm Finish: paint

4.3 TIMBER FASCIAS AND BARGE BOARDS

Species and grade: Pinus Radiata

Treatment: H3.1

Width: To match existing Priming: Pre-primed

4.4 EXTERIOR FINISHING TIMBER

Species and grade: Pinus Radiata

Treatment: H3.1

Location: Refer drawings Priming: Pre-primed

4.5 PVC JOINTERS

Brand: jJmes Hardie Profile/type: 2-way PVC Colour: White

4.6 NAILS, SCREWS AND FASTENINGS

_	, .	(type, gauge and length)	Centres (general and edge)
Bevel Back	Hot dipped	75x3.15mm JH nail (35mm	600mm
Weatherboard	galvanised steel	minimum framing penetration)	

4231HL JAMES HARDIE® LINEA™ CLADDING

1. GENERAL

This section relates to the supply and fixing of the following fibre cement products:

- Hardie™ Linea™ Weatherboard cladding
- Hardie™ Linea™ Oblique™ Weatherboard cladding

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays, foils and DPC.

Refer to painting section/s for the protective coating required to meet the NZBC durability requirements.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1 External moisture
NZBC E2/VM1 Weathertightness

AS/NZS 1170.2:2011 Structural design actions - Wind actions

AS/NZS 2908.2 Cellulose-cement products - Flat sheet

NZS 3602 Timber and wood-based products for use in building

NZS 3604 Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:

Linea™ Weatherboard Technical Specification

Linea™ Oblique™ Weatherboard Vertical Installation Technical Specification

<u>BRANZ Appraisal 897</u> - Linea™ Oblique™ Weatherboard (Vertical) Cavity Cladding

CodeMark™ <u>GM-CM30059</u> James Hardie® Linea™ Oblique™ Weatherboard Cavity

Cladding

Manufacturer/supplier contact details

Company: James Hardie New Zealand Limited

Web: www.jameshardie.co.nz Email: info@jameshardie.co.nz

Telephone: Ask James Hardie™ on 0800 808 868

BRANZ appraisal is available at www.branz.co.nz.

CodeMark[™] Certificate is available at <u>www.building.govt.nz</u>

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER - LINEA™ OBLIQUE™ WEATHERBOARD

Provide a material manufacturer/supplier warranty:

25 years: Linea™ Oblique™ Weatherboard product (refer to James Hardie®

product warranty)

15 year: For accessories supplied by James Hardie® (refer to James Hardie®

product warranty)

From: Date of purchase

- Provide this warranty on the manufacturer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS - NON-CODEMARK INSTALLATION

Workers / Installers / applicators to be experienced, competent trades people familiar with the materials and techniques specified.

1.6 NO SUBSTITUTIONS

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

1.7 SAFE WORKING

To James Hardie® requirements for safe working practices with James Hardie® products, particularly with regards to cutting and drilling.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide relevant James Hardie® maintenance requirements at completion of the work. Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the information.

Requirements - Linea™ Oblique™ weatherboard

- 1.9 LINEA™ OBLIQUE™ VERTICAL WEATHERBOARD INSTALLATION INFORMATION Installer to comply with all the relevant information in;
 - Linea™ Oblique™ Weatherboard Vertical Installation Technical Specification
 - BRANZ Appraisal 897
- 1.10 LINEA™ OBLIQUE™ WEATHERBOARD INSTALLATION CHECKLIST Installer to complete, sign and provide a James Hardie® Installation Checklist. Contact James Hardie® for a copy of the Installation Checklist.

Performance

1.11 PERFORMANCE, WIND

The design wind zones are to NZS 3604, up to and including Extra High Wind Zone. James Hardie® Technical Specifications are suitable for these conditions.

2. PRODUCTS

Materials

2.1 LINEA™ OBLIQUE™ WEATHERBOARDS

Hardie™ Linea™ Oblique™ Weatherboards, rusticated profile, 16mm thick, pre-primed, manufactured from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving, manufactured to <u>AS/NZS 2908.2</u>, tested to <u>NZBC E2</u>/VM1 for weathertightness and complying with the NZBC.

2.2 WALL UNDERLAY

For flexible wall underlays and rigid wall underlays, refer to the appropriate separate section(s).

Components - Linea™ Oblique™ Weatherboards vertically fixed

2.3 HARDIE™ HORIZONTAL CAVITY BATTEN

Proprietary profiled radiata pine battens, minimum 45mm wide x 20mm thick, H3.1 treated to NZS 3602, Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.4 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated uPVC, with upstands.

2.5 OBLIQUE™ TRIMLINE JOINT FLASHING

Aluminium flashing extrusion used behind cladding at horizontal joints.

2.6 TRIMLINE JOINTERS

Aluminium jointers to joint Oblique™ Trimline Joint Flashings at flashing ends, external corners and internal corners.

2.7 FLEXIBLE SEALANT

Bostik Seal N Flex-1, Sikaflex AT Facade or Sikaflex MS sealants.

2.8 WEATHERBOARD INTERNAL "W" CORNER

Anodised aluminium extrusion to flash behind cladding at internal corners.

2.9 AXENT™ TRIM

16mm thick pre-primed fibre cement trim.

2.10 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to NZS 3604, section 4, **Durability**, for requirements for fixing's material to be used in relation to the exposure conditions.

Refer to <u>NZBC E2</u>/AS1, Table 20, Material selection, and <u>NZBC E2</u>/AS1, Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Zone	Fixings Material
Zone D, Zone E / Microclimates (incl. Geothermal)	Grade 316 Stainless
Zone B, Zone C	Hot-dipped galvanized

Check against SED (specific engineering design) requirements for microclimate conditions. For fastener type refer to following clause(s).

2.11 CAVITY BATTEN NAILS

40 x 2.8mm Hardie[™] Flex nails for fixing timber cavity battens and aluminium flashings.

2.12 HOT DIPPED GALVANIZED NAILS

Hot-dipped galvanized, 65 x 2.87mm D head or 65 x 2.87mm RounDrive ring shank nails for fixing Linea™ Oblique™ Weatherboards over cavity battens over flexible underlay.

Accessories

2.13 SEALANT

Silaflex AT-Facade sealant.

3. EXECUTION

Conditions

3.1 STORAGE

Take delivery of products dry and undamaged on pallets, and keep on pallet. Protect edges and corners from damage and cover to keep dry until fixed.

3.2 HANDLING

Avoid distortion and contact with potentially damaging surfaces. Carry weatherboards on edge. Do not drag weatherboards across each other, or across other materials. Protect edges, corners and surface finish from damage.

3.3 SUBSTRATE - TIMBER FRAMING

Do not commence work until the substrate is of the standard required by James Hardie® for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by NZS 3602 to minimise shrinkage and movement after sheets are fixed.

Application - generally

INSTALL CAVITY BATTENS - LINEA™ OBLIQUE™ VERTICAL WEATHERBOARDS Install 20mm thick Hardie™ Horizontal Cavity Battens. Fix horizontal cavity battens to wall framing nogs, fix vertically to studs at corners and openings. The battens are fixed by the cladding fixings which will penetrate the wall framing nogs and studs under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc).

3.5 PENETRATIONS AND FLASHINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- Wall underlay appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the wall underlay.
- Wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations.
- Required holes in cladding accurately formed and cut to James Hardie® requirements, ensure (if required) services penetration grommets/sleeves/seals/tapes are in place prior to cladding installation.
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).
- 3.6 INSTALL LINEA™ OBLIQUE™ WEATHERBOARDS VERTICAL INSTALLATION
 Cut weatherboards to required lengths. Fit joint flashing, internal corners and external
 corners and fix weatherboards as per Linea™ Oblique™ Weatherboard Vertical technical
 specifications.
- 3.7 INSTALL FLASHINGS

Install flashings at all wall openings, penetrations, junctions, connections, window sills, heads and jambs to NZBC E2/AS1.

Completion

3.8 REPLACE

Replace all damaged or marked elements.

3.9 LEAVE

Leave work to the standard required for following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4. SELECTIONS

For further details on selections go to www.jameshardie.co.nz. Substitutions are not permitted to the following, unless stated otherwise.

Linea™ Oblique™ Weatherboards vertically fixed

4.1 JAMES HARDIE® LINEA™ OBLIQUE™ WEATHERBOARDS VERTICALLY FIXED

Location: Refer drawings

Brand/type: James Hardie® Linea™ Oblique™ Weatherboards

Thickness: 16mm
Width: 200mm
Construction: Cavity fix

Fixing: Refer to items under 2.0 PRODUCTS

4.2 HARDIE™ HORIZONTAL CAVITY BATTENS

Supplier: James Hardie® Timber species: Radiata pine

Treatment: H3.1

4.3 AXENT™ TRIM BOXED CORNER

Location: Refer drawing Brand/type: Axent™ Trim

Thickness: 16mm

Width: 84mm and 100mm width to form boxed corner

Fixing: Refer to items under 2.0 PRODUCTS



4.4 PRIMER TO CUT ENDS

Type: Resene Quick Dry

Finishing

4.5 PAINTING

Refer to painting section(s) for details.



5113G GIB® PLASTERBOARD LININGS

1. GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber and steel framed walls and ceilings to form:

- standard systems
- superior finish quality systems
- bracing systems
- fire rated garage boundary wall systems
- wet area systems
- GIBFix® Framing systems

1.1 RELATED WORK

Refer to 3821M Mitek Timber Framing for wall framing specification.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

AWCINZ Association of Wall and Ceiling Industries New Zealand

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2 Protection from fire NZBC E2/AS1 External moisture

AS 1397 Continuous hot-dip metallic coated steel sheet and strip - Coatings of

zinc and zinc alloyed with aluminium and magnesium

AS/NZS 2588 Gypsum plasterboard

AS/NZS 2589 Gypsum linings - Application and finishing

NZS 3604 Timber-framed buildings

AS/NZS 4600:2005 Cold-formed steel structures

ISO 5660.1 Reaction-to-fire tests - Heat release, smoke production and mass loss

rate - Part 1: Heat release rate (cone calorimeter method)

ISO 5660.2 Reaction-to-fire tests - Heat release, smoke production and mass loss

rate - Part 2: Smoke production rate (dynamic measurement)

BRANZ Technical Paper P21 BRANZ Technical Paper P21: A wall bracing test and

evaluation procedure (2010)

NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and Supplier documents relating to this part of the work.

- GIB® Site Guide (September 2018)
- GIB Aqualine® Wet Area Systems (March 2007)
- GIB Ezybrace® Systems (2016)
- GIB Ezybrace® Bracing Software
- GIBFix® Framing System (2016)
- GIB-Cove®
- GIB RocTape®
- GIB Goldline™ Platinum Tape-on Trims (January

2006)

- GIB UltraFlex® high impact corner mould (September 2004)

BRANZ Appraisal 928 (2016) GIB Ezybrace® Systems 2016
BRANZ Appraisal 427 (2007) GIB Aqualine® Wet Area Systems
BRANZ Appraisal 928 (2016) GIB Ezybrace® Systems 2016



GreenTag Certification WWLCG001-001-A-2015 - GreenTag™ GreenRate /

Level B for:

- GIB® Standard (10mm & 13mm) - GIB Braceline® (10mm & 13mm)

Copies of the above literature

are available at:

Company: Winstone Wallboards

Web: www.gib.co.nz
Telephone: 0800 100 442

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.6 INSTALLER WORK SKILLS AND QUALIFICATIONS

GIB® plasterboard fixers and plasterers to be experienced competent workers, familiar with GIB® plasterboard lining systems installation and finishing techniques. Submit evidence of experience on request. For example:

- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance

1.7 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
- before applying finish coatings or decorative papers,

so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

1.8 BRACING REQUIREMENTS

Braced wall systems to NZS 3604 when tested to BRANZ Technical Paper P21, using:

- GIB Ezybrace® Systems (2016) and/or GIB Ezybrace® Bracing Software (2016) Refer to drawings for location and type.

2. PRODUCTS

Materials

2.1 GIB® PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to <u>AS/NZS 2588</u>. Refer to SELECTIONS for location, type, thickness and finish.

GIB® Standard plasterboard

GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard

GIB Aqualine® wet area plasterboard

Components

2.2 SCREWS

GIB® Grabber® drywall type screws as follows:

OID OI ABBOT OIL Y WAIT TYPE SOLOWS AS TOLIOWS.			
Grabber® type	Used for fixing:		
High Thread	GIB Ezybrace® or Standard systems to timber		
Self Tapping	Standard systems to light gauge steel or timber		
Dual Thread Screws	GIBFix®, GIB Ezybrace®, or Standard systems, to light gauge steel or timber		
Wafer Head Needle Tip	Light gauge metal to timber not directly under plasterboard		



Pancake Head Drill	Light gauge metal to light gauge metal directly under plasterboard
Tip	

Refer to GIB® requirements for appropriate details.

2.3 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

GIB® UltraFlex® high impact corner mould

GIB® Levelline® Tape on Trim

2.4 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.5 CONTROL JOINTS

GIB® Rondo® P35 control joints.

GIB® Goldline™ tape-on trims

GIB® plastic W-profile control joints.

Accessories

2.6 ADHESIVE

Timber frame and/or steel frame:

GIBFix® One ultra low VOC water based wallboard adhesive

GIBFix® All-Bond solvent based wallboard adhesive

2.7 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All
	Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade
	Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®, GIB
	Trade Finish® Multi
Cove:	GIB-Cove® Bond

2.8 JOINTING TAPE

GIB® jointing tape.

2.9 GAP FILLER

GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3. EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements. Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in <u>AS/NZS 2589</u>.

3.4 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to **AS/NZS** 2589.

3.5 SUBSTRATE

Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (September 2018).

3.6 TIMBER FRAME MOISTURE CONTENT

Maximum allowable moisture content to <u>AS/NZS 2589</u> for timber framing at lining: 18% or less for plasterboard linings. Refer to <u>NZBC E2/AS1</u> and GIB® Site Guide (Sept 2018).

3.7 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide (Sept 2018).

Application

3.8 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide (September 2018). Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.9 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.10 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.11 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems (2016)

3.12 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide (September 2018) requirements.

3.13 INSTALL TAPE-ON TRIMS

Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

3.14 FINISHING GENERALLY

To GIB® Site Guide (September 2018) and AS/NZS 2589.

Completion & Commissioning

3.15 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4. SELECTIONS

Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer drawings	GIB® Standard plasterboard	10mm	
ar a minge			

4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Bathrooms	GIB Aqualine® plasterboard	10mm	

4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer drawings	GIB® Standard plasterboard	13mm	

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

	Plasterboard type / Lining requirements	Thickness	Finish Level
Bathrooms	GIB Aqualine® plasterboard	13mm	

4.5 GIB® BRACING SYSTEMS

Refer to:

- GIB Ezybrace® Systems (2016)

For bracing element location refer to drawn documentation.



5431KF KOPINE PARTICLEBOARD FLOORS

1. GENERAL

This section relates to the supply and fixing of **Kopine**® high density particleboard as flooring.

It includes:

- Kopine® UltraLock 12
- Kopine® Tongue & Groove 12
- Kopine® is a registered trademark of the New Zealand Panels Group Limited

1.1 RELATED WORK

Refer to 5438H James Hardie® Fibre Cement Interior Floor for ensuite floor sheathing

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS1, C/AS2 Protection from fire

NZBC C/VM2 Protection from fire

AS/NZS 1860.1 Particleboard flooring - Specifications

NZS 3604 Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Kopine® - Product Warranty

Product Warranty

Material Safety Data Sheet

Technical Data Sheet

Installation Guide & Technical Specification

Environmental Choice Certificate

CodeMark CM70064 - Kopine Flooring Systems - Ultralock™ 12 and - Tongue & Groove

Manufacturer/supplier contact details

Company: Kopine® - a business unit of New Zealand Panels Group

Web: www.kopine.co.nz
Email: sales@kopine.co.nz
Telephone: 0800.866.678

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years Kopine® Ultralock and Tongue & Groove flooring

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of Practical Completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Compliance information

1.5 INFORMATION REQUIRED FOR CODE COMPLIANCE

Where the floor forms part of a structural bracing system, install in accordance with NZS 3604, 7.3 Structural Floor Diaphragms and provide the following compliance documentation:

- Installer's approval certificate from the manufacturer / importer / distributor
- Manufacturer / importer / distributor product warranty
- Installer / applicator workmanship warranty

- Producer Statement (PS3) Construction from the applicator / installer
- Producer Statement (PS4) Construction Review from a suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

2. PRODUCTS

2.1 KOPINE® ULTRALOCK 12 HIGH DENSITY PARTICLEBOARD FLOORING

Kopine® Ultralock 12 High Density Particleboard Flooring is manufactured from sustainably grown NZ plantation pine to <u>AS/NZS 1860.1</u>, the fully glued joints on long edges of adjacent panels significantly reduce any potential for edge peaking. In most cases nogs/dwangs are not required. 20mm thick panels are 2400mm x 1200mm or 3600mm x 1200mm. Flooring meets the requirements of the Environmental Choice Specification EC-32-14 'Furniture & Fittings'

2.2 SCREWS

Sure-fast type countersunk 50mm x 8 gauge, minimum length 50mm, minimum Class 3 or stainless steel

2.3 ADHESIVE

Gorilla Grip Express - single-component polyurethane based construction adhesive or elastomeric construction adhesive.

Always supplied with **Kopine**® flooring and must be used to meet CodeMark requirements.

3. EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

Take delivery of packets of particle board, all from the same batch for clear finish floors and store flat stacked on site and protect from damage. Protect finished surfaces, edges and corners from damage. Move/handle particle board in accordance with **Kopine**® requirements. Reject and replace goods that are damaged or will not provide the required finish.

3.2 WORK GENERALLY

To be carried out to CodeMark CM70064 and the relevant **Kopine**® Installation Guide & Technical Specification.

3.3 LAYING PATTERN

Ensure subfloor framing suits the required laying pattern.

3.4 SUBSTRATE

Do not commence work until the substrate is plumb and level, in true alignment and to **Kopine**® requirements.

3.5 SUPPORT EDGES AND JOINTS

Fully support edges and joints on square edges of sheets. T&G edged sheet joints are not fully supported unless shown otherwise.

3.6 EXPOSURE TO WEATHER

Kopine® flooring must not be exposed to weather for more than 12 weeks.

Application

3.7 ADHESIVE FASTENING

Use adhesive fastening to joists in conjunction with mechanical fixing, using the adhesive supplied by **Kopine**®. Apply adhesive to all floor joists, square edge butt joints and grooved edge butt joints, in accordance with the adhesive manufacturer's requirements.

3.8 SCREW FIXING

Fix screws at 150mm centres along short side of the sheets and around the perimeter of the entire floor, and at 200mm centres along intermediate joists. Fixings must be a

minimum of 10mm from the UltraLock 12 panel edge. With tongue and groove flooring, fix screws 15mm from the edge to avoid tongue damage. Pre-drill sheets for screw fixing. Overdriven screws must be removed and set in a new position.

3.9 EXPANSION JOINTS - LARGER FLOORS

Lay particleboard flooring to allow for a 20mm expansion gap at maximum 10m centres for large floor areas to **Kopine**® requirements. Locate under internal walls where possible.

Installation

3.10 LAYING FLOORING - ULTRALOCK 12 GROOVED EDGE

Install particleboard flooring to Kopine® requirements. Programme work for minimal exposure to weather.

- Lay sheets across the joists in a staggered pattern from the centre of large areas, with continuous edge support at building perimeter. Sheets to span at least 3 joists. Lay sheet brand name down.
- Leave 10mm expansion clearance where partitions or walls interrupt and an 8mm minimum clearance between panel edges and fixed objects including columns and bottom plates. Fix sheets using construction adhesive in conjunction with mechanical fixing.
- Apply adhesive in a continuous 5mm bead to all floor joists and nogs.
- Apply a generous glue bead to short edge of sheet. Repeat application for the groove on the long edge of the sheet.
- Fix sheets with nails or screws to **Kopine**® requirements. Clean off excess adhesive.
- Finish all fixings flush with surface at time of fixing. Tighten fixings; punch nails and tighten screws just prior to sanding. Close butt edges of sheets. Do not cramp sheets. Do not allow water to pond on the floor surface. Clean surface of flooring daily to remove sawdust and shavings, when exposed to the weather.

3.11 FINISHING

Refer to **Kopine**® requirements regarding timing of nail punching and general sanding procedures. Lightly sand for floor coverings and 3-cut sand for clear finish. Hand sand into corners.

Completion

3.12 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.13 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

4. SELECTIONS

For further details on selections go to www.kopine.co.nz. Substitutions are not permitted to the following Kopine® materials and/or associated components, unless stated otherwise.

4.1 PARTICLEBOARD FLOORING - KOPINE® ULTRALOCK 12

Manufacturer/supplier:New Zealand Panel Group

Brand/grade: Kopine® Ultralock 12

Thickness: 20mm

Edge detail: Square edge with groove

Fixing type/finish: Stainless steel screw fixing and adhesive

Floor finish: Carpet

4.2 CONSTRUCTION METHOD

Method: To match existing

Components

4.3 ADHESIVE, MULTIPURPOSE

Holdfast Gorilla Grip Express, polyurethane construction adhesive Brand/type:

(supplied with Kopine® flooring)

4.4 **SCREWS**

Type/size/material: 10g x 50mm stainless steel
Note: screw fixing is unacceptable for diaphragm floors to NZS 3604.



5438H JAMES HARDIE® FIBRE CEMENT INTERIOR FLOORING

1. GENERAL

This section relates to the supply and installation of **James Hardie**® Secura™ Interior Flooring substrate for:

- interior wet and dry area applications
- over timber or lightweight steel floor joists.

1.1 RELATED WORK

Refer to tiling section for tiling.

Refer to waterproofing section for waterproofing.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS1, C/AS2 Protection from fire

NZBC E3/AS1 Internal moisture

AS/NZS 2908.2 Cellulose-cement products - Flat sheet

NZS 3602 Timber and wood-based products for use in buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

James Hardie® Secura™ Interior Flooring Installation Manual

Manufacturer/supplier contact details

Company: James Hardie New Zealand Limited

Web: <u>www.jameshardie.co.nz</u> Email: <u>info@jameshardie.co.nz</u>

Telephone: Ask James Hardie™ on 0800 808 868

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years: For James Hardie® Secura™ Interior Flooring.

(refer to James Hardie® product warranty)

15 year: For accessories supplied by James Hardie® (refer to James Hardie®

product warranty)

From: Date of purchase

- Provide this warranty on the manufacturer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 SAFE WORKING

To James Hardie® requirements for safe working practices with James Hardie® products, particularly with regards to cutting and drilling.

1.7 COMPLIANCE

Fibre cement sheets to AS/NZS 2908.2.

2. PRODUCTS

Materials

2.1 FIBRE CEMENT SHEET FLOORING

Secura™ Interior Flooring, lightweight proprietary Scyon® technology, 2700mm x 600mm x 19mm thick fibre cement sheet, manufactured from treated cellulose fibre, Portland cement, sand and water to <u>AS/NZS 2908.2</u>. Tongue and groove jointing system and presealed with a water resistant sealer.

Components

2.2 NAILS FOR TIMBER

50mm x 2.87mm RounDrive, Stainless steel or hot dipped galvanized nails.

2.3 SCREWS FOR TIMBER

Use stainless steel screws under waterproofing membranes.

Accessories - not supplied by James Hardie®

2.4 BACKING ROD

PEF backing rod to be used with sealant in control joints.

2.5 SEALANT

James Hardie® approved sealant used in v joint for tiled applications. Ensure compatibility with waterproofing membrane system selected.

2.6 WATERPROOFING MEMBRANE

James Hardie® approved waterproofing membrane over the Secura™ Interior Flooring in wet areas. Refer to waterproofing section.

2.7 ADHESIVE

Adhesive used over joists prior to installation of Secura™ Interior Flooring. Refer to adhesive manufacturers technical data and James Hardie technical specifications. Refer to adhesive section.

3. EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements. Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 MOISTURE CONTENT

Maximum moisture content of timber framing to NZS 3602.

3.4 SUBSTRATE

Do not commence work until the substrate is of the standard required by the relevant manufacturer's technical literature for the specified finish; plumb, level and in true alignment. Maximum moisture content of timber framing to NZS 3602.

Application

3.5 SUPPORT FRAMING

Ensure support framing is completed to James Hardie® stated requirements.

3.6 SUPPORT EDGES AND JOINTS

Fully support edges and joints of sheets, other than tongue and groove joints.

3.7 FIXINGS

Minimum 50mm from a corner, 12mm from the edge, 200mm maximum centres along edges and on intermediate supports. Leave heads flush with surface.

3.8 FIXING SHEETS - TILE APPLICATIONS

Fix Secura™ Interior Flooring sheets to James Hardie® requirements. Lay sheets in a staggered layout, long edge of sheet at right-angles to support and with sheets in square, true alignment and plane. Install sheet with label 'This side down for tiles' facing down. Always lay sheets across the floor joists. Refer to tiling section for tiling.

3.9 WATERPROOFING MEMBRANE - WET AREAS

Ensure all sheet fixing is completed to James Hardie® installation requirements before the primer and solvent free waterproofing membrane is applied. Refer to waterproofing section for waterproofing installation and manufacturers requirements. If using NZBC E3/AS2, use only 19mm sheet with joists at 400mm centres and blocking at 1200mm centres.

3.10 CUT SHEETS

Ensure the minimum length of any site cut sheet is 900mm minimum or more.

3.11 FORMING HOLES

Required holes accurately formed and cut to James Hardie® requirements.

3.12 CONTROL JOINTS

Form control joints where floor dimensions exceed 4.05 metres in the long direction and where existing structural joints are located. Position joints symmetrical about the centre of the floor where possible. Form control joints where there are changes in wall direction and at doorways where the tiled surface is carried through into the next room. When laying tiles the joint location must coincide with the control joint in the underlay.

Place a 6-8mm diameter polyethylene backing rod in the bottom of the joint between the sheets and fill the joint with a suitable flexible sealant. All square edges to be fully supported.

Completion & Commissioning

3.13 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4. SELECTIONS

For further details on selections go to www.jameshardie.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

4.1 SECURA™ INTERIOR FLOORING

Location: Ensuite

Brand: James Hardie®

Type: Secura™ Interior Flooring

Thickness: 19mm

Fixings: Stainless steel 10g x 40-45mm wood thread self embedding screws



6221A ARDEX TILING SOLUTIONS

1. GENERAL

This section relates to the preparation of floor and wall surfaces for tiling systems with ARDEX Tiling Solutions:

- Acoustic underlays
- Levelling screeds
- Primers
- Undertile heating
- Waterproofing systems
- Adhesives
- Sealants
- Grouts

1.1 RELATED WORK

Refer to 5438H James Hardie® Fibre Cement Interior Flooring for ensuite floor sheathing.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

DTA DTA New Zealand

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC D1/AS1 Access routes

AS CA27 Code of recommended practice for internal plaster on solid

backgrounds

AS 1315 Portland Cement

AS 3740 Waterproofing of domestic wet areas

AS 3958.1 Ceramic tiles - Guide to the installation of ceramic tiles

AS/NZS 4671 Steel reinforcing materials

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.

1.4 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

ARDEX Tiling Solutions

BRANZ Appraisal 472 - ARDEX Undertile Internal Liquid Waterproofing Membranes

DTA New Zealand - Architectural Trims catalogue. Refer to www.dtanz.co.nz

Copies of the above literature are available from ARDEX

Web: www.ardex.co.nz

Email: specification@ardexnz.com

Telephone: 0800 227339

Warranties - waterproofing

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years For materials

- Provide this warranty on the ARDEX standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

15 years For execution

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Warranties - tiling

1.7 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years For materials

- Provide this warranty on the ARDEX standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.8 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years For execution

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works. Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.9 NO SUBSTITUTIONS

Substitutions are not permitted to any specified ARDEX materials, or associated products, components or accessories.

1.10 QUALIFICATIONS

Waterproofing work to be carried out by an ARDEX approved waterproofing applicator. Tiling to be carried out by competent workers experienced with the materials and in the techniques specified.

1.11 DEFLECTION CRITERIA FOR SUSPENDED FLOORS

Check that the floor is rigid enough for the tiling. Deflection of suspended floors should not exceed 1/360th of the span under dead load and live load.

1.12 SYSTEMS ARDEX PROJECT

Contact ARDEX with any relevant key dates and for a list of approved applicators. The contractor is to contact ARDEX prior to starting the contract.

Web: www.ardex.co.nz

Email: ardexspec@ardexnz.com Telephone: 0800 2 ARDEX (27339)

Performance

1.13 QUALITY ASSURANCE

Follow and complete ARDEX QA documents and submit to ARDEX on completion with request for warranty.

2. PRODUCTS

Materials -

2.1 FLOORING UNDERLAY

Fibre cement, 6mm to 10mm thick sheet of Portland cement, sand, fine cellulose fibre and water, with a smooth finish specifically intended as an underlayment for tiles.

2.2 ARDEX LQ 92

ARDEX LQ 92 is a cement-based underlay for levelling uneven concrete floors prior to tiling. When mixed with water, LQ 92 provides a smooth, pourable, free-flowing and self-smoothing material that can be applied to a thickness of 25mm down to a feather edge.

2.3 ARDEX MULTIPRIME - POROUS SUBSTRATES

ARDEX Multiprime is an internal or external primer suitable for porous substrates. Suitable for concrete, wood and fibre-cement sheet substrates. Alternatively. Contact ARDEX for recommendations.

2.4 ARDEX P9 - NON-POROUS SUBSTRATES

ARDEX P9 is a single-part, water-based primer for non-porous substrates. Contact ARDEX for recommendations.

Materials - Waterproofing

2.5 INTERNAL WATERPROOFING SYSTEM

Refer to SELECTIONS for option.

- Ardex Superflex WPM 001, is a BRANZ Appraised, pre-mixed liquid waterproofing membrane specifically designed for use under tiles.
- ARDEX WPM 002 is a BRANZ Appraised, two-part liquid waterproofing membrane specifically designed for use under tiles especially in external applications. Suitable for permanent immersion.

Materials - Tile adhesives

2.6 ARDEX X 18

A superior, white polymer-fortified, cement-based wall and floor tile adhesive that has been specially formulated with mastic type properties. ARDEX X 18 is suitable for use with a wide range of substrates and tile types including permanent immersion and swimming pools.

Materials - Sealants - grouts

2.7 ARDEX SEALANTS

ARDEX SE acetic cure silicone is ideal for movement joints within a tiling system. ARDEX ST neutral cure silicone is ideal for bond breakers or movement joints within a tiling system.

Sealants and back-up materials as described in clause 2.7 of AS 3958.1 and clause 2.6 of AS 3740.

Colours match some grout colours

2.8 ARDEX GROUTS

ARDEX FG 8 cement-based grout for joints 1mm to 8mm wide. Ideal for wet areas when mixed with ARDEX Grout Booster additive.

ARDEX FS DD cement-based, fine sanded grout for joints 1mm - 4mm.

ARDEX EG 15 epoxy grout with excellent stain and chemical resistance for joints 1.5mm to 15mm wide.

2.9 ARDEX GROUT BOOSTER

A water-based, synthetic polymer grout additive formulated for use with cement-based grouts for improved adhesion strength, flexibility and abrasion resistance.

Components

2.10 STRIPS AND WEATHERBARS

Unless otherwise specified DTA tile trim, edge strips, floor finish divider strips and weather bars shall be aluminium.

2.11 EXPANSION JOINT, METAL AND RUBBER

DTA expansion joints available in Aluminium, Brass and Stainless Steel with either a polyurethane or Neoprene insert. All come in a large range of sizes and should be selected based on the flooring material used. The standard widths of expansion joint are 6mm and 10mm, larger custom sizes can be made to suit the requirements of each job.

2.12 EXPANSION JOINT, METAL AND COMPOUND

DTA expansion joints available in Aluminium, Brass and Stainless Steel with either a polyurethane or Neoprene insert. All come in a large range of sizes and should be selected based on the flooring material used. The standard widths of expansion joint are 6mm and 10mm, larger custom sizes can be made to suit the requirements of each job.

2.13 EXPANSION JOINT, PLASTIC

DTA PVC movement joints are available in 3 sizes; 8mm, 10mm and 13mm. They have a flexible central section and are designed for external corners with a tiling system where PVC is specified.

3. EXECUTION

General

3.1 HANDLING AND STORAGE

Take delivery of packets of tiles undamaged and dry. Handle tiles with care to avoid chipping, soiling and damage. Store on hard level standings in non-traffic, non-work areas that are enclosed, clean and dry.

3.2 CHECK TILES

Check tiles to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern. Reject tiles that are damaged.

3.3 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.

3.4 SETTING OUT

Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.

3.5 PREPARATION OF BACKGROUNDS

Prepare backgrounds in accordance with AS 3958.1, section 4 and to the manufacturer's instructions for the selected substrate. See also the ARDEX Flooring manual by visiting www.ardex.co.nz/

Conditions

3.6 SERVICES AND ACCESSORIES

Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.

3.7 DO NOT START

Do not start laying tiles until concrete floors are cured, moisture content of floors is such that shrinkage is complete, thermal movement has been accommodated and the levels and surface finish will allow for tile laying of the required standard.

3.8 SUBSTRATE TEMPERATURE

Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.

3.9 MOISTURE CONTENT

Ensure the floor is dry and if in doubt check for moisture content by hygrometer. Do not proceed with tiling work until readings for the whole area show 75% relative humidity or less. Alternatively, see ARDEX moisture barriers.

Application

3.10 APPLICATION GENERALLY

Prepare backgrounds as described in AS 3958.1, Section 4. Suitably prepare backgrounds and substrates to the manufacturer's instructions to receive the bedded finish. Remove all dirt, dust, grease, oil, loose particles and any other form of contamination or deleterious material. Ensure that substrates are sound and dry.

Installation to be in accordance with AS 3958.1, Section 5, including setting out, fitting, movement joints, sealants, tile finish and joints, and grouting.

3.11 BACKGROUND MATERIALS

Ensure that the installation of background materials and substrate materials meets relevant standards and the manufacturer's instructions. Inspect background and substrate materials for any conditions unsuitable for tiling over. Do not commence work until the affected area is rectified. Confirm any specific preparation required for the adhesive being used.

3.12 FLOORING UNDERLAY

Underlay material: CFC sheet 6mm to 10mm

Locations: In internal locations apply underlay over the following flooring

backgrounds subject to movement - strip timber flooring (T&G);

particleboard sheet flooring.

Installation: Supply and install CFC to the manufacturer's recommendations.

Waterproofing

3.13 WET AREA WATERPROOFING

Provide waterproofing to wet areas as described in AS 3740.

Material: Refer to SELECTIONS

Locations: Extent of wet areas as described in AS 3740 and as shown on the

drawings.

Installation: Supply and install waterproofing membrane to the manufacturer's

recommendations by an approved ARDEX installer.

Tiling

3.14 ADHESIVE APPLICATION METHODS

Ensure that the whole of the back of the tile is in good contact with the adhesive with no voids. Remove a tile periodically during installation to ensure correct coverage. Do not fix tiles over skinned adhesive.

Notched trowel method

- Adhesive application to be as described in AS 3958.1, clause 5.6.2(a). Notched trowel sizes shall be 4.5mm x 4.5mm x 4.5mm (mosaics) 6mm x 6mm x 6mm, 10mm x 10mm x 10mm, 12mm x 12mm x 12mm. Use an appropriately notched trowel to achieve full coverage.

Buttering method

- Adhesive application to be as described in AS 3958.1, Clause 5.6.2(c).

Tiles in awkward locations

- The buttering method may be required, or fixing might be necessary to achieve full bedding, even though the notched trowel method is used generally.

3.15 SETTING OUT

Setting out, cutting and fitting of tiles to be as described in AS 3958.1, clauses 5.4.2 and 5.4.3. Set out tiling as shown on the drawings. Confirm bond and pattern before installing. Provide even and correct falls to floor tiles where required, including falls to floor wastes. Ensure that a level finish is provided at wall lines. Where falls are not required ensure that the tiles are laid level.

3.16 TILE FINISH AND JOINTS

Provide tile finish and joints, including tolerances, as described in AS 3958.1, clause 5.4.6. Joint widths to be suited to tile and to the manufacturer's instructions.

3.17 MOVEMENT JOINTS

Provide movement joints as described in AS 3958.1, clause 5.4.5 and AS 3740, clause

3.13.7.

Depth: Movement joints to go right through the tile and bed to the

background.

Width: Minimum 6mm.

Corner locations: In wall tiling at internal vertical corners; in floor tiling at walls, columns,

nibs, hobs and similar.

Interruptions: Around sanitary fixtures, around fixtures interrupting the tile surface; at

junctions with joinery fixtures, including window and door frames and

built in cupboards; at changes in substrate or background.

Large areas: In floor tiling provide joints at not less than 4.5 metres spacing in both

directions and 3.5 metres externally. In wall tiling provide vertical joints at not less than 3.5 metres spacing along the length of a wall. In wall tiling, provide horizontal joints at each story rise in the height of a

wall. Over all existing expansion joints.

3.18 GROUTING

Grout tiling to AS 3958.1, clause 5.7.

3.19 SILICONE

Apply ARDEX SE acetic cure or ARDEX ST neutral cure silicone to movement joints between tiles, and at junctions to tiled walls and tiled floors. The silicone should only be fixed to two surfaces to allow movement. On flat joints use a polyethylene tape or release agent and on floor to wall joints greater than 10mm deep use a backing rod.

Completion

3.20 REPLACE

Replace damaged tiles or elements.

3.21 CLEANING

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth

3.22 LEAVE

Leave work to the standard required by following procedures.

3.23 REMOVE

Remove debris, unused materials and elements from the site.

3.24 PROTECT TILES

Protect tiles from damage. Ensure tiles are not disturbed by foot traffic for at least 24 hours after laying and after grouting. Provide protection to tiles by laying sheet material such as insulating board for the period between completion of laying and completion of the contract works.

4. SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Underlays

4.1 COMPRESSED FIBRE CEMENT UNDERLAY

Location: Over existing strip timber flooring where tiles are to be installed.

Type/Brand: Ceramic Tile Underlay/James Hardie®

Thickness: 6mm

Tile Selections

4.2 TILES

To be selected by owner.

ARDEX system - residential floors & walls

4.3 ARDEX SYSTEM - FOR CERAMIC OR PORCELAIN TILES

Substrate floors: JH Compressed Fibre Cement Sheet, refer plans.

Substrate Walls 10mm GIB aqualine
Primer: ARDEX Multiprime
Levelling: ARDEX LQ 92
Tile adhesive floor: ARDEX X 18
Tile adhesive wall: ARDEX X 18

Grout: ARDEX FS-DD, 1 - 4mm joints
Grout colour: To be selected by owner

Silicone: ARDEX SE

Silicone colour: To be selected by owner

4.4 ARDEX SYSTEM - WATERPROOFING

Waterproofing: ARDEX WPM 001 or ARDEX WPM 002

Spares & maintenance products

6700R RESENE PAINTING GENERAL

1. GENERAL

This section relates to the general matters related to **Resene** painting work.

1.1 RELATED WORK

Refer to 6721R RESENE PAINTING INTERIOR Refer to 6711R RESENE PAINTING EXTERIOR

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

MPNZA Master Painters New Zealand Association Inc.

SIPDS Surface Information & Preparation Data Sheets

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

Health and Safety at Work Act

AS/NZS 5131 Structural steelwork - Fabrication and erection AS/NZS ISO 9001 Quality management systems - Requirements

MPNZA Health and Safety Programme

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Resene Surface Information & Preparation Data Sheets (SIPDS)

(hard copy or at www.resene.co.nz)

Resene Product Data Sheets

(hard copy or at www.resene.co.nz)

Resene Putting your safety first

Copies of the above literature are available from **Resene** Telephone: 0800 RESENE (0800 737 363)

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal conditions of use against failure referring to the **Resene** Promise of Quality in the **Resene** One-Line specifications and product data manual.

Requirements

This painting specification is written based on information available at the time of writing.

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Resene** coating system, or associated components and products. Do not combine paints from different manufacturers in a paint system.

If in the applicator's own expertise and judgement an amendment to this specification is required, or where a substrate preparation, or required painting system is not covered in this specification, this shall be brought to the attention of the contract administrator and any amendment agreed before work proceeds any further.

1.7 QUALIFICATIONS

Painters to be experienced competent workers, familiar with the materials and the techniques specified and with the **Resene** coating systems and be members of the Master Painters New Zealand Association Inc.



The applicator is to have the necessary skill, experience and equipment to undertake the work. The applicator remains responsible for ensuring proper completion of the work.

Painters to be selected from the **Resene** Eco Decorator programme. The **Resene** Eco Decorator programme is designed to recognise a nationwide network of environmentally responsible, quality focussed painting contractors.

Refer to www.resene.co.nz/ecodecorator.htm for a list of Eco Decorators in your area.

1.8 PRIOR TO WORK COMMENCING

Before any work commences painters should verify, with Architects or specifying authority, that their paint matches a previously supplied standard card or panel. Differently coloured paints will vary in price, opacity and durability. **Resene** normally only specify two coats of colour but with certain colours, such as yellows and oranges, three coats may be needed. Refer to SELECTIONS for location and type.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

Maintenance guide for **Resene** paint finishes www.resene.co.nz/comn/services/maintenance.htm. Provide this information prior to practical completion.

1.10 HEALTH AND SAFETY

Refer to and comply with the requirements of the <u>Health and Safety at Work Act 2015</u> including the obligation to:

- Eliminate hazards and if hazards cannot be eliminated or isolated, then minimise the hazards in this work by using the proper equipment and techniques as required by the MPNZA Health and Safety Programme.
- Supply protective clothing and equipment.
- Inform the contractor as well as the employees and others on site of those hazards and put in place procedures for dealing with emergencies.

1.11 SAFETY DATA SHEETS

Obtain from **Resene** (phone 0800 RESENE, or www.resene.co.nz) the safety data sheet for each product used and comply with the required safety procedures. Keep sheets on site.

2. PRODUCTS

Materials

2.1 MATERIALS GENERALLY

Do not combine paints from different manufacturers in a paint system.

Use only **Resene** products (which are guaranteed for consistency and performance under <u>AS/NZS ISO 9001</u> and APAS) prepared, mixed and applied as directed in the **Resene** One-Line Specifications and Product Data Manual. This specification has been written using where practical and available both low/no VOC and Environmental Choice approved products.

2.2 DARK COLOURS

Darker colours in areas of high sun exposure place significant stress on the coating and substrate. **Resene 'CoolColour'** technology reduces heat absorption of a wide range of colours. Contact your local **Resene** Representative or visit www.resene.co.nz for more information or visit www.resene.co.nz/coolcolour. View a list of **Resene** colours that can be made using **Resene CoolColour** technology at www.resene.co.nz/colourlibrary.



2.3 THINNERS/ADDITIVES

Use only if and when expressly directed by **Resene** for their particular product in a particular application. Always wear gloves when handling any solvents including turpentine as harmful chemicals may be absorbed into the body through the skin.

Accessories

2.4 ACCESSORIES

Contact your local **Resene ColorShop** for a full range of accessories and usage advice.

3. EXECUTION

Conditions

3.1 EXECUTION

To conform to required trade practice, which shall be deemed to include those methods, practices and techniques contained in the Master Painters New Zealand Association Inc. Specification manual.

3.2 TREATED SURFACES

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.

3.3 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior

For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed. Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior

For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish, seal to manufacturer's requirements.

Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.4 ANCILLARY SURFACES

The descriptions of areas in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-faced natural finish is required or items are completely prefinished. In cases of doubt obtain written instructions before proceeding.

3.5 HARDWARE

Do not paint hinges or hardware that cannot be removed. Before commencing work carefully remove hardware, fixtures and fittings, set aside where they cannot be damaged or misplaced and replace on completion. Refer to SELECTIONS for hardware, fixtures and fittings for removal.

3.6 PROTECTION

Supply, lay and fix drop sheets, coverings and masking necessary to protect adjoining, fixtures, fittings and spaces from paint drops, spots, spray and damage.

Application - preparatory work

3.7 SURFACE PREPARATION

Refer to the **Resene** Surface Information & Preparation Data Sheets (SIPDS) and product data manual for surface preparation sheets (or obtain them by phoning 0800 RESENE, or at www.resene.co.nz) listed in the materials systems schedule clauses. Carry out the preparatory work required by them for each of the substrates.

3.8 LEAD-BASED PAINT, ASBESTOS

Handle cautiously lead-based paint and asbestos, if present, as outlined in the **Resene** SIPDS Surface Information & Preparation Data Sheets 3:4B/3 "Cement and Roofing Claddings Containing Asbestos" or SIPDS Surface Information & Preparation Data Sheet 2:1/3 Note V "Lead Containing Paints", and the "Putting Your Safety First" brochure.

3.9 SHARP EDGES, CRACKS AND HOLES

Remove and/or repair sharp edges, cracks and holes if present, as outlined in the preamble of the **Resene** One-Line specifications and product data manual.

Elastomeric sealants, if used, should not be painted. The paint film will not match the flexibility of the sealant and may severely limit its effectiveness.

3.10 REMEDIAL WORK

If any substrate or surface, that even with the preparation work called for in this section, cannot be brought up to a standard that will allow painting or clear finishing of the required standard then do not proceed until remedial work is carried out.

3.11 GAP FILLING

Make good cracks, holes, indented and damaged surfaces. Use suitable gap fillers to match the surface being prepared. Any special priming requirements of the fillers must be satisfied. Allow to dry or set before sanding back level with the surface. Prime or seal timber before using putty.

Exterior and wet areas: Use only Portland cement base or water-insoluble organic base gap fillers.

3.12 OFF-SITE WORK

Carry out this work under cover in a suitable environment with suitable lighting. Store items, both before and after coating, in a clean, dry area protected from the weather and mechanical damage, properly stacked and spaced to allow air circulation and to prevent sticking. Specific instructions for transport to site to avoid damage to the factory applied paint system may be required particularly for metallic top coat paints.

3.13 PRIMING JOINERY

Pre-treat any cut surfaces of preservative treated timber before priming. Ensure L.O.S.P treated joinery has dried sufficiently to lose solvent odour. Pre-treat bare timber with **Resene TimberLock** (see Data Sheet D48) to improve the durability of subsequent coats.

Liberally coat end grain, allow to soak in and then recoat.

3.14 CONCEALED JOINERY SURFACES

Where off-site coatings are specified they must be applied to surfaces including those concealed when incorporated into the building.

3.15 CONCEALED METAL SURFACES

Apply primer to suit the coating system to surfaces which will be concealed when incorporated into the building.

3.16 EXTERNAL DOORS

Prime or seal and paint bottom edges before hanging.

3.17 BEAD GLAZING

Stained, varnished, or painted joinery to have the first two coats of a suitable primer and one undercoat, applied to rebates and beads before glazing.

3.18 PUTTY FRONTING - LINSEED GLAZING PUTTIES

According to the putty manufacturer's instructions allow putty to set, then prime with **Resene Wood Primer** (see Data Sheet D40) or **Resene Enamel Undercoat** (see Data Sheet D44). Fully protect the putty by completing the **Resene** coating system as soon as it is sufficiently firm.

Glazing putties not based on linseed oil to be over coated according to the putty manufacturer's instruction.

Application - generally

3.19 PAINTING GENERALLY

Comply with the **Resene** SIPDS Surface Information & Preparation Data Sheets or **Resene** One-Line specifications and product data manual data sheets and the additional requirements of this work section.

Ensure large wall areas that require more than one container of paint per coat, have enough paint boxed (mixed) together to complete the final coat. This will not apply if a single factory batch of paint, rather than shop tinted paint, is applied.

3.20 MIXING

Although generally supplied ready to use, all paints must be thoroughly mixed to lift any settled pigment and ensure the paint is homogeneous.

3.21 ENVIRONMENT

Defer painting of exterior surfaces until weather conditions are favourable - warm dry days without frost or heavy dews. Avoid painting in direct sunlight any surfaces that absorb heat excessively. As far as possible apply paint in the temperature range 15°C to 25°C. If temperatures fall outside the range of 10°C and 35°C do not paint unless paints with the necessary temperature tolerance have been specified. **Resene Hot Weather Additive** can be added to most **Resene** waterborne top coats to extend open time when application is undertaken at elevated temperatures or conditions that will cause rapid loss of water from the applied wet film. Do not apply solvent borne paint if moisture is present on the surface.

3.22 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- Back painting and pre-installation painting, then post-installation exposed-face painting
- Complete surface preparation before commencing painting.
- Apply primers, sealers, stains, undercoats, paints and clear coatings in the sequences laid down by **Resene**.
- Allow the full drying time between coats laid down by **Resene**.
- Do not expose primers, undercoats and intermediate coats beyond **Resene** recommendations before applying the next coat.
- Finish broad areas before painting trim.
- Ensure batch numbers of tins are matched for whole areas.
- Internally, paint ceilings before walls and walls before joinery, trim and other items.

3.23 APPLICATION

Select brush, roller, or pad and apply coatings to the requirements of **Resene** to obtain a smooth, even coating of the specified thickness, uniform gloss and colour.

3.24 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. A more thorough sanding to provide a mechanical key for the new paint system may be required depending upon the condition or age of the existing paint system..

3.25 DEFECTIVE WORK

Correct defective work immediately and recoat as required, following precisely the **Resene** system being applied. The same applies to transportation damage to site of factory painted items.



3.26 EACH COAT

Each coat of paint and the completed paint system to have the following qualities and properties:

- Uniform finish, colour, texture, sheen and hiding power and the proper number of coats applied.
- No blemishes such as runs, sags, crinkling, fat edges, entrained paint skins, hairs, dust, bare or starved patches, cracks, significant brush marks, ladder marks and blistering.
- Proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application.

Completion

3.27 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at the completion of the building works. Clean glass inside and out to a shining finish. Use the **Resene Washwise** on site 'paint equipment clean-up water' reclamation system to minimise the environmental impact of cleaning paint application tools.

3.28 LEAVE

Leave the whole of this work uniform in gloss and colour, of correct thickness, free from painting defects, clean and unmarked and to the standard required by following procedures.

3.29 REMOVE

Remove drop sheets, coverings and masking to leave surrounding surfaces and areas clean, tidy and undamaged. Remove debris, unused materials and elements from the site.

3.30 REPLACE

Replace hardware without damage to it or the adjoining surface and leave hardware properly fitted and in working order.

3.31 DISPOSAL OF PAINTS AND THINNERS

Note: The use and disposal of paint and thinners represents a significant environmental hazard.

Ensure all paint and thinners are disposed of in the following manner:

- When requested hand over part used paint containers to client for maintenance touch ups.
- Recycle leftover paint at a Resene ColorShop as part of the Resene "Paintwise programme". Contact your local Resene ColorShop for details or view information online at <u>www.resene.co.nz/paintwise.htm</u>.
- Donate left over paint to local community groups.
- Solvent based paints, paint thinners, turpentine, mineral spirits and solvents require special disposal procedures. Do not pour down sewer or stormwater drains, sinks or into the ground. If they cannot be recycled they must be disposed of in a refuse dump licensed to take toxic waste.

3.32 MAINTENANCE

Good maintenance of coating systems involves a routine of regular cleaning as well as regular inspections. Regular inspections of the coating systems are recommended to identify breakdown, accidental damage to or undesirable deterioration of the paint. Wash down of exterior coatings should be undertaken on an annual basis using **Resene Paint Prep** and **Housewash** (see Data Sheet D812).

Refer the **Resene** Caring for your paint finish brochure and the **Resene** website, www.resene.co.nz/comn/services/maintenance.htm.

4. SELECTIONS

4.1 SELECTIONS

Refer to 6711R RESENE PAINTING EXTERIOR and 6721R RESENE PAINTING INTERIOR for selections.