Tāngata HOMES

SPECIFICATION

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

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117



Job number:

Date: 24 February 2022

CONSTRUCTION SCHEDULE

Construction Schedule to be read in conjunction with the "Factory Order". The Factory order is to take precedence over construction schedule. Any Alterations to the Construction Schedule / Consented documentation shall be forwarded to the local Council for approval.

SINGLE STOREY

For the following site/project information refer to the lower section of the title block on the plans:
- Snow zone, Earthquake zone, Corrosion zone, Roof type, Wall types & Wind Zone (Refer to bracing calculation sheet “building location” section for wind zone analysis).

These drawings to be read in conjunction with any supplementary engineer’s documentation (i.e. Truss design, floor framing layout)
All construction to comply with NZS 3604, NZBC & local council policy.
All timber treatment to comply with NZS 3602

FOUNDATION:
Floor Slab: 100mm concrete (MPa as per details, at 28 days standard curing)
Foundations: Concrete (MPa as per details, at 28 days standard curing). Rods and starters as per details
Sub floor: DPM on AP40 compacted at 150mm layers. Where the DPM is likely to be damaged from the granular fill then protection shall be provided by no more than 25mm sand blinding in accordance with NZS 3604 clause 7.5.6.2.
Min. external cover to reinforcement
(a) Against ground 75mm
(b) Against formwork 50mm
(c) Top cover to United Steel SE62 500E, 30 min

ALL FRAMING (unless stated otherwise on the drawings)
SG8 Pinus Radiata
Exterior walls: H1.2, Bottom plate - 90x45 & Double top plate - 90x45 + 140x35
Interior walls: H1.2, Bottom plate & Top Plate - 90x45, refer to ceilings for double top plate requirements
Bottom plate fixings: Power’s Fasteners thru-bolts as per manufacturer’s specifications @ 900mm crs on all external walls and within 150mm of each end of the plate. 75mmx4mmØ shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls. DPC between bottom plate & floor slab (Refer to MiTek specification attached for specific bottom plate fixing details required for bracing & lintels).

WALL FRAMING:
Ground Floor
Exterior & Interior Loadbearing wall: 90 x 45mm studs @ 400 crs
Dwangs Ext: 90x45 @ 800crs)
Non loadbearing: 90 x 45mm studs @ 400 crs
Dwangs Int: 90x45mm @ 1350mm crs max

Lintels: Lintels are shown on the Truss design & H1 Calculations Plan. (All Lintels SG8 unless stated otherwise).

Building Wrap: Thermakraft building wrap with Aluband flexible flashing tape
Air Barrier to unlined wall and gables: Thermakraft building wrap
Building wrap to be strapped @ 300crs between dwangs.

INSULATION, ENERGY EFFICIENCY:
Refer to H1 Schedule, Energy Efficiency Calculations
Exterior Walls: Pink Batts – R 2.8 Wall
Ceilings: Pink Batts – R 3.6 Ceiling
Glazing: Double glazing to all windows, excluding garage
Air Seals: PEF Rod & Low expansion foam.
Lighting: All lighting recessed into ceilings to be closed and abutted type.

TRUSSED ROOF AREA: (An as built truss design will be provided at time of manufacturing)
Purlins: 70 x 45 SG8 H1.2 @ 900crs, fixings 1/10g self-drilling screw, 80mm long
Trusses: @ 900crs, refer to truss design (H1.2 unless otherwise stated)

Fascia & Gutter system:
Refer to manufacturer's specification attached.
Down pipes: 75mm round Colorsteel
Soffits: 4.5mm Hardiflex to ribbon boards, sprockets & packers ex50

CEILINGS:
Interior Walls: Walls running parallel to battens to be double top plate - 90x45 + 140x35
Battens: H1.2, SG 8 70 x 35 timber battens @ 400 crs

Finish garage: 13mm Gib board, Level 3 plaster finish
Flat Ceilings: 13mm Gib board throughout unless specified different on the plans & Level 4 finish to all rooms in flat ceiling areas

FLOOR FINISHES
Note: Floor surfaces of any space containing "*sanitary fixtures or sanitary appliances must be impervious and easily cleaned*." (Seal floor when Laundry is in garage)
Carpet: Non-slip and have a slip (wet) coefficient value of 0.55-0.70 for tufted of loop pile. (NZBC D1/AS1 Table 2) Floors to be carpet unless stated otherwise on plan, not including the garage.
Vinyl: Non-slip and have a slip (wet) coefficient value of 0.25-0.5 for smooth or Imprinted. (NZBC D1/AS1 Table 2)

Entry through external doors to have a max step of 190mm (Riser height and tread depth for all steps in one flight, shall be uniform within the tolerance of ± 5 mm measured at the centreline on straight flights and at the pitch line on curved and spiral flights.)

With outward opening doors, a landing shall be provide with a clear space of at least 400mm from the leading of the door and the full width of the landing.
Build up this area with AP40 and compact, to have a cross fall of no less than 1:100 and fall away from building. (By Others, Coefficient of friction, wet - 0.6 - 0.9)

WET AREAS
Gib Aqualine with enamel paint finish, refer to details attached.
Waterproofing: Flooring to all first floor wet areas, bath plinths to be sealed with
"Mapegum WPS" liquid-applied waterproofing membrane BRANZ appraisal 484 (2005)

KITCHEN JOINERY
Bench top – Laminate Cupboards – Formica/Melamine
Bathroom Joinery
Top – Vitreous China, Cupboards – Polyurethane coated
Minimum Requirements for sinks:
Kitchen Sink: 300mm dia min X 125mm min depth. (As per NZBC G3/AS1)
Laundry tub: No less than 35 litres. (As per NZBC G2/AS1)

VENTILATION:
Mechanical ventilation to be discharged outside via the soffit to comply with NZBC G4/AS1.

Smoke Alarms (Hush type) To comply with NZBC F7/AS1. Smoke detectors to be fitted within 3.0m of sleeping areas and on Escape routes, as indicated on plan. (Proof of compliance will be required for final inspection and issue of Code Compliance Certificate).

WATER PIPES
Water pipe from hot water heater to be 15mmØ with no more than 2 litres total volume (as per NZBC G12/AS1 Table 4 and NZS 4305 cl. 3.2.1 and Table 5) and closed cell foam polymer insulation which is preformed to the shape of the pipe and not less than 13 mm thick, is acceptable material for preventing pipes less than or equal to 40 mm diameter from freezing (as per NZBC G12/AS1)
Acceptable pipe lengths as per NZS 4305 table 5
10 mmØ = 78ml/m (25m max, total)
15mmØ = 176ml/m (12m max, total)
20mmØ = 214ml/m (7m max, total)
NZBC 7.5 Watertightness
7.5.1 The water supply system shall be tested to ensure watertightness.
An acceptable testing method is to:
a) Subject the hot and cold system to a pressure of 1500 kPa for a period of not less than 15 minutes, and
b) Inspect the system to ensure that there are no leaks.

RAINFALL CATCHMENT AREA CALCULATION
Rainfall Intensity: as per Appendix A, E1/AS1
Gutter Type & Downpipe Size: As noted above in “Truss Roof area” note in Construction Schedule.
Cross Sectional Area: Refer to manufacturer’s specification attached
Roof Pitch: As noted in the project information on the plan.
Maximum Catchment Area: 0º - 25º = 60m² as per NZBC E1/AS1 Table 5

PRELIMINARIES AND GENERAL

THE PROJECT
The works are as described in this specification and as shown on the drawings.

SITE
The site of the works, the site address and the legal description are shown on the drawings. Confine access and work to the area of site indicated on the drawings.

BUILDING CONSENT COMPLIANCE
It is an offence under the Building Act 2004 to carry out any work not in accordance with the building consent. Refer the resolution of matters concerning compliance to the main contractor for direction. Where building consent approval is affected refer any change to the territorial authority.

STATUTORY OBLIGATIONS
Comply with all statutory obligations and regulations of regulatory bodies controlling the execution of the works.

BUILDING CONSENT
Obtain the original or copies of the building consent form and documents from the main contractor and keep on site. Liaise with the territorial 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.

PRODUCER STATEMENTS
When producer statements verifying construction are required, provide copies to both the territorial authority and the owner. Producer statements to be in the form required by the Territorial Authority to comply with the Building Act.

SET-OUT AND DATUM
Set out the works to conform with the drawings. Establish a permanent site datum to confirm the proposed building ground floor level and its relationship to all other existing and new building levels.

PREPARATION AND GROUNDWORK

Documents referred to in this section are:

NZBC	B1 Structure
	B2 Durability
	E2 External Moisture
NZS 3604	Timber framed buildings

OSH: Approved code of practice for safety in excavation and shafts for foundations

GRANULAR FILL
Approved screened crushed gravel or scoria, graded in size from 20 mm to 7 mm, clean. When tested with a standard sieve of 4.75 opening no material is to pass.

SURFACE PREPARATION
Comply with NZS 3604 section 3.5

STOCKPILE TOPSOIL
Stockpile excavated topsoil on site where directed. Keep separate from other excavated materials.

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

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

INADEQUATE BEARING
If supplied, Engineers Ground Bearing and Foundation report takes precedence over the following:

When bearing is inadequate, excavate further and backfill as per below.
Confirm any changes with the territorial authority.

Below slabs on grade:	Hardfill
Below footings:	10 MPa concrete
Service trenches:	Hardfill

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

GRANULAR BASE FOR SLABS
To conform with NZS 3604 (Details noted on the plans). Consolidate with a vibrating roller ready to receive a dampproof membrane.

GENERAL BACKFILLING
Obtain written confirmation from the owner & the main contractor before using any excavated material (An Engineer will need to be involved and Council Approval will be required. Compact approved backfilling in 150 mm layers with the last 200 mm in clean topsoil, lightly compacted and neatly finished off to a Maximum depth of 600mm.

CONCRETE

Documents referred to in this section are:

NZS 3101	Concrete structures standard, Part 1 The design of concrete structures.
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber framed buildings
AS/NZS 4671	Steel reinforcing materials

FALSEWORK AND FORMWORK
Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.
Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss.

DAMPPROOF MEMBRANE
0.25 mm minimum polyethylene to NZS 3604 clause 7.5.4 Damp-proof membrane.
Apply polythene membrane to prepared base course with 150 mm laps between sheets. Tape seal laps and penetrations with 50 mm wide pressure sensitive plastic tape.

REINFORCEMENT
Bars to AS/NZS 4671. Grade Ductility Class E, all deformed other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh to AS/NZS 4671.

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109 clause 3.3 Hooks and bends. Do not rebend bars without written approval.

Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums laid down in NZS 3109 clause 3.6 Spacing of reinforcement.

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on the drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101 table 5.5 minimum required cover. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109 clause 3.9 Tolerances for reinforcement.

Length of laps where not dimensioned on the drawings in accordance with the Manufacturers Specification. Increase laps of plain round steel by 100%. Tie all lapping bars to each other.

REINFORCEMENT LAPS

Bar Diameter	Lap
10 mm	400 mm
12 mm	500 mm
16 mm	650 mm

TYING WIRE - Mild drawn steel wire not less than 1.2 mm diameter.

SPACERS AND CHAIRS - Precast concrete or purpose made moulded PVC to approval. Use concrete spacer blocks only where the concrete surface is not exposed in the finished work.

PRE-PLACEMENT INSPECTION
Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the territorial authority inspector.

NORMAL CONCRETE

PRESCRIBED MIX CONCRETE
Prescribed mix concrete as per Engineers specifications.

Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Unless detailed, obtain written confirmation of the type and pattern of all joints.

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109 clause 7.4 Handling and placing and 7.6 Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.
Use power operated vibrators on foundations, vertical constructions and beams.

CASTING IN
Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.

Do not use grounds exceeding 100 mm in length. Location and form of conduits to be approved in writing by the owner. Minimum cover 40 mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25 mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.

Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.

Wrap all pipes embedded in concrete with tape to break the bond and to allow for expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.

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CARPENTRY

Documents referred to in this section are:

AS/NZS 1748	Mechanically stress-graded timber
AS/NZS 1859	Reconstituted wood based panels, 1859.1: Particleboard
AS/NZS 2269	Plywood - Structural
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber framed buildings
AS/NZS 1328 1&2	Glued laminated structural timber
NZS 3631	New Zealand national timber grading rules

Refer to Production Specification for Durability requirements.

TIMBER FRAMING, FOR INTERIOR USE
Timber treatment as per “All Framing” section, machine stress graded timber to AS/NZS 1748, with moisture content at supply of 18% or less.

TIMBER FRAMING, FOR EXTERIOR USE
Timber treatment as per “All Framing” section, machine stress graded timber to NZS 3631 and to NZS 3602, table 1 with moisture content to NZS 3602 table 4

CEILING BATTENS
GIB® Rondo™ Galvanised Steel Ceiling Battens

TIMBER TRUSSES
Moisture content at supply: 18%.

DAMPPROOF COURSE
2-ply/3-ply Kraft felt strip saturated and coated with bitumen.

NAILS
Steel, stainless steel and galvanised steel of pattern to suit the location.

Type to NZS 3604 section 4 Durability, and of the size and number for each particular types of joint as laid down in the nailing schedules of NZS 3604 sections, 6 Foundations, 7 Floors, 8 Walls, 9 Posts, 10 Roof framing and 15 1.5 kPa and 2 kPa snow loading. Except that when hand driving nails into Timber the nail lengths and diameters should be generally as for power driven nails.

BOLTS AND SCREWS
Steel, stainless steel and galvanised steel of pattern to suit the location.

NAIL PLATES
As per manufacturer’s design for the particular locations as shown on the drawings.

CONNECTORS
Galvanised steel connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.

MOISTURE CONTENT
Maximum allowable equilibrium moisture content (EMC) for framing supporting interior linings 18%

FRAMING WALLS
Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604 sections 8 & 15.

FRAMING ROOFS
Frame to required loading and bracing complete with valley boards, ridge boards and purlins/battens. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604 sections, 9 Posts, 10 Roof framing and 15 1.5 kPa and 2 kPa snow loading.

INSTALLING CEILING BATTENS
Fabricate and fasten to as per manufacturers recommendation.

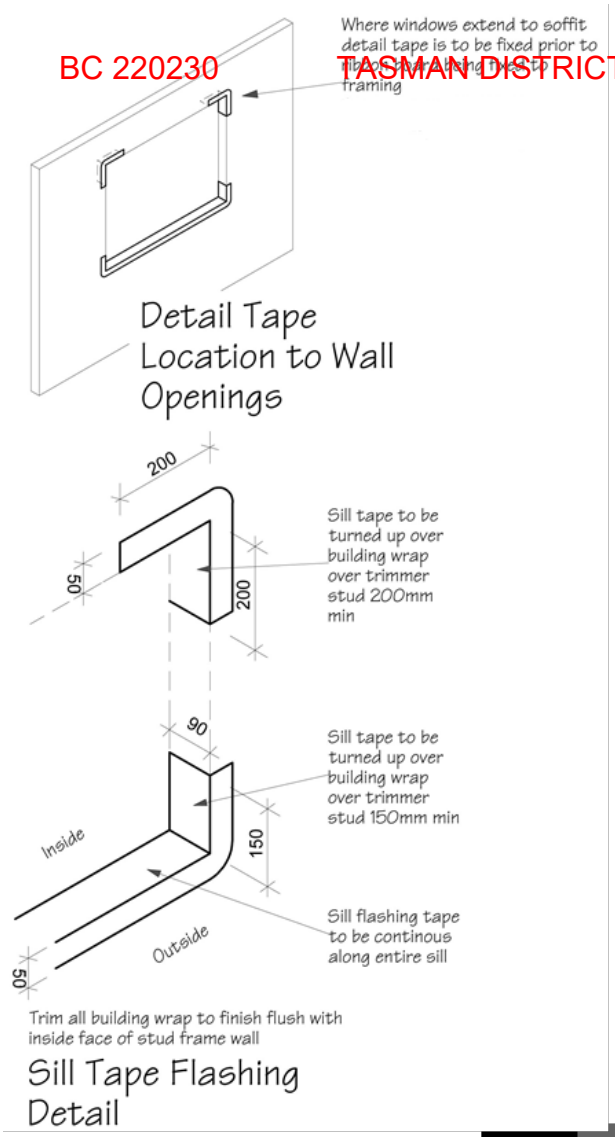
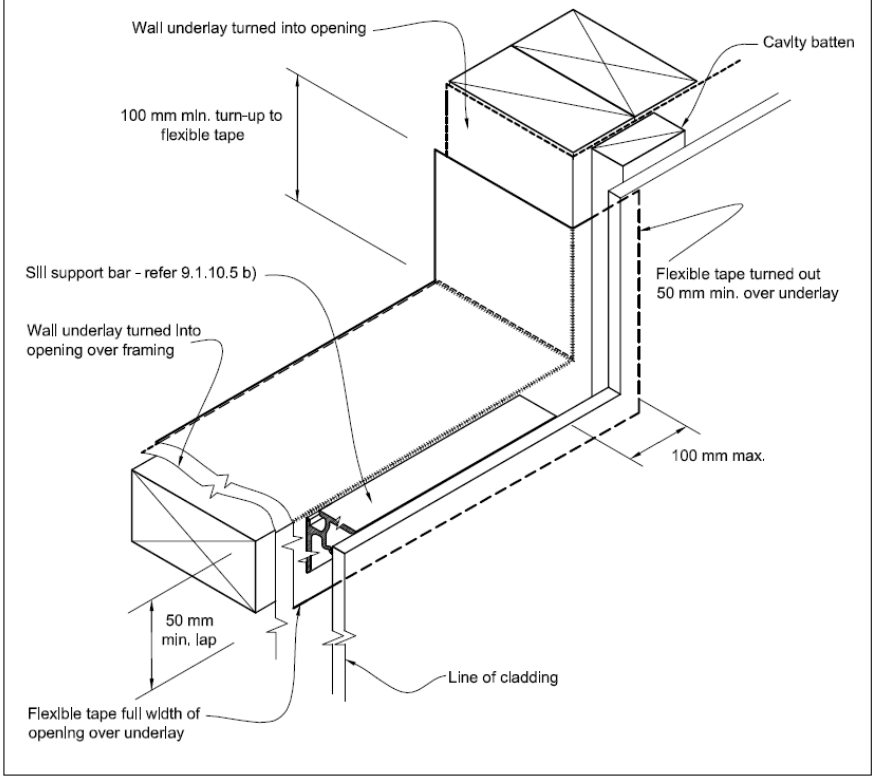


Figure 72B: **General window and door opening with drainage cavity**
Paragraphs 9.1.5, 9.1.9.3, 9.1.10.2, Figures 73C, 76, 85, 86, 91, 99, 116 and 128

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



METAL PROFILED ROOFING

MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:
NZ Metal Roof and Wall Cladding Code of Practice

QUALIFICATIONS
Roofers to be Approved Installers.

FIXINGS, WIND
Design and use the fixings appropriate for the wind zone and topographical classification of this site and building height. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

PERFORMANCE
Install roofing material and associated flashings and accessories to form a weather tight and durable system.

SET-OUT
Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features.

MARKING AND CUTTING PROFILED METAL ROOFING
Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use black lead pencil for marking aluminium/zinc-based products. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof as soon as possible, ensuring that it does not contaminate gutters or lower surfaces.

INSTALLING PROFILED METAL ROOFING
Install and fix 0.40 gauge roofing in accordance with NZ Steel's Installers Guide and to the Manufacturer Product Guide. Use only screws as required by the roofing manufacturer. Colour matched fixings and accessories to be painted before installation.
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.
Confine foot traffic over the roof to within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

FLASHINGS GENERALLY
Formable grade 0.55 BMT for galvanised, aluminium/zinc and pre-coated steel, and 0.90 for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge. Where flashings are required but are not detailed, design to the Manufacturers standard flashing details.

Fasten ridges and all roof flashings at both edges through to the primary structure at centres required by the roofing manufacturer, allowing for localised wind forces. Close flashings neatly at the ends to provide a weatherproof and vermin proof appearance.

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

NZBC E2/AS1 clause 4.5.2 Metal flashing joints
Where metal flashings require to be joined, the method shall be as shown in Figure 6. Joins of metal flashings shall have the following features:
a) Rivets used for joining and sealing laps shall be spaced at a maximum of 50 mm centres, and be:
i) compatible with the flashing material as per NZBC E2 Table 21 and Table 22, and ii) sealed against moisture, or iii) of a sealing type or blind rivet,
b) Expansion joints shall be provided for joined flashings with a combined length exceeding:
i) 12 metres for light coloured steel and stainless steel. 8 metres for dark coloured steel, ii) 8 metres for copper, & iii) 8 metres for aluminium.
c) Where both ends of a flashing are constrained, allowance shall be made for expansion,
d) Where necessary, expansion joints shall be formed as shown in Figure 6, with: i) minimum 200 mm laps, and ii) sliding clips at both sides of the lap.

UNDERLAY
Type: Heavy weight self supporting roofing underlay. (Pauloid)

Lay underlay horizontally or vertically with a 150 mm side lap, over sailing the spouting and/or gutters by 10-20 mm.

FASTENERS GENERALLY
Ensure durability of all fasteners is at least Class 4 and not less than the roofing material being fixed. Where applicable all fasteners factory colour matched prior to installation

FIXING SCREWS
Screws appropriate to the roofing material and the supporting member, as recommended by the Manufacturer.

RIVETS
Sealed aluminium, minimum diameter 4 mm.

SEALANT
Neutral curing silicone or polymer sealant as required by the Manufacturer and used as directed.

Select and use sealants only as recommended for the materials being used. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

CLOSURE STRIPS
Compressible, profiled, closed cell foam strips to fit the sheet profile.

LAP SEALING TAPE
Closed cell, 3 mm x 16 mm self adhesive Trimseal tape.

END LAPS
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.

AVOID DAMAGE
Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface. Allow foot traffic over the roof only within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

ENSURE COMPLETE
Ensure the work is complete with all flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.

Remove metal filings from roofing surfaces at least daily.

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

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

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

ALUMINIUM WINDOWS AND DOORS

DOCUMENTS
Documents referred to in this section are:

NZS 3604	Timber framed buildings
NZS4211	Specification for Performance of Windows
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications

WINDOW AND DOOR SECTIONS
Form all aluminium members from extruded sections. Folded sections are restricted to flashings and concealed members only.

FLASHINGS GENERALLY
Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.

Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.

Except where window/door frames are recessed, ensure that head flashings over-sail jamb facings by 20 mm at each end.

FIXINGS
Ensure all fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.

CONFIRM PREPARATION OF WALL OPENINGS
Confirm that wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:
-wall cladding building wrap to openings finished and dressed off ready for the installation of window and door frames
-claddings neatly finished off to all sides of openings
-interior linings neatly trimmed ready for installation of jamb liners and completion of air seals to all sides of openings
-installation of flashings (those which are required to be installed prior to frames, including Flexible flashing tape).

FIX FRAMES
Fix frames rigidly in place without distortion, to the window manufacturer's and WANZ Aluminium window handbook requirements, plumb, true to line and face, weathertight and with all openings operating freely.

COMPLETE AIR SEAL
Form an air-tight seal by means of proprietary expanding foam, compressible foam strips, or sealants used with backing rods, applied deep within the reveal to completely fill the gap between joinery and structural framing. Ensure that in combination with the internal linings a complete air seal is created.

WINDOWS AND DOORS TYPE

Manufacturer:	First Aluminium (ChCh)
Type/model:	First Aluminium Extrusion

WINDOW AND DOOR JAMB LINERS, TIMBER

Timber species:	Pine
Grade/treatment:	Finger jointed H3
Thickness:	ex40mm
Finish:	Paint grade

ORGANIC POWDER COATING FINISH

Minimum thickness:	40 microns

GLAZING

Documents referred to in this section are:

NZBC B1/AS1	Structure, 7.0 Glazing
NZBC F2/AS1	Hazardous building materials, 1.0 Glazing
NZBC F4/AS1	Safety from falling, 1.0 Barriers in buildings
AS/NZS 2208	Safety glazing materials in building
NZS 3604	Timber framed buildings
NZS 4223	Glazing in buildings
	Part 1: The selection and installation of glass in buildings
	Part 3: Human impact safety requirements
	Part 4: Dead, wind and snow loading
NZS 4211	Performance of windows
AS/NZS 4666	Insulating glass units
AS/NZS 4667	Quality requirements for cut-to-size and processed glass

GLASS
Processed glass to AS/NZS 4667, thickness to NZS 4223 parts 1, 3 and 4 unless otherwise specified:
-Clear float glass: Clear annealed transparent float glass
-Patterned glass: Translucent, annealed, rolled glass with a decorative pattern on one surface.
-Laminated glass: Grade A safety glazing material to AS/NZS 2208 with PVB or CIP resin interlayer.
-Toughened glass: Grade A safety glazing material to AS/NZS 2208.

SAFETY GLASS
All windows noted with “SG” on the elevations require Grade A safety glass. (All glazing in bathrooms <2m requires Grade A safety glass)

MIRROR GLASS
Float mirror glass to NZS 4223, part 1, clause 101.2.2.2: Silvering quality (selection S), with silver and copper plating and 2 coats of protective paint.

GLASS SCREENS
Proprietary shower/bath screens, formed to shape before toughening, complete with matching hardware.

GLAZING TAPE AND GASKETS
Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers’ requirements.

SETTING BLOCKS
Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes.

MIRROR ADHESIVE
Adhesive mirror-mastic and double-sided adhesive tape.

INSTALL GLASS SCREENS
Install shower and bath screens and doors to manufacturer’s requirements. Fix wall channel with silicone sealant.

INSULATION

Documents referred to in this section are:

NZBC H1/AS1	Energy efficiency, 2.0 Building thermal envelope
NZS 4214	Methods of Determining the total thermal resistance of parts of buildings
NZS 4218	Energy efficiency – Small building envelope
NZS 4243	Energy efficiency – Large buildings

FIT THERMAL INSULATION

Lay, install, fit and fix insulation to NZBC H1/AS1: Energy efficiency, 2.0 Building thermal envelope. Install in housing to NZS 4218 and in large buildings to NZS 4243.

Friction fit insulation in place to completely fill the whole of the cavities with no gaps and with no folds. Slightly oversize length for friction fit and cut across pad and fill cavity. Cut smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating segments over the whole of the installation. Do not cover vents. No clearance required to CA type lighting fixtures.

THERMAL INSULATION, WALLS

Location:	Exterior walls (excluding garage)
Brand:	Refer to H1 Schedule
R Value:	Refer to H1 Schedule, Energy Efficiency Calculations

THERMAL INSULATION, CEILING

Location:	Ceilings (excluding garage)
Brand:	Refer to H1 Schedule
R Value:	Refer to H1 Schedule, Energy Efficiency Calculations

GIB® PLASTERBOARD LININGS

Refer to GIB® EzyBrace™ Systems installation information attached to specification.

Documents referred to in this section are:
AS/NZS 2588 Gypsum linings in residential and light commercial construction - Application and finishing, Part 1: Gypsum plasterboard
BRANZ technical paper P21: A wall bracing test and evaluation procedure

MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents which refer to work in this section are:
General: GIB® Site Guide
Wet area: Gib Aqualine
Bracing: GIB EzyBrace® Systems
Ceilings: GIB® Rondo® Metal Batten Systems

GIB® PLASTERBOARD
Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS 2588.

CEILING BATTENS
GIB® Rondo™ galvanised steel ceiling battens and perimeter channel and GIB® Direct Fix Clip. Install in accordance with GIB® Rondo™ Metal Ceiling Batten Systems.

SCREWS
GIB® Grabber™ drywall screws.

NAILS
GIB® Nails (gold passivated).

TAPE ON TRIMS AND EDGES
GIB® Goldline™ tape-on paper tape and galvanised steel trims and edges and/or GIB® UltraFlex high impact corner mould.

ADHESIVE
GIBFix® All Bond wallboard adhesive.

JOINTING COMPOUND
Bedding compound: GIB Tradeset®, GIB® Lite Blue and GIB ProMix® Taping compound
Finishing compound: GIB ProMix® GIB ProMix®, Lite, GIB® All Purpose and GIB Plus 4®

JOINTING TAPE
GIB® paper jointing tape.

CHECK SUBSTRATE
Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Moisture levels not to exceed 18% at the time of lining.

MOISTURE CONTENT
Maximum allowable moisture content in accordance with AS/NZS 2589.1 for:
Framing at lining: 18% for plasterboard linings

PROTECT
Protect all surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

LEVELS OF FINISH
Provide the scheduled plasterboard surfaces to the levels of finish specified in AS/NZS 2589

Before commencing work, agree in writing upon the expectation for the final quality of finish. The specified level of finish for each area should be appropriate for the type of decoration and the type and angle of the primary source of illumination specified in that area.

TILING

Documents referred to in this section are:

NZBC	D1/AS1 – Slip resistance
AS 2358	Adhesives - For fixing ceramic tiles
AS 3740	Waterproofing of wet areas within residential buildings
AS 3958	Ceramic tiles, 3958.1: Guide to the installation of ceramic tiles
BS 6431	Ceramic floor and wall tiles
BRANZ	Good practice guide: Tiling

QUALIFICATIONS
Carry out tiling work using competent tilers, experienced with the materials and techniques specified.

TEMPERATURE
Do not carry out tiling where the ambient temperature is below 5°C, or onto a substrate with a temperature higher than 40°C.

SUBSTRATE
Ensure that all services and accessories are in place and located to suit the tile layout, with the substrate required for tiling work. Commencement of the work means the substrate and environment are accepted by the tile layer as satisfactory.

CONCRETE FLOORS PREPARATION
Remove from the surfaces all contaminants such as paints, oils, release and curing compounds. Remove all projections, unevenness and loose material to leave a clean, dust and dirt-free surface. Remove all existing finishes down to the concrete & prepare surfaces and carry out the tiling work in accordance with AS 3958.1, as modified by BRANZ Good practice guide: Tiling.

LIQUID WATERPROOFING MEMBRANE (refer to Construction Schedule - “Wet Areas” for system used)

Install waterproofing membrane between the tile adhesive and the substrate. Reinforce all junctions of the waterproofing membrane as per the manufacturer’s recommendations. Install waterproof membranes as follows: -
To walls behind bath - Two tiles high

FALLS
Where the shower floor has no upstand or where a wall, screen, door or curtain is omitted, the floor shall have a fall of no less than 1:50 towards the floor waste. The fall shall apply to the floor area within a radius of 1500 mm taken from a point vertically below the shower rose, or from any wall within that radius.

CEMENT BASED SCREED
Mix of 3:1 Portland cement, wash-mix sand, gauged with liquid polymer additive to the tile manufacturer's requirements.

Apply a proprietary cement slurry bond coat over the whole of the floor to the tile manufacturer's requirements. Mix and place a 40 mm thick mortar bed over the bond coat and firmly tamp, screed and compact to the required level. Form screeds with a deviation from plane of not more than 5 mm over 3 metres.

In waterproofed areas where the cement screed has been laid over the waterproofing membrane, prepare the screed surface by applying a further waterproof coating before laying tiles.

Form screeds in areas where water is used in significant amounts with a deviation from plane of not more than 5 mm over 3 metres. Unless otherwise specified form screeds at 1: 40 minimum.

TILE ADHESIVE
To BS 6431, parts 1 to 23 inclusive & AS 2358.
Adhesives selected for use on proprietary substrates or waterproof membranes to have documented compatibility approval from the respective manufacturers.
Apply and float thick bed cement-based adhesive to a maximum 6 mm bed thickness to the tile manufacturer's requirements. Rib surface with a notched trowel, press tiles and beat it into place with 3 mm joints, and to obtain required coverage of adhesive on the back of each tile.

GROUT
Cement based, compressible and to suit the particular location and use.
Remove spacers. Prepare joints, mix and apply proprietary grout and finish off to the grout manufacturer's requirements. Grout to finish uniform in colour, smooth and without voids, pinholes or low spots.

MOVEMENT CONTROL JOINT SEALANT
To BRANZ Good practice guide: Tiling, section 5.0.

CARPETING

Documents referred to in this section are:

AS/NZS 2455.1	Textile floor coverings - Installation practice, Part 1: General
	The New Zealand Carpet Manufacturers' Association Conditions of Warranty and installation guide

QUALIFICATIONS
Carpet layers to be experienced competent workers, familiar with the materials and the techniques specified and with AS/NZS 2455.

EDGE GRIPPER, TAPES, FIXING BARS
To AS/NZS 2455.

BINDER BARS
Anodised aluminium section with a fluted face.

SUBSTRATE
Before starting work inspect the substrate to ensure it will allow work of the required standard and that all fittings and fixtures around which the carpet is to be scribed, are in place.

PROTECTION
Protect adjoining work surfaces and finishes during installation and make good any damage to same.

TAPE
Tape for binding and seaming to be the type and width required by AS/NZS 2455 to suit the specified carpet and the standard of performance required.

LAYOUT
Plan the carpet layout so that seams run lengthways, traffic runs along the seam, light from windows is not across the seam and pile faces away from the main natural light source.

TEMPERATURE
Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

PREPARE FLOOR SURFACE
Prepare floors for laying to AS/NZS 2455 requirements.

INSTALLATION, UNDERLAY
Installation to AS/NZS 2455 Lay at right angles to the carpet direction.

INSTALLATION, TAPED JOINTS
Tape carpet joints, fix grippers to floor, install underlay and carpet, to AS/NZS 2455.

FIX TRIMS
Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to AS/NZS 2455. Ensure that all junctions with other materials are neatly formed, with bars and trims securely fastened to the substrate, 20 mm from each end and at maximum 100 mm centres.

PAINTING

Documents referred to in this section are:
Resene: One-Line Specifications and Product Data Manual

PAINT TYPES
All paint coatings to be **Resene** products (which are guaranteed for consistency and performance under ISO 9001 and APAS) prepared, mixed and applied as directed in the One-Line Specifications and Product Data Manual.

GAP FILLERS
Use suitable gap fillers to match the surface being prepared. Any special primers required of the fillers must be satisfied. Refer to **Resene** surface preparation sheets in the One-Line Specifications and Product Data Manual.

INSPECT
Inspect all surfaces to be painted and report any that will not, after the preparation as laid down in the **Resene** surface preparation sheets; allow work of the required standard.
PRIMING AND SEALING
Ensure that all priming and sealing work necessary before or during construction is carried out when required.

ENVIRONMENTAL CONDITIONS
Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of **Resene**.

SHARP EDGES, CRACKS AND HOLES
Sharp edges, cracks and holes if present: remove and/or repair as outlined in the preamble to the **Resene** One-Line Specifications and Product Data Manual.

PREPARE ALL SURFACES
Prepare all surfaces to be coated to the requirements of the **Resene** surface preparation sheets. Use suitable gap fillers to match the surface being prepared. Any special primers required of the fillers must be satisfied. Refer to **Resene** surface preparation sheets.

APPLICATION
Apply paint by brush and/or roller to the requirements of **Resene** to obtain a smooth, even coating of the specified thickness, uniform gloss and colour. Do not spray on site without express permission.

RESENE SPECIFICATIONS
Refer to the **Resene** One-Line Specifications and Product Data Manual for surface preparation, coating sequence and application requirements as they apply to each system. Correct defective work immediately, with any recoating following the system's requirements.

SCUFF BETWEEN COATS
Between all coats remove any dust pick-up, protruding fibres and coarse particles.

FINISHED PAINT SURFACES
All finished paint surfaces to show uniformity of gloss and colour, to have the correct thickness for each coat, and freedom from painting defects such as tackiness and conspicuous brush marks. Finished work to be clean and free of any disfigurement.

PAINT SYSTEMS TO WET AREAS (Plasterboard firstly apply a sealer coat)

Undercoat & Top Coat:	Lustercryl D310	walls/ceilings
Trim:	Lusterglo	architraves, skirting, sills

PAINT SYSTEMS TO INTERIOR AREAS

Undercoat:	Resene ceiling "Flat white"	walls/ceilings
Top coat:	Resene Acrylic "Low sheen"	walls/ceilings
Trim:	Lusterglo	architraves, skirting, sills

PAINT SYSTEMS TO EXTERIOR AREAS

Undercoat:	Resene SpaceCote “Flat white”
Top coat:	Resene SpaceCote “Flat white”

PAINT SYSTEMS TO PLASTER COATINGS
Brand: **Resene**
Coats: 3
Colour: Client Selection (LRV 43%)
Light Reflectance Value - >40 (A LRV figure of more than 40 is required to comply with NZBC B2 & E2)

HOT AND COLD WATER SYSTEM

Documents referred to in this section are:

NZBC G12/AS1	Water supplies
AS/NZS 2642	Polybutylene pipe fittings
NZS 3501	Specification for copper tubes for water, gas and sanitation
NZS 4606	Storage water heaters
NZS 4607	Installation of thermal storage electric water heaters
NZS 4617	Tempering (3-port mixing) valves
DIN 8077	Polypropylene (PP) Pipe dimensions
DIN 8078	Polypropylene (PP) Pipes Types 1, 2 & 3, General Quality
NZS 4305	Energy efficiency domestic hot water systems

Plumbers, Gasfitters and Drainlayers Act 2006

Note: Floor surfaces of any space containing sanitary fixtures or sanitary appliances must be impervious and easily cleaned. (Seal floor when Laundry is in garage)

QUALIFICATIONS
Plumbers to be experienced competent craftsman plumbers, or registered plumbers working under the direction of a craftsman plumber, familiar with the materials and techniques specified.

WATER MAIN POLYETHYLENE
High density polyethylene pipe complete with rubber ring compression type fittings.

POLYBUTYLENE WATER PIPE
Polybutylene tubing to AS/NZS 2642.2 and AS/NZS 2642.3 complete with fittings and accessories brand-matched.

EXPOSED PIPES
Chrome plated copper pipe with chrome plated brass nuts and fittings.
Faucet hoses covered with stainless steel braid and fitted with stainless steel nuts.
White polyethylene composite pipe with white nuts and accessories.
Selected pipework finish to include escutcheon plates and bends and elbows protruding from walls or fittings. All cold water pipework installed in external walls or exposed to the elements to be lagged and protected from frost.

VALVES
Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1: Water supplies. (Set to 55º) The storage water heater control thermostat shall be set at a temperature of not less than 60º C to prevent the growth of Legionella bacteria.

15mm copper pressure relief valve from HWC (100mm max straight or bent) to discharge into 20mm @ 1:40 copper relief drain. The drain to discharge to over GT with 25mm air gap. (As per NZBC G12/AS1 cl.6.7 and Fig 12)

Tempering valve to NZS 4617 to NZBC G12/AS1: Water supplies.
Install 1 metre minimum from outlet of hot water cylinder and to manufacturer’s instructions.

ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE
To NZS 4606.3, ceramic-coated steel thermal storage cylinder, insulated and complete with fittings required for installation by the manufacturer.

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.10. Valve-vented systems to NZS 4607.

ELECTROLYTIC ACTION
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

EXCAVATE
Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

WATER MAIN
Lay a minimum of 500 mm below ground level (600 mm under driveways) from the utility network operator's supply through a gate valve and meter toby box to the building. Lay marker tape above the water main in backfill.

POLYBUTYLENE/POLYETHYLENE WATER SUPPLY
Size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Run pipes complete with all fittings, support and fixing, and jointed to the pipe manufacturer's specifications, all to NZBC G12/AS1. Conceal pipework and pressure test before the wall linings are fixed.

INSTALLING HOT WATER PIPE INSULATION
Insulate all hot water pipes in accordance with the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of studs. Where hair felt is used, wrap around pipes in two layers in opposite directions and secure with galvanised steel wire ties.

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

INSTALL TAPS AND FAUCETS
Install taps and faucets in accordance with the tap manufacturer's requirements. Flush out on completion. Check that washers or ceramic discs are operating correctly.

TESTING OF PLUMBING
NZBC G12/AS1 7.5 Watertightness
7.5.1 The water supply system shall be tested to ensure watertightness. An acceptable testing method is to:
a) Subject the hot and cold system to a pressure of 1500 kPa for a period of not less than 15 minutes, and
b) Inspect the system to ensure that there are no leaks.

WATER MAIN

Material:	Polyethylene
Internal diameter:	(ID)20mm/ (OD)25mm

WATER PIPE

Material:	Polybutylene
Nominal bore:	(ID)20mm/ (OD)25mm

INSULATION FOR HOT WATER PIPES

Brand/type:	Euro lagging
Inside diameter:	16/22 mm

ELECTRIC HOT WATER CYLINDER

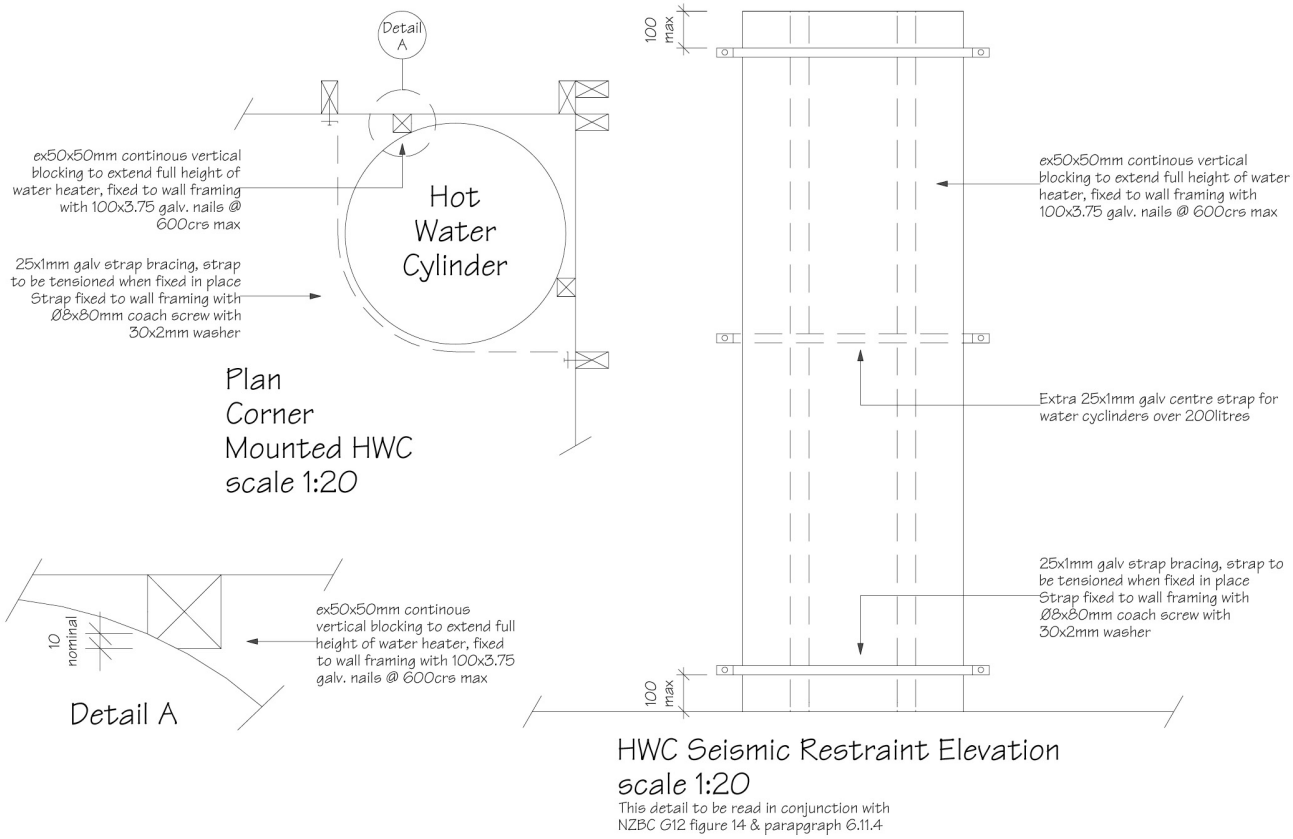
Brand/model number:	Peter Cocks
Capacity:	250 litres

NZBC G12/AS1

Table 7: Water Supply Pipework Support Spacing
Paragraph 7.1.3

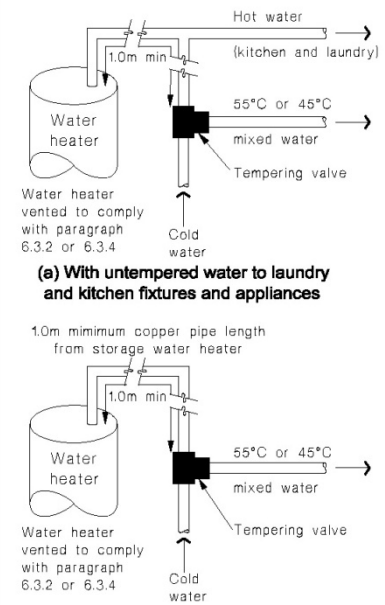
Pipe material	Pipe diameter (mm)	Maximum distance between supports (m) Vertical pipe	Graded and horizontal pipe
Copper	10 – 15	1.5	1.2
	20 – 25	2.0	1.5
Galvanised steel	15 – 20	2.0	1.5
	25	3.0	2.5
uPVC	15 – 20	2.0	1.0
	25	2.4	1.2
Polyethylene and polybutylene (cold water supply)	15 – 20	1.5	0.75
	25	1.8	0.9
Polybutylene (hot water supply)	15 – 18	1.0	0.6
	20 – 22	1.4	0.7

Note:
The spacing for these pipe materials is based on the pipes being located within the *building* structure.



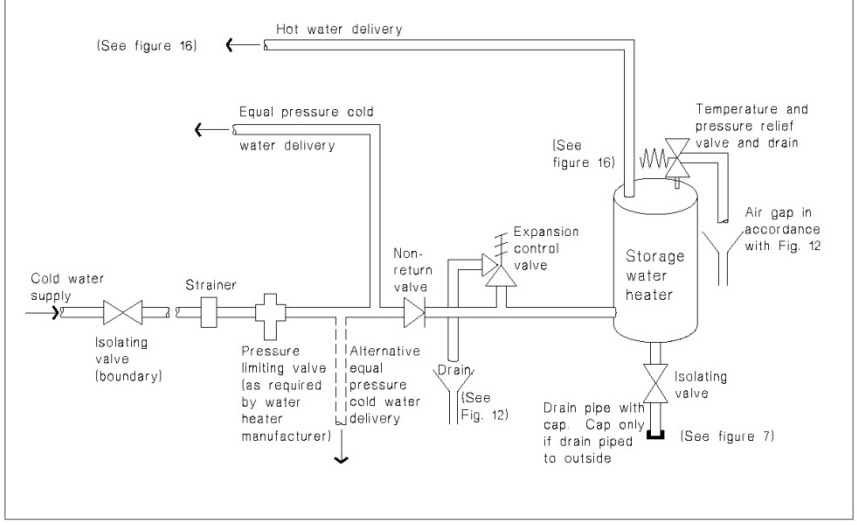
NZBC G12/AS1

Figure 16: Tempering Valve Installation
Paragraph 6.14.2 a)



Note:
1. For optimum system efficiency the tempering valve, for other than a mains pressure system, may be located as low as practicable to achieve the manufacturer's recommended head, at the tempering valve.
2. 1.0m minimum copper pipe length from storage water heater.

Figure 8: Mains Pressure Storage Water Heater System (unvented)
Paragraphs 6.1.2 and 6.2.1 b)



RAINWATER SYSTEMS

Documents referred to in this section are: -
NZBC B1, B2, E1 & E2
AS 1397 Steel sheet and strip - hot-dipped, zinc-coated or aluminium/zinc-coated
Workers to be either competent craftsman plumbers, or registered plumbers working under the direction of a craftsman plumber, or roofers, familiar with the materials and techniques specified.

Aluminium/zinc alloy coated pre-painted steel
ALUMINIUM/ZINC ALLOY PRE-PAINTED SHEET STEEL
0.55 mm sheet steel coated to AS 1397, pre-painted.

ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING
Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.

DOWNPIPES
Complete with stand-off brackets and galvanised screws.

FLASHINGS GENERALLY
0.55 mm sheet steel galvanised to AS 1397, aluminium/zinc coated to AS 1397, 1.8 mm (20 kg/m^2) copperised pure lead, 0.5 mm half hard copper sheet, or proprietary rubberised perforated aluminium strip, all to location, compatibility and design requirements of BRANZ Bulletin 304 Flashing design.

Aluminium/zinc alloy coated pre-painted steel
ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL FASCIA

Shape/size:	Refer to construction schedule
Brand/type:	Coloursteel
Paint coating type:	Endura

ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING

Shape/size:	Multiline Quad (Cross Sectional Area – Refer to construction schedule)
Brand/type:	Coloursteel
Paint coating type:	Endura

SANITARY PLUMBING

Documents referred to in this section are:

NZBC G1/AS1	Personal hygiene
AS-NZS 3500	Plumbing & Drainage Part 5
NZBC H1/AS1	Energy Efficiency – hot water systems
AS/NZS 1260	PVC pipes and fittings for drain, waste and vent applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent application

Plumbers, Gasfitters and Drainlayers Act 2006

QUALIFICATIONS
Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 2006.

UPVC WASTE, SOIL AND VENT PIPES
UPVC pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

EXPOSED PIPES AND TRAPS
Chrome plate on copper pipes and associated copper and brass fittings.
White polybutylene or PVC, including all associated fittings.

SEALANT, SANITARY FIXTURES
For between sanitary fixtures and accessories and adjacent floor or wall surfaces.
1-part, silicone, containing mildew resistant agents.
Colour: White

EXECUTION GENERALLY
Carry out this work and complete all tests to NZBC G1/AS1: 2.0, 3.0 and AS-NZS 3500 Part 5.

ELECTROLYTIC ACTION
Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

INSTALL SANITARY FIXTURES
Fit and install sanitary fixtures and associated screens, elements and hardware, plumb, true to line and rigid, to the fixture manufacturer's requirements. Supply standard chrome plated brass wastes and plastic plugs on chrome plated chains with all basins, tubs and baths.

INSTALL TRAPS, WASTE AND VENT PIPES
All traps sized to AS 3500.2. Wastes and vents all uPVC. Wastes shall be to AS 3500.2 falls as a minimum. Vents shall be generally as indicated, but avoid where permissible in compliance with AS 3500.2, or shall be combined above the flood level of the fittings.
Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

PENETRATIONS
At penetrations through constructions provide and fit collars and escutcheon plates to match pipework. Penetrations to the DPM under the slab to be sealed with DPM tape. Wall penetrations as per E2/AS1 Figure 68.
T-rib metal roof penetrations as per E2/AS1 Fig 53 & 54

AS-NZS 3500

TABLE 4.6.1

MAXIMUM SPACING OF BRACKETS, CLIPS AND HANGERS

Piping material	Maximum spacing of supports m	
	Vertical pipes	Graded pipes
Cast iron and ductile iron	3	3
Copper, copper alloy	3	3
PVC-U DN 40—50	2	1
PVC-U DN 65—150	2.5	1.2
PP	2.0	1.0
PE	2.0	1.0

NOTE: For all pipe materials, maximum spacings shall be in accordance with manufacturer's recommendations.

DRAINAGE

Documents referred to in this section are:

NZBC B1/AS1	Structure – general
NZBC E1/AS1	Surface water
AS3500	Foul Water
AS/NZS 1254	PVC pipes and fittings for storm and surface water applications
AS/NZS 1260	PVC pipes and fittings for drain, waste and vent applications
AS/NZS 4130	Polyethylene pressure pipes (PE)
NZS 3107	Precast concrete drainage and pressure pipes
NZS 3104	Specification for concrete production
NZS 7643	Installation of unplasticised PVC pipe systems
	Plumbers, Gasfitters and Drainlayers Act 2006

QUALIFICATIONS
Drainlayers to hold a current licence within the terms of the Plumbers Gasfitters & Drainlayers Act 2006 and be experienced, competent and familiar with the materials and techniques specified.

CONCRETE
17.5 MPa ordinary grade to NZS 3104.

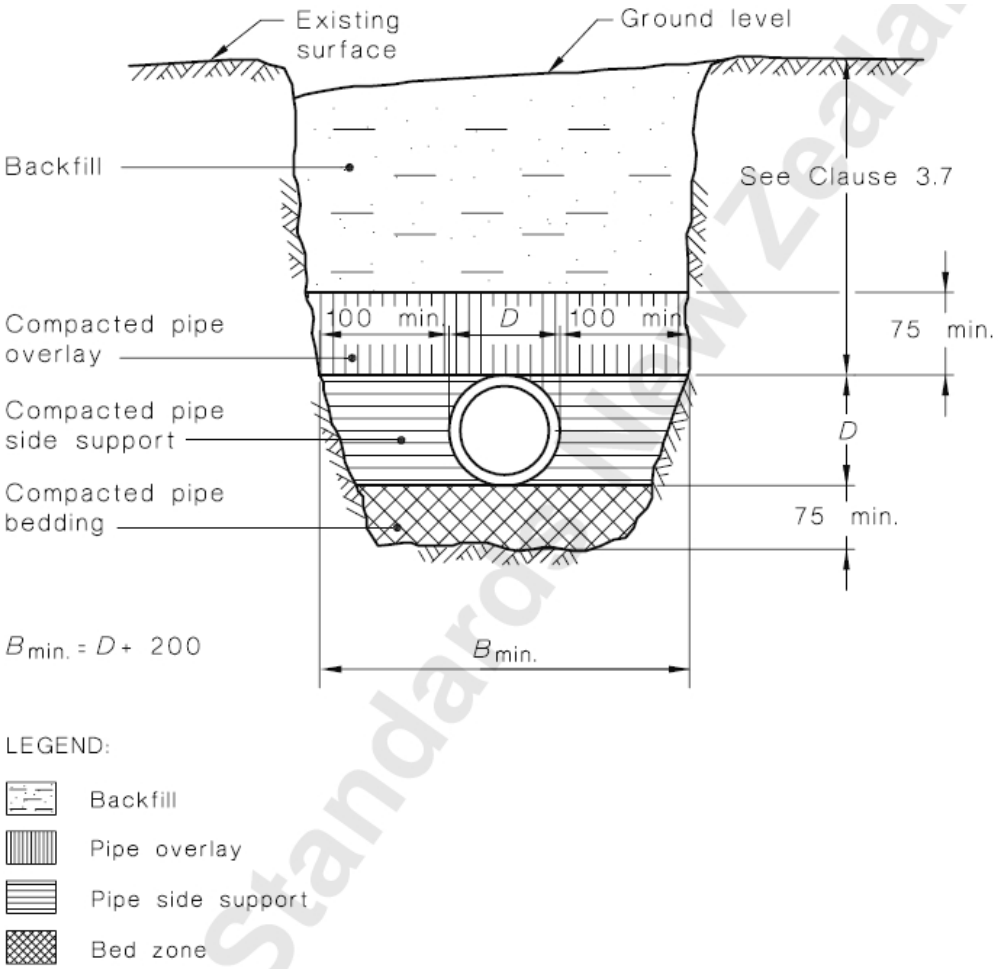
uPVC PIPES
uPVC Pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260.

DRAINAGE AND FILLING MATERIALS
Granular: Clean gravel or crushed stone or a blend of these. Particle size from minimum 7 mm to maximum 20 mm & AP40 compacted at 150mm layers under slab. (use AP40 compacted at 150mm layers under slab as drain bedding)
Selected: Fine grain soil or granular material suitable for bedding; excluding topsoil.
Ordinary: Top soil or other excavated materials.

STORMWATER

CONCRETE ENCASEMENT
Concrete encase shallow drains and drains under driveways, on a 100 mm deep 17.5 MPa concrete bed reinforced with three 10 mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100 mm 17.5 MPa concrete.

BEDDING AND BACKFILL
Backfill drain lines in 150 mm layers, well tamped but without disturbing the drains. Finish off with 150 mm of topsoil, slightly mounded above the finished ground line. As per AS3500 Bedding and backfilling



DIMENSIONS IN MILLIMETRES

FIGURE 5.1 TYPICAL BEDDING OF DRAINS

TABLE 3.4

MINIMUM COVER FOR BURIED PIPING

Location	Minimum depth of cover, mm	
	Cast iron, ductile iron	Other materials
Where subject to heavy vehicular traffic	300	500
Where subject to light vehicular traffic	300	450
Elsewhere	Nil	300*

* Except as provided in Clauses 3.7.3 and 3.7.4.

ELECTRICAL

Documents referred to in this section are:

NZBC F7/AS1	Warning systems, 3.1 Domestic smoke alarms
NZBC G2	Laundering – Service connections
NZBC G3	Food Preparation and Prevention of Contamination
NZBC G8	Artificial Light - Illuminance
NZBC G9/AS1	Electricity, 1.0 Electrical Installations within domestic dwellings
NZS 4514	Part 6: Smoke Alarms
AS/NZS 3000	Wiring Rules
AS/NZS 3008	Electrical installations - Selection of cables 3008.1.2: Typical New Zealand installation conditions
AS/NZS 5000.2	Electric cables - Polymeric insulated - For working voltages up to and including 450/750 V
NZECP 51:2004	New Zealand Electrical Code of Practice for Homeowner/Occupier's Electrical Wiring Work in Domestic Installations

PVC-insulated cables for electric power and lighting
Electricity Regulations
New Zealand electrical codes of practice (ECP)

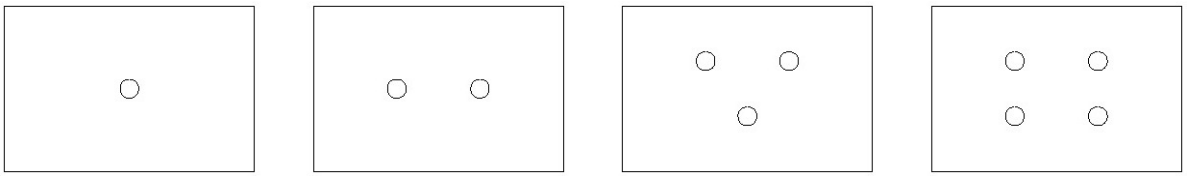
Illuminance at floor level shall be no less than 20 lux as per NZBC G8.3 - Performance requirement. Minimum requirement: 1 standard lighting fixture per 10m² minimum. (per room) Hallway requires 1 lighting fixture per 4.7 lineal meters minimum. Lighting areas based on 100w closed abutted (CA80 or CA135) down light, 100w batten holder & 100w ceiling pan. (Where energy efficient bulbs are used they shall have an equivalent wattage to the minimum stated)

LIGHTING SCHEDULE (Minimum per area/room)

2 LF/room	Living, kitchen, dining, family, activity, media, lounge & bedroom.
1 LF	Hall (1 LF per 4.5 lineal metres min.)
1 LF/bay	Garage
1 LF	Entry, toilet, bathroom, laundry, WIR, store.
1 LF	Other rooms (1 LF per 10m² min.)

H Halogen – 50w (1 H per 5m² min. or 1 H per 2.2 lineal metres)

LIGHTING LAYOUT EXAMPLES



Single (1LF) Double (2 LF) Triple (LF) Quad (4 LF)

Lighting to be spaced out evenly.

Note: The above lighting schedule is the minimum requirement. The final layout is by owner on site but will not be less than the above schedule.

COMPLY
Comply with the referenced Electricity Regulations, Standards and the New Zealand electrical codes of practice for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection.

QUALIFICATIONS
Carry out work by or under the direct supervision of a holder of a practising certificate under the Electricity Regulations.

CERTIFICATE OF COMPLIANCE
Supply a certificate of compliance to the owner, as required by the Electricity Regulations, and in particular, clauses 16, 34 and 35. Allow the network utility operator to test before the meter installation, listed work inspection, polarity check and livening of supply.

MAINS SUPPLY, SINGLE PHASE
Tough plastic sheathed neutral screened cable to AS/NZS 5000.2 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

MAIN EARTH - Provide a plastic toby box or UPVC tube to contain and protect the earth pin. Fix the connecting earth wiring securely against wall surfaces. Earth Bar to be bonded to the reinforcing mesh.

RCD protection to AS/NZS 3000

Bond together and to earth all plumbing fittings not adequately isolated, to the Electricity Regulations and to the fitting manufacturer's requirements.

CABLES
Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0 mm^2, and to AS/NZS 3008.1.2. Minimum sizes. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the connected load, or produce an excessive voltage drop.

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions may be above 35°C.

METER BOX
Proprietary manufactured, zinc plated powder coated metal case, weatherproof if mounted outdoors, and complete with meter mounting, main switch and fuse.

DISTRIBUTION BOARD

MINIATURE CIRCUIT BREAKERS
Miniature moulded case circuit breakers

WALL BOXES
Standard size in plastic, with 2 or more gang size, all screw fixed.

SWITCH UNITS
Sixteen amp minimum rated, 230 volt polycarbonate flush plate units.

Fit all single and double switch units and socket at the following heights (to the centre of the unit) unless shown otherwise on the drawings.
Switch Units: 1000 mm & at least 500mm from corners.
Socket Units: 150 mm above work benches,

Mount switches vertically and socket units horizontally. Label all switch units that control electrical equipment by colour filled engraving on the switch plate.

HOT WATER SYSTEM SWITCH
One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

SWITCHED SOCKET UNITS
Ten amp, 230 volt polycarbonate flush plate 3 pin flat NZS combination switch units, single or multi gang.

SMOKE ALARMS
Smoke alarms shall be installed on or near the ceiling in accordance with NZS 4514 and the manufacturer’s instructions.

LAUNDRY
No less than 1x 10amp socket outlet to be provided adjacent to space provided for washing machine.

KITCHEN
No less than 1x 10amp socket outlet to be provided in space behind Refrigerator.
Provide 1x fixed outlet to cooking appliance

GARAGE DOOR CONTROLLERS
Provide single switched socket outlet for the door controller to plug into.

LIGHT FITTINGS
All fittings complete with lamps, install light fittings in locations as directed by the owner, and in accordance with the fitting manufacturer's requirements and no less than the lighting schedule.
All downlights to be closed and abutted, halogen downlights to have factory heat shields.

CIRCUIT PROTECTION
Install MCBs to protect each final sub circuit sized for circuit maximum loading.

Domestic
Install RCD protection at the switchboard of final sub circuits controlling socket outlets and lighting except for:
- Fixed cooking equipment, heating, HWC and A/C units

SET-OUT
Unless specifically detailed, confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring with the owner. Fix outlet items level, plumb and in line.

CABLING
Install with a maximum of 17 light outlet units or 6 double or single switched socket units on any circuit. Minimum 2 lighting circuits per installation. Separate circuits for all electric heating appliances. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground.
Complete all labelling in clear machine printed permanent manner. Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

WALL BOXES
Flush mounted in cavity construction.

EXTRA LOW VOLTAGE LIGHTING
Where remote transformers are used for ELV lamps, connect from transformer to lamp with minimum 2.5 mm^2 conductor, to ensure voltage drop in transformer and conductor does not exceed 0.8 volts. Connect lamps 50 watt or greater matched to no more than one per transformer, located as close as practicable to the lamp. Ensure transformers and rear of light fittings are adequately ventilated and clear of any thermal insulation.

ELECTRIC HOT WATER SYSTEM
Wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in heat resistant conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under HOT AND COLD WATER SYSTEM.

COMPLETION
Leave work operating correctly, with equipment clean and all lamps operational.

Management of Site Safety

The main contractor to undertake best practice systems to manage health and site safety.
Building supervisors are all site safe qualified. The contractors are inducted on our Health and Safety policy and also provide the main contractor with documentation on their Health and Safety Management systems and also fill out a health and safety questionnaire.

The main contractor (Noted on specifications cover sheet) undertakes to manage hazards by elimination, isolation or minimisation in that order.

There is a Hazard Register posted on site at all times and all sub trades and suppliers required to record any potential hazards introduced onto site.

Earthworks and trenching will generally be back filled on same day but if this is not possible, barriers will be erected to minimise hazard.

To ensure site is clear, work areas are to be kept clean and tidy with receptacles provided and areas allocated areas for waste and refuse.

Chemicals and paints will be stored in original containers in a secure and well ventilated place appropriate to the product.

Building materials stored on site will be stacked so they cannot fall or protrude dangerously.

Public visiting site are instructed to report to site foreman who will ensure public are provided with a high visibility vest which must be worn on site at all times. Site foreman to ensure public are detoured from hazardous areas.

Fencing to keep out unauthorised personel. Under NZBC F5 – Construction and Demolition Hazards Clause 1.1.1, a 2.0 metre fence is required for protection of public.

Safety Nets are to be used to avoid the likelihood of tools or materials falling onto places where people might be present. Under NZBC F5 – Construction and Demolition Hazards, Performance Clause F5.3.1.

Non-work Periods

The main contractor and sub contractors have responsibility to ensure public is not endangered in any way and site is safe during non-work periods

All sites have sign posted at entry stating ‘Authorised personnel access only and please report to site foreman.

Tools locked away at end of day.

EROSION AND SEDIMENT CONTROL PLAN

(Please also refer to the Drainage Plan and Rainwater & Drainage Sections of this Specification.)

The main contractor will use the relevant erosion and sediment control measures to meet the requirements for this site.

Provide protection for neighbouring sites from rubbish or sediment contamination.

Erosion Control
Minimum existing vegetation and soil will be removed from the site,
Sediment Control measures will be in place before earthworks begin
Earthworks will keep to a minimum.
Stockpiles will be delivered as late as possible, located within the sediment control zone, and protected from runoff and covered where necessary.
Trenching will where possible be done at one time for all services. Contractors will be requested to set out, dig, and backfill trenches in a such as way as to minimise erosion and runoff.
Hard wastes will be placed in the bins provided by the Company.
Clients will be encouraged to landscape and cover exposed soil on their site as soon as possible.

Sediment and Run-off Control
Upslope water will be diverted from the site where possible.
Sediment controls will be placed at the bottom of the site to minimise runoff leaving the site. These may involve sediment fencing, supplemented with straw bales on steep areas.
Existing vegetation will be used where possible to minimise runoff
Sump inlets will be protected from sediment runoff.
Storm water down pipes will be connected as soon as practicable to the permanent Storm water system once the roof is laid.
Contractors will be required to comply with these control measures
Wash down and wet trade runoff will be trapped and controlled on site
Sediment control measures will be regularly inspected and maintained.

Site Access
Stabilised access from the road to the platform will be provided.
A runoff diversion bund will be included in the site access way if required.
Sediment on footpaths and roads will be removed as soon as practicable

PRODUCT SPECIFICATIONS

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Contents:

1- T-Rib Vertical Metal Cladding – Details & Technical Specification
2- James Hardie Linea Weatherboard – Details & Technical Specification
3- Slab Reinforcing Mesh & Bottom Plate Fasteners - Tech Details & Specification
4- Gib and Ecoply Bracing Technical Specifications
5- Building Wrap & Flashing Tape Technical Specifications
6- Roofing Details & Technical Specifications
7- Ardex Undertile Waterproofing Membrane - Mftr's Installation Specifications
8- Potable Water System - Mftr's Technical & Installation Information

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 1

T-Rib Vertical Metal Cladding & Cavibat System - Details & Technical Specificatons

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CAVIBAT
CAVITY BATTEN SYSTEM

Cavity Batten System

The Cavibat - Cavity Batten System has been developed specifically to provide the ultimate defense against the transfer of moisture in cavity wall construction, for all cladding types, protecting the structural integrity of residential and commercial buildings.



Benefits

- Total moisture barrier around the exterior of the building structure.
- Thermal break between the cladding and framework increase the ‘R’ value of the building making it more energy efficient.
- Superior draining and ventilating in a horizontal or vertical orientation.
- Resists water tracking across from the cladding to the structural framing.
- Stable non-absorbing material, eliminates expansion and contraction with changes in moisture content that cause nail and screw heads to pop.
- ‘O’ Ring seals around nails and screws preventing capillary action.
- Durable, non-reactive,non toxic and recyclable, category #5.

Technical Support:
enquiries@ cavibat.co.nz

0508 CAVIBAT
cavibat.co.nz

Cavibat - Cavity Batten System

Cavibat's innovative design is the latest solution in the quest to safeguard your investment.

Cavibat protects the integrity of your building by providing a total moisture barrier, thermal break and unobstructed draining and ventilation around the total building.

Cavibat is suitable for use with all cladding types for timber and steel framed construction. The batten may be used for wall or roofing systems offering rigid support for the cladding.

The system is BRANZ Appraised, No. 524 (2007) as an alternative solution to E2/AS1 and exceeds H1 Thermal Break requirements. Note: when a thermal break *and insulation* is required use Cavibat 'R'.

Cavibat side elevation



Dimensions:
1200 x 45 x 18 mm

Pack Quantity:
Cavibat is purchased in bags of 100 metres.

Installation:
Cavibat battens may be installed vertically or horizontally following studs and noggins. Run the batten continuously around windows and doorways to support the cladding and flashing.

The preferred method of fixing is with a brad finishing gun. Galvanized brad nails 30-50 mm long at 400 mm centers are suitable for all applications tacking the batten on until the cladding is installed, nailing or screwing through the batten into the framework.

The battens have one side thicker than the other. For the best results keep the thicker side outward. Set the nail height adjustment so the nail sits just below the surface and nail as close as possible to the webbing.

Cut the battens with a drop saw, handsaw or stanley knife. Do not cut with a skill saw as it tends to bite.

Supply:
Cavibat may be purchased through your local merchant.

Technical:
Further information may be found on our web site cavibat.co.nz or ph. 0508 CAVIBAT (0508 2284228)



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BRANZ Appraised
Appraisal No. 524 [2012]

CAVIBAT CAVITY BATTENS



Appraisal No. 524 (2012)

This Appraisal replaces BRANZ Appraisal No. 524 (2007) dated 21 March 2007.

BRANZ Appraisals

Technical Assessments of products for building and construction.

Cavity Batten Systems Limited
194 Oceanbeach Road
Mount Maunganui
Tel: 07 575 5567
Fax: 07 575 5569
Web: www.cavibat.co.nz

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
branz.co.nz

Product

1.1 Cavibat Cavity Battens consist of a range of extruded fluted battens designed for use as non-structural cavity battens in cavity-based wall cladding systems. The Cavibat cavity batten is designed for use with timber framed buildings and the Cavibat R cavity batten is designed for use with steel framed buildings where a thermal break is required.

1.2 Cavibat Cavity Battens create a minimum 18 mm cavity, providing a secondary means of weather resistance by separating the cladding from the external wall framing, as well as providing an unobstructed path for any occasional ingress of water that may get past the external skin to drain to the exterior of the building.

Scope

2.1 Cavibat Cavity Battens have been appraised for use as non-structural cavity battens for use with non-structural wall cladding systems on timber framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with cavity-based wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a nominal 20 mm (minimum 18 mm) drained and vented cavity; and,
- situated in NZS 3604 Wind Zones up to, and including Extra High.

2.2 The Cavibat R cavity batten has also been appraised for use as a non-structural cavity batten incorporating a thermal break for use with non-structural wall cladding systems on steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with cavity-based wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a nominal 20 mm (minimum 18 mm) drained and vented cavity; and,
- situated in NZS 3604 Wind Zones up to, and including Extra High.

(Note: Cavibat and Cavibat R cavity battens can also be used on buildings subject to specific weathertightness design. Weathertightness design and detailing of these installations is the responsibility of the designer and is outside the scope of this Appraisal. Cavibat and Cavibat R Cavity Battens are not suitable for use where pressure equalized cavities are required.)

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Cavibat Cavity Battens 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. Cavibat Cavity Battens meet the requirements for loads arising from wind and impact [i.e. B1.3.3 (h) and (j)]. See Paragraphs 8.1 - 8.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Cavibat Cavity Battens meet these requirements. See Paragraphs 9.1 to 9.3.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Cavibat Cavity Battens when used to form a drainage cavity behind a cladding system will contribute to meeting this requirement. See Paragraphs 12.1 - 12.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Cavibat Cavity Battens meets this requirement and will not present a health hazard to people.

3.2 Cavibat Cavity Battens have been tested to E2/VM1 and are an **Acceptable Solution** in terms weathertightness performance in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.4. Cavibat Cavity Battens are an Alternative Solution in terms of New Zealand Building Code compliance for all other provisions of the NZBC.

Technical Specification

4.1 System components and accessories supplied by Cavity Batten Systems Limited are:

- **Cavibat Cavity Battens** are manufactured from extruded polypropylene. The battens are cut after extruding to a finished size of approximately 45 mm wide by 18 mm thick. The battens are coloured green and are supplied in 1200 mm long lengths.
- **Cavibat R Cavity Battens** are manufactured from 10 mm thick extruded polypropylene with 10 mm thick extruded polystyrene (XPS) adhered to the back face. The battens are cut after extruding to a finished size of approximately 45 mm wide by 20 mm thick. The battens are coloured blue and are supplied in 1200 mm long lengths.

4.2 System components and accessories supplied by the building contractor are:

- **Cavibat and Cavibat R fixings (timber frame)** – 50 mm hot-dip galvanised or stainless steel finishing brads used to temporarily fix the battens in place until the cladding is installed.
- **Cavibat and Cavibat R fixings (steel frame)** – 30 or 38 mm hot-dip galvanised finishing brads used to temporarily fix the battens in place until the cladding is installed.

Handling and Storage

5.1 Handling and storage of the Cavibat and Cavibat R cavity battens, whether on or off site, is under the control of the building contractor. The battens must be protected from direct sunlight and physical damage, and should be stored flat and under cover.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Cavibat Cavity Battens. 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.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Design Information

General

7.1 Cavibat Cavity Battens can be used to form drained cavities as specified by NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.2, except that Cavibat and Cavibat R cavity battens can also be installed continuously in a horizontal orientation as ventilation and drainage is permitted through the batten flutes.

7.2 Cavibat and Cavibat R cavity battens can be used as an alternative to the timber and polystyrene cavity battens specified within NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.4.

7.3 Cavibat and Cavibat R cavity battens do not provide vermin proofing to the bottom of the drained cavity. A cavity vent strip complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 must be installed as part of the selected cladding system.

7.4 Where the Cavibat and Cavibat R cavity battens are installed vertically or horizontally at greater than 450 mm centres and a flexible building underlay is used, a building underlay support in accordance with NZBC Acceptable Solution E2/AS1 Paragraph 9.1.8.5 must be installed over the building underlay behind the cavity battens at 300 mm centres horizontally to prevent bulging of the building underlay into the drainage cavity.

7.5 Cavibat Cavity Battens is compatible with wood based, cement based, fibre cement, polystyrene based, metal and uPVC cladding products and kraft paper based and synthetic building underlays.

Structure

8.1 The Cavibat and Cavibat R cavity battens must be treated as non-structural packers only. Fixing lengths for the cladding material must be as required for non-structural timber cavity battens. If the Cavibat and Cavibat R cavity battens are to be used with a cladding system that was originally direct fixed, the fixing length must be increased by a minimum of 20 mm to ensure frame penetration depths are maintained.

Impact Resistance

8.2 Cavibat and Cavibat R cavity battens have adequate resistance to impact loads likely to be encountered in normal residential and commercial use. The battens also have adequate resistance to compressive loads likely to be encountered during fixing of the cladding.

Wind Zone

8.3 Cavibat and Cavibat R cavity battens are able to transfer the positive wind loads on the wall cladding to the structural wall frame. Cavibat and Cavibat R cavity battens are suitable for use on buildings situated in all Wind Zones of NZS 3604, up to, and including Extra High.

Durability

Serviceable Life

9.1 Provided the Cavibat cavity batten is not exposed to weather or ultra-violet (UV) light for a total of more than 60 days, it is expected to have a serviceable life of at least 15 years.

9.2 Provided the Cavibat R cavity batten is not exposed to weather or ultra-violet (UV) light for a total of more than 21 days, it is expected to have a serviceable life of at least 15 years.

9.3 Cavibat Cavity Battens will have a durability equivalent to that of the cladding to meet code compliance with NZBC Clause B2.3.2 provided the cladding system is maintained in accordance with this Appraisal and the battens are continually protected from UV light.

Maintenance

10.1 No maintenance is required for Cavibat Cavity Battens. Regular checks, at least annually, must be made of the wall cladding, flashings and penetrations to ensure they are maintained weathertight and continue to perform their function, to ensure that water will not penetrate the cladding.

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Prevention of Fire Occurring

11.1 Cavibat Cavity Battens must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solutions C/AS1 to C/AS6, Paragraph 7.5.9 for the protection of combustible materials.

External Moisture

12.1 Cavibat Cavity Battens alone will not prevent airflow into the roof space. The cavity must be sealed off from the roof space to meet code compliance with NZBC Clause E2.3.5.

12.2 Drained cavities constructed using Cavibat Cavity Battens allow excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC Clause E2.3.6.

12.3 Where a cladding manufacturer specifies a drained cavity that complies with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.2 as part of their system, Cavibat Cavity Battens may be used. Where a proprietary cladding system manufacturer specifies timber or polystyrene cavity battens as part of their system, permission must be obtained from the cladding manufacturer before the timber or polystyrene cavity battens are substituted with Cavibat or Cavibat R battens.

12.4 The detailing of the cladding system including junctions between the cladding system and external joinery, other wall penetrations, e.g. meter boxes, and other cladding and roofing junctions is the responsibility of the building designer for compliance with the NZBC. These details have not been assessed as part of this Appraisal.

12.5 The use of Cavibat Cavity Battens to form a drained cavity where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirements for junctions, penetrations etc of the cladding system to remain weather resistant.

Internal Moisture

13.1 The XPS layer of the Cavibat R cavity batten has an R-Value of R0.3 m^2K/W. Where a cladding manufacturer specifies a drained cavity that complies with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.2 and thermal break that complies with NZBC Acceptable Solution E3/AS1, Paragraph 1.1.4 (d) as part of their system, Cavibat R cavity battens may be used. Cavibat R cavity battens must be installed over the building underlay over each steel member to provide the thermal break. Where a proprietary cladding system manufacturer specifies timber or polystyrene cavity battens over a thermal break as part of their system, permission must be obtained from the cladding manufacturer before the timber or polystyrene cavity battens and thermal break are substituted with Cavibat R cavity battens.

Installation Information

Installation Skill Level Requirements

14.1 Installation of Cavibat Cavity Battens must be completed by competent tradespersons with an understanding of cavity construction.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

15.1 The selected building underlay and flexible sill and jamb flashing tape must be installed in accordance with the underlay and flashing tape manufacturer's instructions prior to the installation of the Cavibat and Cavibat R cavity battens.

Cavibat and Cavibat R Cavity Battens

15.2 The battens may be cut on site with a knife, hand saw or drop saw.

15.3 The battens must be installed over the building underlay to the wall framing. The cavity battens must be fixed in place with 40 x 2.5 mm galvanised flat head nails or galvanised or stainless steel finishing brads at approximately 400 mm centres.

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15.4 Where the studs are at greater than 450 mm centres and a flexible building underlay is used, a building underlay support in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 must be installed horizontally over the building underlay at 300 mm centres.

15.5 The battens must be installed in continuous lengths and may be installed vertically and/or horizontally to suit the requirements of the selected cladding.

15.6 Cavibat cavity battens can be installed with either of the batten faces against the wall underlay. Cavibat R cavity battens must be installed with the XPS face against the wall underlay.

Inspections

15.7 The Technical Literature must be referred to during the inspection of Cavibat Cavity Batten System installations.

Health and Safety

16.1 There are no specific health and safety requirements for Cavibat Cavity Battens, however safe use and handling procedures for the components that make up the cladding system must be followed in accordance with the requirements of the relevant manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

17.1 The following testing has been completed by BRANZ:

- Assessment of the face load strength of Cavibat Cavity Battens was completed by fixing a representative cladding material through the Cavibat cavity batten into timber framing. Power-driven nails, hand driven nails, wood screws and Tek screws were used to fix the cladding and the results were used in assessing the impact resistance of Cavibat Cavity Battens.
- BRANZ expert opinion on NZBC E2 code compliance for Cavibat Cavity Battens was based on testing to the relevant components of E2/VM1 [as contained within NZBC Clause E2, Amendment 4]. The testing assessed the performance of the Cavibat cavity batten in a continuous vertical and horizontal orientation. In addition to the weathertightness test, the Technical Literature has been reviewed, and an opinion has been given by BRANZ technical experts that Cavibat Cavity Battens will meet the performance levels of Acceptable Solution E2/AS1 for drained cavity claddings.

Other Investigations

18.1 A durability opinion has been given by BRANZ technical experts.

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

18.3 The Technical Literature for Cavibat Cavity Battens has been examined by BRANZ and found to be satisfactory.

Quality

19.1 The manufacture of the Cavibat and Cavibat R cavity batten has been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

19.2 The quality of supply to the market is the responsibility of Cavity Batten Systems Limited.

19.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems, building underlays, flashing tapes, airseals and cladding system in accordance with the instructions of the designer.

19.4 The quality of installation, handling and storage on site of the Cavibat and Cavibat R cavity battens is the responsibility of the installer.

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Sources of Information

- NZS 3604: 2011 Timber-framed buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 (Amendment 5, 1 August 2011).
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition (Amendment 12, 10 October 2011).
- The Building Regulations 1992.

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BRANZ

In the opinion of BRANZ, Cavibat Cavity Battens 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 Cavity Batten Systems 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. Cavity Batten Systems 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 Cavity Batten Systems 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 Cavity Batten Systems Limited or any third party.

For BRANZ

Pieter Burghout
Chief Executive

Date of Issue:
20 December 2012

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

BC 220230

Special environments

In New Zealand there are areas where local conditions create an **increased likelihood of corrosion.** Special consideration should be given to material selection in these areas. If you think your project may experience one of the below environments, please contact New Zealand Steel for advice about the best COLORSTEEL® product to use.

GEOTHERMAL AREAS
Hydrogen sulphide associated with geothermal activity creates a corrosive environment. Variations in natural activity or draw-off from steam bores plus the effects of weather conditions make the high risk areas hard to define.

WEST COAST, SOUTH ISLAND
In this area, smoke from coal burning fires may cause high concentrations of sulphur dioxide in the air. The combination of this and the high rainfall for the region creates an aggressive situation which must be considered when choosing the appropriate COLORSTEEL® solution. The effects of a severe coastal environment aggravate the situation. This area combines the most severe features of both industrial and coastal environments.

INTERNAL ENVIRONMENTS
Some commercial or agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. Similarly a corrosive environment can develop within sheds for intensive animal farming.

INDUSTRIAL ENVIRONMENTS
Environments close to corrosive industrial emissions and subject to heavy fallout from them require extra consideration.

Considerations

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

NON-RESIDENTIAL WARRANTY
For applications like schools, warehouses and other commercial buildings please contact New Zealand Steel. The maximum warranty offered on commercial buildings is 15 years.

FURTHER ASSISTANCE
Further advice on the selection of the appropriate product to suit your particular location is available from New Zealand Steel or your local COLORSTEEL® supplier.



NZS0005-201

TASMAN DISTRICT COUNCIL - APPROVED

26/04/2022

COLORSTEEL®

For more information about warranties and maintenance, please call **0800 697 833** or visit **colorsteel.co.nz**

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NEW ZEALAND MADE



Environmental Categories, Warranty & Product Maintenance Recommendations

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

ENVIRONMENTAL CATEGORIES & PRODUCT MAINTENANCE RECOMMENDATIONS

New Zealand has a wide range of environmental conditions.

From the harsh west coast beaches, to the relative shelter of the Waikato farming region, New Zealand Steel offers a range of coated steel products that are suitable for most locations.

This chart is intended as a guide only. Design, position and other factors can influence which product is recommended. Please contact New Zealand Steel for further advice on the best COLORSTEEL® product to use.

Eligible for a residential warranty.
Not eligible for a residential warranty.
[1] *Against perforation as a result of corrosion.*
[2] *Covering the paint surface against flaking, peeling and excessive fade.*

VERY SEVERE

Starts 25m from the high water mark on the east coast and 50m from the high water mark on the west coast, characterised by:

- Heavy salt deposits.
- The almost constant smell of salt spray in the air.
- Close to breaking surf such as is found on exposed coasts (typically starts 25-50 metres).

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

SEVERE

Characterised by:

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

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

MODERATE

Characterised by:

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

			VERY SEVERE				SEVERE				MODERATE			
			WALL CLADDING	ROOFING	GUTTER DOWNPIPES	FASCIA	WALL CLADDING	ROOFING	GUTTER DOWNPIPES	FASCIA	WALL CLADDING	ROOFING	GUTTER DOWNPIPES	FASCIA
ENDURA®	**RESIDENTIAL WARRANTIES**	PERFORATION[1]						15 YEARS	10 YEARS	15 YEARS	15 YEARS	30 YEARS	10 YEARS	15 YEARS
		PAINT[2]						15 YEARS	5 YEARS	5 YEARS	15 YEARS	18 YEARS	10 YEARS	10 YEARS
	MAINTENANCE		Not recommended in this environment				Not recommended in this environment	Rain washing	Manual washing every 3 months	Manual washing every 3 months	Rain washing plus manual washing every year	Rain washing	Manual washing every 6 months	Manual washing every 6 months
MAXX®	**RESIDENTIAL WARRANTIES**	PERFORATION[1]	15 YEARS	15 YEARS	10 YEARS	15 YEARS	15 YEARS	20 YEARS	10 YEARS	15 YEARS	15 YEARS	30 YEARS	10 YEARS	15 YEARS
		PAINT[2]	15 YEARS	15 YEARS	10 YEARS	10 YEARS	15 YEARS	15 YEARS	10 YEARS	10 YEARS	15 YEARS	18 YEARS	10 YEARS	10 YEARS
	MAINTENANCE		Rain washing plus manual washing every 3 months	Rain washing	Manual washing every month	Manual washing every month	Rain washing plus manual washing every 6 months	Rain washing	Manual washing every 3 months	Manual washing every 3 months	Rain washing plus manual washing every year	Rain washing	Manual washing every 6 months	Manual washing every 6 months
DRIDEX®	**RESIDENTIAL WARRANTIES**	PERFORATION[1]									15 YEARS	30 YEARS		
		PAINT[2]									15 YEARS	18 YEARS		
	MAINTENANCE		Not recommended in this environment				Not recommended in this environment				Rain washing plus manual washing every 6 months	Rain washing	Not recommended in this environment	Not recommended in this environment
DRIDEX+®	**RESIDENTIAL WARRANTIES**	PERFORATION[1]					15 YEARS	20 YEARS			15 YEARS	30 YEARS		
		PAINT[2]					15 YEARS	15 YEARS			15 YEARS	18 YEARS		
	MAINTENANCE		Not recommended in this environment				Rain washing plus manual washing every 6 months	Rain washing	Not recommended in this environment	Not recommended in this environment	Rain washing plus manual washing every 6 months	Rain washing	Not recommended in this environment	Not recommended in this environment
ZINCALUME®	**RESIDENTIAL WARRANTIES**	PERFORATION[1]									15 YEARS	15 YEARS	10 YEARS	10 YEARS
	MAINTENANCE		Not recommended in this environment				Not recommended in this environment				Rain washing plus manual washing every 6 months	Rain washing	Manual washing every 3 months	Manual washing every 3 months

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 2

JH Linea Weatherboard – Details & Technical Specifications

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

Linea™ WEATHERBOARD

jameshardie.co.nz

Cavity Fix

Technical Specification

May 2020 New Zealand



BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

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2 Application and Scope

2.1 Application

This specification includes the installation of Linea Weatherboard cavity construction where risk matrix is 13 or more and must be read in conjunction with the current CodeMark Certificate and BRANZ Appraisal. This installation method can also be used for buildings where the risk matrix score is 0 - 12 if desired.

This document is intended for use by architects, designers, specifiers or builders who are involved in specifying Linea Weatherboard. The document also serves the purpose of an installation manual for this product.

For use of Linea Weatherboard outside this published scope, the architect, designer or engineer must undertake specific design. For advice on designs outside the scope of this specification, Ask James Hardie on 0800 808 868.

Refer to the Linea Weatherboard Direct Fixed Technical Specification when installing Linea Weatherboard without a cavity.

2.2 Scope

Linea Weatherboard cavity construction is suitable for use in timber framed buildings that fall within the scope limitations of the New Zealand Building Code (NZBC) Acceptable Solution E2/AS1, Paragraph 1.1.

Linea Weatherboard cavity construction is also suitable for use in specific engineering design projects (SED) subject to a wind pressure of 2.5kPa (ULS) maximum for building heights upto 25m.

2.3 Limitations

- Linea Weatherboard cladding must not be used on curved wall applications
- Linea Weatherboard cladding must not be installed vertically or angled
- The minimum ground clearances specified must be maintained
- Timber window joinery/recessed openings is subject to an alternative design by the designer
- Maximum SLS inter-story seismic deflections up to span/180 when used in specific design buildings (SED) buildings above 10m height. To accommodate higher inter-story drifts, a deflection should be used.

2.4 Details

Various typical Linea Weatherboard details are provided within this document. In addition to these, the construction details with HomeRAB™ Pre-Cladding/RAB™ Board have also been developed and are available on our website. These details are available in dwg, dxf, jpg and pdf file format and can be downloaded at **www.jameshardie.co.nz.**

All dimensions shown are in millimetres unless noted otherwise.

3 Compliance

3.1 NZBC Compliance

When installed in accordance with the conditions of CodeMark number GM-CM30018 Linea Weatherboard complies with all relevant requirements of the NZBC.

CODEMARK™
30018

Please refer to www.building.govt.nz for a copy of the certificate.

Linea Weatherboard cavity fixed cladding also has a BRANZ Appraisal number 447 (2010) available at www.branz.co.nz or www.jameshardie.co.nz.

BRANZ Appraised
Appraisal No.447 [2010]

4 Design

4.1 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.

All New Zealand Standards referenced in this manual are current edition and must be complied with.

Specifier

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.

Installer

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 the details provided in this document must be read in conjunction with the project specification.

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 their aesthetic expectations before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation. James Hardie will only offer a replacement product if Linea Weatherboard or Axent Trim supplied are found to be out of its manufacturing specification.

4.2 Clearances

The clearance between the bottom edge of cladding and the paved/unpaved ground must comply with section 9.1.3 of E2/AS1. On the roofs and decks the minimum clearance must be 50mm. These clearances must be maintained throughout the life of the building.

Linea Weatherboard must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by the NZBC Acceptable Solution, E2/AS1 Table 18.

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 ‘Surface Water’.

Do not install cladding such that it may remain in contact with water or ground, refer to figures in section 9 of this manual.

4.3 Structure

4.3.1 Timber Framing

Timber framing must be in accordance with NZS 3604 (Timber-framed buildings) or designed as for specific engineering design (SED) in accordance with NZS 3603 and AS/NZS 1170 where specific engineering design is required, the framing stiffness must be equivalent to or more than the framing provisions of NZS 3604.

The stud spacing must not exceed 600mm centres maximum for buildings within the scope of NZS 3604 and 400mm centres maximum for wind pressures more than 1.5kPa (ULS).

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.

4.3.2 Durability

Timber framing must be treated to a minimum H1.2 treatment requirements and comply with Acceptable Solution B2/AS1 ‘Durability’ of the NZBC. For further timber treatment information refer to the NZS 3602 (Timber and Wood-Based Products for use in Buildings) for minimum timber treatment selection and treatment requirements. Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturers. Refer to the NZS 3602 for information about the allowable moisture content in timber framing.

4.4 Structural Bracing

Bracing can be achieved by using HomeRAB Pre-Cladding or RAB Board installed direct to framing instead of a flexible underlay or by using Villaboard™ Lining bracing system on the internal face.

4.5 Energy Efficiency

External walls constructed as per this technical specification, using Linea Weatherboard cladding must use suitable bulk insulation to meet the minimum thermal insulation requirements as per Clause H1/AS1 'Energy Efficiency' of the NZBC.

4.6 Fire Rated Walls

External walls with Linea Weatherboard cavity fix construction method can achieve fire ratings up to 60/60/60 when constructed in accordance with the James Hardie Fire and Acoustic Design Manual. Linea Weatherboard must be face fixed for fire rated applications.

Refer to the Fire and Acoustic Design Manual for further information about fire rated systems.

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4.7 Control of External Fire Spread

External spread of fire (clause C3.5 and C3.7) apply where:

- Building height is greater than 10m and upper floors have sleeping uses or are different property (C3.5), and
- Where the building is located within 1m of a relevant boundary (C3.7)

Refer to Table 5.1 of Section 5.4 of C/AS1 for group SH or table 5.5 of Section 5.8.1 of C/AS2 for the other risk groups to identify the external fire spread requirement applicable to the external cladding material and surface finish.

For the other situations where 'no requirement' is listed, Linea Weatherboard installed as per the details published in this specification complies.

For buildings that are >10m high and contain tenancies above as per Table 5.5. of C/AS2, Linea Weatherboard installed over timber cavity battens in conjunction with RAB Board with R2.2 fibreglass/James Hardie mineral insulation complies. Refer to Figure 38 and 39 for RAB Board and cavity batten layout. For the complete set of suitable Linea Weatherboard cavity construction details with RAB Board for this application, refer to www. jameshardie.co.nz.

4.8 Alpine regions

In regions subject to freeze/thaw conditions, Linea Weatherboard must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions subject to snow drifts over winter.

The Linea Weatherboard has been tested in accordance with AS/NZS 2908.2 Clause 8.2.3.

5 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/NZS1716 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.

FAILURE TO ADHERE TO 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

✕ NEVER use a power saw indoors or in a poorly ventilated area

✕ NEVER dry sweep

✓ ALWAYS use M Class or higher vacuum or damp down dust before sweeping up

✕ 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

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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.

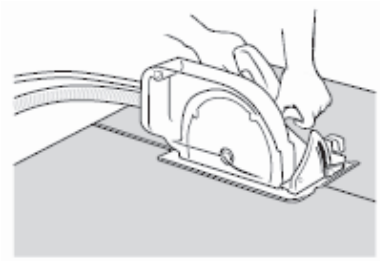
When cutting

- ✓ 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 operation
  - If you are not clean shaven, then use a powered air respirator with a loose fitting head top
  - Wear safety glasses
  - Wear hearing protection
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

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

5.1 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:

✗ 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.

5.2 Tips for safe and easy handling of weatherboard products

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

6 Installation

The horizontal lap between the two Linea Weatherboard must be 30mm minimum. In certain scenarios you may require to creep up the lap, this must not exceed 33mm.

Linea Weatherboard must be kept dry whilst in storage prior to and during fixing. Site cut ends that are exposed such as slimline box corners, internal corners etc. and any sanded patches on the boards surface must be primed prior to installation. Dust and loose material must be removed before priming.

6.1 Fastener

6.1.1 Fastener – Size and Method

Linea Weatherboard and Axent Trim must be fixed to timber with the types of nails specified in Tables 4 and 5, in accordance with the following requirements:

- Linea Weatherboard can either be face/exposed fixed or concealed fixed
- Linea Weatherboard must be fixed into studs at maximum 600mm centres. Fixing centres to coincide with stud spacing, refer to figures in section 9 of this manual
- All concealed nails must be driven flush with the board surface
- When concealed fixing Linea Weatherboard, nails must be driven under the lap of boards, except at all corners and vertical edges of openings where Linea Weatherboard must be face fixed, refer to figures in section 9 of this manual
- Nails must be fixed 25mm from the end of the board when hand nailing. For gun nailing refer to Section 6.1.2
- When using concealed fixing method, any gaps that may appear under the lap due to site conditions can be minimised by fixing a jolt head nail through the lap as per the exposed nailing method. Refer to figures in section 9 of this manual
- When using concealed fixing method, Linea Weatherboard may be tied together by face fixing through the lap using a 32mm brad nail if desired.
- When face fixing Linea Weatherboard, the upper board must be pre-drilled before fixing with a jolt head nail

Table 4

Wind pressure (kPa)	Underlay	Fixing method	Fixing type	Instructions
Up to 1.5 (up to and including VH Wind Zone)	Flexible underlay	Concealed nailing	60 x 3.15mm HardieFlex™ nail or a 60 x 2.87mm D/round head gun nail	Finish flush with the board surface.
		Face nailing	75 x 3.15mm jolt head nails	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3mm drill bit.
	Rigid air barrier	Concealed nailing	75 x 3.15mm HardieFlex™ nail or a 75 x 3.06mm D/round head gun nail	Finish flush with the board surface.
		Face nailing	90 x 3.55mm jolt head nails	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3.5mm drill bit.
1.5 to 2.5 (EH Wind Zone and SED projects)	RAB Board	Face nailing	90 x 3.55mm jolt head nail	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3.5mm drill bit.

Table 5

Nail requirements for Axent Trim	
Single thickness	60mm jolt head nails. If fixing over Linea Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled hole, using a 3mm drill bit.
Single thickness plus packer	If fixing over Linea Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled hole, using a 3mm drill bit. When fixing to timber support use 60mm jolt head nails.

For fire rated wall applications the Linea Weatherboards must be face fixed. For more information Ask James Hardie on 0800 808 868.

6.1.2 Gun Nailing

Linea Weatherboard can be gun nailed with a D-Head or RounDrive nail when concealed fixing method is used.

- Nails must be no closer than 50mm from the ends of boards when gun nailing is used, double studs will be required.
- Be minimum length and nearest gauge as per Table 4.
- Be finished flush with surface of board.

6.1.3 Fastener Durability

Fasteners must meet the minimum durability requirements of the NZBC. Refer to Table 6 for fixing materials requirements to be used in relation to the exposure conditions.

Table 6

Exposure conditions and nail selection prescribed by NZS 3604		
Zone	**Application**	
D (sea spray) and geothermal hot spots	General	Stainless steel 304/316
	Fire	
*C and B	General	Hot dip galvanised**
	Fire	

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

**Hot dip galvanised must comply with AS/NZS 4680.

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.

6.2 Framing

Framing to be in accordance with the NZS 3604. The following must be provided for fixing Linea Weatherboard:

- Studs at 600mm centres maximum for all wind speed zones up to and including very high (VH)
- Studs at 400mm centres maximum for wind pressures more than 1.5 kPa (ULS)
- Double studs are required at internal corners
- Extra packers may be required at external corners
- Extra studs are required for aluminium internal corner sections

6.2.1 Specific Engineering Design (SED)

For EH wind zone and specific engineering design projects the timber framing is required to be designed in accordance with NZS 3603 and AS/NZS 1170. The minimum framing sizes and layout must comply with this specification:

- Stud spacing 400mm centres maximum
- Nog spacing 1200mm centres maximum
- Double studs are required at internal corners
- Extra packers may be required at external corners
- Extra studs are required for aluminium internal corner sections

6.2.2 Gable Ends

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 independent design producer statement.

6.2.3 Tolerances

In order to achieve an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with the requirements of NZS 3604 and the manufacturer's specifications. All framing must be made flush. The visual aspects of the finished cladding can differ between two different sites or the builders installing the product. It is recommended that you also refer to a building guidance document published by MBIE to understand an acceptable level of tolerances allowed in building materials and workmanship. www.building.govt.nz Guide to tolerances, materials and workmanship in new residential construction 2015

6.3 Flexible Underlay or HomeRAB Pre-Cladding

Flexible underlay or HomeRAB Pre-Cladding must be provided to comply with the requirements of E2/AS1 up to and including very high wind zone.

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. HomeRAB Pre-Cladding is suitable for use as an air barrier and must be installed in accordance with James Hardie Rigid Air Barriers Installation Manual.

6.4 Intermediate Support

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

- Intermediate cavity batten between the studs; or
- 75mm galvanised mesh; or
- Polypropylene tape at 300mm centres fixed horizontally and drawn taut.

No intermediate supports are required:

- Where studs are at maximum 400mm centres; or,
- When rigid sheathings instead of flexible underlays are used.

6.5 Rigid Air Barrier

In EH wind zone or for specific design wind zone, a rigid air barrier i.e. RAB Board, must be used instead of flexible underlay.

For buildings more than 10m, RAB Board must be used. To achieve the temporary weathertightness using James Hardie rigid air barriers, windows/doors need to be installed with required flashing tapes and seals etc. Refer to James Hardie Rigid Air Barriers Installation Manual for information regarding its installation and to achieve temporary weathertightness.

6.6 Vent Strip

Linea 35mm cavity closer vent strip (uPVC) must be installed at the bottom of all walls constructed using the drained and ventilated for cavity construction method. James Hardie Linea 35mm cavity closer vent strip has an opening area of 1000mm^2/m length. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. Alternate cavity closer can be used ensuring compliance of E2 and may need to be used with a cant strip.

6.7 Cavity Battens

The cavity battens provide airspace between the frame and cladding and are considered a "packer" only in this specification.

The timber battens must be minimum H3.1 treated to comply with the durability requirements of B2/AS1.

Cavity battens must comply with E2/AS1 and:

- Be minimum 18mm thick
- Be minimum 45mm wide
- Until claddings are fixed the battens need only to be tacked to framing with 40 x 2.8mm nails at 800mm centres maximum (batten fixing is required temporarily to keep them straight on the wall during construction)

6.8 Joints

6.8.1 Jointing

The ends of Linea Weatherboard are jointed off-stud by means of a tongue and groove joint. Tongue and groove joints may be located centrally between studs but no closer than 100mm from the edge of a stud. The joints must be staggered by 600mm minimum. Flexible sealant must be applied to the front of tongue before pushing into the groove at the time of installation. From a visual perspective, the joint line will be visible and must not be hard filled.

6.8.2 Drainage Joint

After every two floors a horizontal drainage joint flashing is required, refer to figures Figure 29 in section 9 of this manual.

6.8.3 External Corner Joint

There are a number of options to select from when detailing external corners:

- 90º corner soaker in aluminium, copper or stainless steel
- 135º corner soaker 180mm aluminium
- Aluminium boxed corners
- Box corners using Axent Trim
- Mitred corners to weatherboards

Refer to figures in section 9 of this manual.

6.8.4 Internal Corner Joint

There are a number of options to select from when detailing internal corners:

- 90º or 135º Aluminium W-mould
- Scribed corner

Refer to figures in section 9 of this manual.

6.9 Junctions and Penetrations

All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for Linea Weatherboard which meet the performance requirements of E2 ‘External Moisture’, an approved document of the NZBC, refer to figures in section 9 of this manual.

7 Finishes

Protective coating of Linea Weatherboard and Axent Trim is required in order to meet the durability requirements of the NZBC.

7.1 Preparation and Priming

The Linea Weatherboard and Axent Trim must be dry before painting. Punch and fill all exposed nails a maximum of 2mm below the surface. Fill the hole with an exterior grade 2 part builders fill, eg CRC ADOS Builders Fill, allow to cure and using 60 grit sand paper smooth ready for painting. Prime any sanded patch on board surface or the site cut edges that will be exposed.

It is not recommended to seal gap under the lap of weatherboards as it helps in circulation of air behind the weatherboard cladding. However if sealing of the gap is undertaken, the product warranty still applies.

7.2 Sealants

All sealants must demonstrate the ability to meet the relevant requirements of the NZBC. Application and use of sealants must comply with manufacturer's instructions. Sealants, if coated, must be compatible with the paint system.

7.3 Painting

All Linea Weatherboards are pre-primed on their face and bottom edge with a factory applied acrylic base coat.

Linea Weatherboard and Axent Trim must be painted within 90 days of installation. Dark coloured paints can be used, i.e. there is no restriction on the Light Reflectance Value (LRV) of paint to be applied. All exposed faces, including the top edges under the sills and bottom edges of Linea Weatherboard, Axent Trim and accessories must be finished with an exterior paint system.

For best aesthetic results a low sheen paint is recommended.

The dark colours in certain environments may fade over a period of time. Special paints/coatings are required in certain harsh environments.

Stainless steel soakers are generally left natural. For painting over stainless steel soakers, refer to paint manufacturer as special preparation and paints are required.

Paint selection and the preparation required is dependent on paint chosen. Refer to the paint manufacturer for information before starting painting.

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8 Care and Maintenance

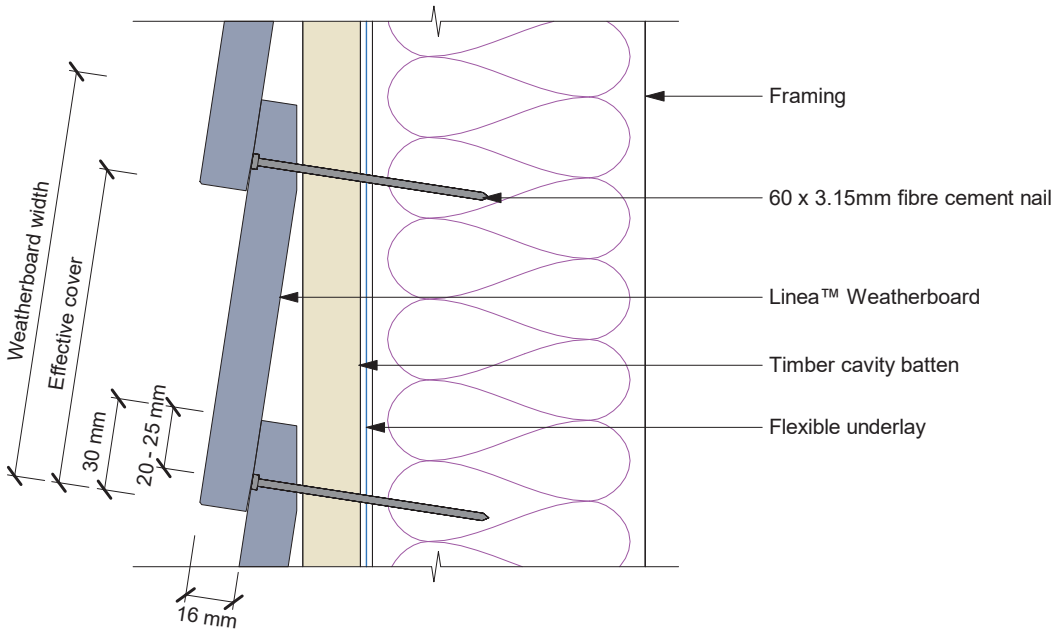
The extent and nature of maintenance will depend on the geographical location and exposure of the building. It is the responsibility of the specifier to determine normal maintenance requirements to comply with the NZBC Acceptable Solution B2/AS1. As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6-12 months* using low pressure water and a brush, and every 3-4 months in extreme coastal conditions or sea spray zones
- Re-coating exterior protective finishes. Always refer to your paint manufacturer for re-coating requirements
- Maintaining the exterior envelope and connections including junctions, penetrations, flashings and sealants
- Cleaning out gutters, blocked pipes and overflow pipes as required
- Pruning back vegetation close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained especially where gardens are concerned
- The clearances between the bottom edge of Linea Weatherboard and the finished/unfinished ground must always be maintained
- Stainless steel soakers used in extreme coastal conditions or in sea spray zones may show some signs of 'tea staining'. It is an aesthetic issue and to minimise staining soaker must be washed/polished frequently

*Do not use a water blaster to wash down the cladding. Refer to your paint manufacturer for washing down requirements.

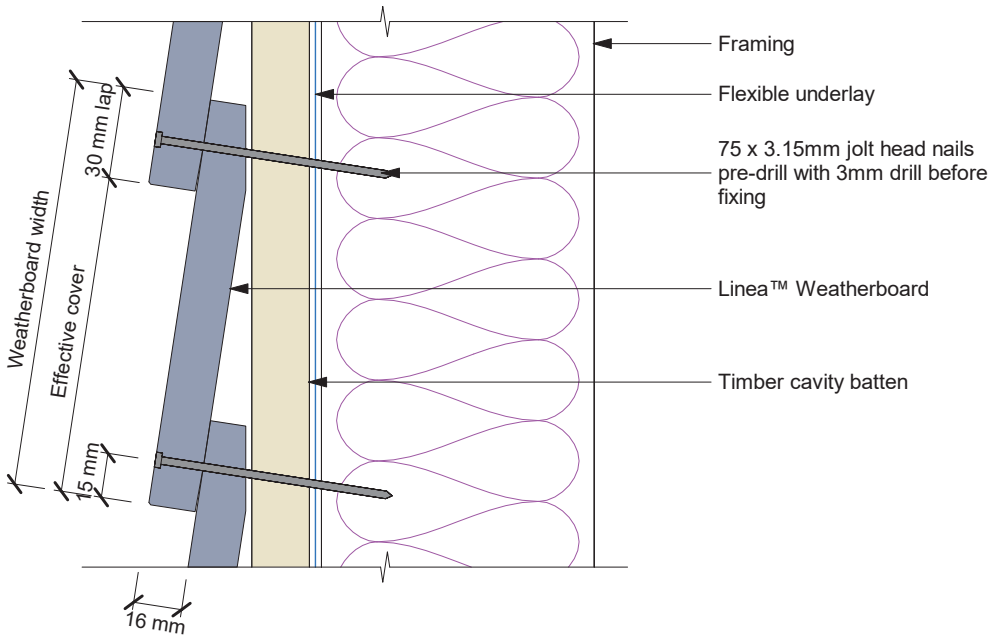
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Figure 1: Weatherboard fixing



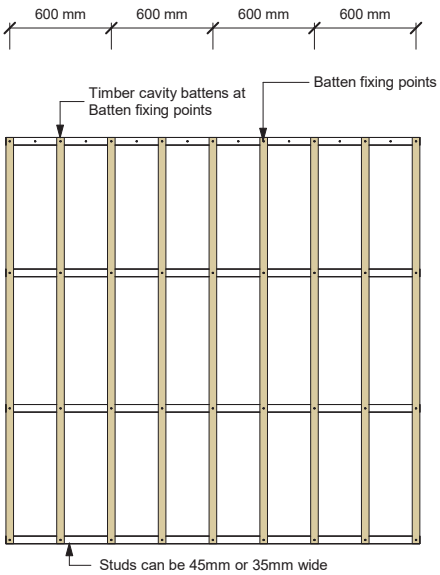
Concealed Nailing

Linea™ Weatherboards to be face fixed at corners and down window and door openings using jolt head nails at 90° to face, punch 2mm below surface and fill. Refer to fixing table 4



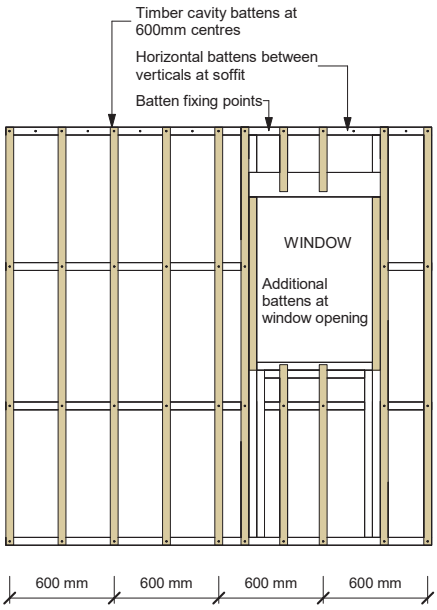
Exposed Nailing

Figure 2: Batten fixing



The intermediate support for insulation between the studs could be a timber cavity batten, polypropylene tape or 75 mm galvanised wire mesh. Refer to E2/AS1 Paragraph 9.1.8.5 Polypropylene tape must be fixed horizontally and drawn taut at 300 mm centres.

Figure 3: Batten layout at window opening

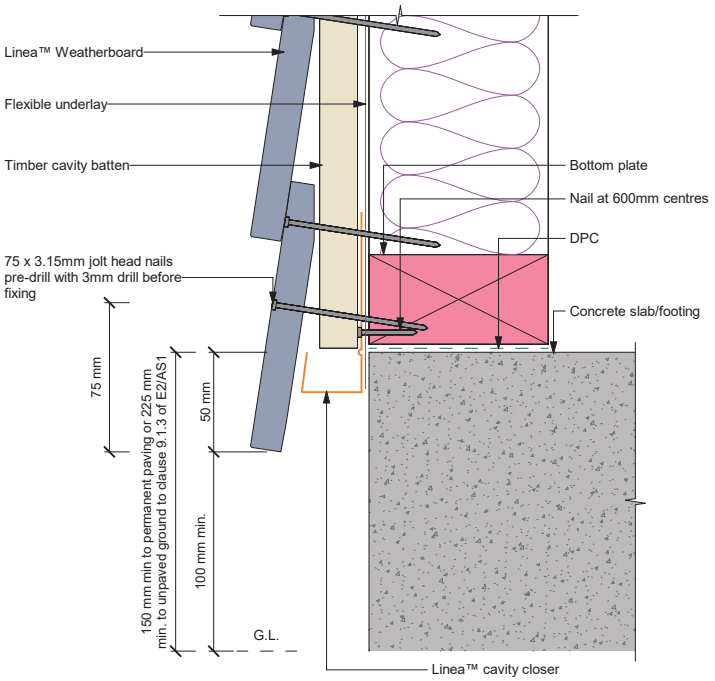


- Studs can be 45mm or 35mm wide

-The intermediate support for insulation between the studs could be a timber cavity batten, polypropylene tape or 75 mm galvanised wire mesh. Refer to E2/AS1 Paragraph 9.1.8.5 Polypropylene tape must be fixed horizontally and drawn taut at 300 mm centres.

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Figure 4: Foundation detail



Note:
Drain holes in James Hardie uPVC vent strip are sufficient to achieve ventilation openings of 1000mm² per lineal metre

Figure 6: Jointing off stud

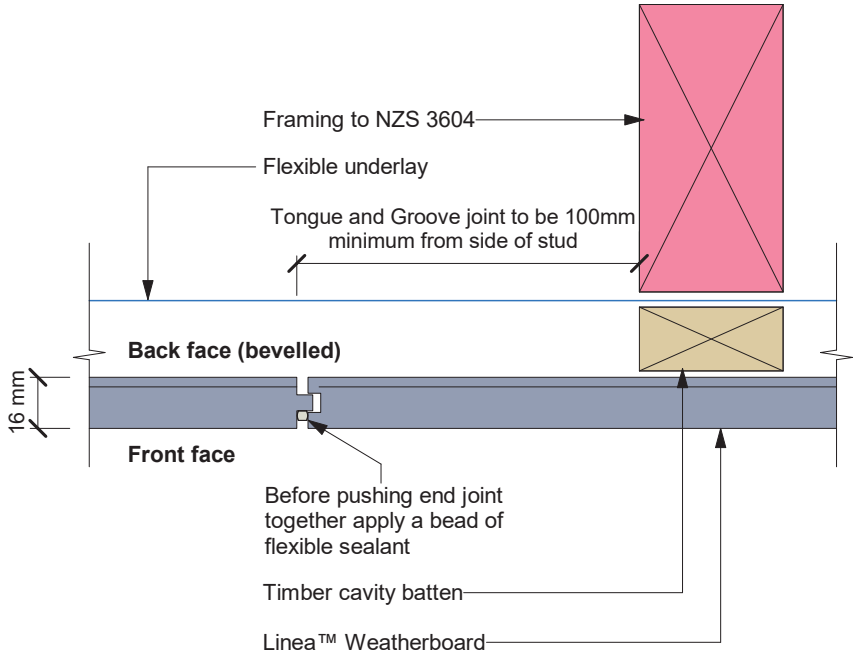
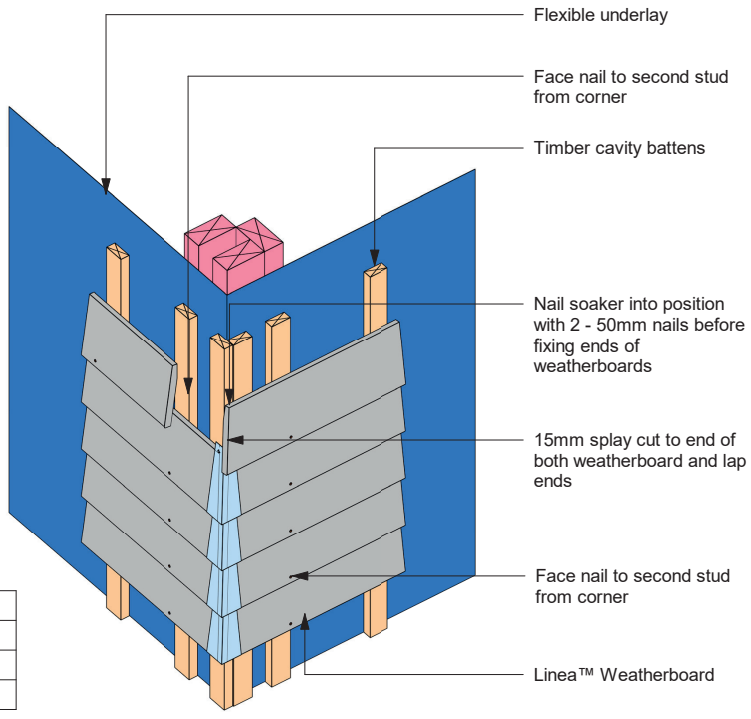


Figure 7: External corner soaker



Soaker material	Nail material
Copper	Copper or phosphor bronze
Aluminium	Hot dip galvanised
Stainless steel	Stainless steel

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Figure 11: Internal 90 ° aluminium ‘W’ mould corner

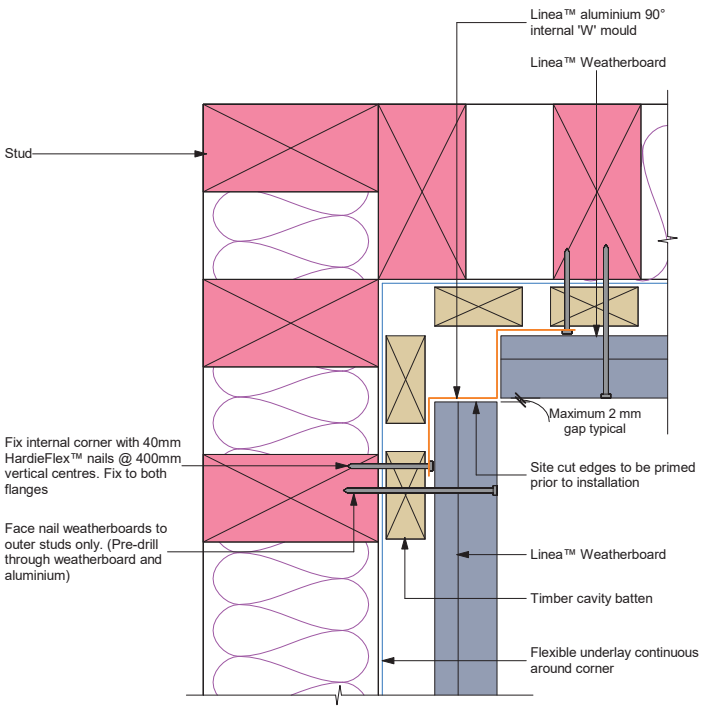


Figure 13: Internal corner joint flashing

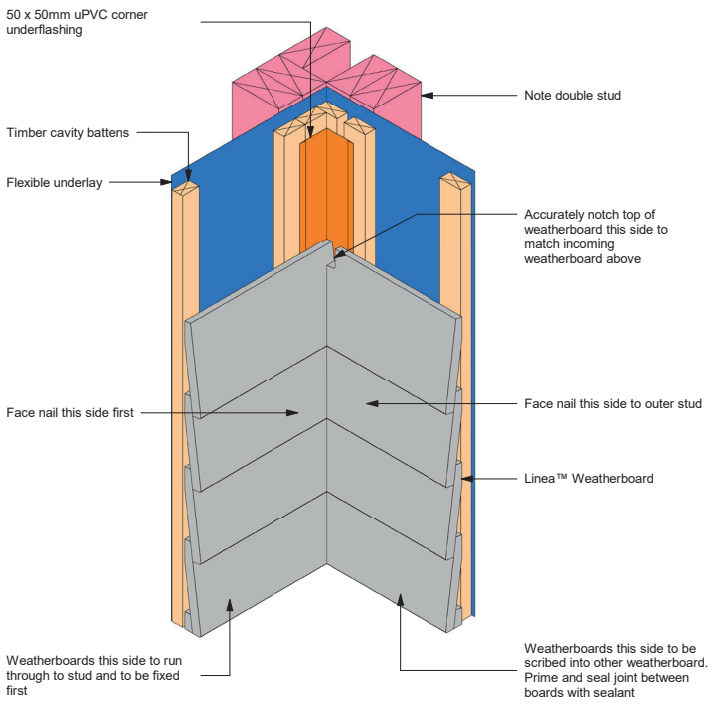
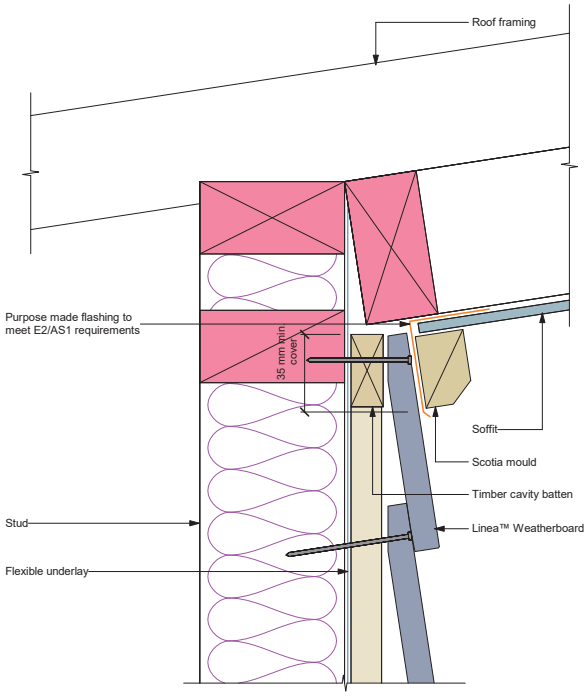
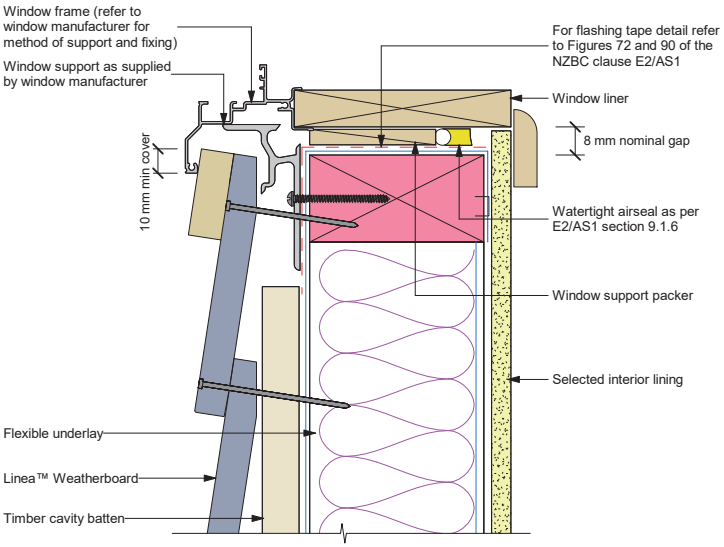


Figure 16: Sloping soffit and wall junction



Note: Site cut edges to be primed

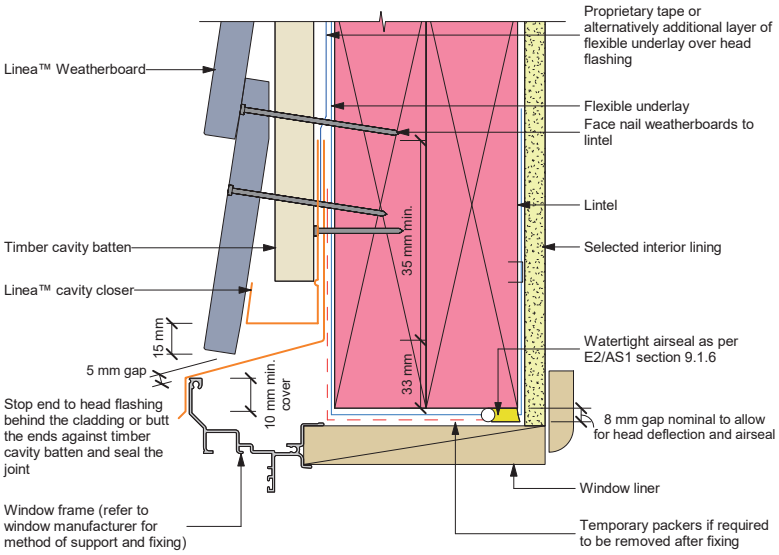
Figure 17: Window and door sill



General notes for materials selection
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

Refer to the manufacturer or supplier for technical information for these materials

Figure 18: Window head



Note:
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED pressures
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1
- Refer to Figure 22 for sealing end battens to head flashing
- Site cut edges to be primed

Figure 19: Window jamb

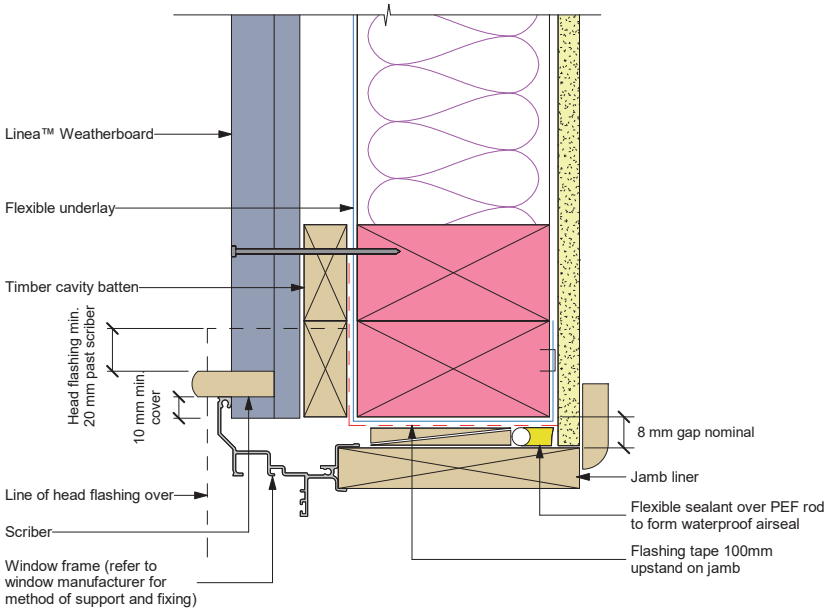
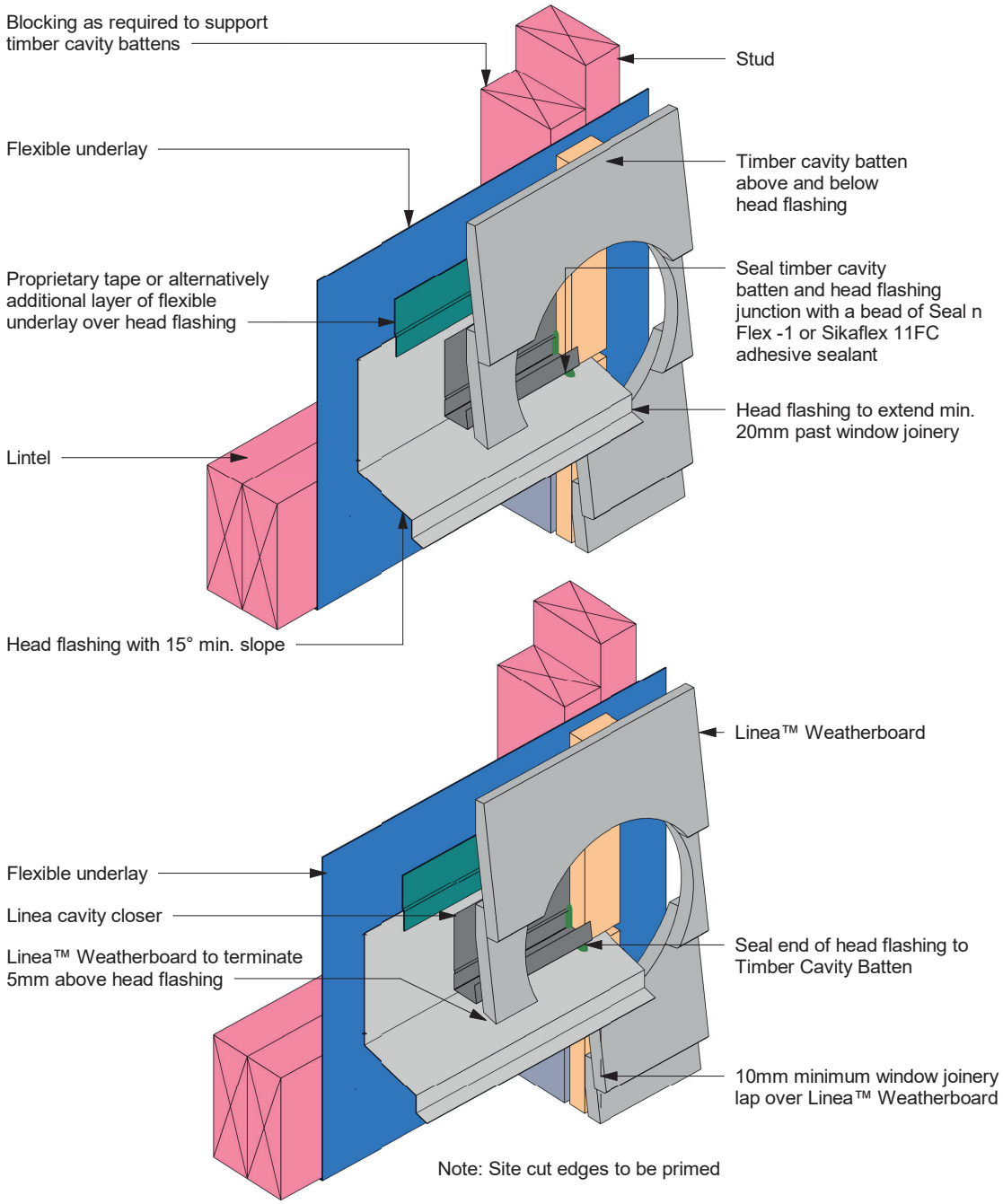
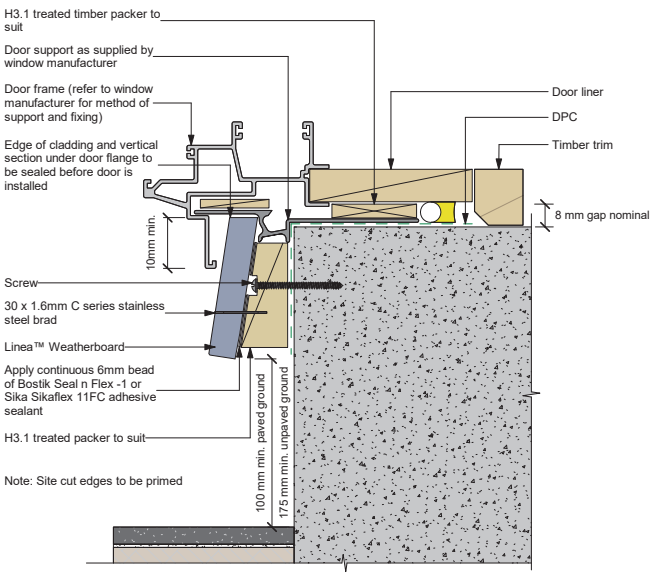


Figure 20: Window head stop end



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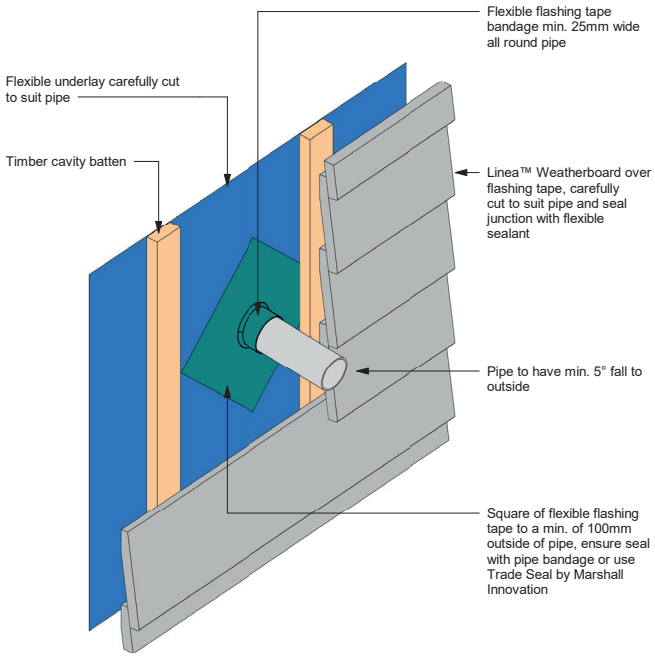
Figure 24: Door sill support detail



Refer to the manufacturer or supplier for technical information for these materials

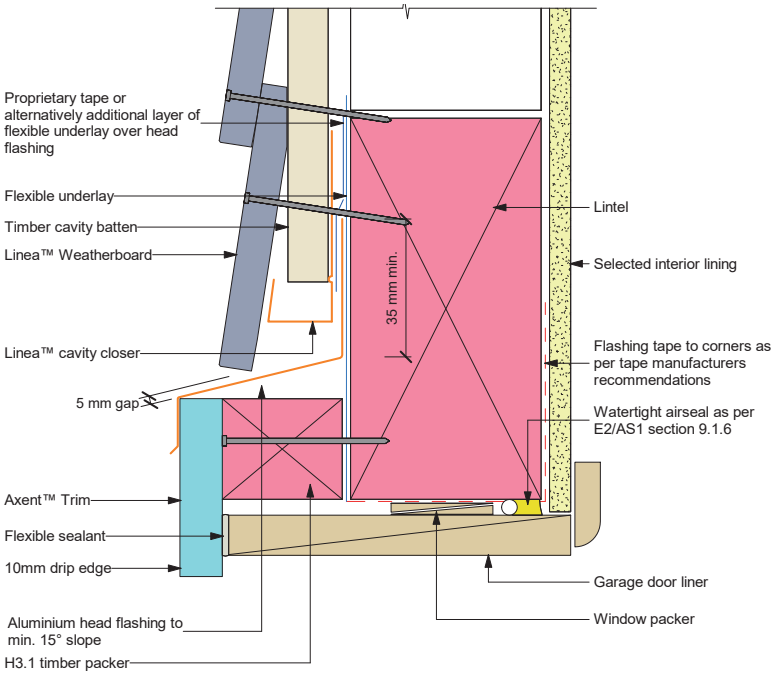
General notes for materials selection
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of the NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact
4. Linea™ Weatherboard to have sealed butt joint over batten at each corner of opening

Figure 25: Pipe penetration



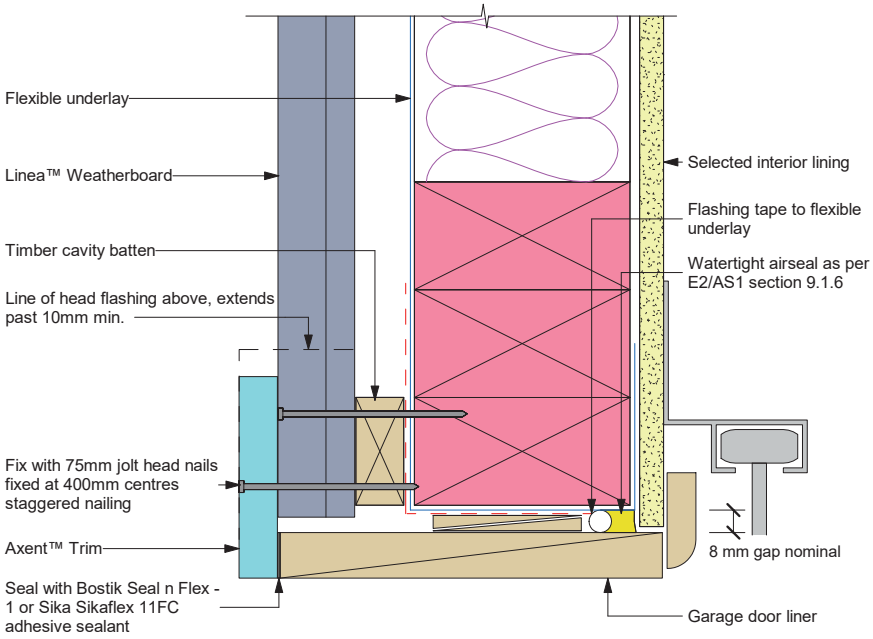
Note: Site cut edges to be primed

Figure 36: Garage door head



Note:
- Sealant must be applied between head flashing and liner in VH and EH wind zones and SED wind pressures
- Site cut edges to be primed

Figure 37: Garage door jamb



Note: Site cut edges to be primed

Linea™ WEATHERBOARD

Product Warranty

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

a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.

b) This warranty is not transferable.

c) The Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice.

d) The project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("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).

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 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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BRANZ Appraised

Appraisal No. 447 [2020]

LINEA™ WEATHERBOARD CAVITY CLADDING



Appraisal No. 447 (2020)

This Appraisal replaces BRANZ Appraisal No. 447 (2010)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

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

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

Scope

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

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

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

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

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

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

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

Readers are advised to check the validity of this Appraisal by

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BRANZ Appraised
Appraisal No. 447 [2020]

Building Regulations

New Zealand Building Code (NZBC)

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

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

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Linea™ Weatherboard Cavity Cladding meets these requirements. See Paragraphs 10.1-10.3.

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

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

Technical Specification

4.1 System components and accessories for Linea™ Weatherboard Cavity Cladding supplied by James Hardie New Zealand Limited are:

- **Linea™ Weatherboards** are bevel-back weatherboards with a tongue and groove at each end for jointing. The weatherboards are pre-primed with an acrylic primer on the front face and both edges. Linea™ Weatherboards are 16 mm thick and are available 135 mm, 150 mm and 180 mm wide. All boards are supplied 4,200 mm long. Linea™ Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a bevel is cut on the back face of the weatherboards, the front edge at the bottom of the board is chamfered and the ends are tongue and grooved for jointing. Linea™ Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

Accessories

- **Axent™ Trim** - a 16 mm thick fibre cement trim manufactured from a reduced density cellulose fibre cement formulation. Axent™ Trim is pre-primed with an acrylic primer on the front face and both edges, and is available in sizes of 84 mm and 100 mm wide by 2,600 mm long.
- **External and internal corner mouldings** - chromate treated aluminium external box corner, 90° internal corner 'W' mould and 135° internal corner 'W' mould. The mouldings are available in 2,700 mm and 4,000 mm lengths.
- **Corner soakers** - 90° soakers are available for 135 mm, 150 mm and 180 mm Linea™ Weatherboards. The soakers are available in chromate treated aluminium, copper and stainless steel.
- **Cavity vent strip** - uPVC, available in 3,000 mm lengths.
- **Rigid wall underlay** – HomeRAB™ Pre-Cladding, RAB™ Board, plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.

4.2 System components and accessories used with Linea™ Weatherboard Cavity Cladding which are supplied by the building contractor are:

- **Flexible wall underlay** – building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
- **Flexible building underlay support** – polypropylene strap at 300 mm centres fixed horizontally and drawn taut, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *[Note: Mesh and wire galvanising must comply with AS/NZS 4534. Additional vertical battens may also be installed to provide support.]*

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- **Flexible sill, head and jamb flashing tape** - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **Cavity battens** - nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) timber treated to Hazard Class H3.1.
- **Joinery head flashings** - folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Planted sill and scribers** - timber treated to Hazard Class H3.1, pre-primed before installation.
- **Window and door trim cavity air seal** - air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Flexible sealant** - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- **Cavity batten fixings** - 40 x 2.8 mm flathead hot-dip galvanised nails.
- **Linea™ Weatherboard fixings** - 60 x 3.15 mm flathead hot-dip galvanised HardieFlex nails or stainless steel ring shank HardieFlex nails (for concealed nailing in NZS 3604 Wind Zones up to, and including, Very High), 75 x 3.15 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in NZS 3604 Wind Zones up to, and including, Very High), and 90 x 3.55 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa).

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

- **Axent™ Trim fixings** - 60 x 3.15 mm or 75 x 3.15 mm hot-dip galvanised jolthead nails and stainless steel ring shank jolthead nails.
- **Aluminium joinery head flashing** - as supplied by the joinery manufacturer or the contractor.
- **Flashings** - balustrade and parapet cap flashings, and inter-storey joint flashings. Refer to NZS 3604 Section 4, and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.

Paint System Specification

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

4.4 All exposed faces, including top edges at sills and all bottom edges of Linea™ Weatherboard, Axent™ Trim and accessories must be finished with at least 2 coats of an exterior grade latex acrylic 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 Limited or the building contractor, whether on-site or off-site, is under the control of the building contractor. Linea™ Weatherboards must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. Weatherboards must always be carried on edge.

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

Technical Literature

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

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Design Information

Framing

Timber Treatment

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

Timber Framing

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

7.3 Timber framing must have a maximum moisture content of 20% at the time of the cladding application. *[Note: If weatherboards are fixed to framing with a moisture content of greater than 20%, problems may occur at a later date due to excessive timber shrinkage.]*

General

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

8.2 Punchings in the cavity vent strip provide a minimum ventilation opening area of 1,000 mm^2 per lineal metre of wall in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 b).

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

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

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

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

Inter-storey Junctions

8.7 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 m in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 b).

Structure

Mass

9.1 The mass of the 135 mm wide Linea™ Weatherboard when installed on the wall is 25.7 kg/m^2 at equilibrium moisture content (EMC). The mass of the 150 mm wide board is 24.93 kg/m^2 at EMC and the mass of the 180 mm wide board is 23.92 kg/m^2 at EMC. Linea™ Weatherboard Cavity Cladding is therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

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

Wind Zones

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

Durability

Serviceable Life

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

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

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

Maintenance

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

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

11.3 Regular cleaning (at least annually) of the paint coating surface is recommended to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Paint systems must be re-coated 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™ Weatherboard Cavity Cladding.)*

Fire Affecting Areas Beyond the Fire Source

Vertical Fire Spread

12.1 This Appraisal only covers buildings 10 m or less in height. NZBC Functional Requirement C3.2 identifies that external vertical fire spread to upper floors only needs be considered for buildings with a building height greater than 10 m. Control of external vertical fire spread is therefore outside the scope of this Appraisal.

Horizontal Fire Spread

12.2 Linea™ Weatherboards have a peak heat release rate of less than 100 kw/m^2 and a total heat released of less than 25 MJ/m^2. Testing was carried out as per Paragraph 5.4 of NZBC Acceptable Solution C/AS1 and Paragraph 5.8.1 of NZBC Acceptable Solution C/AS2, achieving a Type A performance. Linea™ Weatherboards can therefore be used within 1 m of the relevant boundary.

12.3 Refer to NZBC Acceptable Solutions C/AS1 and C/AS2 and Verification Method C/VM2 for fire resistance rating and control of external fire spread requirements for external walls.

Prevention of Fire Occurring

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

External Moisture

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

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

14.3 Linea™ Weatherboard Cavity Cladding allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC 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™ Weatherboard Cavity Cladding where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

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

Water Vapour

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

Installation Information

Installation Skill Level Requirements

16.1 All design and building work must be carried out in accordance with the Linea™ Weatherboard Cavity Cladding Technical Literature and this Appraisal by competent and experienced tradespersons conversant with the cladding system. 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.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

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

Cavity Battens

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

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

Linea™ Weatherboard Installation

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

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

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

17.8 The first course of weatherboards must be full length, i.e. 4,200 mm and commence from an external corner. Jointing of Linea™ Weatherboards is made off the stud using the pre-cut tongue and groove joint. Tongue and groove joints may be located centrally between the studs, but must be no closer than 100 mm to the edge of a stud. A bead of sealant must be applied to the front side of the tongue before the corresponding board is inserted. Subsequent courses of weatherboards must be installed so that the tongue and groove joints are staggered by 600 mm minimum from joints in the previous course.

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

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

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

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

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

Aluminium Joinery Installation

17.14 Aluminium joinery and associated head and sill (for direct fixed) 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.

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

Inspections

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

Finishing

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

Health and Safety

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

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

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

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Basis of Appraisal

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

Tests

19.1 The following testing has been completed by BRANZ:

- BRANZ expert opinion on NZBC E2 code compliance for Linea™ Weatherboard Cavity Cladding was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Linea™ Weatherboard Cavity Cladding was tested to E2/VM1 (as contained within NZBC Clause E2, Third Edition, Amendment 5).
- Uniform wind face load tests to simulate wind pressures on 12 mm thick Linea™ Weatherboards were carried out by BRANZ, and the results were used in assessing 16 mm thick Linea™ Weatherboard used in Linea™ Weatherboard Cavity Cladding.
- Cone calorimeter testing to determine the peak rate of heat release and total heat release of Linea™ Weatherboard was completed by BRANZ. The testing was carried out in accordance with AS/NZS 3837.

19.2 Linea™ Weatherboards have been tested by a National Association of Testing Authorities (NATA) accredited laboratory in accordance with AS/NZS 2908.2. The results have been reviewed by BRANZ and found to be satisfactory.

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

Other Investigations

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

20.2 Site inspections 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™ Weatherboards 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 Limited is the responsibility of James Hardie New Zealand Limited. The quality control system of James Hardie New Zealand Limited has been assessed and registered as meeting the requirements of ISO 9001: 2015.

21.3 Quality on site is the responsibility of the installer.

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

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

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Sources of Information

- AS 3730 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4534: 1998 Zinc and zinc/aluminium-alloy coatings on steel wire.
- AS/NZS 4680: 2006 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

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BRANZ

In the opinion of BRANZ, Linea™ Weatherboard Cavity Cladding is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to James Hardie New Zealand 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. James Hardie 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;
   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 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 James Hardie New Zealand Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
02 September 2020

Readers are advised to check the validity of this Appraisal by

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 3

Slab Reinforcing Mesh & Bottom Plate Fasteners

Tech Details & Specification

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Seismic Grade Reinforcing Mesh

SE62 Res

Mesh Specification

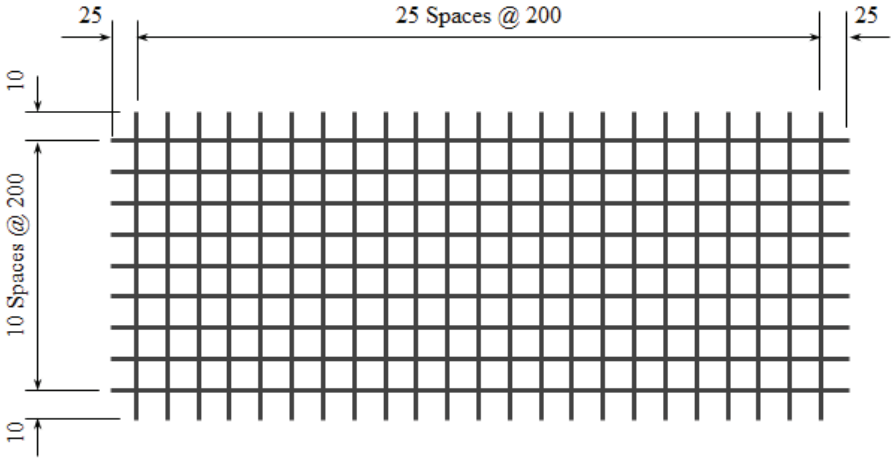
Product Description: 5.05m x 2.02m — 200 x 200 Grid R6.1 Line Wire, R6.1 Cross Wire

	Wire Dia. (mm)	Spacing (mm)	Length (mm)	No. of Wires	Overhangs (mm)		mm²/m	Wire kg/m	Weight (kg)
Longitudinal Wire	6.1 R	200	5050	**11**	**25**	**25**	**146.1**	**0.2294**	12.74
Cross Wire	6.1 R	200	2020	**26**	**10**	**10**	**146.1**	**0.2294**	12.05

GROSS SHEET WEIGHT (Kg): 24.79

MASS PER SQ METER (Kg/m²): 2.294

MESH SKETCH (not to scale)

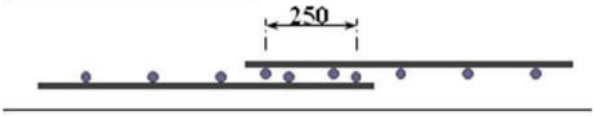


GROSS SHEET AREA (m²):	10.201
NETT COVER (m²):	8.312
Ratio STACK & TURNED (Y/N):	Y
No. OF SHEETS / BUNDLE:	25
ESTIMATED CUBIC (m³):	0.0933
BUNDLE WEIGHT (Tonnes):	0.6198

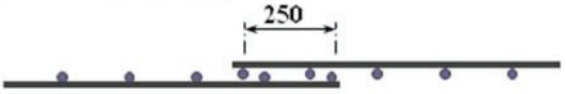
MECHANICAL PROPERTIES

Uniform Elongation %	Yield Strength		Tensile Ratio		Weld Shear Strength
	Min	Max	Min	Max	
≥ 10%	500MPa	600MPa	1.15	1.4	> 7.3

LAPPING ON ENDS



LAPPING ON SIDES



Product is fully tested for Grade 500E compliance as per AS/NZS 4671:2001. All Super Ductile 500E product is Individually tagged . The tag contains the product code and the unique batch number relevant to the sheet. It is important that this tag is kept in position to allow easy identification until covered with concrete.

* All measurements/weights approximate

Mesh App:
Download our free smart-phone app by visiting the Apple or Google stores. Alternatively, scan the QR code from your phone to download directly.



Available on the App Store

Available on the Android Market

www.fletcherreinforcing.co.nz

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Materials

Zn — ZINC Electroplated
GAL — Galvanised
A4 316 — Stainless Steel 316

Description

The TruBolt™ Stud Anchor is a true-to-size, heavy duty, torque controlled expansion anchor, for permanent anchoring into concrete.

Specification

Material - Bolt	Carbon Steel, Stainless Steel 316 (A4)
Corrosion Protection	Zinc Plating, Hot Dipped Galvanising
Head Styles	Hex Nut
Fixing Method	Through Fixture
Setting Method	Torque Controlled
Anchoring Method	Expansion
Thread Diameters	M6, M8, M10, M12, M16, M20
Drilled Hole Diameters	6mm, 8mm, 10mm, 12mm, 16mm, 20mm
Anchor Lengths	55mm, 65mm, 75mm, 80mm, 85mm, 90mm, 100mm, 120mm, 125mm, 140mm, 150mm, 160mm, 175mm, 180mm, 215mm
Maximum Fixture Thickness'	6mm, 8mm, 10mm, 12mm, 15mm, 20mm, 25mm, 30mm, 35mm, 40mm, 45mm, 50mm, 65mm, 70mm, 80mm, 90mm, 100mm
Indicative Working Loads in 32MPa Concrete*	Max Tensile 3.4kN - 32.5kN Max Shear 2.8kN - 27.3kN
Substrates	Concrete

* Refer to load table

Features & Benefits

- The TruBolt™ diameter equals the required hole diameter providing maximum shear capacity for hole size and making drill bit selection simple. Its cold forged construction ensures superior strength and reliability.
- The anchor design ensures maximum expansion of the sleeve and pull-down on the fixture. These actions are both further assisted by the application of load.
- The anti-rotation expansion sleeve is designed to grip the sides of the hole, preventing anchor rotation during installation.

Related Products

DynaDrill™
Carbide Drill Bits
Diamond Motor
Diamond Core Drill Bits
Hole Cleaning Brush
Hole Cleaning Pump
Wet and Dry Vacuum

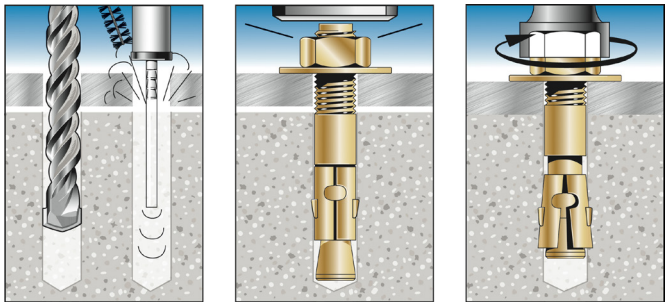
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Trades & Applications

	Steel Fabricator	Elevator Installer	Construction Contractor	Seating Contractor	Racking Installer
Installing handrails, balustrades & safety barriers	✓				
Anchoring elevator guide rails		✓	✓		
Anchoring structural steel columns/beams	✓				
Staduim seating				✓	
Pallet racking					✓

Installation

1. Drill or core a hole to the recommended diameter (same as the TruBolt™) and depth using the fixture as a template. Clean the hole thoroughly with a hole cleaning brush. Remove the debris with a hand pump, compressed air, or vacuum.
2. Insert the anchor through the fixture and drive with a hammer until the washer contacts the fixture.
3. Tighten the nut with a torque wrench to the specified assembly torque.





TruBolt™ Stud Anchors - Hex Nut - Stainless Steel

Ramset Part No	Description	Thread Diameter	Drill Diameter	Total anchor length	Hole depth minus fixture thickness	Minimum Drilling depth	Maximum fixture thickness	Maximum tightening Torque	Fixture clearance hole diameter
T06055SSA	Trubolt M6 x 55mm	ø6	ø6	55mm	66mm	51mm	15mm	10Nm	ø8
T08055SSA	Trubolt M8 x 55mm	ø8	ø8	55mm	70mm	65mm	5mm	20Nm	ø9
T08070SSA	Trubolt M8 x 70mm	ø8	ø8	70mm	85mm	65mm	20mm	20Nm	ø9
T08090SSA	Trubolt M8 x 90mm	ø8	ø8	90mm	105mm	65mm	40mm	20Nm	ø9
T08130SSA	Trubolt M8 x 130mm	ø8	ø8	130mm	145mm	65mm	80mm	20Nm	ø9
T10065SSA	Trubolt M10 x 65mm	ø10	ø10	65mm	83mm	78mm	5mm	35Nm	ø12
T10075SSA	Trubolt M10 x 75mm	ø10	ø10	75mm	93mm	78mm	15mm	35Nm	ø12
T10095SSA	Trubolt M10 x 95mm	ø10	ø10	95mm	113mm	78mm	35mm	35Nm	ø12
T10120SSA	Trubolt M10 x 120mm	ø10	ø10	120mm	138mm	78mm	60mm	35Nm	ø12
T12080SSA	Trubolt M12 x 80mm	ø12	ø12	80mm	100mm	95mm	5mm	50Nm	ø14
T12100SSA	Trubolt M12 x 100mm	ø12	ø12	100mm	120mm	95mm	25mm	50Nm	ø14
T12115SSA	Trubolt M12 x115mm	ø12	ø12	115mm	135mm	95mm	40mm	50Nm	ø14
T12140SSA	Trubolt M12 x 140mm	ø12	ø12	140mm	160mm	95mm	65mm	50Nm	ø14
T16125SSA	Trubolt M16 x 125mm	ø16	ø16	125mm	147mm	117mm	30mm	100Nm	ø18
T16150SSA	Trubolt M16 x 150mm	ø16	ø16	150mm	172mm	117mm	55mm	100Nm	ø18
T16170SSA	Trubolt M16 x 170mm	ø16	ø16	170mm	192mm	117mm	75mm	100Nm	ø18

TruBolt™ Stud Anchors - Hex Nut - Stainless Steel

Part No	Thread Size	Max Fixture Thickness (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Fixture Hole Ø (mm)	Min Hole Depth (mm)	Effective Length	Order Qty
T20140SS	M20	10	120	20	24	140	85	10
T20160SS	M20	35	160	20	24	170	115	10

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TruBolt™ Stud Anchors - Hex Nut - Hot Dipped Galvanised

Part No	Thread Size	Max Fixture Thickness (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Fixture Hole Ø (mm)	Min Hole Depth (mm)	Effective Length	Order Qty
T12080GH	M12	6	80	12	15	90	58	20
T12100GH	M12	25	100	12	15	105	71	20
T12120GH	M12	45	120	12	15	105	93	20
NZ ONLY								
T12140GH	M12	65	140	12	15	105	111	20
T12180GH	M12	100	180	12	15	125	151	20
T16110GH	M16	8	100	16	19	115	67	20
T16125GH	M16	20	125	16	19	135	85	20
T16150GH	M16	45	150	16	19	145	110	20
T16175GH	M16	70	175	16	19	145	135	20
T20140GH	M20	15	140	20	24	140	95	10
T20160GH	M20	35	160	20	24	170	115	10
T20215GH	M20	90	215	20	24	200	170	10



TruBolt™ Stud Anchors - Hex Nut - Zinc Plated

Part No	Thread Size	Max Fixture Thickness (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Fixture Hole Ø (mm)	Min Hole Depth (mm)	Effective Length	Order Qty
AU ONLY								
T06055	M6	15	55	6	8	55	38	100
T06085	M6	45	85	6	8	75	68	100
T06120	M6	80	120	6	8	75	103	50
T06150	M6	110	150	6	8	75	133	100
T06180	M6	140	180	6	8	75	163	100
T08065	M8	12	65	8	10	65	45	50
T08090	M8	40	90	8	10	75	70	50
T10075	M10	12	75	10	12	80	52	50
T10090	M10	30	90	10	12	90	67	50
T10120	M10	50	120	10	12	100	97	20
T12080	M12	6	80	12	15	90	58	20
T12100	M12	25	100	12	15	105	71	20
T12120	M12	45	120	12	15	105	93	20
T12140	M12	65	140	12	15	105	111	20
T12180	M12	100	180	12	15	125	151	20
T16110	M16	8	110	16	19	125	67	20
T16125	M16	20	125	16	19	135	85	20
T16150	M16	45	150	16	19	145	110	20
T16175	M16	70	175	16	19	145	135	20
T20140	M20	15	140	20	24	160	95	10
T20160	M20	35	160	20	24	170	115	10
T20215	M20	90	215	20	24	200	170	10

TruBolt™ Stud Anchors - Indicative Working Loads in 32MPa Concrete

Thread Size	Embedment Depth (mm)	Tightening Torque (Nm)	Min Edge Distance (mm)	Min Anchor Spacing (mm)	Max Tensile Load, N_a (kN)*	Max Shear Load, V_a (kN)*
M6	32	10	50	100	3.4	2.8
M8	54	20	80	160	7.2	4.9
M10	72	35	110	220	9.9	6.8
M12	86	50	130	260	12.7	8.6
M16	115	155	170	340	20.9	14.4
M20	145	355	220	440	32.5	27.3

***The design engineer should ensure the structural element is capable of supporting these loads.**
Refer to Ramset™ Specifiers Resource Book for more information or explanation of technical data.

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 4

Gib Bracing & Ecoply Technical Specifications

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GIB® plasterboard linings

When fixing part sheets of GIB® plasterboard, a minimum sheet width of 300mm applies for bracing elements. Horizontal fixing is recommended. If fixing vertically, full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs or over the studs and fastened at 200mm centres. Alternatively, and preferably, sheet end butt joints may be back-blocked.

When a GIB® Bracing element has been designated for a section of wall, BU ratings cannot be increased by incorporating additional proprietary bracing elements within that same section of wall.

LIMITATIONS

- GIB® plasterboard must be stacked flat and protected from the weather.
- GIB® plasterboard must be handled as a finishing material.
- GIB® plasterboard in use must not be exposed to liquid water or be installed in situations where extended exposure to humidities above 90% RH can reasonably be expected.
- GIB EzyBrace® Systems must not be used in showers or behind baths.
- It is highly recommended not to install GIB® plasterboard in any situation where external claddings are not in place or the property is not adequately protected from the elements.
- If GIB® plasterboard is installed under these conditions, the risk of surface defects such as joint peaking or cracking is greatly increased.

GIB EzyBrace® Systems in water-splash areas

When GIB® plasterboard is installed in locations likely to be frequently exposed to liquid water it must have an impervious finish. Examples are adhesive fixed acrylic shower linings or ceramic tiles over an approved waterproof membrane over GIB Aqualine®. The NZBC requires 15 years durability in these situations. Bracing elements are required to have a durability of 50 years. Bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members. Otherwise GIB EzyBrace® Systems can be used in water-splash areas as defined by NZBC Clause E3, provided these are maintained impervious for the life of the building.

For futher design details refer to the current GIB Aqualine® Wet Area Systems literature.

Renovation

When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in bracing elements

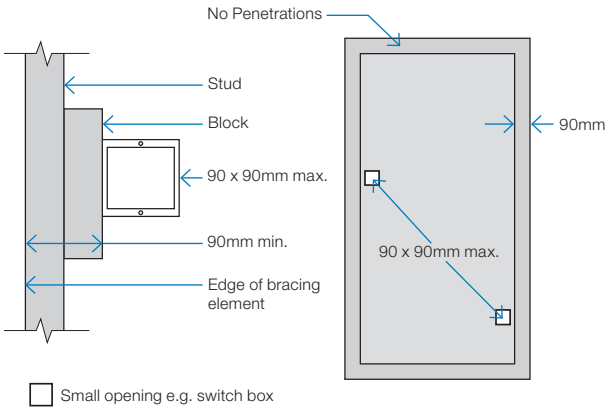
SMALL OPENINGS

Small openings (e.g. power outlets) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element. A block may need to be provided alongside the perimeter stud as shown below.

LARGE OPENINGS

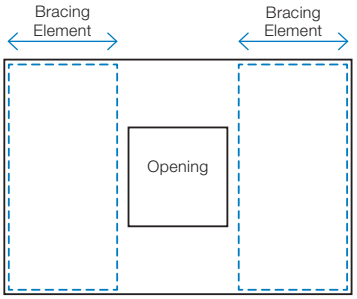
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



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Timber framing

General framing requirements such as grade, spacings and installation shall comply with the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 45mm for external walls and 70 x 45mm for internal walls.

As a minimum the use of Kiln Dried Stress Graded timber for all wall, roof and mid-floor framing members is recommended.

GIBFix® Framing System (alternative layout)

Practices recommended as part of the GIBFix® Framing System aim to increase timber framing efficiencies, reduce reliance on unnecessary framing at wall junctions and minimise surface imperfections that commonly arise from constructing plasterboard junctions over multiple timber members. GIBFix® Angles fixed to a single timber framing member are introduced to tie together plasterboard junctions, improving seismic resilience and decrease the risk of future defects due to timber movement. The GIBFix® Framing System can be used in conjunction with the GIB EzyBrace® System.

Note: GIBFix® Angles and 32mm x 7g GIB® Grabber® Dual Thread Screws may also be used in traditional wall framing layouts and in GIB EzyBrace® Systems.

When the GIBFix® Framing System is used a minimum of 2 equally spaced nogs for walls between 2.4m and 3m in height are required at corners and wall junctions.

When used in GIB EzyBrace® systems GIBFix® Angles must run from top to bottom on all applicable studs. If 2 GIBFix® Angles are required on a stud they must be overlapped by a minimum of 300mm with 2/32mm 7g GIB® Grabber® Dual Thread Screws penetrating through both GIBFix® Angles.

For full specification details refer to GIBFix® Framing System literature available at gib.co.nz/gibfix.

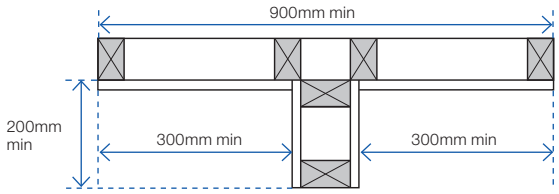
Guidelines for intersection walls

GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions shall be fixed and jointed as specified for intermediate sheet joints. The bracing element length must be no less than 900mm.

Where a Wall Bracing Element is interrupted by a T-junction the element is deemed to be continuous for the whole length (900mm minimum in the example illustrated).

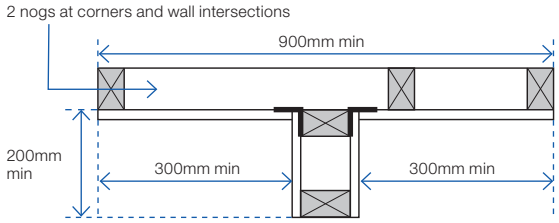
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



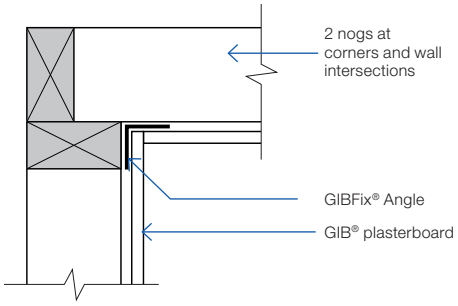
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



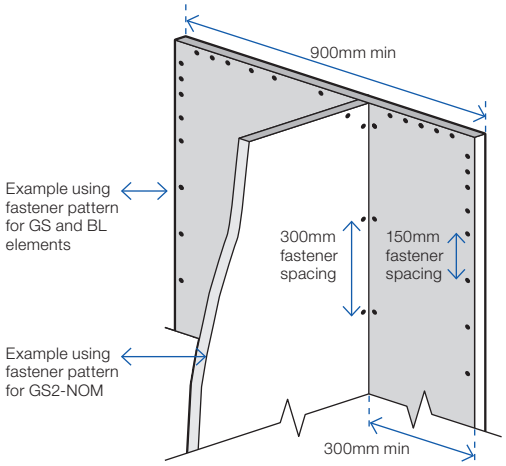
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

Min 32mm x 6g GIB® Grabber® High Thread or 32mm x 7g GIB® Grabber® Dual Thread Screws @ 300mm ctrs each side.

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Top plate connections

For top plate connections refer to NZS3604:2011 section 8.7.3.

Parapets and gable end walls

Bracing elements must be fixed from top plate to bottom plate. Fixing to a row of nogs is not acceptable unless either:

A continuous member such as an ex 90 x 45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line, as shown in figure 16.

or

GIBFix® Angle as shown in figure 17. The angle is fixed to a row of nogs with 30 x 2.5mm galv flat head nails or 32mm x 7g GIB® Grabber® Dual Thread Screws at 300mm centres.

Bottom plate fixing

TIMBER FLOOR

For elements with an 'N' specification use 2/100 x 3.75mm hand or 3/90 x 3.15mm power-driven nails at 600mm centres.

In addition, for elements with an 'H' specification, use GIB HandiBrac® panel hold-down fixings at each end of the bracing element, see p.16.

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix external wall plates in accordance with NZS 3604:2011.

Use GIB HandiBrac® panel hold-down fixings at each end of bracing elements with an 'H' specification and minimum intermediate fixings as required by NZS 3604:2011.

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix plates in accordance with NZS 3604:2011 or use 75 x 3.8mm shot-fired fasteners with 16mm discs spaced at 150 and 300mm from end-studs and 600mm centres thereafter.

For bracing elements with an 'H' specification use GIB HandiBrac® panel hold-down fixings at each end of the element and minimum intermediate fixings as required by NZS 3604:2011.

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

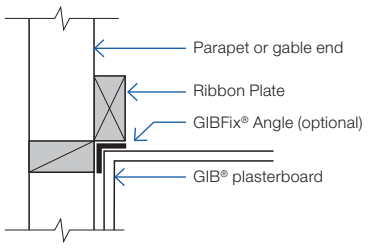
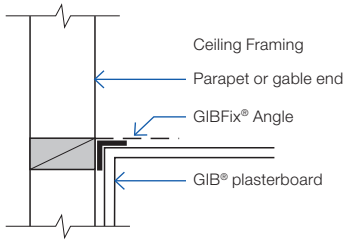


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

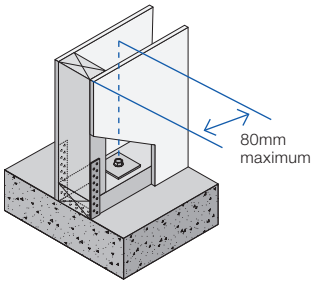
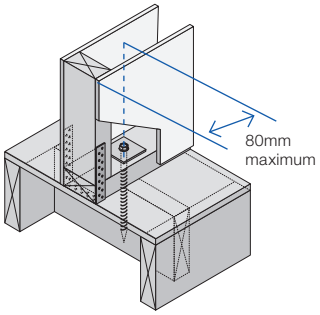
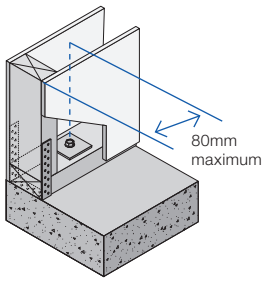
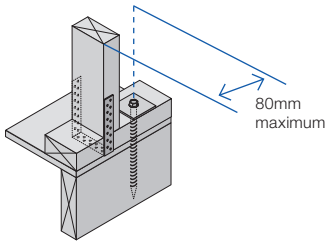
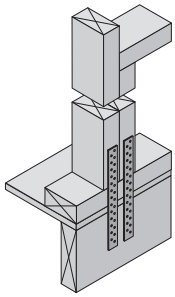
BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required.	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011.
GS2-N	Not applicable.		
GS2-NOM			
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011 In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.		Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011. In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.
BLG-H	Not applicable	As for GSP-H, BL1-H, BLP-H on concrete slab as illustrated on p.15 and 16.	

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Bracing strap installation

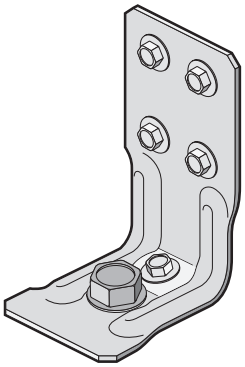
Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to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

Concrete floor	Timber floor
400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.	
Internal wall	
 GEB004	 GEB005
External wall	
 GEB006	 GEB007
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library.	2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.
	 GEB008

Hold-down fastener requirements	
Concrete floor	Timber floor
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.	12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element

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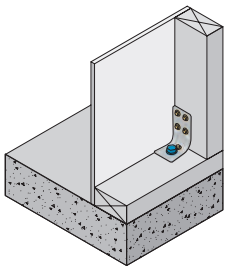
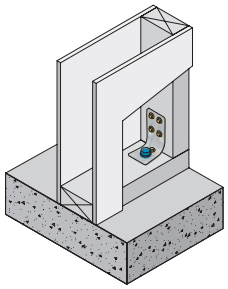
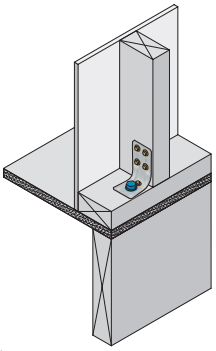
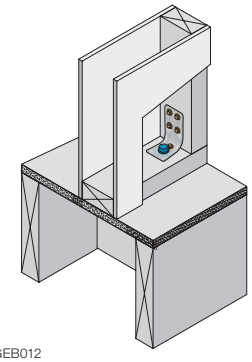
GIB HandiBrac® installation



Developed in conjunction with MiTek™, the GIB HandiBrac® has been designed and tested by Winstone Wallboards for use in GIB EzyBrace® elements that require hold-downs. The GIB HandiBrac® is a substitute for bottom plate hold-down straps.

- Quick and easy to fit.
- May be fitted at any stage before lining.
- Framing face is clear to allow flush lining.
- Easily inspected.

The GIB HandiBrac® with BOWMAC® blue head screw bolt is suitable for timber and concrete floors constructed in accordance with NZS 3604:2011.

Concrete floor		**Timber floor**	
External walls	Internal walls	External walls	Internal walls
 GEB009	 GEB010	 GEB011	 GEB012
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac® at the stud/plate junction and at mid-width of plate.	Position GIB HandiBrac® flush with the outside stud face, as close as practicable to the centre of the boundary joist.	Position GIB HandiBrac® in the centre of floor joist or full depth solid block.
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.		12 x 150mm galvanised coach screw or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.	

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GIB HandiBrac® placement with GIBFix® Framing System for concrete floors

Figure 18 shows the preferred positioning of the GIB HandiBrac® panel hold-down brackets within the GIBFix® Framing System layout and where they are required by bracing systems with an 'H' in the specification code.

Note that, in corners and at wall junctions, a single GIB HandiBrac® can serve 'H' type bracing elements in both directions, but additional intermediate concrete anchors may need to be installed to meet the minimum requirements of NZS 3604:2011 for bottom plate fixing.

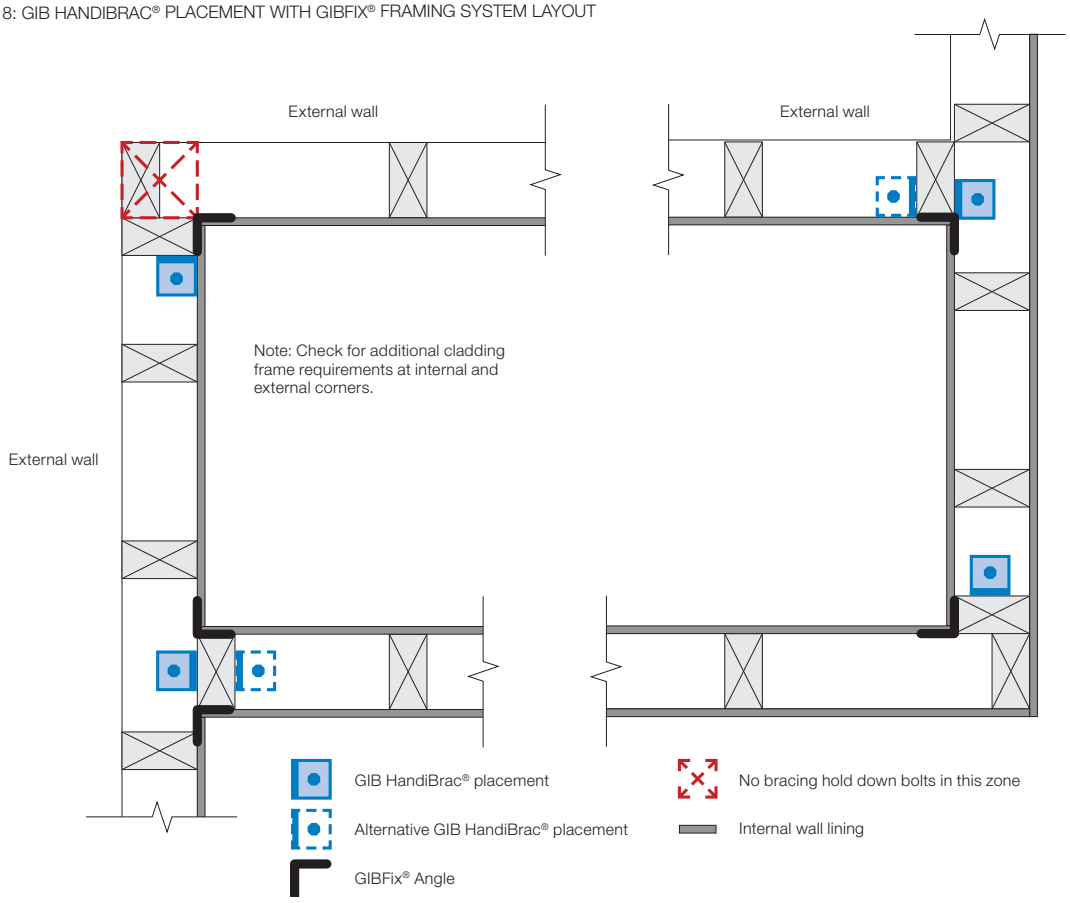
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

For bracing elements with sheet material both sides of the wall connect corner studs using 8/90mm gun nails as shown in figure 19.

TIMBER FLOORS

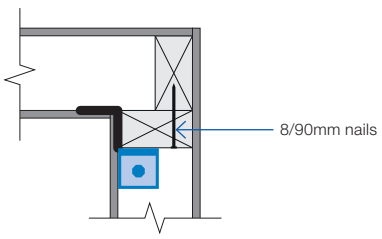
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

FIGURE 18: GIB HANDIBRAC® PLACEMENT WITH GIBFIX® FRAMING SYSTEM LAYOUT



GEB013

FIGURE 19: STUD CONNECTION FOR 'H' TYPE BRACING ELEMENTS WITH SHEET MATERIAL BOTH SIDES



GEB014

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Length of GIB EzyBrace® elements ('N' Type)

The length of GIB EzyBrace® elements with an ‘N’ extension (requiring standard NZS3604:2011 plate connections) can be taken as the full frame length measured from the outside of the end-stud to the opening face as illustrated in figures 29-32.

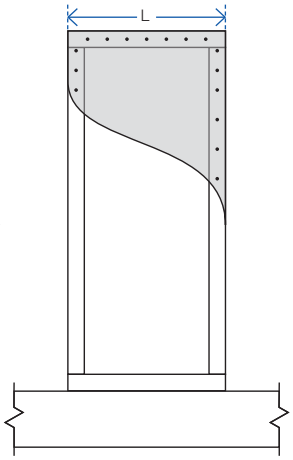
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

The dimension 'L' shall not be less than 400mm.

Perimeter bracing fixing for linings of both ‘H’ and ‘N’ type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening.

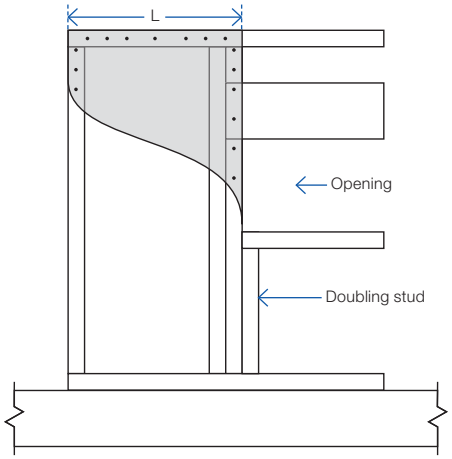
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



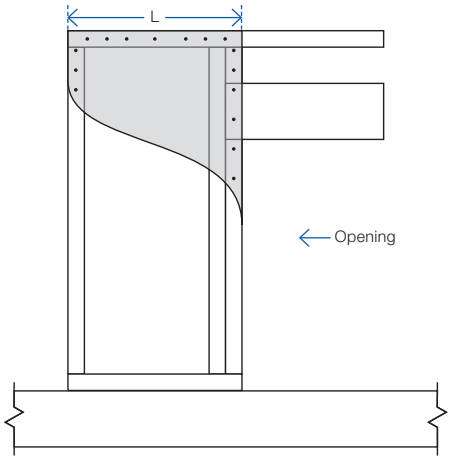
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



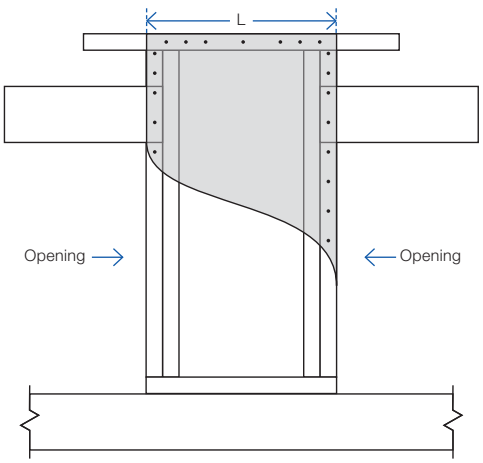
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

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Length of GIB EzyBrace® elements ('H' Type)

GIB EzyBrace® elements with an 'H' extension (requiring special panel hold-down fixings) can be used when the dimension 'L' as illustrated in figures 33–36 is 400mm or more.

'H' type GIB EzyBrace® elements are identified by GIB® specification numbers GSP-H, BL1-H, BLG-H and BLP-H.

The length of an 'H' type element is not only determined by the sheet material, but also by the placement of the hold-down fixings.

Hold-down fixings cannot be placed closer together than what is shown for the standard panel in figure 33.

Hold-down fixings can be placed under windows provided sill trimming studs beneath the opening are connected to the bracing element using 8/90mm gun nails, as illustrated in figure 34.

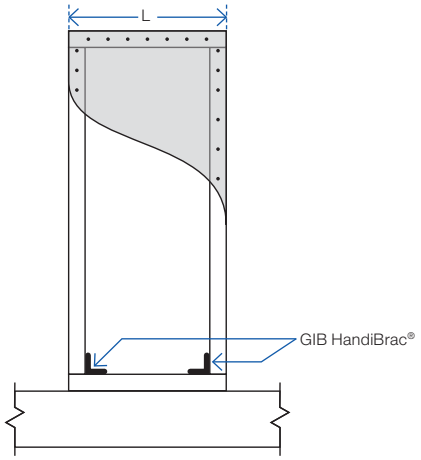
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening as indicated in figures 34-36.

When using bracing straps, installed in accordance with p.17, fix the strap to the same framing member as shown for the GIB Handibrac® below, and install the adjacent anchor bolt in the same position as the GIB HandiBrac® bolt.

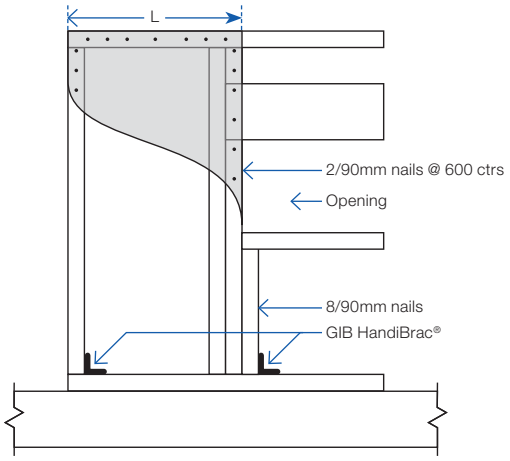
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



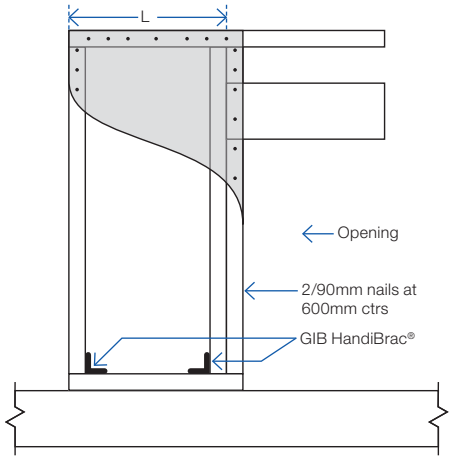
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



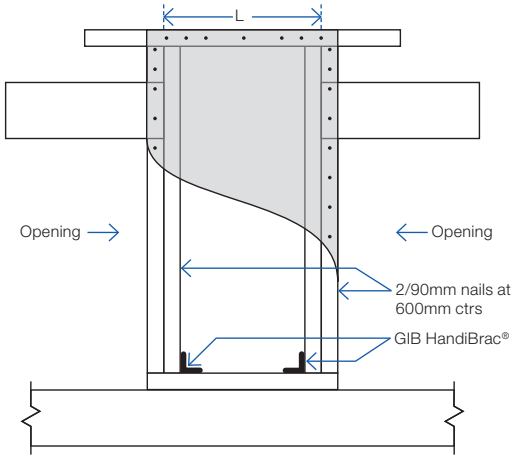
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

GIB EzyBrace® Systems specification GS1-N

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

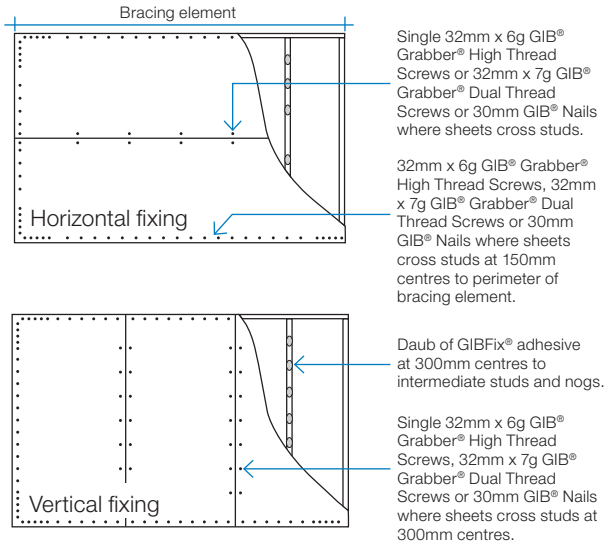
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

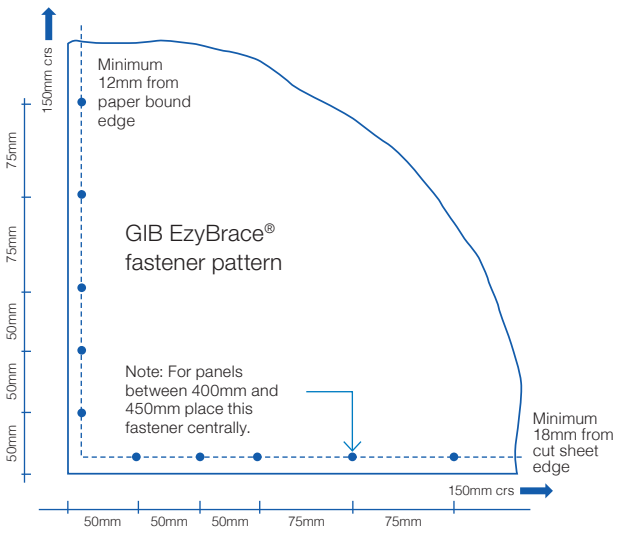
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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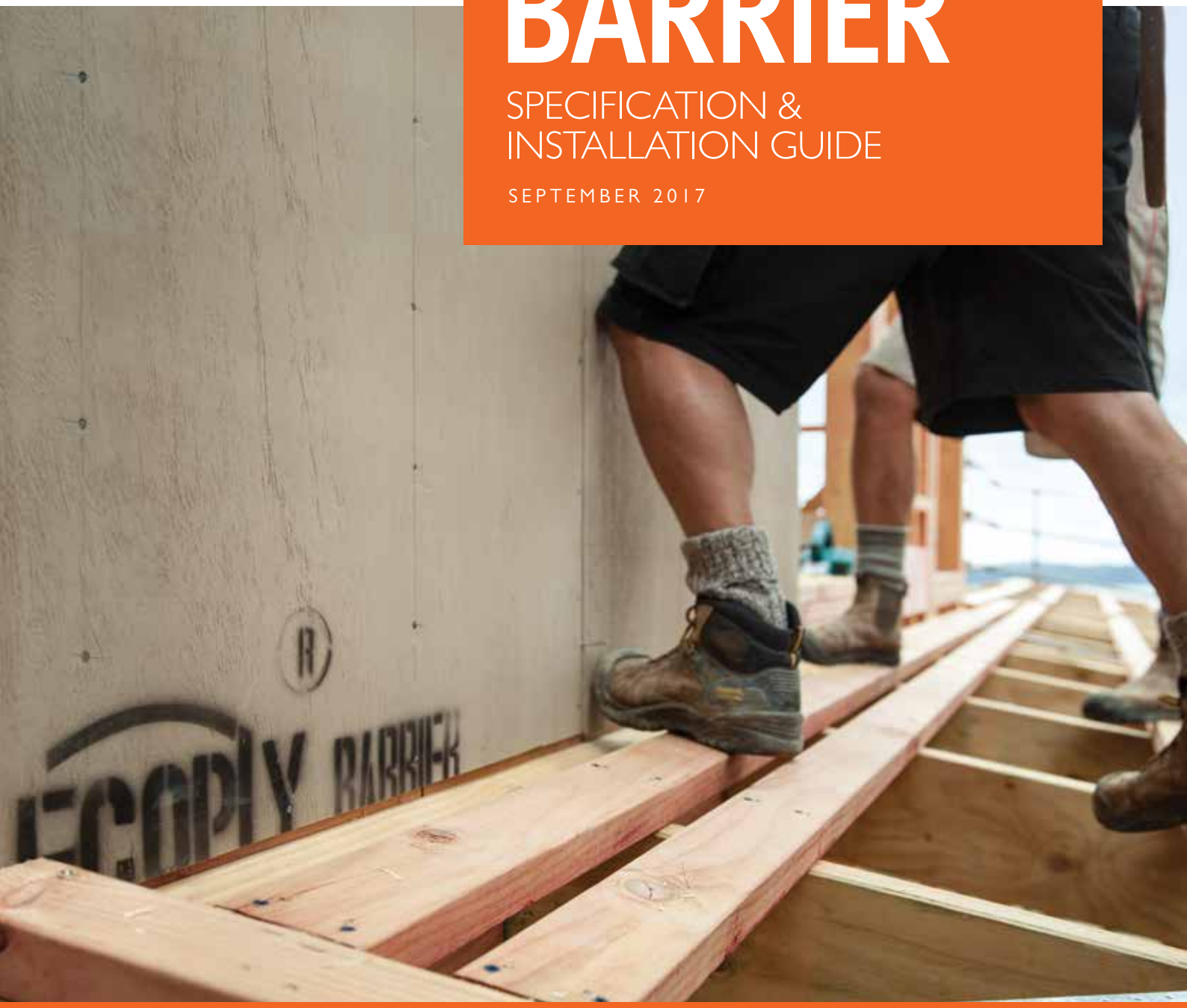
ecoply
Proven. Durable. Strong

ECOPLY® STRUCTURAL RIGID AIR BARRIER

BARRIER

SPECIFICATION & INSTALLATION GUIDE

SEPTEMBER 2017



CarterHoltHarvey
Woodproducts New Zealand

Information contained within is specific to Ecoply® Barrier structural plywood products and must not be used with any other plywood products, no matter how similar they may appear.



1.0 ECOPLY® BARRIER

Ecoply® Barrier provides a weathertight rigid air barrier system for drained and vented cavity systems outside the building frame, effectively replacing traditional building wrap in the cavity while providing structural bracing, and forming a strong secondary line of defence against moisture penetration into the building envelope.

Ecoply Barrier is suitable for use in both residential and commercial buildings and consists of a 7mm thick H3.2 CCA (Copper Chrome Arsenate) water borne treated structural plywood panel which is coated on the face and edges using a polyester powder coating process for increased sheet durability and protection from moisture penetration.

Ecoply Barrier meets the New Zealand Building Code (NZBC) requirements for rigid underlays as outlined in section 9.1.4, the performance requirements of Table 23 of NZBC Clause E2 External Moisture, Acceptable Solution (E2/AS1), and has been tested for wind speeds exceeding Extra High wind zone as defined in Standards New Zealand 3604 Timber Framed Buildings (NZS 3604). Testing has been completed to provide solutions for buildings outside the scope of NZS 3604. For details on this, please contact CHH Woodproducts for further information.

Ecoply Barrier is BRANZ appraised for use as a rigid sheathing and temporary weather-protecting sheathing on timber framed buildings.

Ecoply Barrier must be competently installed in accordance with good building practices and sound design principles to satisfy the requirements of the Building Act 2004, the New Zealand Building Code (NZBC), and applicable New Zealand Standards. This is the responsibility of building owners and the design professionals and builders that they engage.

This document contains information, limitations, and cautions regarding the properties, handling, installation, usage, and the maintenance of Ecoply Barrier. However, to the maximum extent permitted by law, Carter Holt Harvey Woodproducts New Zealand (CHH Woodproducts) assumes no legal liability to you in relation to such information.

Ecoply Barrier panels are engineered to allow the wall system to breathe and dry out, while also preventing the intrusion of exterior moisture. Once the full system has been installed, the system provides a lasting protective barrier.

What is a Rigid Air Barrier?

A rigid air barrier is a barrier against air pressure and water infiltration from the outside to the interior of the building. A rigid air barrier acts as a secondary line of defence against water penetrating into the wall system – the primary defence being the exterior wall cladding.

Definition of an Air Barrier:

- Impermeable to airflow — the system must be continuous (no holes, openings or penetrations) and resistant to air pressure differentials.
- Continuous over the entire building enclosure.
- Able to withstand the forces that may act on them during and after construction.

Ecoply Barrier is a full sheathing system developed to prevent unwanted air movement and replace traditional building wrap.

BRANZ Appraised
Appraisal No.827 [2014]

The information contained in this document is current as at September 2017. It is your responsibility to ensure you have the most up to date information available. The information contained in this publication relates specifically to Ecoply® Barrier manufactured by Carter Holt Harvey Woodproducts New Zealand and must not be used with any other plywood manufacturer's products no matter how similar they may appear. Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Ecoply Barrier structural plywood products or Ecoply Barrier Tapes is not appropriate, and could in extreme cases lead to premature failure and/or buildings which do not meet the requirements of the New Zealand Building Code (NZBC).

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4.2 BUILDERS

Ecoply® Barrier lets you say goodbye to flexible wall underlays forever. Builders no longer have to worry about installing traditional housewrap or building paper on a windy day or having to return for re-work due to rips, tears or wrap that has blown off the home. Ecoply Barrier can typically save up to 2-4* weeks off the total house build time*, by allowing a faster building close in, for an earlier interior start and a quicker overall build time.

Ecoply Barrier installs quickly with two easy steps – fasten the panels and tape the seams. Once completed, the system provides moisture protection both during and after construction.



Advantages:

- Immediate close-in of structure, allowing interior and exterior work to be completed in parallel.
- Reduced builder liability; strong secondary line of defence and solid material for sealing penetrations.
- Schedule your subcontractors sooner.
- No call backs for rips, tears or wrap that has blown off.
- Easy to work light material, simple and easy to install.
- Up to 180 day exposure during construction cycle. No hold-ups while the cladding has to be installed i.e. brick layers etc.

4.3 HOMEOWNERS

An airtight building envelope means less airflow into and out of the home. Since conditioned air is expensive air, homeowners can take comfort in knowing that Ecoply Barrier will provide a strong secondary line of defence against the elements.



Advantages:

- Get possession faster, builders building with Ecoply Barrier can typically reduce up to 2-4* weeks off a typical house build*.
- Structurally rigid home.

* Timeframes and efficiencies are indicative only. Construction production gains will differ with respect to individual builder's abilities and other contributing circumstances outside the control of CHH Woodproducts.

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5.0 ECOPLY® BARRIER COMPONENTS

Table 1: Product Range

Description	Weight (kg/m²)	Thickness	Width	Length
Ecoply® Barrier – structural plywood with factory applied proprietary coating to sheet surface and edges	Approx 4.0	7mm	1197mm	2440mm 2745mm
Sill Tape – one piece stretchable sill tape for window and door sills	-	2 Rolls per Box	150mm, 200mm	20m per roll
Frame Sealing Tape – for a permanent seal of all Ecoply® Barrier openings (Use in conjunction with Sill Tape)	-	2 Rolls per Box 1 Roll per Box	150mm 200mm	30m per roll
Sealing Tape – for a permanent seal of all Ecoply Barrier vertical joints	-	10 Rolls per Box	60mm	30m per roll

COMPONENTS NOT SUPPLIED BY CHH WOODPRODUCTS:

- PVC Horizontal Flashing: use Ecoply® Horizontal Jointer (Product Code RDZF7) supplied by E2 Flashing Solutions.
- Bracing Hold-Down Connectors: GIB HandiBrac® hold-down brackets manufactured by MiTek® complete with mechanical fastener with a minimum 15kN uplift capacity for concrete floors and 150mm x 12mm galvanised coach screw for timber floors.
- Fasteners.

5.1 TAPES

The Ecoply Barrier – Sill Tape, Frame Sealing Tape and Sealing Tape transform our sheathing plywood panels into a seamless protective barrier for your construction project. All tapes are proven to deliver an airtight and watertight seal. The Ecoply Barrier 'rigid air barrier system' tapes save you time and money on the job; and you can leave the site with confidence it will perform.



Table 2: Tapes

Technical Data	Sealing Tape	Sill Tape	Frame Sealing Tape
Description	For a permanent seal of Ecoply Barrier vertical joints	One piece stretchable sill tape, for use on all window / door frame sills	For a permanent seal of all Ecoply Barrier openings (Except window / door frame sill)
Carrier Paper	Special fleece made from PP	Butyl rubber with PE film	Special fleece made from PP
Width / Length	60mm x 30m	150mm x 20m 200mm x 20m	150mm x 30m (box of 2) 200mm x 30m (box of 1)
Release Paper	Siliconized Paper	Siliconized Foil (Split 90mm / 60mm) (Split 140mm / 60mm)	Siliconized Paper (Split 90mm / 60mm) (Split 140mm / 60mm)
Temperature Resistance	Long Term -40°C to +90°C	Long Term -40°C to +90°C	Long Term -40°C to +90°C
Processing Temperature	From -10°C	From -10°C	From -10°C
Colour	Grey	Black	Grey

Storage: All sealing tapes must be stored in clean dry conditions and not in an area with direct sunlight.

5.2 COATING - PANELS

The film formulation provides resistance to the effects of exposure to weathering including sun and moisture, typically experienced during the construction and normal service life of cavity substrate systems. The factory applied powder coat film is specifically formulated for use on Ecoply Barrier plywood panels.

- The film, formed by the powder coating process, helps resist moisture penetration.
- The edges of Ecoply Barrier sheets are coated and sealed.
- High film build (60–80 microns), delivers a smoother and more durable sheet surface allowing easier moisture drainage in cavity construction applications.
- Sealer coating contains low Volatile Organic Compounds (VOC).
- The beige coloured sealer coating can be exposed to the external environment for up to 180 days prior to cladding installation.

6.0 DESIGN CONSIDERATIONS

Responsibility

Design responsibility lies with the building owner and the professionals that they engage. The Specifier for the project must ensure that the products and 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.

Preservative Treatment

Ecoply® Barrier is treated in accordance with AS/NZS 1604.3 with H3.2 CCA (Copper Chrome Arsenate) water borne treatment. H3.2 CCA treated plywood in accordance with AS/NZS 1604.3 is described as suitable for: "outside above ground applications" and periodic moderate wetting.

Cut Sheets

Ecoply Barrier is envelope preservative treated. If a sheet end is cut, place the cut end to the top. Always have a sealed sheet end at the bottom to minimise potential moisture ingress into the panel. All other cuts and penetrations must be covered by Ecoply Barrier Sealing Tape and installed in accordance with the Ecoply Barrier literature. When installed as per the above requirements, cut edges and penetrations are not required to be retreated with a brush on preservative treatment however, if desired, CHH Woodproducts recommends the use of Holdfast® Metalex® Concentrated Timber Preservative Green (Holdfast® Metalex® Green).

Dimensional Sheet Change

Detailing and construction using Ecoply Barrier must allow for natural movement in line with normal cycles of moisture change occurring in the environment. The total expansion both along and across a 2440 x 1197mm panel can be in the order of 1.5mm to 3mm depending on the environment. Detailing and construction practice should take the potential for natural movement into consideration. Ecoply Barrier sheets may exhibit slight sheet bowing across the sheet resulting from the preservative treatment and surface coating processes. This is to be expected and will not affect the product's structural performance or weathertightness when installed as per the specifications.

Formaldehyde

Formaldehyde occurs naturally in the environment and is emitted by processes such as combustion, decay and naturally by all timber species. Ecoply Barrier meets the lowest formaldehyde emission classification (E0 – less than 0.5mg/ litre).

Wind Loadings

Ecoply Barrier meets the NZBC requirements for rigid underlays as outlined in section 9.1.4, the performance requirements of Table 23 of E2/ AS1, and has been tested for wind speed exceeding Extra High wind zone as defined in NZS 3604. Testing has been completed to assist in providing solutions for buildings outside the scope of NZS 3604. Contact CHH Woodproducts for further information.

Sustainability

Ecoply Barrier is manufactured from radiata pine, a plantation grown medium density softwood. It is grown on tree farms which are tended and harvested to provide wood for plywood manufacture. The crop is managed on a sustainable basis to yield millable trees. Ecoply Barrier is available Forestry Stewardship Council (SCS-COC-001316) certified upon request.

Health & Safety

Ecoply Barrier should be handled in accordance with the Safety Data Sheet (SDS) for H3.2 CCA treated Ecoply Barrier. Always wear safety glasses or non-fogging goggles when working with Ecoply Barrier. If wood dust exposure is not controlled when machining (sawing, drilling etc.) a P1 or P2 replaceable filter or disposable face piece respirator should be worn. Wear comfortable work gloves to avoid skin irritation and the risk of splinters. Wash hands with mild soap and water after handling panels.

Storage & Handling

Ecoply Barrier panels and tapes must be stored and handled with care to maintain good condition prior to installation:

- The storage area must be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity.
- Support for the sheets must be provided at both ends and middle to avoid distortion. Ensure bearers in packs above are aligned over bearers below to avoid inducing curves in sheets.
- The stack must be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage.
- The sheets must be stacked flat, NOT on edge.

Maintenance

Ecoply Barrier will not normally require maintenance. However, if damage occurs to the cladding or lining protecting the Ecoply Barrier or to the Ecoply Barrier itself, repairs or replacement should be carried out to ensure the integrity of the rigid air barrier. Small perforations in the panels can be covered by the Frame Sealing Tape or Sealing Tape (200mm, 150mm or 60mm Width, Grey Colour).

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7.0 INSTALLATION

7.1 INSTALLATION

Step 1 Framing:

Install the Ecoply® Barrier sheathing panels positioned with the water resistant powder coat film facing outwards. The panels must be installed with the long side of each panel orientated vertically to the framing members.

All Ecoply Barrier sheet edges must be fully supported by being fastened to framing:

- Studs must not exceed 600mm centres.
- Nogs must be provided at 1350mm centres maximum.
- The minimum framing width for fixing Ecoply Barrier is 45mm at sheet joints.
- Framing must be kept as dry as possible at all times.
- Do NOT glue to frame.

All timber framing sizes and set outs must comply with NZS 3604 (or be specifically designed to NZS 3603:1993 – Timber Structures Standard), with stud and nog centres and timber widths required by this specification. Use kiln dried framing such as Laserframe® in accordance with timber framing manufacturers specification and treated in accordance with NZBC Clause B2 Durability, Acceptable Solution (E2/AS1) or Standards New Zealand 3602:2003 Timber and Wood based products for use in building (NZS 3602).

Step 2 Fastener Durability:

Fasten the panels to the framing members. It is of particular importance in coastal areas, areas subject to salt spray and other corrosive environments that the correct fastener is verified prior to installation.

Fasteners shall be a minimum of hot dip galvanised for all B and C zones excluding sea spray zone D where stainless steel fasteners are required. Where stainless steel is required, annular grooved nails must be used.

Step 3 Fasteners:

Fastener heads should be flush with the panel surface. It is not required to tape over over-driven fasteners unless the fastener head completely penetrates the thickness of the face veneer.

Cladding fasteners must be increased in length by a minimum of 7mm to achieve the required fastener pull out loadings. (Ecoply Barrier is 7mm thicker than building wrap).

Table 3: Fastener Type

Fixing Type	Minimum Nail Length
Hand Driven	50 x 2.8mm nails (flat head or round head), hot dipped galvanised or better
Power Driven – Paslode Pneumatic Cladding Coil Nailer	Paslode Impulse 50 x 2.8mm hot dipped galvanised or better, ring round head drive B20557

NOTE: Please refer to Step 2 Fastener Durability.

Step 4 Sheet Layout:

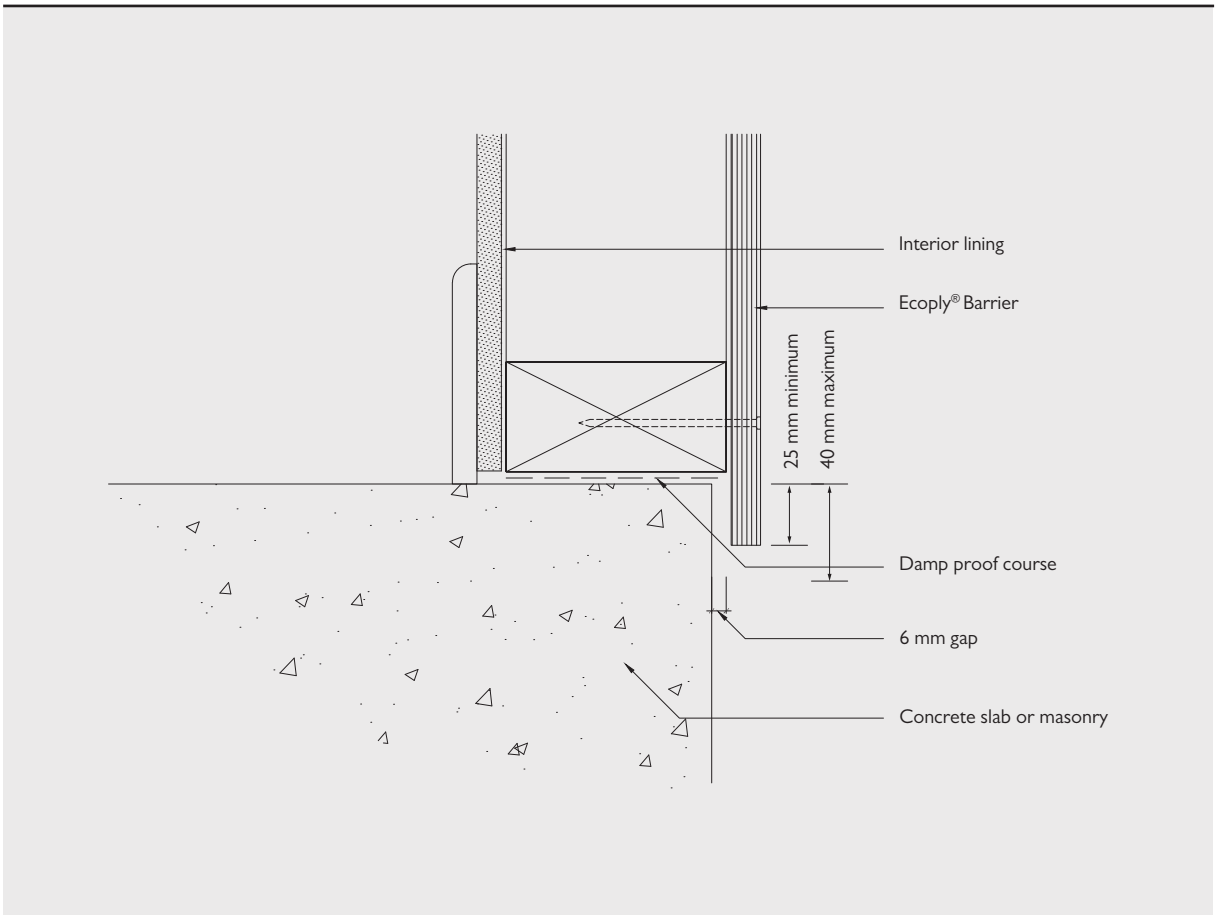
When using Ecoply Barrier, flexible wall underlay is not required. Ecoply Barrier has been BRANZ appraised and tested to demonstrate product performance against the requirements of Table 23 of Clause E2 / AS1 of NZBC. The sheets are jointed keeping an expansion gap of 2-3mm maximum between the plywood panels. Each plywood panel is 1197mm in width to allow for standard 400mm or 600mm stud spacing.

- All sheet edges must be supported by the framing.
- Use fastener pattern unless otherwise specified (refer to the bracing specifications in the Ecoply Specification and Installation Guide).
  - 150mm centres at sheet edges
  - 300mm centres within sheet body up to and including 'Very High' wind zone or;
  - 150mm centres within sheet body in 'Extra High' wind zone
- Sheets must overhang the bottom plate by a minimum of 25mm over timber and concrete foundations (Refer to BAR005: Overhang Clearances For Concrete Slab or Masonry) with a maximum overhang of 40mm.
- For brick cladding rebates, in addition to the 25 – 40mm sheet overhang, 40mm clearance must exist between the face of the Ecoply Barrier sheet and the brick cladding in accordance with E2/AS1 Section 9.2.6 Cavities (Refer to BAR005A: Brick Rebate Overhang Clearance).
- For cantilevered floor joists, sheets must overhang a minimum of 25mm, with claddings to extend a minimum of 50mm below the lowest part of the timber framing in accordance with E2/AS1 Table 18 (Refer BAR005B: Timber Floor Overhang Clearance For Cantilevered Joists).
- For timber sub-floor systems, sheets must overhang the bearer a minimum of 25mm, with claddings to extend a minimum of 50mm below the lowest part of the timber framing in accordance with E2/AS1 Table 18 (Refer BAR005C: Overhang Clearance for Timber Sub-Floors).

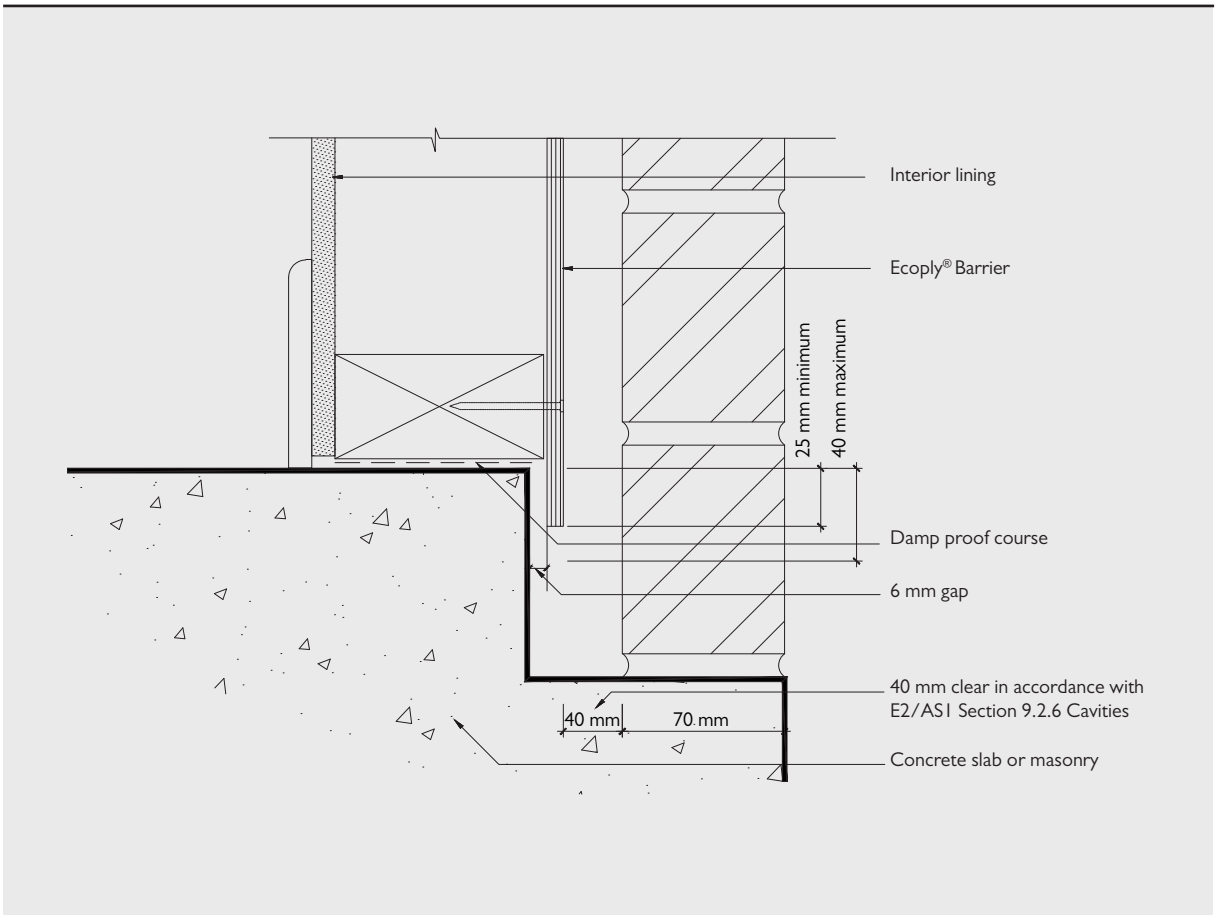
Ground Clearances:

Minimum ground clearances must be maintained for the cladding being installed in accordance with Clause E2/AS1 – Figure 65 and Table 18, and with NZS 3604 for timber floors. The adjacent ground must slope away from the building in accordance with NZBC requirements. Ecoply Barrier must not be installed where product will remain in contact with non-draining water, damp, or soil.

BAR005: Overhang Clearances For Concrete Slab or Masonry



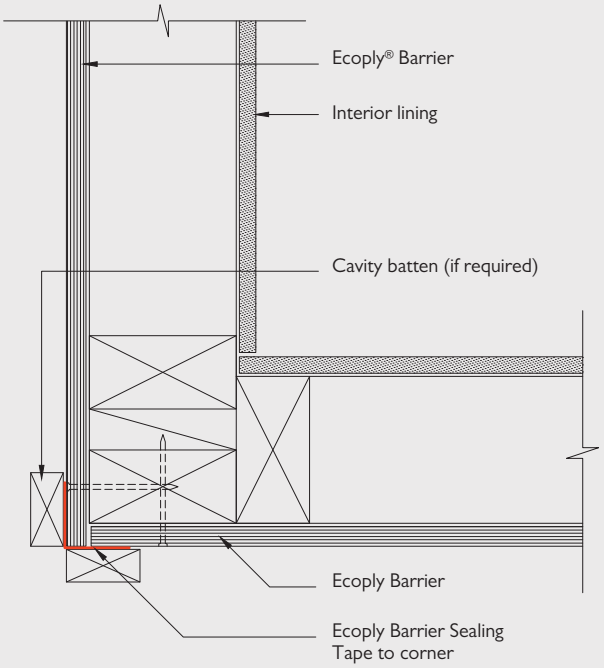
BAR005A: Brick Rebate Overhang Clearance



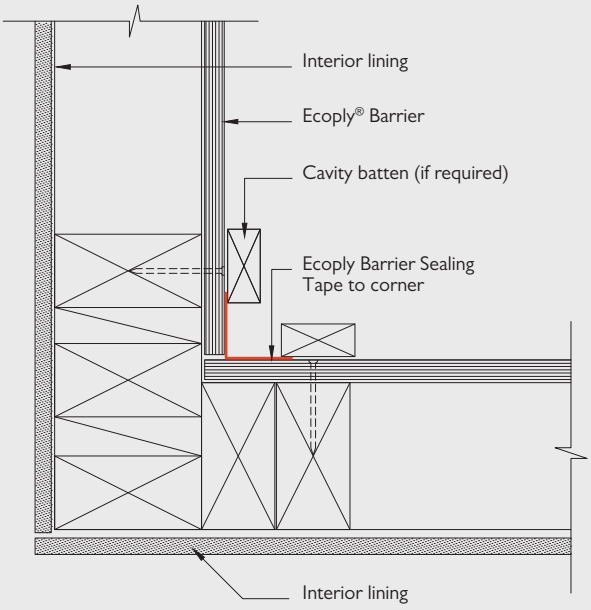
Internal and External Corners:

- Corners must be sealed with Ecoply® Barrier Sealing Tape (60mm Grey Colour). (Refer to BAR008 and BAR009: External and Internal Corner).

BAR008: External Corner



BAR009: Internal Corner

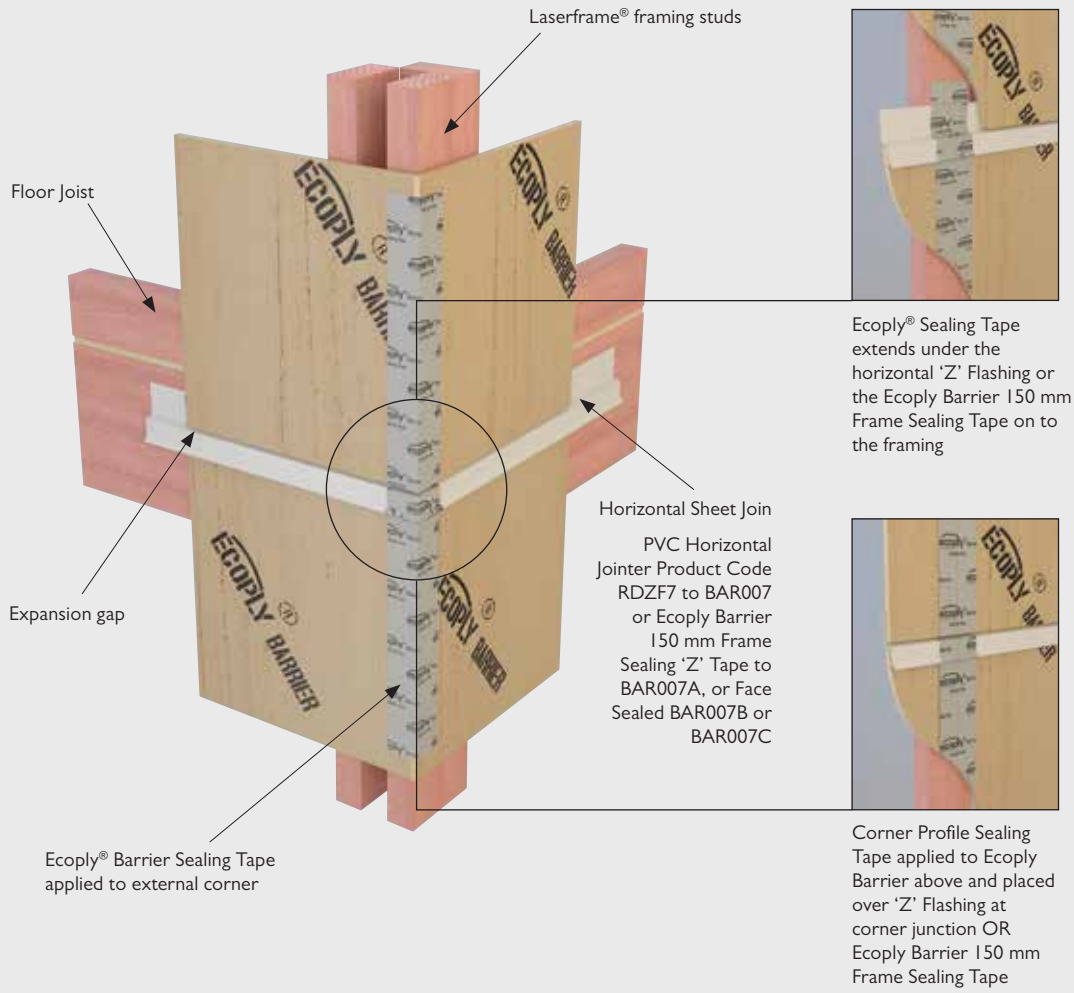


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Corner Junctions to Horizontal Joints

- Corners must be sealed with Ecoply® Barrier Sealing Tape (60mm Grey Colour).
- PVC Horizontal Z Flashings must be butted together, 60mm Ecoply Barrier Sealing Tape must overlap the PVC butt join entirely over the face and up stand of the PVC Flashing to form a weathertight joint where horizontal Flashings meet.
- Horizontal joins may also be completed using Ecoply Barrier Frame Sealing Tapes.

BAR010: External Corner to Horizontal Joint



7.3 INSTALLATION - SILL TAPE

Apply Ecoply® Barrier Sill Tape to the horizontal trimmer section of the window or door opening. The exposed timber framing on the sill of the window opening must be totally covered with the Ecoply Barrier Sill Tape (150mm or 200mm Black Colour) – one continuous piece. The tape must be sealed over the face of the Ecoply Barrier.

Take special care to avoid any wrinkles or voids at corner junctions, Ecoply Barrier Sill Tape requires pressure for a secure seal.

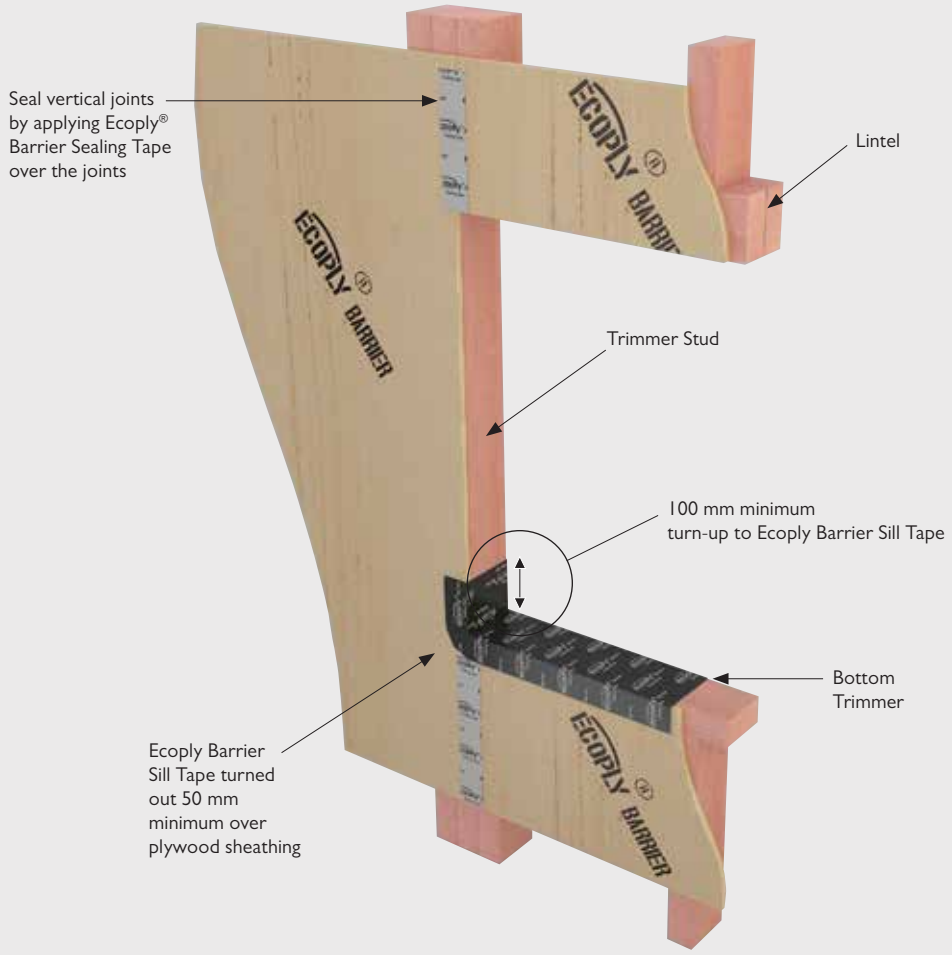
Horizontal Sill Flashing Detail:

- Cut the Ecoply Barrier Sill Tape 200mm longer than the horizontal window/door bottom trimmer.
- Ensure that the framing is free of sawdust and dirt prior to taping.
- Apply the Ecoply Barrier Sill Tape to cover the bottom of the opening, overhanging onto the Ecoply Barrier by at least 50mm and extending 100mm up trimmer stud.
- Carefully bend the Ecoply Barrier Sill Tape to mould into the corners providing a tight seal.



NOTE: Door openings are to be treated similarly to window openings. The bottom trimmer may be either a timber or concrete floor.

BAR012: Window Penetration Sill Tape Installation



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7.4 INSTALLATION - FRAME SEALING TAPE

Apply Ecoply® Barrier Frame Sealing Tape to the vertical trimmer stud and lintel of the window or door opening. The exposed timber framing must be covered with the Ecoply Barrier Frame Sealing Tape (150mm / 200mm Grey Colour). The tape is sealed over the face of the Ecoply Barrier panel.

Take special care to remove any wrinkles or voids at corner junctions, Ecoply Barrier Frame Sealing Tape requires pressure for a secure seal.



Vertical Jamb Detail:

- Cut the Ecoply Barrier Frame Sealing Tape 100mm longer than the vertical opening size.
- Ensure that the trimmer stud is free of sawdust and dirt prior to taping.
- Apply the Frame Sealing Tape to cover the entire trimmers' opening. The tape should extend a minimum of 100mm around the corner at the head of the window framing, and over-lap the Sill Tape on the trimmer stud by a minimum of 50mm.
- Carefully slit the tape from the corner to get a smooth adhesion to the plywood sheathing panel. Bend the Ecoply Barrier Frame Sealing Tape to mould into the corners providing a tight seal.
- Cut and apply a small 100mm strip to reinforce the corner using Ecoply Barrier 150mm Frame Sealing Tape.

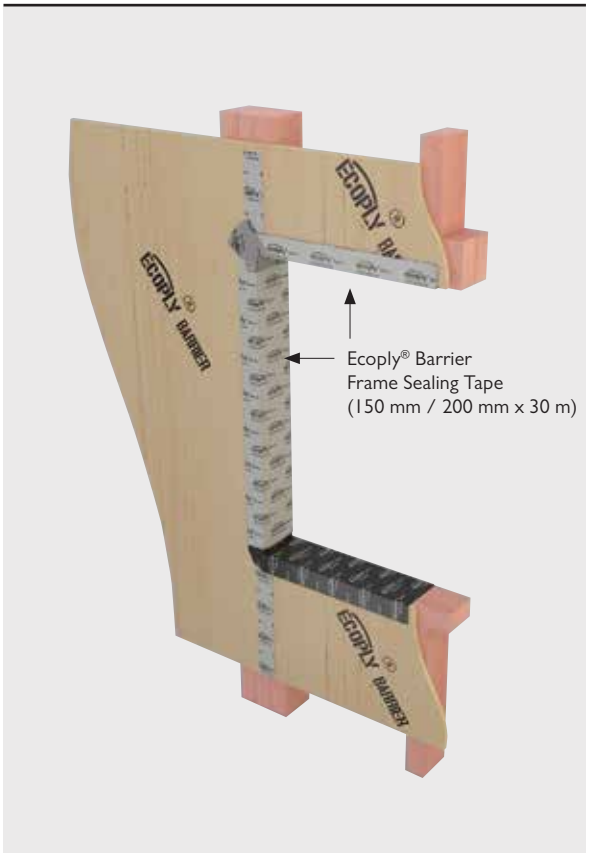
Horizontal Head Detail:

- Once both trimmer studs are installed, cut the Frame Sealing Tape for the horizontal head trimmer and Flashing to suit. Make sure to over-lap the existing tape from the trimmer by at least 50mm (Do not extend tape past the corner).
- Specific installation requirements pertaining to window and door systems should be sought from the joinery manufacturer.

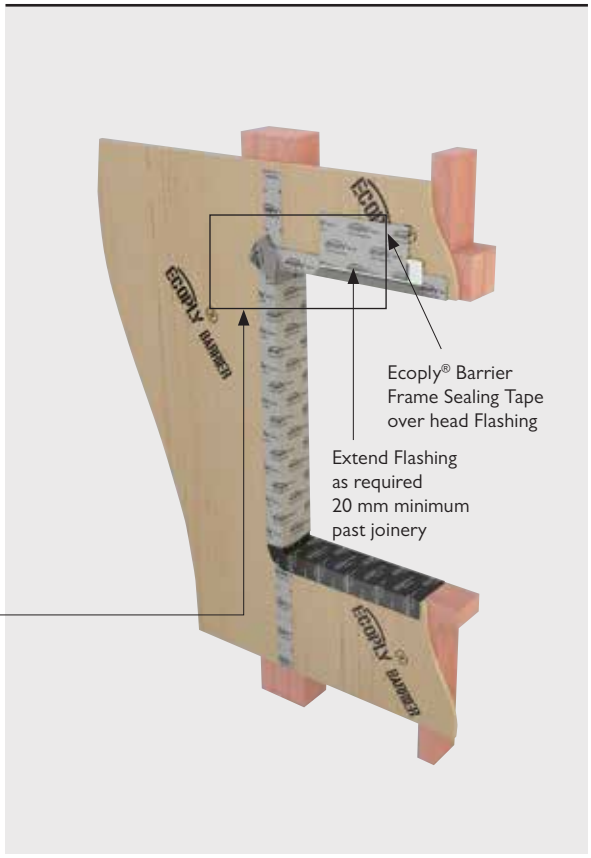
NOTE: Door frames are to be treated similarly to window openings.



BAR013: Window Penetration Sill Tape Installation



BAR014: Window Penetration Frame Sealing Tape Installation with Head Flashing



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7.6 STRUCTURAL BRACING

Ecoply Barrier is designed to comply with the New Zealand Building Code (NZBC).

Structure

NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution B1/AS1 Structure. CHH Woodproducts have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604.

Demand may be calculated by following section 5, Bracing Design of NZS 3604 or using the GIB EzyBrace® software, downloadable from www.gib.co.nz.

EPB bracing systems properties can be easily loaded into the EzyBrace software by way of a software patch downloadable from www.chhwoodproducts.co.nz together with loading instructions.

Specific Design

Ecoply® Barrier structural plywood panels are manufactured to AS/NZS 2269, and is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand timber design code, NZS 3603 Timber Structures, and so can be designed in compliance with Verification Method B1/VM1 under Clause 6.0 Timber for use in buildings over three storeys in height.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120BUs/m.

Durability

Ecoply Barrier plywood panels are manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in Buildings. If the product is used, handled and installed in accordance with CHH Woodproducts product literature it will meet the durability requirements of the NZBC.

Adjustments for Wall Height

Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4m, the bracing rating determined by test or from table below should be multiplied by 2.4 ÷ element height in metres, except that elements less than 2.4m high shall be rated as if they are 2.4m high.

(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height.

(c) Wall heights <1.5m are to be subject to Specific Engineer Design (SED).

Joining Panels for Walls Higher than Maximum Sheet Length

Ecoply Barrier bracing panels must be fixed from top plate to bottom plate. For wall heights over 2.44m, Ecoply Barrier is available in 2.745m sheet lengths. Alternatively, a part sheet can be installed above a full sheet, in accordance with section 7.2 Installation - Sheet Joins (Three Options for Horizontal Sheet Joins) on a single row of common nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply Barrier bracing specifications (e.g. 2.4m x 1.2m sheet with a 0.3 m x 1.2 m part sheet above it to give a 2.7m x 1.2m bracing element).

Table 4: Summary P21 Ratings for 2.4m High Ecoply® Barrier Wall Elements

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPB1	0.4m	Ecoply® Barrier one side	Yes GIB HandiBrac®	80	95
	0.6m			95	105
	1.2m			120	135
EP2	0.6m	Ecoply Barrier or Ecoply each side	Yes GIB HandiBrac®	105	115
EPBS	0.4m	Ecoply Barrier one side	No additional fastening[1]	60	60
	0.6m			60	65
	1.2m			65	70
	2.4m			80	90
EPBG	0.4m	Ecoply Barrier one side and 10mm GIB® Standard plasterboard other side	Yes GIB HandiBrac®	100	115
	1.2m			150	150

[1] As per NZS 3604: 2011. No specific additional fastening required.

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7.7 ECOPLY® BARRIER BRACING SPECIFICATION – EPB1

Table 5: Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPB1	0.4m	Ecoply® Barrier one side	Yes GIB HandiBrac®	80	95
	0.6m			95	105
	1.2m			120	135

Framing

Wall framing must comply with:

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

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber of minimum SG8, such as Laserframe®, is recommended.

Bottom Plate Fixing

Use GIB HandiBrac® hold-down connections at each end of the bracing element. Refer to manufacturer installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604.

Lining

One layer of 7mm Ecoply® Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Fastening Ecoply® Barrier Panels

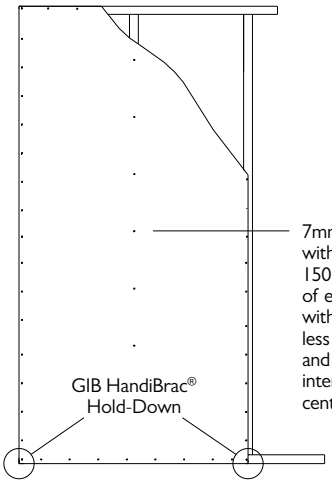
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 in the Ecoply Barrier Specification and Installation Guide for these circumstances and further fastener selection advice. Where stainless steel nails are required, annular grooved nails must be used.

Fastening Centres

Fasteners are placed at 150mm centres around the perimeter of each sheet and 300mm centres to intermediate studs or 150mm centres in Extra High wind zones. Where more than one sheet forms the brace element each sheet must be nailed off independently.



Ecoply® Bracing Systems are designed to meet the requirements of the New Zealand Building Code and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply Barrier manufactured by CHH Woodproducts and SG8 timber framing and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

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7.9 ECOPLY® BARRIER BRACING SPECIFICATION – EPBS

Table 7: Single Sided Structural Plywood Brace No Additional Hold-Down

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPBS	0.4m	Ecoply® Barrier one side	No additional fastening [1]	60	60
	0.6m			60	65
	1.2m			65	70
	2.4m			80	90

[1] As per NZS 3604: 2011. No specific additional fastening required.

Framing

Wall framing must comply with:

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

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber of minimum SG8, such as Laserframe®, is recommended.

Bottom Plate Fixing

Bottom plates are fixed in accordance with the requirements of NZS 3604. No specific additional fastening required.

Lining

One layer of 7mm Ecoply® Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Fastening the Ecoply® Barrier

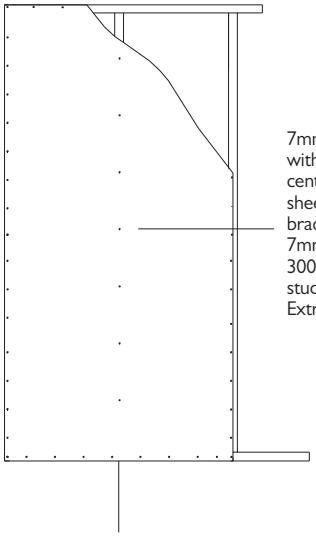
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 in the Ecoply Barrier Specification and Installation Guide for these circumstances and further fastener selection advice. Where stainless steel nails are required, annular grooved nails must be used.

Fastening Centres

Fasteners are placed at 150mm centres around the perimeter of each sheet and 300mm centres to intermediate studs or 150mm centres in Extra High wind zones. Where more than one sheet forms the brace element each sheet must be nailed off independently.



7mm Ecoply® Barrier fixed with 50 x 2.8mm nails at 150mm centres to perimeter of each sheet or part sheet within the bracing element at no less than 7mm from sheet edge and at 300mm centres to intermediate studs or 150mm centres in Extra High wind zones.

Bottom plate fixed in accordance with the requirements of NZS 3604.

Ecoply® Bracing Systems are designed to meet the requirements of the New Zealand Building Code and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply Barrier manufactured by CHH Woodproducts and SG8 timber framing and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

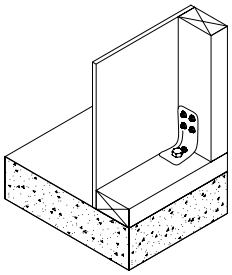
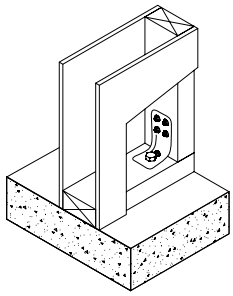
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7.11 GIB HANDIBRAC® - RECOMMENDED INSTALLATION METHOD

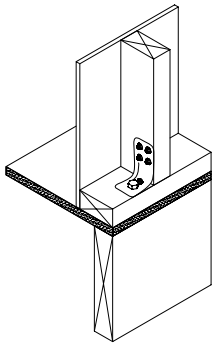
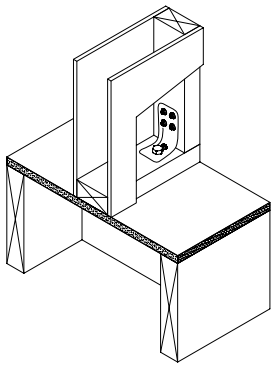
Developed in conjunction with MiTek®, the GIB HandiBrac® has been tested for use as a hold-down in all EPB bracing elements.

- The GIB HandiBrac® registered design provides for quick and easy installation.
- The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps.
- The GIB HandiBrac® is suitable for both new and retrofit construction.
- The design also allows for installation and inspection at any stage prior to fitting internal linings.

Concrete Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac® at the stud/ plate junction.
Hold-down Fastener Requirements	
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or screw bolt supplied with the bracket.	

Timber Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® in the centre of the perimeter joist or bearer.	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block.
Hold-down Fastener Requirements	
M12 x 150mm galvanised coach screw or screw bolt supplied with the bracket.	

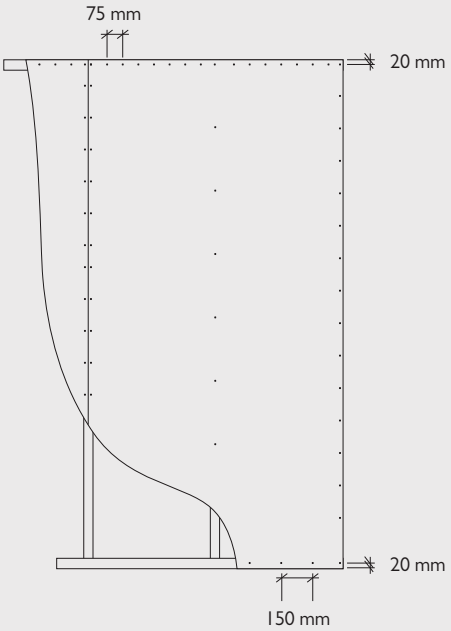
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7.12 TOP PLATE HOLD-DOWN CONNECTIONS

Additional nailing of the Ecoply® Barrier to the top and bottom plates in accordance with the details shown in Figure 1 and described below will provide sufficient top plate hold-down capacity to comply with a Type B fixing or 4.7kN uplift capacity as listed in Table 8.18, NZS 3604.

Figure 1: Top Plate Hold-Downs Connections using Ecoply® Barrier



Fastening

Nails must be 50mm x 2.8mm flat head hot dip galvanised or stainless steel as described in the Ecoply Barrier Specification and Installation Guide for Fastener Durability (Section 7.1).

Nailing to the top plate is at 75mm centres and 20mm from the sheet edge.

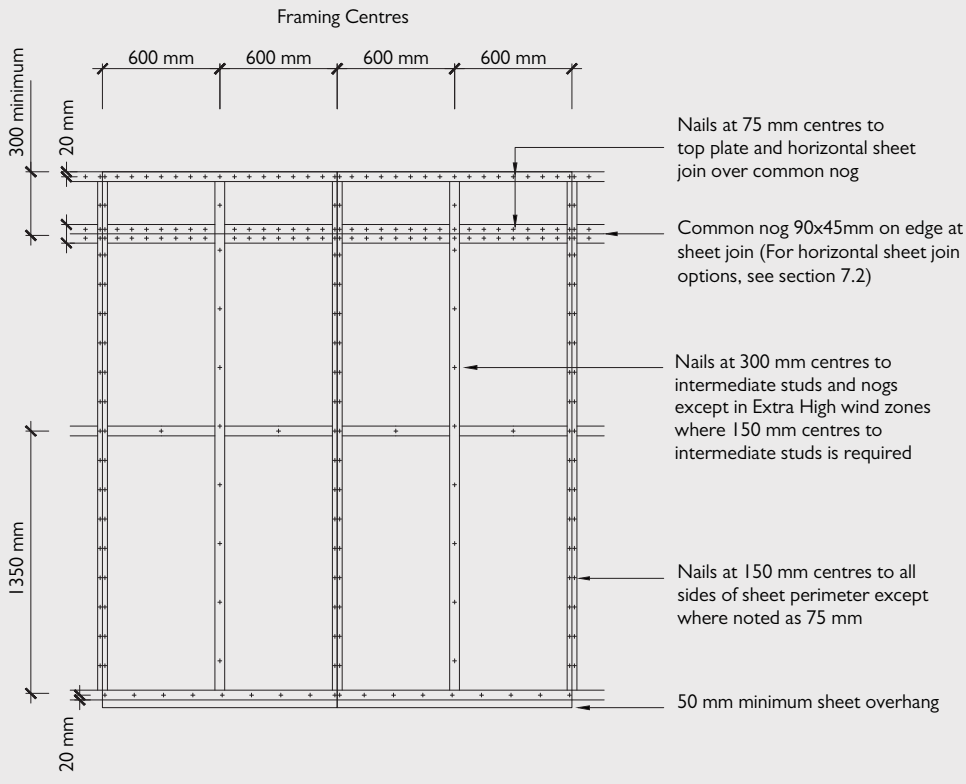
The remainder of the sheet perimeter is fastened at 150mm centres no less than 7mm from the sheet edge and 300mm at intermediate studs (or 150mm centres for Extra High wind zones) as with standard nailing for Ecoply Barrier.

Standard nailing of the Ecoply Barrier to the top plate in accordance with the Ecoply Barrier literature will provide a top plate hold-down capacity that exceeds a Type A fixing or 0.7kN uplift capacity as listed in Table 8.18, NZS 3604.

Horizontal Sheet Joints and Top Plate Hold-Down

Where horizontal sheet jointing is required and top plate hold-down connections are completed using Ecoply Barrier, nailing to the noggin at 75mm centres and 20mm from the sheet edge is also required at the sheet joins. Refer Figure 1B Top Plate Hold-Downs and Horizontal Sheet Joins.

Figure 1B: Top Plate Hold-Downs and Horizontal Sheet Joints



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7.13 BRACING LENGTHS

Length of Ecoply® Barrier Bracing Elements (EPB1, EPBG and EP2).

Ecoply® Barrier bracing elements can be used when the overall bracing element length is >400mm.

The length and capacity of an EPB1, EPBG or an EP2 type element is not only determined by the plywood, but also the placement of the GIB HandiBrac® hold-down fixing. The GIB HandiBrac® must be installed to a continuous stud at the perimeter of the bracing element, refer to Figure 1C: Framing/ Handibrac installation, 1D: Bracing Panel Installation, 1E: Bracing Panel Installation – long and 1F: Bracing Panel Installation at Lintel.

Note: If used for Bracing purposes GIB HandiBrac® should not form part of lintel tie down solution.

Bracing Panel and Hold-down Location at Lintels and 90° Wall Junctions such as Garage Door Openings.

Ecoply Barrier bracing panels can be installed up to lintels and 90° wall junctions such as garage door openings where the element length is > 400mm. See Figure 1E: Bracing Panel Installation at Lintel for bracing element length, and correct GIB Handibrac® location.

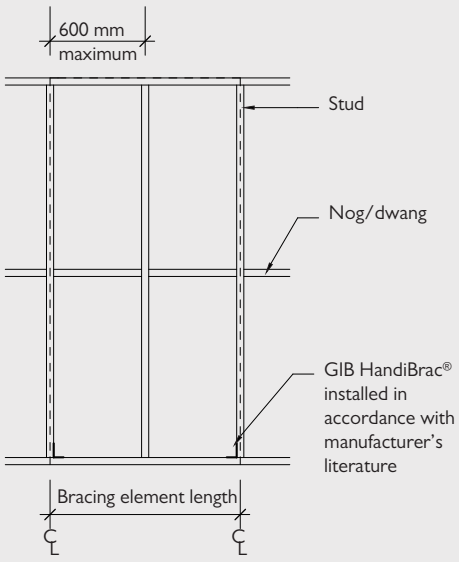
Note: Designers need to be aware of the framing requirements and not try to specify bracing elements based on length only. Framing requirements may mean bracing lengths are not practically achievable as designed and tested and developed due to framing layout.

When lintels share jamb studs with bracing elements, alternate hold-down will be required (the GIB HandiBrac® forming part of the bracing solution must not form part of the lintel hold-down).

Length of EPBS Elements

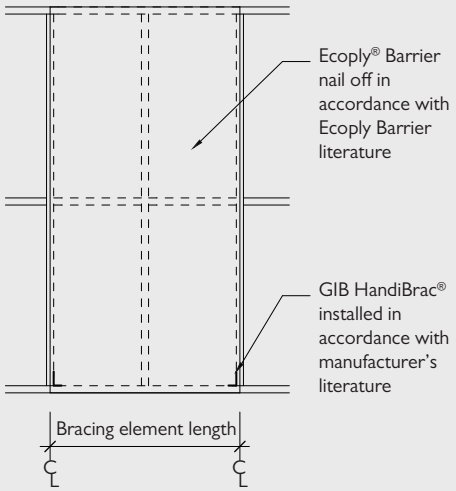
The length of the EPBS element (requiring standard NZS 3604:2011 bottom plate connections) can be taken as full frame length measure from the outside of the end stud to the opening face as illustrated in Figure 1G: EPBS Bracing panel Installation – Long. The length of the bracing element shall be >400mm.

Figure 1C: Framing/HandiBrac Installation



*Note: Bracing panel not shown for clarity

Figure 1D: Bracing Panel Installation



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Figure 1E: Bracing Panel Installation - Long

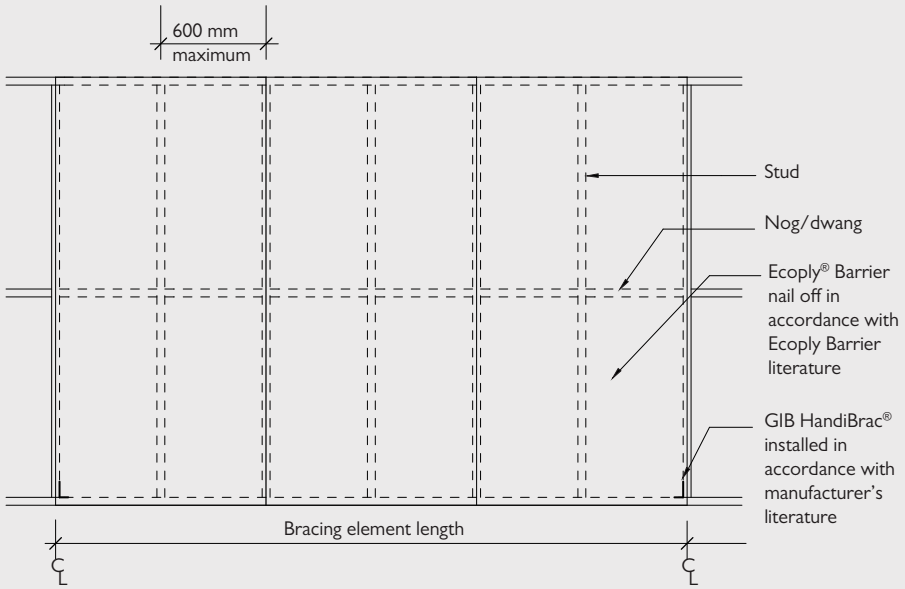


Figure 1F: Bracing Panel Installation at Lintel

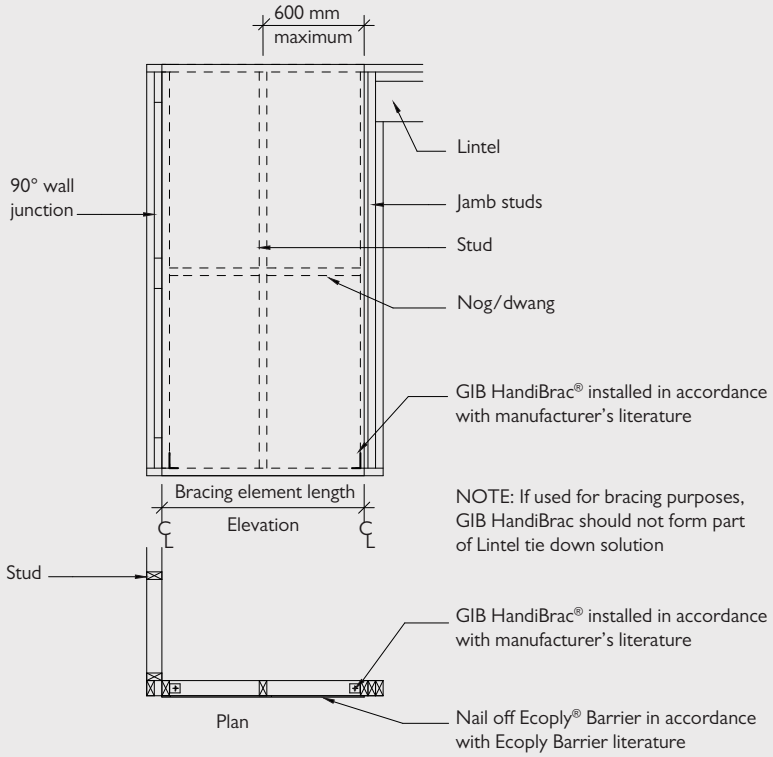
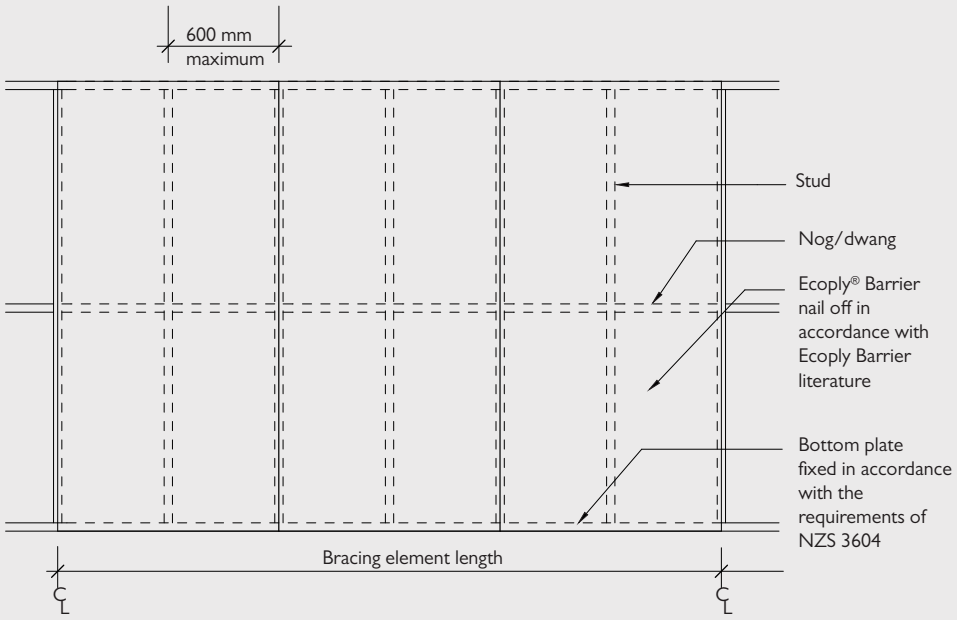
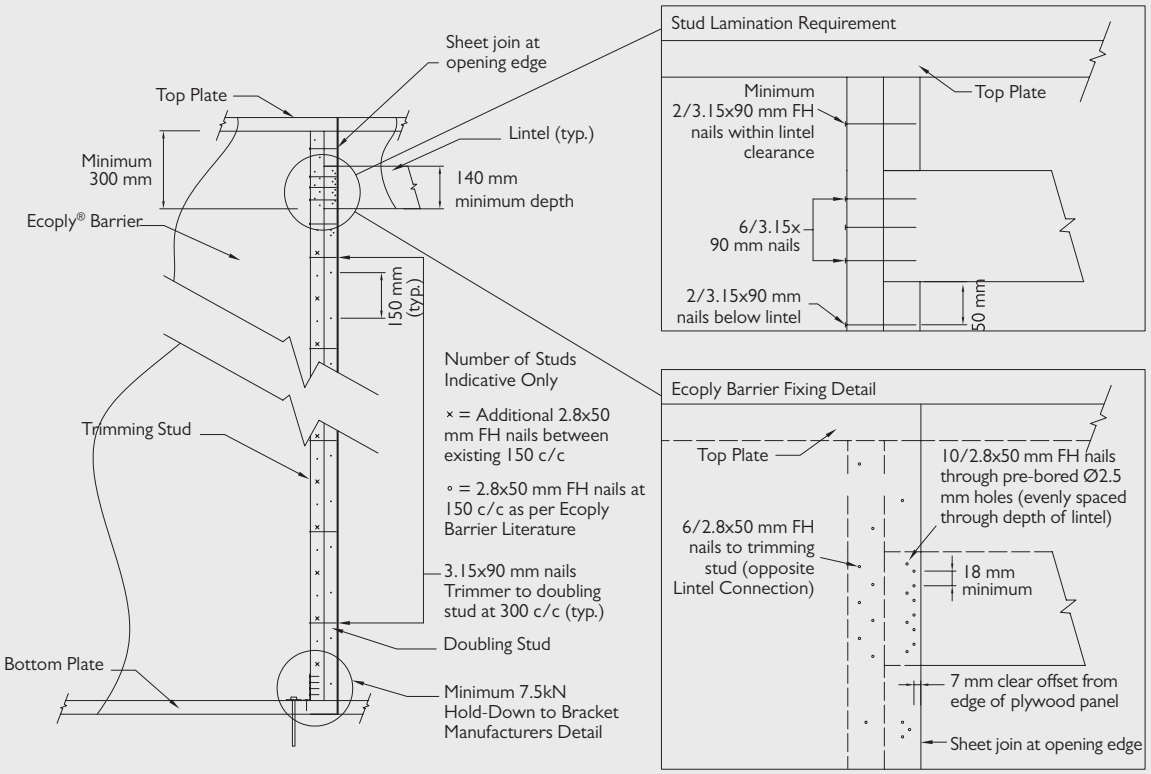


Figure 1G: EPBS Bracing Panel Installation



7.14 LINTEL TIE DOWN CONNECTION

Figure 2: Lintel Connection Detail (For Uplifts Not Exceeding 7.5kN) as Detailed in Clause 8.6.1.8 of NZS 3604



Notes:

1. Observe minimum end and edge distances for fasteners to NZS3603.
2. Fastener Durability as per the Ecoply Barrier Specification and Installation Guide (Section 7.1).
3. Not suitable for use with trimming studs checked out for lintels.

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BRANZ Appraised
Appraisal No. 827 [2019]

ECOPLY ® BARRIER RIGID AIR BARRIER



Appraisal No. 827 (2019)

This Appraisal Replaces BRANZ Appraisal No. 827(2014)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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branz.co.nz

Product

1.1 The Ecoply® Barrier Rigid Air Barrier is sealed plywood sheets and tapes designed for use as a rigid wall underlay and air barrier (sheathing) behind cavity wall cladding systems. Ecoply® Barrier is also for use as a wall bracing system to resist wind and earthquake loads on timber framed buildings.

Scope

2.1 Ecoply® Barrier has been appraised for use as a rigid wall underlay, air barrier and temporary weather-protecting sheathing on timber framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained and vented cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
- situated in NZS 3604 Wind Zones up to, and including Extra High.

2.2 Ecoply® Barrier has also been appraised for use as wall bracing systems for timber framed buildings within the scope of NZS 3604.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Ecoply® Barrier, 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 B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Ecoply® Barrier meets the requirements for loads arising from earthquake and wind [i.e. B1.3.3 (f) and (h)]. See Paragraphs 8.1 - 8.4.

Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years, B2.3.1 (b), 15 years and B2.3.2. Ecoply® Barrier meets these requirements. See Paragraphs 9.1 - 9.3.

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

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Ecoply® Barrier meets this requirement and will not present a health hazard to people.

3.2 Ecoply® Barrier can be used to satisfy the bracing demand requirements of Section 5 of NZS 3604 which is an Acceptable Solution for compliance with NZBC Clause B1.

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Technical Specification

4.1 The components and accessories for Ecoply® Barrier, which are supplied by Carter Holt Harvey Woodproducts New Zealand are:

- **Ecoply® Barrier sheets** are 7 mm thick, 1197 mm wide and 2440 and 2745 mm long structural plywood, manufactured from radiata pine in accordance with AS/NZS 2269, and H3.2 CCA treated in accordance with AS/NZS 1604.3. The sheets are coated on the front face and four edges with a beige polyester powder coating. Plywood sheets are marked Ecoply® Barrier for identification.
- **Ecoply® Sealing Tape** - 60 mm x 30 m, tape for sheet joints.
- **Ecoply® Frame Flashing Tape** - 150 mm x 30 m and 200 mm x 30 m.
- **Ecoply® Sill Tape** - 150 mm x 20 m and 200 m x 20 m.

Tapes are marked Ecoply® and type for identification.

4.2 The components and accessories for the Ecoply® Barrier, which are supplied by the building contractor are:

- **Ecoply® Horizontal Jointer** - PVC horizontal 'Z' flashing supplied by E2 Flashing Solutions.
- **Fasteners** - 50 x 2.8 mm flat head hand-driven nails, hot-dip galvanised or stainless steel. Paslode Impulse 50 x 2.8 mm round head gun-nails. Hot-dip galvanised or stainless steel. Stainless steel nails must be ring shanked.

[Note: Hot-dip galvanising must comply with AS/NZS 4680 and stainless steel must be Grade 304 or 316.]

- **Bracing panel end stud connection -** GIB® HandiBrac® 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 g x 35 mm.
- **Timber floor end stud hold down -** 12 mm x 150 mm hot-dipped galvanised coach screws.
- **Concrete floor end stud hold down** - cast-in bolts M12 x 150 mm minimum or proprietary fixings with a minimum characteristic strength of 15 kN.

Handling and Storage

5.1 Handling and storage of all materials supplied by Carter Holt Harvey Woodproducts New Zealand or the building contractor, whether on or off site, is under the control of the building contractor. Ecoply® Barrier plywood sheets 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. The Ecoply® Tapes must be protected from damage and weather and stored in clean, dry conditions away from direct exposure to sunlight. uPVC jointers must be protected from physical damage and should be stored flat and under cover.

5.2 Other accessories must be stored so they are kept clean, dry and undamaged.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Ecoply® Barrier Specification & Installation Guide which must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Ecoply® Barrier Specification & Installation Guide and within the scope of this Appraisal must be followed.

Design Information

General

7.1 Ecoply® Barrier is intended for use as a rigid wall underlay and an air barrier fixed over timber framed walls in order to support wind pressures and to act as a secondary barrier to wind-driven rain. With all joints sealed with Ecoply® Tapes no flexible wall underlay is required over the Ecoply® Barrier plywood.

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7.2 Commencing from installation, the Ecoply® Barrier including the Ecoply® Tapes must not be exposed to the weather for more than 180 days.

7.3 Ecoply® Barrier may be used as a temporary weather protecting sheathing to allow the insulation and internal lining of the building to proceed before the wall cladding is installed. To achieve temporary weathertightness, all joints, internal and external corners of the Ecoply® Barrier must be sealed, the roof cladding and soffit linings must be installed, the flexible sill and jamb flashing tape system must be installed around the window and door openings, and the window and door joinery must be installed complete with head flashings and air seals. The timber wall framing must have a maximum moisture content as specified by the internal lining system supplier at the time of the insulation installation and internal lining application.

7.4 Ecoply® Barrier is suitable for use under wall claddings as a rigid wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings. Refer to Table 1.

Table 1: NZBC E2/AS1, Table 23 Requirements

NZBC E2/AS1 Table 23 Rigid Wall Underlay Properties	Property Performance Requirement	Ecoply® Barrier Actual Property Performance
Vapour Resistance	≤ 7 MN s/g	2.2 MN s/g
Absorbency	≥ 100 g/m^2	1451 g/m^2
Water Resistance	≥ 20 mm	Pass

Timber Treatment

7.5 Timber wall framing behind the Ecoply® Barrier must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

7.6 Timber framing must be minimum 90 x 45 mm structural grade SG8 and must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170 considering local factors. In all cases studs must be at maximum 600 mm centres. Dwangs must be fitted flush between the studs at maximum 1200 mm centres. *[Note: The timber framing must also be suitable for the selected wall cladding. Refer to the selected cladding system's Technical Literature for specific framing requirements.]*

7.7 Timber wall framing where the Ecoply® Barrier plywood sheets are joined must be nominal 50 mm width (i.e. 45 mm minimum finished width).

7.8 Timber framing must be kiln dried and as dry as practically possible at the time of the Ecoply® Barrier installation.

Ecoply® Barrier Set Out

7.9 All Ecoply® Barrier plywood sheet edges must be fully supported by framing.

7.10 Ecoply® Barrier must be installed vertically. At the base of the wall the plywood sheets must hang below the bottom plate a minimum of 25 mm, up to a maximum of 40 mm.

Ecoply® Barrier Plywood and Cladding Fixing

7.11 Ecoply® Barrier plywood sheets must be fixed at maximum 150 mm centres around the perimeter of each sheet and at maximum 300 mm centres to intermediate studs. In Extra High Wind Zones, the fixing centres on the intermediate studs must be closed up to maximum 150 mm centres. The fixings are at the same centres regardless of whether the Ecoply® Barrier plywood is being used for bracing or not.

7.12 The length of the selected wall cladding fasteners must be increased by a minimum of 7 mm to maintain the face load strength of the wall cladding system.

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Structure

Mass

8.1 The mass of Ecoply® Barrier is approximately 4.0 kg/m^2. This mass must be added to the selected wall cladding system mass when determining the overall wall cladding mass in terms of NZS 3604.

Wind Zones

8.2 Ecoply® Barrier is suitable for use in all Wind Zones of NZS 3604, up to, and including, Extra High.

Bracing

8.3 The bracing units achieved (wind and earthquake) for the Ecoply® Barrier are given in Table 2. The Technical Literature gives details of edge and end fixing distances and provides comprehensive construction and panel hold-down details.

8.4 The bracing units are derived from the 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 value shown in Table 2 by 2.4 divided by the wall height in metres. Walls lower than 2.4 m shall be rated as if they were 2.4 m in high.

Table 2: Bracing Ratings for Ecoply® Barrier Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	Bottom Plate Hold-down and Fixing	BUs/m Wind	BUs/m Earthquake
EPBI	0.4 m	Ecoply® Barrier one side	GIB HandiBrac®*	80	95
	0.6 m			95	105
	1.2 m			120	135**
EP2	0.6 m	Ecoply® Barrier or Ecoply® each side	GIB Handibrac®	105	115
EPBS	0.4 m	Ecoply® Barrier one side	No additional fastening*	60	60
	0.6 m			60	65
	1.2 m			65	70
	2.4 m			80	90
EPBG	0.4 m	Ecoply® Barrier one side and 10 mm GIB® Standard plasterboard other side	GIB HandiBrac®	100	115
	1.2 m			150**	150**

Notes:

** Bottom plate fixed in accordance with the requirements of NZS 3604.*

*** Timber Floors - A limit of 120 BU/m applies to NZS 3604 timber floors.*

Penetrations for Services

8.5 Small openings for services of up to 90 x 90 mm may be placed no closer than 90 mm to the edge of the bracing element and service penetrations up to a maximum of 150 mm diameter may be placed no closer than 150 mm from the sheet edge, without affecting the bracing rating of the panel.

Connections

8.6 The Ecoply® Barrier Technical Literature contains a top plate hold down detail and a lintel tie down connection detail that are alternatives to the details given in NZS 3604.

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Durability

9.1 Ecoply® Barrier meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years when used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, or where it is used as a bracing element, and code compliance with NZBC Clause B2.3.1 (b), 15 years where the cladding durability requirement is 15 years and the Ecoply® Barrier is not used as a bracing element.

Serviceable Life

9.2 Provided Ecoply® Barrier is not exposed to the weather or ultra-violet light for a total of more than 180 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, the Ecoply® Barrier is expected to have a serviceable life of at least 50 years.

9.3 Areas of geothermal activity and coastal locations can be very corrosive to fasteners, especially coastal locations within distances of up to 500 metres of the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets in some instances. These coastal locations are defined in NZS 3604 as Zone D and stainless steel fasteners must be used. For installation in NZS 3604 Corrosion Zones C and B hot-dip galvanised steel fasteners complying with the requirements of NZS 3604 may be used.

Maintenance

10.1 Ecoply® Barrier will not normally require maintenance. However, if damage occurs to the cladding or lining protecting the sheathing or to the sheathing itself, then repairs or replacement must be carried out to ensure the integrity of the rigid air barrier.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to the Ecoply® Barrier and associated combustible materials from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 - C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Ecoply® Barrier must be used behind claddings that meet the performance requirements of NZBC Clause E2.

12.2 Ecoply® Barrier, when installed in accordance with the Ecoply® Barrier Specification & Installation Guide and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirements

13.1 Installation must always be carried out in accordance with the Ecoply® Barrier Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

System Installation

Ecoply® Barrier Installation

14.1 Ecoply® Barrier plywood sheets may be cut using any circular saw or hand saw tool. Holes and cut-outs may be formed by using a hole saw.

14.2 Sheets must be dry prior to installation. Cut edges that are left exposed must be sealed in accordance with the Ecoply® Barrier Specification & Installation Guide prior to installation.

14.3 Prior to fixing Ecoply® Barrier plywood sheets, a check must be made to ensure all sheet edges will be supported by framing. At the base of the wall, the sheet must hang below the bottom plate by a minimum of 25 mm.

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14.4 Ecoply® Barrier plywood sheets must be fixed to the timber framing with 50 x 2.8 mm hot dipped galvanised flat head clouts or 50 x 2.8 mm ring shanked stainless steel nails. Nails may be either hand driven or power driven. Refer to Paragraph 7.11 for fixing centres and Paragraph 9.3 for material selection.

14.5 At vertical joints Ecoply® Barrier must be installed with a 1.5-3.0 mm gap between the sheet edges. Sheets at horizontal joints between floor levels must be installed with a minimum 15 mm gap between the edges and must be supported over horizontal framing. All horizontal joints must be flashed with the Ecoply® Horizontal Jointer.

14.6 Any damaged areas of Ecoply® Barrier, or gaps around service penetrations, must be repaired by covering with joint sealing tape.

Joint Sealing Tape Installation

14.7 Ecoply® Barrier plywood sheets must be cleaned of dust and other surface contaminants prior the application of the joint sealing tape to ensure adequate adhesion is achieved.

14.8 All vertical sheet joints, internal and external corners, penetrations or damaged areas and over driven nails must be covered with Ecoply® Sealing Tape. The manufacturer's instructions regarding the application temperatures for the joint sealing tapes must be followed.

Flexible Sill and Jamb Tape Installation

14.9 The Ecoply® Sill Tape and Ecoply® Frame Flashing Tape must be installed in accordance with the Ecoply® Barrier Specification & Installation Guide. Particular attention must be paid to the installation of the sill and jamb tapes around window and door joinery openings to ensure all exposed timber wall framing in the opening is protected.

Inspections

14.10 The Ecoply® Barrier Specification & Installation Guide must be referred to during the inspection of the Ecoply® Barrier installations.

Health and Safety

15.1 Ecoply® Barrier must be handled in accordance with the Material Safety Data Sheet for H3.2 CCA treated Ecoply®.

15.2 When power tools are used for cutting or forming holes, health and safety measures as set out in the Ecoply® Barrier Specification & Installation Guide must be undertaken because of the amount of dust generated.

15.3 Safe use and handling procedures for the Ecoply® Barrier and the components that make up the cladding system are provided in the relevant manufacturers' Installation Guides.

Basis of Appraisal

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

Tests

16.1 Racking tests were carried out in accordance with BRANZ Technical Paper P21. The earthquake and wind bracing ratings were determined using the evaluation procedures outlined in BRANZ Technical Recommendation No. 10. The test results and laboratory methods have been reviewed by BRANZ and found to be satisfactory.

16.2 Testing has been carried out by BRANZ to determine the face load pressure resistance of Ecoply® Barrier.

16.3 Testing to determine the resistance of Ecoply® Barrier plywood to water vapour transmission in accordance with AS/NZS 4200.1 and resistance to water penetration in accordance with AS/NZS 4201.4 has been completed. The results have been reviewed by BRANZ and found to be satisfactory.

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16.4 The Ecoply® Sealing Tape, Frame Flashing Tape and Sill Tape have been tested to BRANZ criteria to assess the tensile strength of control and UV aged material, nail sealability, water resistance of control and UV accelerated aged material and pliability. BRANZ has determined that the tapes are fit for purpose for the intended use. The adhesion to the Ecoply® Barrier plywood sheet has also been tested and found to be satisfactory.

Other Investigations

17.1 Structural and durability opinions were given by BRANZ technical experts.

17.2 An assessment was made of the durability of the Ecoply® Barrier Tapes by BRANZ technical experts.

17.3 BRANZ expert opinion on NZBC E2 code compliance for Ecoply® Barrier was based on evaluation of all details within the scope and as stated within this Appraisal. The details contained within the Ecoply® Barrier Specification & Installation Guide have been reviewed and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of Acceptable Solution E2/AS1 for a rigid wall underlay.

17.4 Site inspections were carried out by BRANZ to assess the practicability of installation.

17.5 The Ecoply® Barrier Specification & Installation Guide has been examined by BRANZ and found to be satisfactory.

Quality

18.1 The manufacture of the Ecoply® Barrier plywood has been examined by BRANZ, including methods adopted for quality control. Details regarding the composition of the materials used were obtained by BRANZ and found to be satisfactory.

18.2 The quality of materials, components and accessories supplied by Carter Holt Harvey Woodproducts New Zealand is the responsibility of Carter Holt Harvey Woodproducts New Zealand. The quality control system for the manufacture of the plywood used for the Ecoply® Barrier has been assessed and registered as meeting the requirements of AS/NZS 2269 by the Engineered Wood Products Association of Australasia, Certificate No. 911.

18.3 The manufacture of Ecoply® Tapes has been examined on behalf of BRANZ, including methods adopted for quality control. Details of the quality and composition of the materials used were obtained and found to be satisfactory.

18.4 Quality of installation on site of components and accessories supplied by Carter Holt Harvey Woodproducts New Zealand and the building contractor is the responsibility of the installer.

18.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation in accordance with the instructions of Carter Holt Harvey Woodproducts New Zealand.

Sources of Information

- AS/NZS 1170: 2002 Structural design action - General principles.
- AS/NZS 2269: 2012 Plywood - Structural.
- AS/NZS 4200.1: 2017 Pliable building membranes and underlays - materials.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays - Methods of test - Resistance to water penetration.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 8, 30 November 2018).
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

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BRANZ

In the opinion of BRANZ, Ecoply® Barrier Rigid Air Barrier 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 Carter Holt Harvey Plywood, 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. Carter Holt Harvey Plywood:
   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 Carter Holt Harvey Plywood.
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 Carter Holt Harvey Plywood or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
21 June 2019

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 5

Building Wrap & Flashing Tape

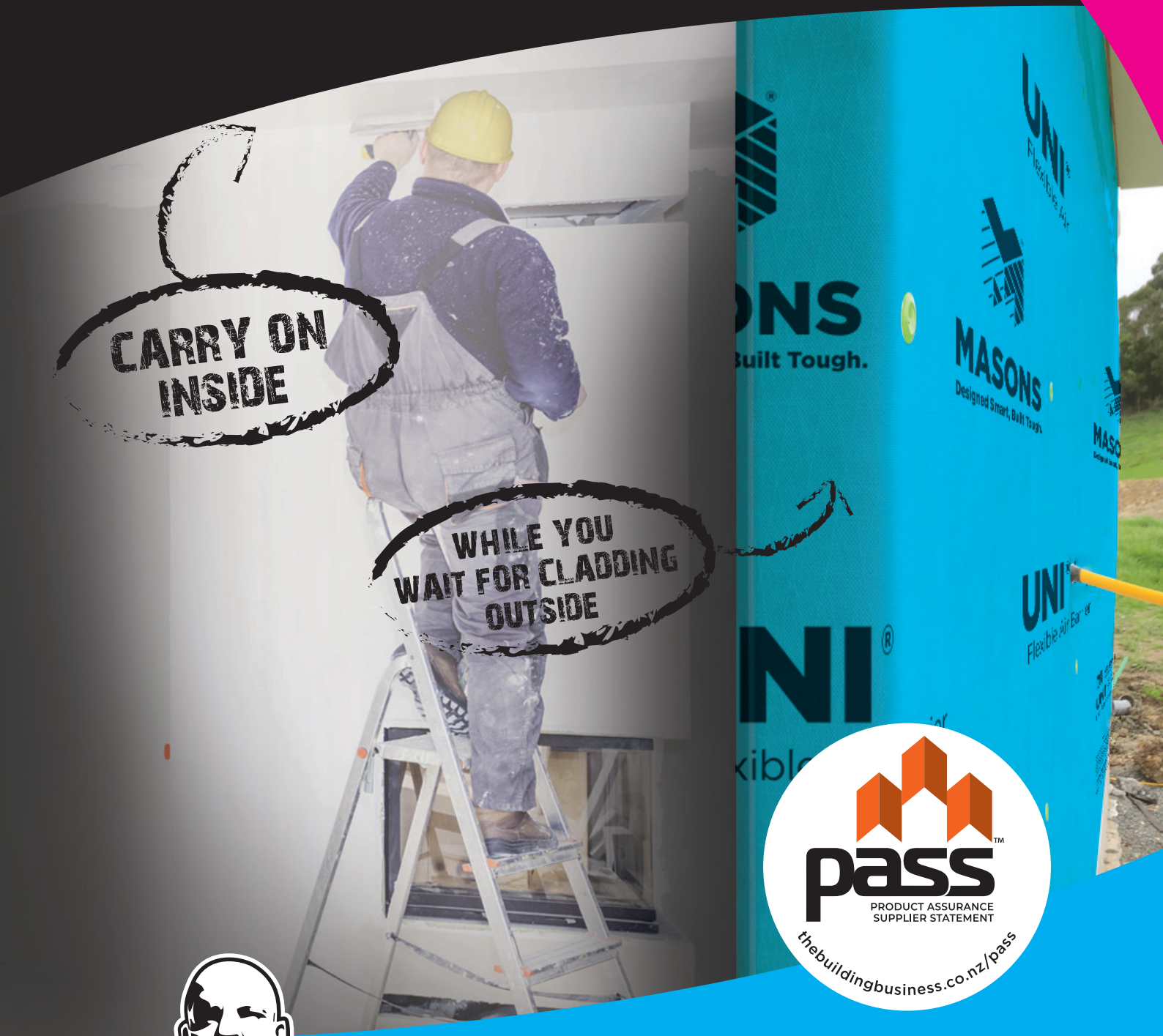
Technical Specifications

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MASONS
Designed Smart, Built Tough.

UNI® FAB
Flexible Air Barrier

NEW IMPROVED



pass™
PRODUCT ASSURANCE SUPPLIER STATEMENT
thebuildingbusiness.co.nz/pass



STAY ON TRACK WITH YOUR BUILD
If cladding is delayed

90 DAYS **TEMPOARARY WEATHER PROTECTION**
For up to 90 days

QUICK AND EASY TO INSTALL

masons.nz 0800 522 533

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MASONS
Designed Smart, Built Tough.

UNI® FAB

More than just a building wrap.
It's a game changer!

UNI® FAB is a Flexible Air Barrier giving early enclosure to builds and allowing work to continue on the inside (for up to 90 days), without waiting for the cladding to be complete. The weather protection is due to UNI's UV properties, waterproof features, and unique toughness.



FLEXIBLE AIR BARRIER

No more hold ups due to cladding delays or bad weather. UNI FAB provides temporary protection from UV exposure to timber framing for up to 90 days from installation.



A SECONDARY LINE OF DEFENCE

Once installed UNI is a secondary line of defence against moisture over the life of the building. It is highly breathable and passes vapour from inside the building out.

SAVES MONEY

UNI® FAB is much cheaper than Rigid Air Barriers (materials and labour) yet has most of the benefits.

VERY STRONG AND TEAR RESISTANT

UNI has a high vapour permeable, water resistant membrane sandwiched between two tough layers of non woven polyolefin fabric.

FULL TRAINING AND SUPPORT

Masons is commited to supporting builders with their first time use of UNI. An installation video, written instructions and training is available.

FIRE RETARDANCY

UNI® FAB is non fire retardant.

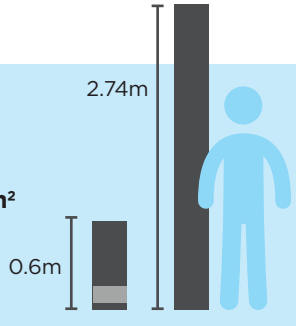


Soffit: With a handy 'peel and stick' adhesive strip for easy application.

Available as

UNI® FAB Roll – 2.74m x 18.25m roll = 50m²

UNI® FAB Soffit Roll – 0.6m x 18.25m roll = 10.95m²



No more Hold-ups due to Cladding Delays or Weather	Work on the Inside with Confidence Prior to Cladding	Secondary line of Defence Against Moisture	Easy to Install. Full Training Given	More Cost Effective than Rigid Air Barriers

March 2021 v3

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CN100 UNI Cap Nailer Gun
To Fix UNI/UNI FR to the Frame

Best practice for securing **UNI**. This gun shoots plastic caps with a 25mm ring shanked nail, and increases the holding power of the wrap.

A 90-100 PSI Air Compressor is also required.



UNI® Fasteners

Available as:
Galvanised nail and washers for wood frames **for use with a hammer.**

Galvanised nail and washer pack for **wood frames using a UNI Cap Nailer.**

Galvanised screws and washers **for steel frames.**



UNI® FAB Seam Tape
For Seams and Repairs

A 60mm seam and repair tape based on polypropylene non-woven (PP) fabric.

Made specifically for building wraps and underlays.



40 Below Platinum
Flashing Tape

Superb adhesion in all weather conditions from -10˚C to 40˚C.

No primers or heat guns required.

Ultra-thin and pliable.

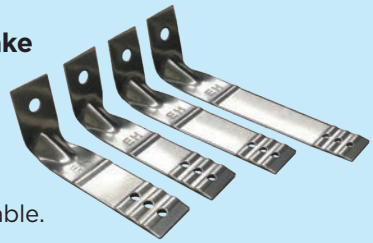
Use a scraper to assist adhesion.



BrickTies
Heavy Duty Earthquake

Masons BrickTies are manufactured to comply with AS/NZS2699.1.2000.

Medium Duty also available.



Penetration Seals
For Pipe Penetrations

Air seal flashings designed for cavity construction where pipes or wires penetrate the air barrier.

Available sizes:
1-75mm and 80-170mm.



Corner Guards
For Windows

To use with the installation of Masons 40 Below Flashing Tapes.



PEF Backing Rod
Joint Filler

A cylindrical flexible closed cell polyethylene material.

Available in multiple diameters from 6mm to 50mm.



Product Description	Masons Code
UNI FAB 2.74m x 18.25m = 50m²	UNI2.74X50
UNI FAB Soffit 0.6m X 18.25m = 10.95m²	UNISOFFIT
UNI Fasteners Galv Nail and Washer 32mm QTY 2500 (for use with hammer)	UNIFASTGN
UNI Cap Nailer Gun	UNICAPNAILER
UNI Nail/Washer Pack for UNI Gun QTY 2000 (for use with UNI Gun)	UNINAILPACK
UNI Nail Washer Pack for Steel Frames QTY 1500	UNIFASTSTLFRAME

Product Description	Masons Code
40 Below Platinum (or Flex) Flashing Tape 150mm x 20Lm, 75mm x 20Lm	40PLBELOW150x20 40PLBELOW75x20
40 Below Super Sticky Flashing Tape can be used instead of 40 Below Platinum or Flex	40BELOW150x20 40BELOW75x20
UNI FAB Seam & Repair Tape 60mm x 25m	UNISEAMTPE60MM
Penetration Seal – 1–75mm Pack of 10	PSEAL75
Penetration Seal – 80–170mm Pack of 10	PSEAL170
BrickTies - various sizes - Galv & Stainless	visit: mpb.co.nz
PEF Rod - various sizes - 6-50mm diameter	visit: mpb.co.nz
Corner Guards - 50 pack	HYDROCG50

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

MASONS
Designed Smart, Built Tough.

Meets requirements of **NZBC E2/AS1** clauses E2, F2, B2
Find out more at **masons.nz**

UNI® FAB

Applications

- Suitable for commercial and residential construction.
- Absorbent and can be used with all cladding systems.
- Strong and durable and suitable for all areas of New Zealand including up to 'Extra High' wind zones of NZS 3604 using a specific fixing method. (See UNI installation instructions on our website).
- Performs well over timber or steel framing.
- Suitable as a non rigid backing for stucco plaster.
- Suitable as an air barrier on walls that are not lined including gable ends.
- Has a fire retardancy to European Standard EN 13501-1 with a Class E rating. Must be covered with a suitable wall lining to any occupied areas.



New Zealand Building Code Standard (NZBC)

If designed, installed and maintained in accordance with our requirements, UNI® FAB meets or exceeds the requirements of the NZBC.

UNI® FAB also holds a 'Product Assurance Supplier Statement' or PASS. Details are available on our website: **mpb.co.nz**

pass PRODUCT ASSURANCE SUPPLIER STATEMENT thebuildingbusiness.co.nz/pass

Physical Properties

- A non-woven breathable synthetic Flexible Air Barrier.
- Highly water resistant and designed to provide temporary protection from weather conditions and UV exposure to timber framing without the installation of the cladding, which allows for the continuation of internal work on the house for up to 90 days after installation.
- UNI® FAB comprises three polypropylene layers: two outer layers of non-woven polypropylene with a middle layer of a functional-technical film. It is manufactured to meet the European standard EN 13589-1:2014 as well as the absorbency performance requirement as per NZS 2295:2006.





Installation Training

Masons is commited to supporting builders with their first time use of UNI® FAB. An installation video and printable instructions are available on our website. Please read the instructions carefully and contact us through your Masons Rep to book a training session.

For quick access to the installation video, please scan this QR code.

March 2021 v2

21154

Call your Masons Rep for further information

Waikato, Taranaki, Wanganui, Franklin, Takanini and Papakura: **Arthur 021 772 925**
Gisborne, Hawkes Bay, BOP, Rotorua, Coromandel, Wellington, Wairarapa, Kapiti, Palmeston North: **Graham 021 929 070**
Auckland and the Far North: **Jacqueline 021 414 100**
South Island: **Riki 021 786 898**

masons.nz 0800 522 533

MASONS UNI FLEXIBLE AIR BARRIER (UNI)

TECH DATA SHEET

MASONS
Designed Smart, Built Tough.

V1.0 September 2021

DESCRIPTION

UNI is a three-layer flexible wall underlay. It is manufactured by thermally bonding outer spunbonded layers to an inner layer of microporous polypropylene film.

Property	Method	Units	Value
Informative			
Mass/unit area	EN 1849-2:2010	g/m^2	180
Thickness	EN 1849-2:2010	mm	0.7
Width	EN 1849-2:2003	m	2.74 0.6 m
Length	EN 1849-2:2003	m	18.2
Straightness	EN 1849-2:2003	mm/10 m	30
Visible defects	EN 1850-2:2004		No defects
Normative			
Reaction to fire	EN ISO 11925-2 AC-2011	class	E
Resistance to water penetration	EN 1928:2002	class	W1
Water vapour transmission (sd)	EN ISO 12572:2004 EN 1931:2002	m	0.2
Water absorbance	NZS 2295	AS/NZS 4201:part 6	
Air resistance (Air permeability)	EN 12114	m^3/(m^2 x h x 50 Pa)	≤ 0.01
Dimensional stability	EN 1107-2:2002	%	≤2
Flexibility at low temps	EN 495-5:2014	°	-40
Resistance to tearing MD	EN 12310-1:2010	N	210N

BC 220230

TASMAN DISTRICT COUNCIL - APPROVED

26/04/2022

PRODUCT CERTIFICATE

Masons UNI® Flexible Air Barrier

CERTIFICATE NO: CM70116

Date of issue: 25 November 2021

1 CERTIFICATE HOLDER DETAILS

MASONS Plastabrick Ltd
18A David McCathie Place
Silverdale, Auckland 0932, New Zealand

info@mpb.co.nz
Ph: +64 9 414 7551
www.mpb.co.nz

2 PRODUCT CERTIFICATION BODY

Bureau Veritas Australia Pty Ltd
3/435 Williamstown Road
Port Melbourne VIC 3207
Australia

Ph: 1800 855 190
www.bureauveritas.com.au
Bureau Veritas Australia Pty Ltd

The complaints process for this certificate can be found here:
www.bureauveritas.com.au/your-feedback

KEY INFORMATION

3 SUMMARY OF DESCRIPTION OF BUILDING METHOD OR PRODUCT

Masons UNI® Flexible Air Barrier is a tri-laminate synthetic sheet consisting of two outer non-woven layers - a blue front face and a black rear face - and a middle synthetic membrane which is dark grey. The sheet is 2.74 metres wide and marked "UNI® Flexible Air Barrier". It is also available as 600mm wide sheet with a self-adhesive strip, marketed as UNI Soffit.

Continuation of description can be found in item 9. Supporting Information about Description of Building Product or Method.
Matters that should be taken into account in the use or application of the building method or product can be found in item 6. Conditions and Limitations of Use.

4 SUMMARY OF INTENDED USE OF BUILDING METHOD OR PRODUCT

Masons UNI® Flexible Air Barrier is a wall underlay and flexible air barrier, and is suitable for use as temporary weather protection to allow interior works to continue inside the building without the exterior wall cladding being fully in place for up to 90 days.

Continuation of intended use can be found in item 8. Supporting Information about Intended use of Building Product or Method.

5 BUILDING CODE PROVISIONS

The performance clauses of the New Zealand Building Code that are relevant to the intended use and with which the building method or product complies or contributes to (where used as part of a system).

B2 Durability: B2.3.1(a), B2.3.2
E2 External moisture: E2.3.2 (contributes to), E2.3.5 (contributes to), E2.3.7
F2 Hazardous building materials: F2.3.1
H1 Energy efficiency: H1.3.1(b) (contributes to)

How the building method or product complies or contributes can be found in item 12. Basis for Certification. Any qualifications on the extent of that compliance can be found in item 6. Conditions and limitations of use.

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.
The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product.
The Ministry disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website http://www.building.govt.nz.

PRODUCT CERTIFICATE

Masons UNI® Flexible Air Barrier

6 CONDITIONS AND LIMITATIONS OF USE

1. Masons UNI® Flexible Air Barrier is certified for use as a wall underlay and air barrier on buildings:
   a) within the scope limitations of:
      i. NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area for timber-framed construction; or
      ii. NZBC Acceptable Solution E2/AS4 with regards to building height and floor plan area for light-steel framed construction, and
   b) situated in wind zones (as defined in NZS 3604:2011) up to and including 'Extra High', provided stud and fixing centres are no greater than specified in the Masons UNI® Flexible Air Barrier Design and Installation Guide V1.0, October 2021-CM, and
   c) with absorbent or non-absorbent wall claddings directly fixed to the frame; or installed over an 18mm minimum drained cavity; or with masonry veneer, in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or NZBC Acceptable Solution E2/AS4 for steel framed buildings, and
   d) where the underlay is not exposed to view in an occupied space.
2. Masons UNI® Flexible Air Barrier shall be:
   a) installed in accordance with the Masons UNI® Flexible Air Barrier Design and Installation Guide V1.0, October 2021-CM, and
   b) separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solutions C/AS1 and C/AS2, Paragraph 7.5.9 for the protection of combustible materials, and
   c) protected from sunlight within 90 days.
3. Contribution to compliance with Building Code clause H1.3.1(b) is conditional on:
   a) the element incorporating Masons UNI® Flexible Air Barrier being part of the thermal envelope of the building, and
   b) horizontal and vertical laps being securely taped.

NOTE: Together, items 3, 4, 5 and 6 define scope of use.

7 HEALTH AND SAFETY INFORMATION

The compliance with any manufacturer's installation instructions, maintenance, OH & S statements, MSDS's and other Health and Safety declarations will provide the necessary Health and Safety Information pertaining to the product.

8 SIGNATURES

Sam Guindi
Product Certification Manager

For and on behalf of
Bureau Veritas Australia Pty Ltd

Trent Mason
Director

For and on behalf of
MASONS Plastabrick Ltd

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CERTIFICATE V1.3

PRODUCT CERTIFICATE

Masons UNI® Flexible Air Barrier

SCHEDULE: INFORMATION THAT SUPPORTS KEY INFORMATION

9 SUPPORTING INFORMATION ABOUT DESCRIPTION

The following accessories are used with Masons UNI® Flexible Air Barrier :

- UNI Seam Tape
- UNI Fasteners
- Masons 40 Below, 40 Below Platinum and 40 Below Flex flashing tapes
- Masons Corner Guards
- Penetration seals

10 SUPPORTING INFORMATION ABOUT INTENDED USE

Further details regarding the use of the product can be found in Masons UNI® Flexible Air Barrier Design and Installation Guide V1.0, October 2021-CM.

11 SUPPORTING INFORMATION ABOUT CONDITIONS AND LIMITATIONS OF USE

N/A

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PRODUCT CERTIFICATE

Masons UNI® Flexible Air Barrier

12 BASIS FOR CERTIFICATION

B2 Durability - By testing and comparison with Acceptable Solution E2/AS1 and referenced standard NZS2295
E2 External moisture - By testing and comparison with Acceptable Solution E2/AS1 and referenced standard NZS2295
F2 Hazardous building materials - By comparison with requirements of performance requirements of Building Code clause F2.3.1
H1 Energy efficiency - By testing and comparison with Acceptable Solution E2/AS1 and referenced standard NZS 2295

13 SUPPORTING DOCUMENTATION FOR CERTIFICATION

1. Verification Methods E2/VM1 and Acceptable Solutions E2/AS1, E2/AS2 and E2/AS3 for New Zealand Building Code Clause E2 External Moisture Third edition (Amendment 10), 5 November 2020
2. NZS 2295:2006 Pliable, permeable building underlays
3. Masons Plastabrick Material Safety Datasheet V1.0, September 2021
4. Scion Report No 2704886 [J31991 / QT8222VHPU] Evaluation of Roof VHP Ultra to NZS2295, July 2020
5. ProConsult Report Reference 13038 HP Ultra wall underlay system compliance with NZBC B1 Structure (including fixing recommendations), 22 March 20
6. L H Bolton Report 201265 Assessment of Masons Roofing Underlays for Buildings, 21 October 2020
7. Masons UNI® Flexible Air Barrier Design and Installation Guide V1.0, October 2021 - CM

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CERTIFICATE V1.3

PRODUCT CERTIFICATE

Masons UNI® Flexible Air Barrier

14 CONDITIONS RELATING TO NOTIFICATION

(a) the certificate holder notifies the product certification body (Bureau Veritas) in writing of any intended change to any of the following particulars:
(i) the name, address, or contact details of the certificate holder:
(ii) any address of a location where a certified product is produced or manufactured:

(b) the certificate holder notifies the product certification body (Bureau Veritas) in writing of any intended change, modification, or alteration to any of the following:
(i) the certified building method or product:
(ii) the method of its production or manufacture:
(iii) the product quality plan prepared in respect of the certified building method or product:
(iv) the application or installation instructions for the certified building method or product:
(v) any documentation relating to the use and maintenance of the certified building method or product:

(c) if the certificate holder has any reason to suspect that the certified building method or product does not comply with the Building Code, the certificate holder notifies the product certification body (Bureau Veritas) in writing of the reason for that suspicion:

(d) if the certificate holder or the product certification body (Bureau Veritas) finds that a certified building method or product that has been released on the market does not comply with the Building Code, the certificate holder discloses that fact in disclosure statements published in a form that is acceptable to the product certification body and to the chief executive:

(e) if the certificate is suspended or revoked, the certificate holder—
(i) notifies all customers to whom the building method or product is regularly supplied; and
(ii) immediately ceases using the certificate, the mark of conformity, and any reference to the number of the certificate.

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.
The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product.
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Property	Method	Units	Value
Resistance to tearing CD	EN 12310-1:2010	N	290N
Tensile strength MD	EN 12311-2:2013	N/50 mm	330
Tensile strength CD	EN 12311-2:2013	N/50 mm	230
Tensile strength – elongation MD	EN 12311-2:2013	%	40
Tensile strength – elongation CD	EN 12311-2:2013	%	80
Performance after artificial aging			
Method of aging	EN 1296 & EN 1297		
Water resistance, Resistance to water penetration	EN 1928:2002	class	W1
Tensile strength MD/ CD	EN 12311-2:2013	n/50 mm	280/195
Tensile strength elongation	EN 12311-2:2013	%	34/68

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NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 6

Roofing Details & Technical Specifications

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

Thermakraft™



Product Data Sheet

COVERTEK 401

Self-supporting synthetic roof underlay

Covertek 401 is an affordable lightweight roof underlay designed to keep water out and allow moisture to escape. Covertek 401 is a more affordable option if your project does not require a fire-retardant underlay. It is stable, shrink resistant, easy to handle and easy to install.

Covertek 401 comes in four roll sizes:

401	1350mm wide	18.6m long	25m^2 coverage*
401	1350mm wide	37m long	50m^2 coverage*
401	1350mm wide	55m long	75m^2 coverage*
401 Wide	2700mm wide	33.4m long	90m^2 coverage*

* **Note:** m^2 is the roll size for actual coverage, allow for laps and joins.

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thermakraft.co.nz

BRANZ Appraised
Appraisal No.943 [2016]

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

Covertek 401

Self-Supporting Synthetic roof underlay

Scope of Use

- Suitable with masonry tile, metal tile or profiled metal roof cladding.
- Suitable for timber or steel framed buildings.
- Self-supporting in roof pitch application greater than or equal to 10 degrees (Refer to installation guide)
- Will provide temporary weather protection during construction (maximum 7 days), same day coverage recommended.
- Covertek 401 may be installed during adverse conditions (rain/snow) without affecting durability or performance.
- Suitable for use under dark coloured roofs.

General

- Covertek 401 is NOT fire retardant.
- 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.
- Tear resistant and strong.

Limitations

- Cannot be used as a wall underlay.
- Must NOT be exposed to the weather or UV for more than 7 days.

Compliance

Designed for use as a roof underlay 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.
- Situated in NZS3604 Wind Zones up to, and including, 'Extra High' (ROOF ONLY).
- Refer BRANZ Appraisal No 943 (2016) for full details.

Durability

Contributes to meeting the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 (a) 50 years, B2.3.1 (b) 15 years and B2.3.2), E2 External Moisture E2.3.2), and F2 Hazardous Building Materials F2.3.1, providing:

- It is not damaged.
- Is installed in accordance with instructions.
- Is not left exposed for more than 7 days (roof), same day coverage recommended.
- Is installed by or under guidance of Licensed Building Practitioners.
- Is compatible with cladding system used. (**Note:** specifiers and product users must test for roof cladding system compatibility with the underlay before installation.)

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 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.
- Ceiling penetrations and entry of warm air into roof cavities.
- Occupancy activities which have high moisture loading on conditioned spaces.
- 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 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.**

Property Performance

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

Thermakraft Limited / 0800 806 595

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

BRANZ Appraised
Appraisal No.943 (2016)

The recommendations contained in Thermakraft's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Thermakraft (for example quality of workmanship and design), Thermakraft shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards. Literature subject to change without notification. Latest documentation can be found on the website. E&OE.

Issue 6, June 2021

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

BRANZ Appraised

Appraisal No. 917 [2020]

THERMAKRAFT COVERTEK 403 ROOF AND WALL UNDERLAY



Appraisal No. 917 (2020)

This Appraisal replaces BRANZ Appraisal No. 917 (2016) and No. 918 (2016)

BRANZ Appraisals

Technical Assessments of products for building and construction.

Thermakraft

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

BRANZ

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 Thermakraft Covertek 403 Roof and Wall Underlay is a fire retardant, synthetic building underlay for use under roof and wall claddings. The product consists of a micro-porous, water-resistant film, laminated to two layers of non-woven spun-bonded polyolefin.

Scope

Roof Underlay

2.1 Thermakraft Covertek 403 has been appraised for use as a non self-supporting roof underlay 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 masonry tile roof cladding; and,
- with metal tile and profiled metal roof cladding; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Flexible Wall Underlay

2.2 Thermakraft Covertek 403 has also 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 buildings; or,
- 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 and NASH Standard Part 2 Wind Zones up to, and including, Very High; or,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High when used over a rigid wall underlay in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions Paragraph 9.1.7.2.

Readers are advised to check the validity of this Appraisal by

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

BRANZ Appraised
Appraisal No. 917 [2020]

Specific Design

2.3 Thermakraft Covertek 403 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 Thermakraft Covertek 403 into their design in accordance with the declared properties and the instructions of Thermakraft Limited.

Building Regulations

New Zealand Building (NZBC)

3.1 **In the opinion of BRANZ, Thermakraft Covertek 403 Roof and Wall Underlay, 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. Thermakraft Covertek 403 Roof and Wall Underlay meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Thermakraft Covertek 403 Roof and Wall Underlay meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the roof or wall cladding system, Thermakraft Covertek 403 Roof and Wall Underlay will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Thermakraft Covertek 403 Roof and Wall Underlay meets this requirement.

Technical Specification

4.1 Thermakraft Covertek 403 Roof and Wall Underlay is a synthetic building underlay for use under roof and wall claddings. The product consists of a micro-porous water-resistant film, laminated to two layers of non-woven spun-bonded polyolefin. Thermakraft Covertek 403 Roof and Wall Underlay is coloured white on the top and bottom faces.

4.2 The product is supplied in rolls 1.35 m wide x 18.6 m, 37.0 m and 55.0 m long. The product is printed with the Covertek 403 logo repeated along the length of the roll. The rolls are wrapped in clear polythene film.

Accessories

4.3 Accessories used with Thermakraft Covertek 403 Roof and Wall Underlay which are supplied by the installer are:

- **Fixings** - stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the underlay to the framing.
- **Roof underlay support (timber frame)** - polypropylene strap, or minimum 0.9 mm diameter galvanised steel wire mesh where required to support the roof underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 8.1.5.1. (Note: The mesh must be galvanised in accordance with AS/NZS 4534.)
- **Roof underlay support (steel frame)** - polypropylene strap, or minimum 0.9 mm diameter galvanised steel wire mesh where required to support the roof underlay in accordance with NASH Building Envelope Solutions, Paragraph 8.1.5.1. (Note: The mesh must be galvanised in accordance with AS/NZS 4534.)
- **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.

Readers are advised to check the validity of this Appraisal by

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

- **Thermal break sheathing (steel framing)** – in accordance with NASH Building Envelope Solutions, Paragraph 11.4.3.2.

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 Thermakraft Covertek 403 Roof and Wall Underlay. 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 Thermakraft Covertek 403 Roof and Wall Underlay is intended for use as an alternative to conventional kraft paper underlays, which are fixed over timber or steel-framed roofs and walls. The underlay is intended to limit the entry of wind into the roof and wall cavities. For roofs the underlay assists in the moisture management of the roof cladding system and for walls it acts as a secondary barrier to wind-driven rain. Refer to Table 1 for material properties.

Table 1: Material Properties

NZBC E2/AS1 Table 23 Roof Underlay Properties	Roof Property Performance Requirement	Wall Property Performance Requirement	Results
Absorbency	≥ 150 g/m^2	≥ 100 g/m^2	Pass ≥ 150 g/m^2
Vapour Resistance	≤ 7 MN s/g	≤ 7 MN s/g	Pass
Water Resistance	≥ 100 mm	≥ 20 mm	Pass ≥ 100 mm
pH of Extract	≥ 6.0 and ≤ 9.0	≥ 6.0 and ≤ 9.0	Pass
Shrinkage	≤ 0.5%	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 217N Cross direction = 104 N **Tensile strength (Average):** Machine direction = 4.57 kN/m Cross direction = 2.63 kN/m
Air Barrier	Not applicable	Air resistance ≥ 0.1 MN s/m^3	Pass. Thermakraft Covertek 403 can be used as an air barrier

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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 cladding is installed. Hence, the entire building must be closed-in and made weatherproof before moisture sensitive materials such as internal linings and insulation materials are installed.

7.3 Thermakraft Covertek 403 Roof and Wall Underlay must not be exposed to the weather or ultraviolet (UV) light for a total of more than 7 days before being covered by the cladding when used as a roof underlay, or for more than 42 days when used a wall underlay.

Timber and Steel Framing

7.4 Timber and steel framing must be provided in accordance with the requirements of the NZBC and the cladding manufacturer.

Use as a Roof Underlay

7.5 Thermakraft Covertek 403 Roof and Wall Underlay is suitable for use under roof claddings on buildings as a roof underlay in accordance with NZBC Acceptable Solution E2/AS1 Table 23 for timber-framed buildings and NASH Building Envelope Solutions Table 23 for steel-framed buildings.

7.6 Thermakraft Covertek 403 Roof and Wall Underlay is suitable for use in residential and commercial roofs with roof pitches of minimum 10° and above and must be fully supported with a corrosion resistance roof underlay support. Thermakraft Covertek 403 can be installed vertically and horizontally and must span no more than 300 mm in one direction. *[Note: For roof pitches less than 10°, Thermakraft Limited recommends the use of Thermakraft Covertek 407. Refer to BRANZ Appraisal No. 651].*

7.7 Refer to Table 2 for a summary of the roof underlay support requirements.

Table 2: Roof Underlay Support Requirements

Roof Pitch	Span	Roof Underlay Support Required?	
		Horizontally Installed	Vertically Installed
10° or more	Greater than 300 mm	Yes	Yes
	300 mm or less	No	No

Use as a Wall Underlay

7.8 Thermakraft Covertek 403 Roof and Wall Underlay is suitable for use under wall claddings as a wall underlay in accordance with 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.

7.9 Thermakraft Covertek 403 Roof and Wall Underlay 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).

7.10 In cavity installations where the cavity battens are installed at greater than 450 mm centres, Thermakraft Covertek 403 Roof and 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 frame or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel frame. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, vertical cavity battens or thermal break sheathing (steel frame only).

Structure

8.1 Thermakraft Covertek 403 Roof and Wall Underlay 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 and NASH Standard Part 2 up to, and including, Extra High when used as an overlay for rigid wall underlays or as a roof underlay.

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Durability

9.1 Thermakraft Covertek 403 Roof and Wall Underlay meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for underlays used where the roof or wall cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding or masonry veneer. It also meets code compliance with NZBC Clause B2.3.1 (b), 15 years for underlays used where the roof or wall cladding durability requirement is 15 years.

Serviceable Life

9.2 Thermakraft Covertek 403 Roof and Wall Underlay is expected to have a serviceable life equal to that of the cladding. This is provided the cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant. In addition, the product must not be exposed to the weather or UV light for a total of more than 7 days when used as a roof underlay prior to installation of the roofing. When used as a wall underlay a total exposure of 42 days applies prior to installation of the wall cladding.

Control of Internal Fire and Smoke Spread

10.1 Thermakraft Covertek 403 Roof and Wall Underlay has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS1 and 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 Thermakraft Covertek 403 Roof and Wall Underlay 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.

External Moisture

12.1 Thermakraft Covertek 403 Roof and Wall Underlay must only be used under 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 Thermakraft Covertek 403 Roof and Wall Underlay, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirements

13.1 All design and building work must be carried out in accordance with the Technical Literature and this Appraisal by competent and experienced tradespersons conversant with 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

General

14.1 Thermakraft Covertek 403 Roof and Wall Underlay must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self-drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.

14.2 When fixing the product in windy conditions, care must be taken due to the large sail area created.

14.3 Any damaged areas of Thermakraft Covertek 403 Roof and Wall Underlay, 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.

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Roof Underlay

14.4 Thermakraft Covertek 403 Roof and Wall Underlay may be run horizontally or vertically. Refer to Table 2 for a summary of roof underlay support requirements. The roof underlay must extend from the ridge and overhang the fascia board by 20-25 mm.

14.5 Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide. To assist with achieving the correct lap dimension, Thermakraft Covertek 403 Roof and Wall Underlay has a 150 mm lap line printed continuously along the top face.

Wall Underlay

14.6 Thermakraft Covertek 403 Roof and Wall Underlay 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 underlay. End laps must be made over framing and be no less than 150 mm wide.

14.7 Thermakraft Covertek 403 Roof and 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.

14.8 Thermakraft Covertek 403 Roof and Wall Underlay 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.

Inspections

14.9 The Technical Literature must be referred to during the inspection of Thermakraft Covertek 403 Roof and Wall Underlay 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 Thermakraft Covertek 403 Roof and Wall Underlay 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 Thermakraft Covertek 403 Roof and Wall Underlay was exposed to UV light.

15.2 The flammability index of Thermakraft Covertek 403 Roof and Wall Underlay has been evaluated in accordance with AS 1530.2.

Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Thermakraft Covertek 403 Roof and Wall Underlay in direct contact with metal roof cladding has been completed by BRANZ.

16.3 The practicability of installation of Thermakraft Covertek 403 Roof and Wall Underlay 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.

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Quality

17.1 The manufacture of Thermakraft Covertek 403 Roof and Wall Underlay has been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ 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 roof 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 4201.3: 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.
- NASH Building Envelope Solutions: 2019 Light steel framed buildings.
- NASH Standard Part Two: 2019 Light steel framed buildings.
- NZS 2295: 2006 Pliable, permeable building underlays.
- 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.

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BRANZ

In the opinion of BRANZ, Thermakraft Covertek 403 Roof and Wall Underlay 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:
   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:
27 November 2020

Readers are advised to check the validity of this Appraisal by

ROOF PLANE DIAGONAL BRACING

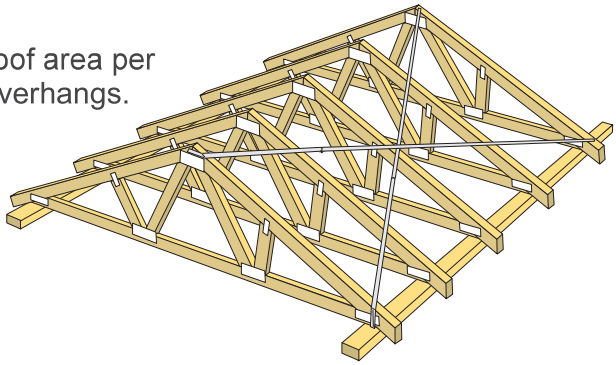
AS PER NZS3604:2011 SECTION 10

ROOF BRACE Definition

A “roof brace” comprises a diagonal pair of Pryda Strap Braces intersecting at 45°, connecting the ridge of the roof to the top plate of the wall with both ends fixed as shown in the diagrams below. A “roof brace” can also be a valley or hip connected continuously.

Light Weight Roofs

Require ONE “roof brace” in each plane of the roof area per 50m² of plan roof area which also includes any overhangs.

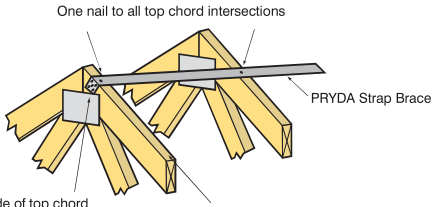


Heavy Weight Roofs

Require ONE “roof brace” in each plane of the roof area per 25m² of plan roof area which also includes the overhangs.

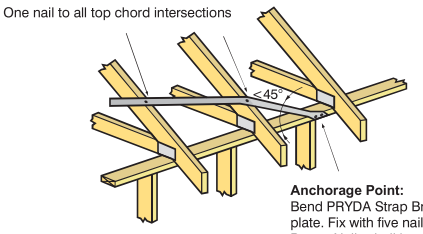
Note: Porches, dormers and small roof planes of less than 6m² do not require bracing.

END FIXING DETAIL AT APEX



Anchorage Point:
Bend strapbrace over side of top chord and fix PRYDA Strap Brace end with five nails. Nails shall be no closer than 10mm to the edge of the timber

END FIXING DETAIL TO TOP PLATE



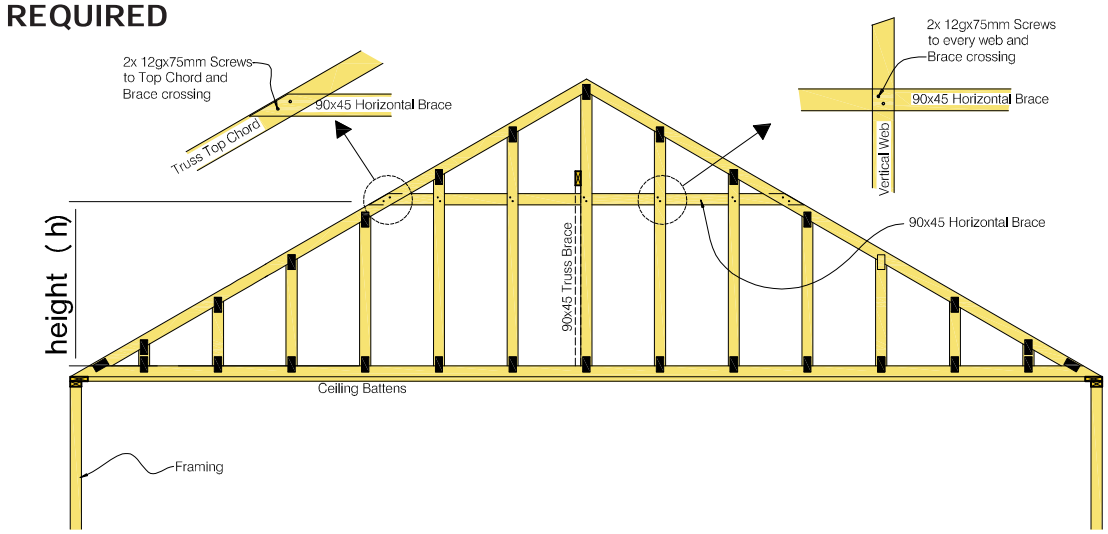
Anchorage Point:
Bend PRYDA Strap Brace over side and under top plate. Fix with five nails to each end of PRYDA Strap Brace. Nails shall be no closer than 10mm to the edge of the timber

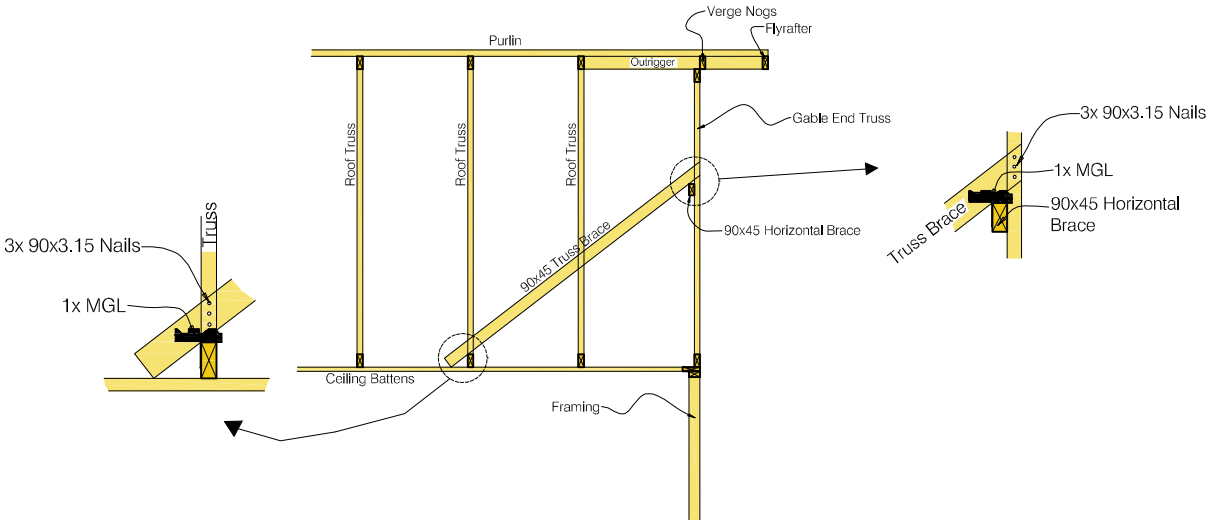
Installation Notes

1. The distribution of roof braces should be performed in an even and balanced fashion
2. For purlins / battens 50mm or deeper, the roof brace shall occupy the plane directly on top of the top chords or rafters
3. Pryda Strap Brace shall be used for spans up to 12m. For spans over 12m Pryda Maxibrace shall be used
4. Nail off Pryda Strap Brace at apex end with 5 nails. Layout Pryda Strap Brace at 45° and nail off at heel end with 5 nails
5. Tension Pryda Strap Brace using Pryda Tensioner before final nailing of one nail per top chord crossing

GABLE TRUSS WEB LATERAL BRACING GUIDE

MAXIMUM HEIGHT (H) FOR VERTICAL TRUSS WEB BEFORE A LATERAL BRACE IS REQUIRED





	Web size (mm) SG8 or better	Wind Zone				
		Low	Medium	High	Very High	Extra High
Single Truss	70x45 SG8 at 400crs	2200	2000	1750	1600	1500
	90x45 SG8 at 400crs	2400	2150	1900	1850	1650
	70x45 SG8 at 600crs	1900	1700	1500	1400	1250
	90x45 SG8 at 600crs	2100	1900	1650	1500	1400
Double Trusses	2/70x45 SG8 at 400crs	2800	2550	2250	2050	1900
	2/90x45 SG8 at 400crs	3050	2750	2450	2250	2100
	2/70x45 SG8 at 600crs	2450	2200	1950	1750	1650
	2/90x45 SG8 at 600crs	2650	2400	2100	1950	1800

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 7

Ardex WPM Details & Technical Specifications

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ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed)

Single component undertile waterproofing membrane

Low VOC content – meets Green Building Council of Australia Green Star IEQ-13 requirements

Fast drying one part acrylic membrane

Class III membrane, conforms to the requirements of AS4858:2004 Wet Area Membranes

ARDEX Australia Pty Ltd
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Seven Hills NSW 2147
Ph: (02) 9851 9199
Fax: (02) 9674 5621
Email: techinfo@ardexaustralia.com
Internet: www.ardex.com

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ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

PRODUCT DESCRIPTION

ARDEX WPM 001 (Superflex Premixed) is a tough, ready to use waterproofing membrane specifically designed for use under tiles. ARDEX WPM 001 has been uniquely formulated with synthetic microfibres to increase its strength and eliminate the need for a separate reinforcement mat. ARDEX WPM 001 is based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification once cured.

ARDEX WPM 001 is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives. ARDEX WPM 001 is one of the fastest drying one part acrylic membranes on the market – normally ready to tile in 48 hours @ 23°C.

WPM 001 meets the Green Building Council of Australia Green Star IEQ-13 requirements for Architectural Sealant when tested in accordance with SCAQMD Method 304-91 Determination of Volatile Organic Compounds (VOC) in Various Materials as referenced by South Coast Air Quality Management Division (SCAQMD) Rule 1168.

FEATURES/BENEFITS

- Fast drying ARDEX WPM 001 can be tiled over in 48 hours in non critical areas*.
- Fibre reinforced: Excellent strength, eliminates need for reinforcing mat.
- Flexible: Accommodates normal building movement class 3 membrane as per AS 4858: 2004 Wet Area Membranes.
- Advanced acrylic: Will not re-emulsify once cured.
- Designed for tiling – Fully compatible with ARDEX tile adhesive systems.
- Water based, safe to use, low odour and easy cleaning.
- Conforms to the requirements of Australian Standards 4858: 2004 Wet Area Membranes.

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

APPLICATION RANGE

Performance levels

Commercial and residential.

Location

Internal wet areas, balconies, decks, and other areas that will be tiled or otherwise protected from regular foot traffic.

Surfaces

Walls and floors.

Substrates

Concrete	Cured for min. 28 days or sealed when set with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. External wet concrete should be allowed to dry thoroughly or sealed with one coat of ARDEX HydrEpoxy WPM 300 as above.
Renders and screeds	Cured for min. 7 days or sealed when set with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet render should be allowed to dry thoroughly or sealed with one coat of ARDEX HydrEpoxy WPM 300 as above.
Fibre cement	Wet area grade fibre cement.
Plasterboard	Wet area grade only.
Plywood	Structural plywood (PAA branded), marine grade or other wet area grade only. Special preparation is required – contact ARDEX. Not recommended for external use (refer ARDEX).
Particleboard	Wet area grade, internal use only (special preparation is required – contact ARDEX). Not recommended for external use (refer ARDEX).
Permanent Immersion	In conditions of permanent immersion, it is recommended that ARDEX WPM 002 (Superflex Two Part) is used. Must be covered with tiles for full immersion.

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

SPECIFICATION CLAUSE

ARDEX WPM 001 (Superflex Premixed)

The waterproofing membrane shall be ARDEX WPM 001: a one part acrylic modified fibre reinforced membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Single component: 20kg (approx 15 litres) or 6.5kg (approx 5 litres).

SHELF LIFE

12 months when stored in the original unopened packaging, in a dry place at 23°C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining contents from part used containers within 3 months.

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TABLE 1

	Thickness per coat		Total dry film thickness (2 coats)	Theoretical coverage		Per unit
	Dry film	Wet film		Per coat	For 2 coats	
FLOORS	0.5mm	1.0mm	1.0mm	15m²	7.5m²	20kg(15L) unit
WALLS	0.25mm	0.5mm	0.5mm	30m²	15m²	20kg(15L) unit

COVERAGE

Two coats are recommended for an effective waterproof membrane.

Coverage will vary depending on the porosity of the surface.

One 20kg (15 litre) unit will cover approximately 7.5–15m² (based on two coats) depending on area requirements between wall and floor surfaces to be treated. Refer Table 1.

DRYING TIMES

Recoat time

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

Dry through

The slowest drying areas are those where the membrane has been applied over a silicone bond breaker, eg. wall and floor junctions. The membrane cannot be tiled over until these critical areas are completely dry. ARDEX WPM 001 is totally dry in 48 hours at 23°C / 50% RH, but can take up to 72 hours at 10°C / 50% RH in corners or for thick films.

Fully cured

The shower should not be used until the membrane has reached its full strength. ARDEX WPM 001 membrane is fully cured after 3 days at 23°C, or after 5 days at 10°C.

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

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

CLEANING

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

SAFETY PRECAUTIONS

Do not use the product in the following situations:

- Areas subject to negative hydrostatic pressure or rising damp, unless treated with ARDEX HydrEpoxy WPM 300.
- Where the substrate is wet – wet surfaces can be sealed with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight.
- Where rain is imminent.
- Where the membrane will be left exposed and subjected to regular foot traffic.
- On glazed, glass or other totally impervious surfaces (eg. areas pre-treated with water repellants).
- Where the surface temperature is below 10°C or greater than 35°C.
- All floor areas must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to application of the ARDEX WPM 001.

For substrates or situations other than those listed contact ARDEX.

SAFETY DATA

ARDEX WPM 001 is non-hazardous and non dangerous. In case of skin contact, flush with running water. In case of irritation seek medical advice. If swallowed, immediately give a glass of water.

Additional information is listed in the Material Safety Data Sheet.

QUALITY PRODUCT

ARDEX WPM 001 is manufactured and tested to ARDEX procedures which are maintained in accordance with Quality System Standard ISO 9001.

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ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

USER NOTES

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

APPLICATION

Apply ARDEX WPM 001 by brush or roller. A medium nap (12–15mm pile) paint roller is recommended. New rollers should be dampened with water before being used for the first time.

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

To achieve the required dry film thickness per coat, application must consist of laying the product onto the surface and lightly finish the surface. Do not try to apply in the same manner as a building paint. A conventional building paint is normally applied at 25–40 micrometers wet film thickness while ARDEX WPM 001 needs to be applied at between 0.5 and 1.0mm per coat depending on product and application (Refer Table 1).

Critical areas:

INTERNAL WET AREAS

1. Construction should be in accordance with Australian Standards 3740 – 2004 Waterproofing of wet areas within residential buildings.
2. All render and tile bed requirements should be completed before application of the membrane and tiles or other floor coverings should be direct bonded to the membrane.
3. Ensure wall and floor sheets are installed as per sheet manufacturer's recommendations.
4. Ensure suitable brick/concrete hobs are used (do not use timber), and that the top of the hob does not slope outwards.
5. Ensure that falls to the waste are min 1:60 (ie. approx. 30mm in 2mtr) before waterproofing. Ensure outlet pipes are fixed securely and that the waste or drainage flanges are recessed into the floor.
6. Avoid sheet joints in shower recess floor. Ensure that sheets are securely fixed to the wall at the bottom edge, and sheet joints are sealed with a neutral cure silicone sealant spread approximately 6mm on either side of the joint.
7. Treat nail and screw holes with neutral cure silicone sealant.
8. Seal the perimeters of taps, shower outlets and waste outlets with neutral cure silicone sealant.
9. Apply a bead of neutral cure silicone sealant to all horizontal and vertical corners.
10. Apply a bead of neutral cure silicone sealant to the junction of the hob or angle and walls.
11. Waste outlets shall incorporate a puddle flange or similar in accordance with AS 3740 and the top surface shall be set flush with the surface to which the membrane is to be applied. A bead of neutral cure silicone shall be applied across the intersection of the puddle flange and the screed/floor.
12. Apply the membrane to the entire shower recess floor and down into waste or drainage flange. Apply the membrane over the hob and at least 100mm beyond the outside edge of the hob (ideally to entire wet area floor).
13. Plastic (eg. PVC) fittings should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.
14. Apply the membrane 1800mm up the walls or 80mm above the height of the shower rose within the shower recess.
15. Install the shower screen to inside edge of the hob.

Fig.1 – Shower recess – Critical areas

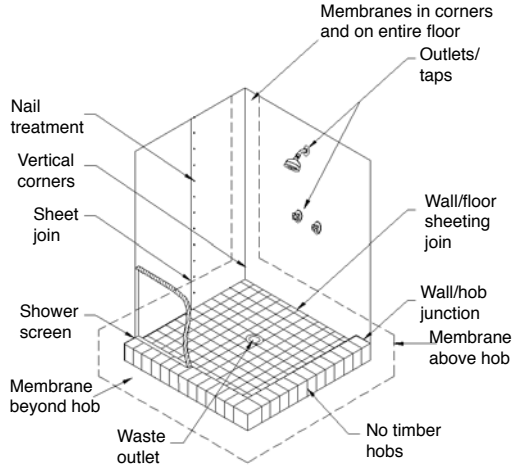
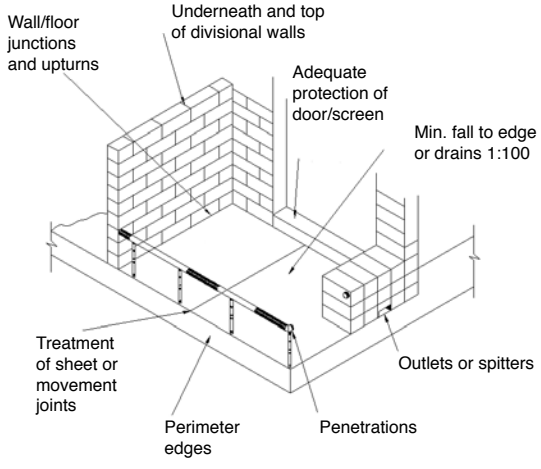


Fig.2 – Balcony – Critical areas



BALCONIES AND DECKS

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

APPLICATION NOTES

Surface preparation

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

Priming

The primer is a critical part of the waterproofing system. Apply one coat of ARDEX WPM 265 water based primer by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to completely dry prior to the application of the ARDEX WPM 001 membrane. This will take around 20–30 minutes depending upon weather conditions and porosity of the substrate. Coverage is approximately 6m² per litre. Plastic (eg. PVC) pipes should be primed with a solvent based plumbers pink primer. Prime metal surfaces with a suitable metal primer such as epoxy polyamide primer.

GENERAL APPLICATION

Crack preparation

Cracks <2mm:

Clean and remove any loose particles in the crack. Prime the crack and adjacent area carefully with ARDEX WPM 265 water based primer and allow to dry before applying two coats of ARDEX WPM 001 membrane in a band at least 200mm wide equidistantly across the crack and along the length of the crack.

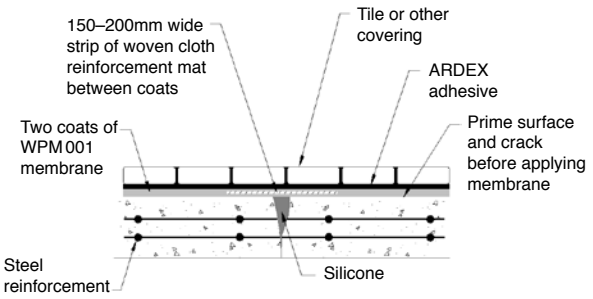
Cracks 2–6mm:

(Refer Fig.3) Prepare and prime the crack as above. Apply a bead of neutral cure silicone into the crack and extend it 6mm either side. Apply a 300mm wide band of ARDEX WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of ARDEX Deckweb woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth preferably using a fluted roller, and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Cracks >6mm:

Contact your local ARDEX representative.

Fig.3 – Crack treatments



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ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

MOVEMENT/CONSTRUCTION JOINTS

Movement joints (<6mm)

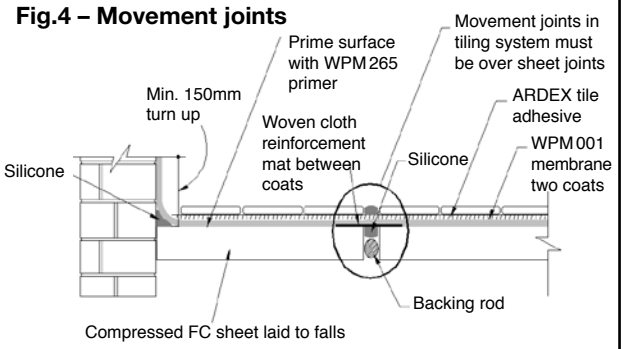
Use same procedure as in crack preparation.

Clean and prime the joint before filling it with a bead of neutral cure silicone and extending it 6mm each side of joint. Apply a 300mm wide band of ARDEX WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of ARDEX Deckweb woven cloth reinforcement over the applied membrane. Thoroughly wet out the mat and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Construction joints (>6mm)

Use the same procedure as above, but replace the reinforcing mat with 120mm of ARDEX Coving Bandage. Note: if tiling, movement joints should be taken to the surface of the tiles. Fill the joints between the tiles immediately above the movement joints with an appropriate joint sealant. (Refer Fig.4)

Fig.4 – Movement joints



Corners and coving areas

After priming with ARDEX WPM 265 water based primer and allowing it to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates in coving areas and corners. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry.

Apply a first coat of ARDEX WPM 001 to the area and allow the membrane to dry.

Apply a second coat ensuring that excess product is removed from the junction (the final dry film thickness should be minimum of 1.0mm). Alternatively, if a reinforcement mat is used between coats then the second coat can be applied as soon as the mat is fully bedded into the first coat.

WALL/FLOOR JUNCTION

After priming with ARDEX WPM 265 water based primer and allowing to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry. Place a 190mm wide band of ARDEX Deckweb woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. The ARDEX WPM 001 should be applied to at least 150mm up the wall surfaces as per the recommendations for the application of ARDEX WPM 001 to floors.

Walls

Two coats of ARDEX WPM 001 are required to achieve a minimum total dry film thickness of 0.5mm.

After priming with ARDEX WPM 265 water based primer and allowing to dry, apply two coats of ARDEX WPM 001 (to achieve a minimum dry film thickness of 0.5mm) in two opposite directions. Wall sheet joints should be treated with a neutral cure silicone, PVC duct tape or base jointing compound. In balcony situations take the membrane up underneath any existing cover flashing or install appropriate flashing. Allow the first coat to dry before applying the second coat.

Floors

Two coats of ARDEX WPM 001 are required to achieve a minimum total dry film thickness of 1.0mm. The flooring recommendations should be extended at least 150 mm up all perimeter walls.

Prime the surface with ARDEX WPM 265 water based primer and allow to dry.

Apply the first coat over the primed surface and allow it to dry (1–2 hours at 23°C, 50%RH) before applying a second coat in an opposite direction. In shower recesses a drainage flange must be installed on all timber/sheeted floors, and are strongly recommended on all other substrates. Where possible rebate the flange into the floor. Seal the perimeter of the flange with neutral cure silicone sealant. If a flange is not installed the membrane must be applied down into the pipe. (Refer Fig.5) Allow the membrane to dry completely before tiling. Refer drying times above.

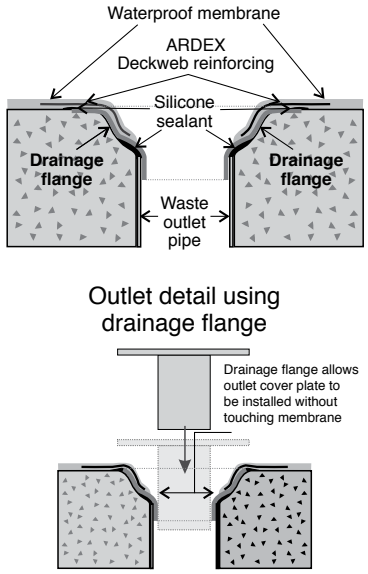
Waste outlet

Prime the surface with ARDEX WPM 265 water based primer and allow to dry. Surfaces of the outlet flange must be primed with an appropriate primer.

Plastic (eg. PVC) fittings should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.

Apply ARDEX WPM 001 over the adjacent floor surface extending down into the waste outlet flange overlapping the edge of flange by at least 30 mm. Place ARDEX Deckweb woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. (Refer Fig.5)

Fig.5 – Waste outlet



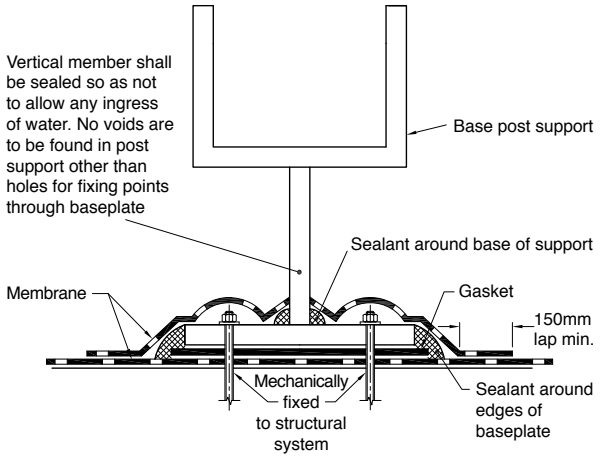
Balcony penetrations (Refer Fig.6)

All upstands are to be mechanically fixed through the membrane, which must be fabricated with a base plate flange.

Prime the metal with an appropriate metal primer such as an epoxy polyamide primer and allow to dry. Apply a 12mm bead of neutral cure silicone around the perimeter of the penetration. Apply the first coat of ARDEX WPM 001 on the substrate and the flanged metal.

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

Fig.6 – Post membrane installation



Tiling systems

It is advisable to conduct a flood test of the waterproofed area once the membrane has cured (normally after 72 hours), and before the tiling commences. A broad range of ARDEX tile adhesives can be used over ARDEX membranes. Contact ARDEX or your nearest ARDEX stockist for advice on the most suitable system.

TECHNICAL DATA

ARDEX WPM 001 (Superflex Premixed)
Characteristics of liquid

Form and colour	Blue viscous paste
Type	Single part
Specific gravity	Approx. 1.3kg/litre
pH of liquid	8.5
Tensile strength 7 days dry AS1145	1.04 MPa
Full cure	1.92 MPa
Elongation at break 7 days dry AS1145	780%

Conforms to requirements of class 3 membrane of AS/NZ 4858: 2004 Wet Area Membranes.

VOC content	18g/L

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

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DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standard, our instructions and recommendations and only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program.

Country specific recommendations, depending on local standards, codes of practice, building regulations or industry guidelines, may effect specific installation recommendations.

The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. You should make yourself familiar with them.

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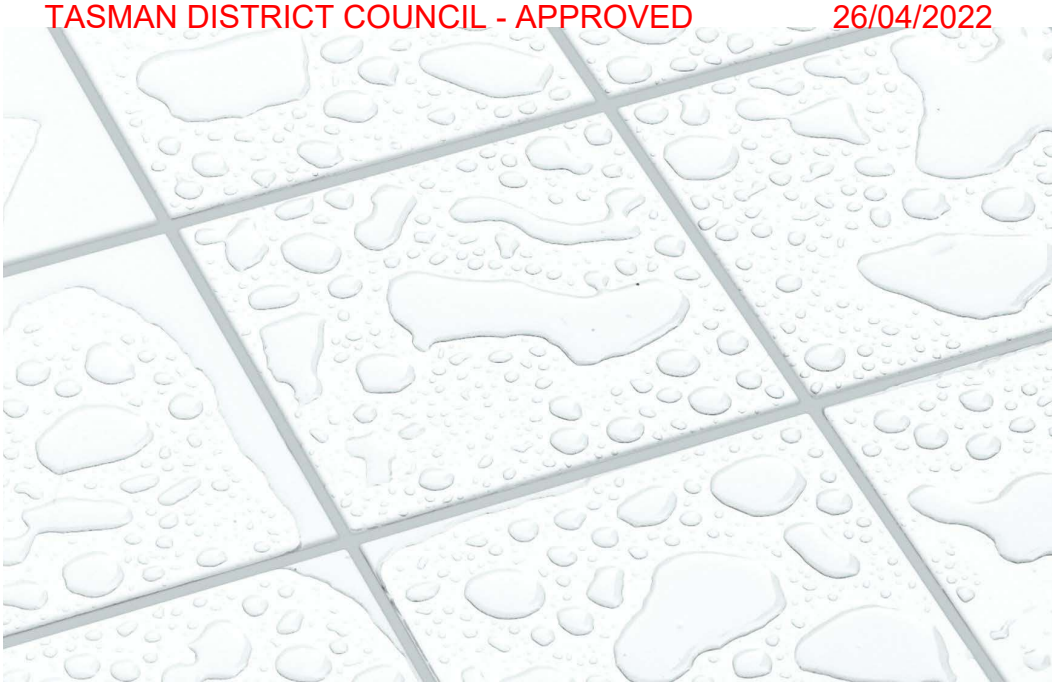
March 2012

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

BRANZ Appraised

Appraisal No. 472 [2017]

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.

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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

2.1 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.

Readers are advised to check the validity of this Appraisal by

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BRANZ Appraised
Appraisal No. 472 [2017]

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

5.1 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

6.1 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%.

Readers are advised to check the validity of this Appraisal by

Substrates

Plywood

8.1 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.

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.

11.2 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.

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 micro-organism 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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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.

BC 220230 TASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

BRANZ

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;
   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 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

Readers are advised to check the validity of this Appraisal by

NEW DWELLING

Andrew Shepherd,
105 Redvale Road,
Redwood Valley
Lot 14 DP 476117

Section 8

Potable Water System - Mftr's Technical Information

BCTASMAN DISTRICT COUNCIL - APPROVED 26/04/2022

SB, SBA

Installation and operating instructions



be
think
innovate

GRUNDFOS

BCT/2020/0001 BRENTWOOD DISTRICT COUNCIL - APPROVED 26/04/2022

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RGT248/249/N DISTRICT COUNCIL – APPROVED 26/04/2022

Original installation and operating instructions

These installation and operating instructions describe Grundfos SB, SBA and SB HF.

Sections 1-5 give the information necessary to be able to unpack, install and start up the product in a safe way.

Sections 6-10 give important information about the product, as well as information on service, fault finding and disposal of the product.

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Read this document before you install the product. Installation and operation must comply with local regulations and accepted codes of good practice.



This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.



Make sure that the system in which the pump is incorporated is designed for the maximum pump pressure.



This pump has been evaluated for use with water only.

1. General information

1.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.



WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.



CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

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The hazard statements are structured in the following way:

SIGNAL WORD



Description of hazard

Consequence of ignoring the warning.

- Action to avoid the hazard.

1.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.

2. Receiving the product

2.1 Inspecting the packaging

On receipt of the product, do the following:

1. Check that the product is as ordered. If the product is not as ordered, contact the supplier.
2. Check that no visible parts have been damaged. If any visible parts have been damaged, contact the transport company.

2.2 Scope of delivery

The box contains the following items:

- 1 pump
- 1 adapter
- 1 installation and operating instructions
- 1 quick guide
- 1 floating inlet strainer, for side inlet variant only
- 1 non-return valve, for SB only.

3. Installing the product



Observe local regulations concerning limits for manual lifting or handling.

CAUTION



Crushing of feet

Minor or moderate personal injury

- Use safety shoes when handling the pump.

DANGER



Electric shock

Death or serious personal injury

- Switch off the power supply before you start any work on the product. Make sure that the power supply cannot be accidentally switched on.

3.1 Location

Install the pump in a frost-free location.

Before the pump is submerged in the well or tank, make sure that the well or tank does not contain sand or solid sediment.

Install the pipe so that the pump is not exposed to mechanical stress.

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3.1.1 Maximum installation depth

Product	Maximum installation depth [m]
SB	10
SBA	10
SB HF	15

3.1.2 Highest tapping point for SBA pumps

Install SBA pumps so that the height between the pump and the highest tapping point does not exceed these values:

SBA 3-35: 13 m.

SBA 3-45: 20 m.

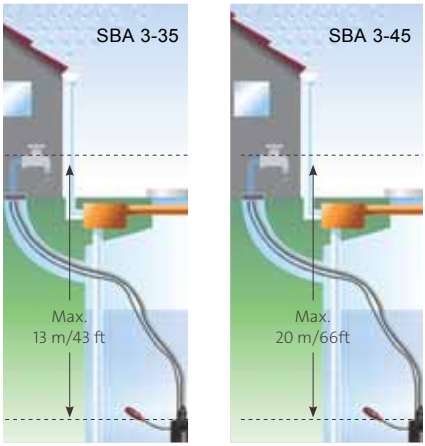


Fig. 1 Highest tapping point for SBA

3.1.3 Minimum space

Pumps installed with a float switch require a free space between the float switch and the wall to ensure free movability.

Pumps with side inlet require a free space between the floating inlet strainer and the wall.

If you install the pump in a well or tank, the minimum free space must be as shown in figs 2 and 3.

Pumps installed without a float switch require a space that corresponds to the physical dimensions of the pump.

SB and SBA pump with float switch and side inlet

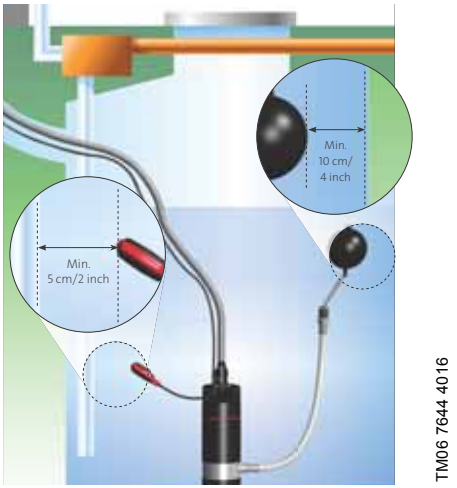


Fig. 2 Minimum space for SB and SBA pump in a well or tank

SB HF pump with a float switch

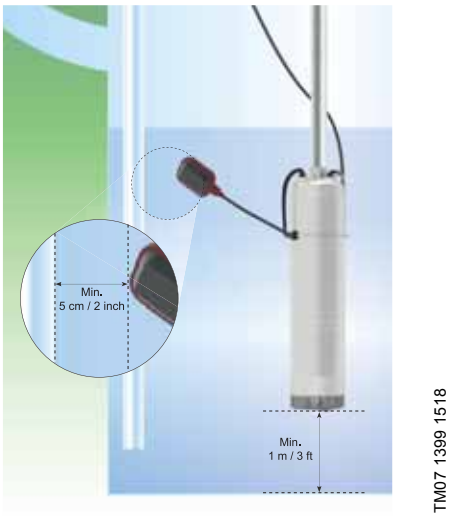


Fig. 3 Minimum space for SB HF pump. This example shows installation in a well

BOSTON LINCOLNSHIRE DISTRICT COUNCIL - APPROVED 2022

3.1.4 Vertical placement of SB, HF pump

Tank installation of SB HF

Place the pump on the bottom of the tank. The pump must not run dry.

Well installation of SB HF

Install the pump so that the pump inlet is at least 1 m above the bottom of the well to avoid suction of sand and impurities. See fig. 3.

Use rigid metal pipes to hang the pump, and secure the pipes with brackets at the top of the well.

Do not use the power cable to hang the pump above the bottom of the well.

Secure the pump by attaching a wire to the lifting eye on the top of the pump. Do not hang the pump on the lifting wire.

3.1.5 Adjustment of the float switch

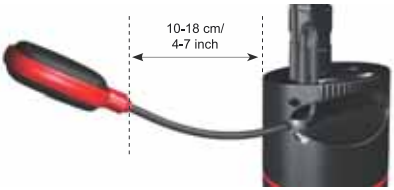
To make sure that the float switch can start and stop the pump, adjust the start and stop level by changing the free cable length between the float switch and the lifting handle.

A reduced free cable length results in more starts and stops and a small difference in level. The minimum free cable length is 10-18 cm. See fig. 4.

- An increased free cable length results in fewer starts and stops and a large difference in level.

Make sure that the float switch can move freely.

Make sure that the stop level does not fall below the pump inlet strainer.



TM07 1355 1618

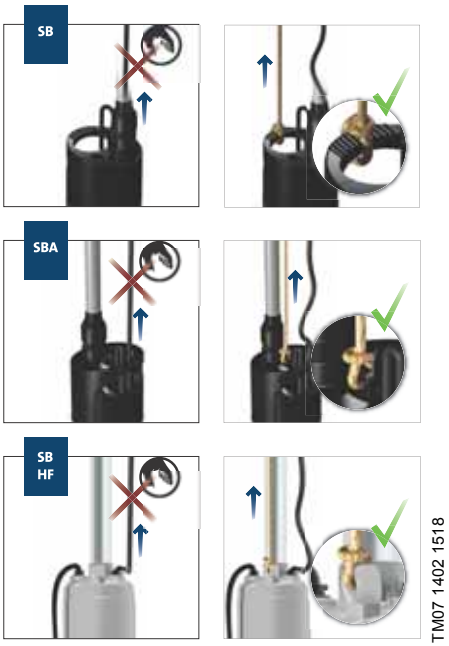
Fig. 4 Minimum free cable length for float switch

3.2 Mechanical installation

3.2.1 Lifting the product

Lift the pump by the lifting handle. Never lift the pump by the power cable. Tie a rope to the lifting handle or lifting eye instead.

Do not lift the product by the power cable. Lift the product by means of a rope.



TM07 1402 1518

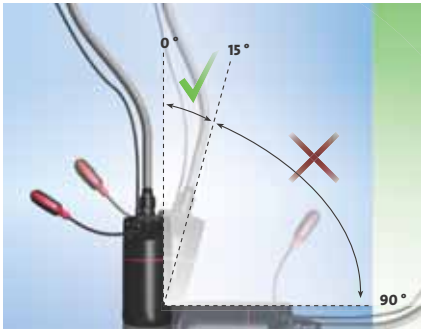
Fig. 5 Lifting the pump

BOTANY BAY DISTRICT COUNCIL - APPROVED 2022

3.3 Pump position

3.3.1 Pump position of SB and SBA

Use the pump in the vertical position as shown in fig. 5.

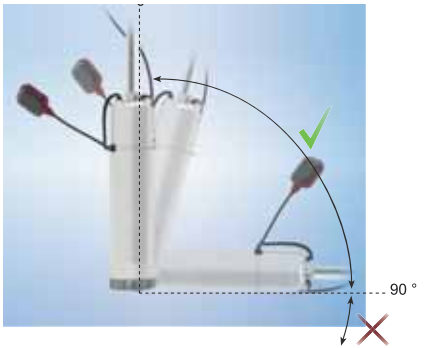


TM06 7643 4016

Fig. 6 Position of SB, SBA pumps

3.3.2 Pump position of SB HF

The pump is suitable for both vertical and horizontal installation. However, the pump shaft must never fall below the horizontal plane. See fig. 7.



TM07 1400 1518

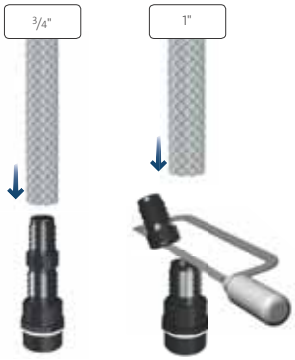
Fig. 7 Position of SB HF pumps

3.4 Connecting the outlet hose or pipe

Product	External pipe thread [inch]
SB	G 3/4 or 1
SBA	G 3/4 or 1
SB HF	G 1 1/4

The outlet hose or pipe can be connected to the pump outlet port by means of an adapter. You can also connect a pipe directly to the pump outlet.

SB and SBA pumps include an adapter. Cut off the adapter so that it matches the outlet port diameter.



TM06 7645 2715

Fig. 8 SB and SBA adapter

3.5 Non-return valve for SB pumps

Connect the non-return valve to the SB pump outlet. The non-return valve has G 1" threads for connection to the adapter or the pipe.



TM06 7646 4016

Fig. 9 Non-return valve

PCT/SSP/20 PASSPORT DISTRICT COUNCIL - APPROVED 20/04/2022

3.6 Electrical connection

DANGER

Electric shock



Death or serious personal injury

- Switch off the power supply before you start any work on the product. Make sure that the power supply cannot be accidentally switched on.
- The pump must be earthed.

DANGER

Electric shock



Death or serious personal injury

- The protective earth of the socket outlet must be connected to the protective earth of the pump. The plug must therefore have the same PE connection system as that of the socket outlet. If not, use a suitable adapter.



We recommend that you fit the permanent installation with a residual-current circuit breaker, RCCB, with a tripping current less than 30 mA.

DANGER

Electric shock



Death or serious personal injury

- If the pump is used for cleaning or other maintenance of swimming pools, garden ponds or similar places, make sure that the pump is supplied through a residual-current circuit breaker, RCCB, with a tripping current of 30 mA.

DANGER

Electric shock



Death or serious personal injury

- Connect pumps that are delivered without cable and/or plugs to an external main switch with a minimum contact gap of 3 mm in all poles.



Make sure that there is at least 3 m free cable above the liquid level.

Check that the supply voltage and frequency correspond to the values stated on the pump nameplate.

The electrical connection must be carried out by an authorised electrician in accordance with local regulations.

3.6.1 Thermal protection

The pump has a built-in thermal switch and requires no additional motor protection. If the pump is running without water, or if it is otherwise overloaded, the built-in thermal switch will cut out. When the motor has cooled to normal temperature, it will restart automatically.

3.6.2 Connecting to external controller

SB

SB pumps must be connected to an external controller. We recommend a Grundfos Pressure Manager: net.grundfos.com/qr/i/97506325

SBA

SBA pumps have an integrated control unit.

SB HF

SB HF pumps must be connected to an external controller. We recommend a Grundfos Pressure Manager: net.grundfos.com/qr/i/97506325

3.6.3 Power supply failure

In case of a power supply failure, the pump restarts automatically when power returns and runs for at least 10 s.

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4. Starting up the product

WARNING



Flammable material

Death or serious personal injury

- Do not use the pump for flammable liquids, such as diesel oil, petrol or similar liquids.

DANGER



Electric shock

Death or serious personal injury

- Do not use the pump in swimming pools, garden ponds or similar places if there are people in the water.

1. Open a tap in the system.
2. Switch on the power supply.
3. Check that the pump is running and water is coming out of the tap.
4. Check that the pump is running and pressure is being built up in the system.
5. Close the tap.
6. Check that pressure has been built up in the system.
7. Check that the pump stops after a few seconds.



During operation, the SB HF pump inlet strainer must always be completely submerged in liquid.

Do not run the SB HF pump against a closed outlet valve.



Connect SB pumps to an external controller.

4.1 SBA starting and stopping conditions

When water is consumed in the water supply system, the pump starts when the starting conditions are fulfilled. This happens for example when a tap is opened which makes the pressure in the system drop. The control unit stops the pump again when consumption stops, that is when the tap is closed.

Starting conditions

The pump starts when one of the following conditions is fulfilled:

- The flow rate is higher than the minimum flow rate.
- The pressure is lower than the start pressure.

Stopping conditions

The pump stops with a time delay of 10 s when the flow rate is lower than the minimum flow rate.

The start pressure and minimum flow rate values are shown in section *9. Technical data*.

Automatic restart of SBA pumps

SBA pump models with a float switch automatically restart when water is added. Models without a float switch will attempt to restart every 24 hours.

5. Handling and storing the product

5.1 Handling the product



Do not lift the product by the power cable. Lift the product by means of a rope.

Do not drop or shake the product.

5.2 Storing the product

Store the product indoors in a dry and dust-free environment. Protect the product from vibrations. Storage temperature: -10 to +40 °C.

5.3 Frost protection

It the pump is not used during periods of frost, drain the pump and the pipe system before you take the pump out of operation.

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6. Product introduction

6.1 Product description

The pumps are submersible booster pumps available in two main versions:

- pump with integrated inlet strainer with 1 mm mesh
- pump with side inlet, which includes a flexible inlet hose with floating inlet strainer with 1 mm mesh.

Both versions are available with or without float switch. The float switch can be used for automatic operation or dry-running protection of the pump.

6.2 SB pumps

The SB submersible booster pump is available with integrated inlet strainer or floating inlet strainer. The SB pump must be connected to an external controller, see section *3.6.2 Connecting to external controller*.

6.3 SB HF pumps

SB HF is a high-flow submersible pump with a stainless steel body. The integrated inlet strainer enables the pump to draw water from a low level in the installation. The SB HF pump must be connected to an external controller, see section *3.6.2 Connecting to external controller*.

6.4 SBA pumps

The SBA pump is a complete submersible booster pump available with integrated inlet strainer or floating inlet strainer.

SBA has a built-in control unit, eliminating the need for a controller.

The pump has built-in protection against overheating.

6.5 SBA dry-running protection

The built-in control unit incorporates dry-running protection that automatically stops the pump in case of dry running.

The dry-running protection functions differently during priming and operation.

6.5.1 Dry running during priming

If the control unit does not detect any pressure and flow within 5 min after it has been connected to a power supply and the pump has started, the dry-running function is activated and the pump stops.

6.5.2 Dry running during operation

If the control unit does not detect any pressure and flow within 40 s during normal operation, the dry-running function is activated and the pump stops.

6.5.3 Resetting of dry-running alarm

If a dry-running alarm has been activated, you can restart the pump manually by switching off the power supply, wait for 2 min and reconnect power. If the control unit does not detect any pressure and flow within 40 s after restarting, the dry-running alarm is reactivated.

6.6 Intended use

Grundfos SB, SBA and SB HF pumps are designed for pumping clean water. The pumps are especially suitable for rainwater applications and small private wells.

Typical applications:

- traditional wells
- shallow wells
- rainwater collection in tanks
- boosting of public water
- emptying of garden ponds
- irrigation.

6.7 Pumped liquids

The pumps are suitable for thin, clean, non-aggressive and non-explosive liquids, not containing solid particles or fibres that may attack the pump mechanically or chemically.

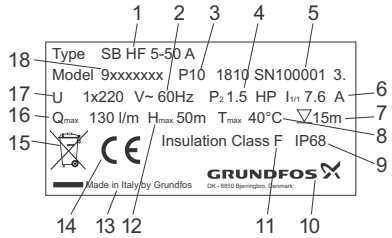
The pump is not suitable for these liquids:

- liquids containing long fibres
- inflammable liquids (oil, petrol, etc.)
- aggressive liquids.

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6.8 Identification

6.8.1 Nameplate



TM07 1530 1618

Fig. 10 Example of nameplate

Pos.	Description
1	Product type
2	Frequency [Hz]
3	Production code, year and week
4	50 Hz, P1: Power input [W] 60 Hz, P2: Motor output [HP]
5	Serial number
6	Full-load current [A]
7	Maximum installation depth [m]
8	Maximum liquid temperature [°C]
9	Enclosure class
10	Manufacturer
11	Motor insulation class
12	Maximum head [m]
13	Country of origin
14	Approval marks
15	Waste electrical and electronic equipment
16	Maximum flow rate [l/min]
17	Supply voltage [V]
18	Product number

7. Maintaining the product

DANGER

Electric shock

Death or serious personal injury

- If the power supply cable is damaged, it must be replaced by the manufacturer, his service agent or similarly qualified persons in order to avoid hazard.

Clean the strainer every fall with a brush and a water jet when needed. In normal operation, the pump does not require any specific maintenance.

PERTH AND KINROSS DISTRICT COUNCIL - APPROVED 26/04/2022

8. Fault finding the product

DANGER

Electric shock

Death or serious personal injury

- Switch off the power supply before you start any work on the product. Make sure that the power supply cannot be accidentally switched on.

See also the quick guide.

Fault	Cause	Remedy
1. The pump does not run.	a) The fuses in the electrical installation are blown.	Replace the fuses. If the new fuses blow too, check the electrical installation and the power cable.
	b) The residual-current circuit breaker, RCCB, has tripped.	Cut in the circuit breaker.
	c) No power supply.	Contact the power supply company.
	d) The motor protection has cut off the power supply due to overload.	Check if the pump is blocked. SB and SBA only: 1. Switch off the power supply to the pump. 2. Remove the rubber plug. See figs 1 to 3 (25) in the appendix. 3. Try to turn the pump shaft with a screwdriver. 4. If the pump shaft is stuck, follow the instructions in point 1, h. **Note:** Remember to refit the rubber plug.
	e) The pump or the power cable is defective.	Repair or replace the pump or cable.
	f) The float switch is in dry-running position.	Check the water level and the float switch for free movability. **Note:** If the tank is empty, and the float switch is often in this position, install a larger tank.
	g) SBA: The dry-running protection of the pump has stopped the pump.	Check the water level. Switch off the power supply and wait 2 min before switching it back on.
	h) The pump is blocked.	Check and clean the pump. 1. Switch off the power supply to the pump. 2. Remove the screws at the bottom of the pump with a cross-head screwdriver. See figs 1 and 2 (84b) and fig. 3 (115) in the appendix. 3. Remove the pump base. See figs 1 and 2 (56) and fig. 3 (104) in the appendix. 4. Clean the inlet strainer and hydraulic parts with a brush and a water jet. 5. Reassemble the pump.

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Fault	Cause	Remedy
2. The pump runs but gives no water.	a) The outlet valve is closed.	Open the valve.
	b) No water or too low water level in the tank.	Increase the installation depth of the pump. Reduce the pump performance, or replace the pump by a pump with a lower performance.
	c) The non-return valve is stuck in its closed position.	Pull out the pump, and clean or replace the valve.
	d) The inlet strainer is clogged.	Pull out the pump, and clean the inlet strainer with a brush and a water jet.
	e) The pump is defective.	Repair or replace the pump.
3. The pump runs at reduced performance.	a) The valves in the outlet pipe are partly closed or blocked.	Check and clean or replace the valves.
	b) The outlet pipe is partly blocked by impurities.	Clean or replace the pipe.
	c) The non-return valve in the outlet pipe is partly blocked.	Clean or replace the valve.
	d) The pump and outlet pipe are partly blocked by impurities.	Pull out the pump. Check and clean or replace the pump. Clean the pipes.
	e) The inlet strainer is clogged.	Clean the inlet strainer.
	f) The pump is defective.	Repair or replace the pump.
	g) Leakage in the pipes.	Check and repair the pipes.
	h) The outlet pipe is defective.	Replace the outlet pipe.
	i) Undervoltage has occurred.	Check the power supply.
4. Frequent starts and stops.	a) The float switch has not been adjusted correctly.	Adjust the float switch to ensure suitable time between the cutting-in and cutting-out of the pump.
	b) The non-return valve is leaking or stuck half-open.	Clean or replace the non-return valve. See the position in the appendix. SB: fig. 1 (149) SBA: fig. 2 (151) SB HF: fig. 3 (no valve included)
	c) The supply voltage is unstable.	Check the power supply.
	d) The motor temperature is too high.	Check the water temperature.
	e) The pump is blocked.	Check and clean the pump. 1. Switch off the power supply to the pump. 2. Remove the screws at the bottom of the pump with a cross-head screwdriver. See figs 1 and 2 (84b) and fig. 3 (115) in the appendix. 3. Remove the pump base. See figs 1 and 2 (56) and fig. 3 (104) in the appendix. 4. Clean the inlet strainer and hydraulic parts with a brush and a water jet. 5. Reassemble the pump.
	f) Leakage in the pipes.	Check and repair the pipes.

BCT/2022/34 BRENTWOOD DISTRICT COUNCIL - APPROVED 07/07/2022

9. Technical data

9.1 Operating conditions

9.1.1 Flow rate

Maximum flow rate	[m^3/h]
SB	3
SBA	3
SB HF	5

Minimum flow rate	[l/min]
SBA 3-35	1.0
SBA 3-45	1.0

9.1.2 Maximum head

Maximum head	[m]
SB 3-25	25
SB 3-35	35
SB 3-45	45
SBA 3-35	35
SBA 3-45	45
SB HF 5-55 (50 Hz)	55
SB HF 5-70 (50 hz)	70
SB HF 5-50 (60 Hz)	50
SB HF 5-65 (60 Hz)	65

9.1.3 Temperature

Liquid temperature	[°C]
SB	0 to 40
SBA	0 to 40
SB HF	0 to 40

Storage temperature	[°C]
SB	-10 to +40
SBA	-10 to +40
SB HF	-10 to +40

9.1.4 Pressure

Start pressure	[bar]	[MPa]
SBA 3-35	1.5	0.15
SBA 3-45	2.2	0.22

9.1.5 Frequency of starts/abe stops

Maximum starts per hour	
SB	20
SBA	20
SB HF	30

9.2 Mechanical data

Cable length	[m]
SB	15
SBA	15
SB HF	20/30

Maximum installation depth	[m]
SB	10
SBA	10
SB HF	15

Protection grade	
Enclosure class	IP68
Insulation class	F

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9.3 Electrical data

SB	Voltage [V]	Frequency [Hz]	P1 [kW]	P2 [hp]	$I_{1/1}$ [A]
3-25	1 x 230	50	0.57	0.52	2.8
3-35			0.80	0.72	3.8
3-45			1.05	0.83	4.8
3-25	1 x 115	60	0.70	0.50	5.5
3-35			0.90	0.75	8.4
3-45			1.10	1.00	9.8
3-25	1 x 230		0.57	0.50	2.5
3-35			0.73	0.75	3.3
3-45			0.92	1.00	4.2

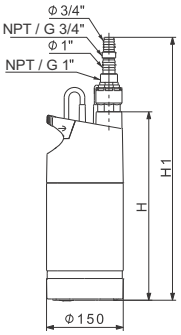
SBA	Voltage [V]	Frequency [Hz]	P1 [kW]	P2 [hp]	$I_{1/1}$ [A]
3-35	1 x 230	50	0.80	0.72	3.8
3-45			1.05	0.83	4.8
3-35	1 x 115	60	0.80	0.75	8.4
3-45			1.05	1.00	9.8
3-35	1 x 230		0.74	0.75	3.4
3-45			0.90	1.00	4.1

SB HF	Voltage [V]	Frequency [Hz]	P1 [kW]	P2 [hp]	$I_{1/1}$ [A]
5-55	1 x 230	50	1.70	1.36	7.0
5-70			2.00	1.60	9.1
5-50	1 x 230	60	1.67	1.36	7.6
5-65			2.07	1.63	9.4

9.3.1 Speed

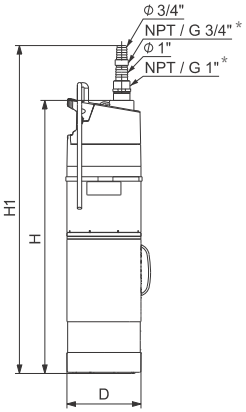
Speed	50 Hz [min^{-1}]	60 Hz [min^{-1}]
SB	2800	3400
SBA	2800	3400
SB HF	2800	3360

9.4 Dimensions



TM04 6243B 5109

Fig. 11 SB pump. same dimensions with integrated inlet strainer and with floating inlet strainer



TM05 4804 2712

Fig. 12 SBA pump. same dimensions with integrated inlet strainer and with floating inlet strainer

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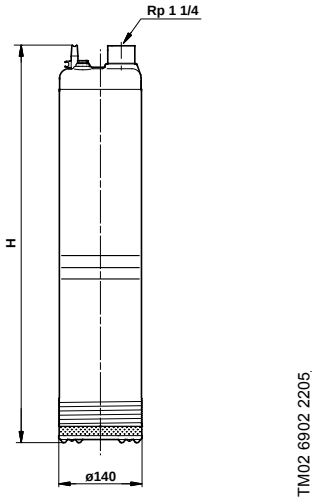


Fig. 13 SB HF pump with integrated inlet strainer

Pump type	H [mm]	H1 [mm]	D [mm]
SB 3-25	370	537	∅150
SB 3-35	392	559	
SB 3-45	417	584	
SBA 3-35	530	623	∅150
SBA 3-45	554	647	
SB HF 5-55	608		∅140
SB HF 5-70	628		
SB HF 5-50	588		
SB HF 5-65	588		

10. Disposing of the product

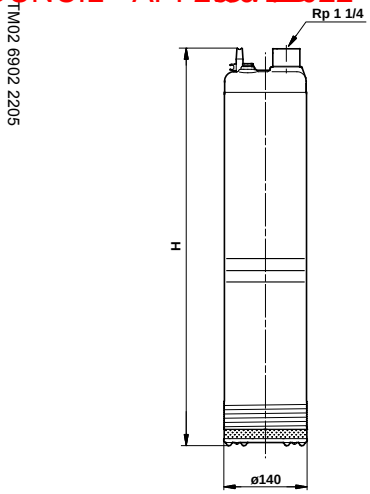
This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.



The crossed-out wheelie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.

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شـكل 13 مضـخة SB HF مُـزودة بمصـفاة دخـول مُدمجـة

نـوع المضـخة	H [مم]	H1 [مم]	D [مم]
SB 3-25	370	537	Ø150
SB 3-35	392	559	
SB 3-45	417	584	
SBA 3-35	530	623	Ø150
SBA 3-45	554	647	
SB HF 5-55	608		Ø140
SB HF 5-70	628		
SB HF 5-50	588		
SB HF 5-65	588		

10. التخلــص مــن المنتــج

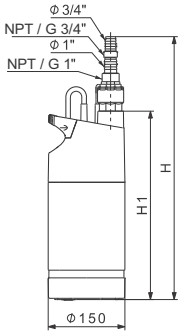
يجـب التخلـص مـن هـذا المنتـج أو أجـزاء منـه بطريقـة صـحيحة بيئيـــا:

1. اسـتخدم خدمـة جمـع النفايـة العامـة أو الخاصـة.
2. إذا لـم يكـن هـذا ممكنـا، اتصـل بـاقرب شـركة جرونـدفوس أو ورشة خدمة.

يعـني رمـز حاويـة القمامـة ذات العجـلات المشـطوب عليـه الظـاهر علـى أحـد المنتجـات أنـه يجـب التخلـص مـن المنتـج بشـكل منفصـل عـن النفايـات المنزليـة. عنـدما تنتهـي صـلاحية أحـد المنتجـات المـزودة بهـذا الـرمز، خـذه إلـى نقطـة التجميـع المُخصصـة مـن قِبـل سـلطات التخلـص مـن النفايـات المحليـة. سيسـاعد تجميـع تلـك المنتجـات وإعـادة تـدويرها بشـكل منفصـل فـي حمايـة البيئـة وصـحة الإنسـان.

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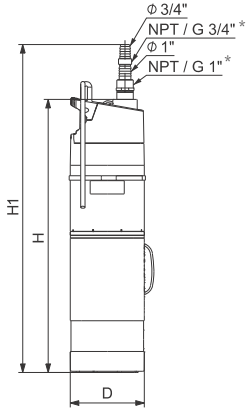
TM04 6243 5109



شكل 11 مضخة SB. نفس الأبعاد مع مصفاة الدخول المُدمجة ومصفاة الدخول العائمة

SB	الجهد الكهربي [فولت]	التردد [هرتز]	P1 [كيلو واط]	P2 [حصان]	I1/1 [أمبير]
3-25	1 x 230	50	0,57	0,52	2,8
3-35			0,80	0,72	3,8
3-45			1,05	0,83	4,8
3-25	1 x 115	60	0,70	0,50	5,5
3-35			0,90	0,75	8,4
3-45			1,10	1,00	9,8
3-25	1 x 230		0,57	0,50	2,5
3-35			0,73	0,75	3,3
3-45			0,92	1,00	4,2

TM05 4804 2712



شكل 12 مضخة SBA. نفس الأبعاد مع مصفاة الدخول المُدمجة ومصفاة الدخول العائمة

SBA	الجهد الكهربي [فولت]	التردد [هرتز]	P1 [كيلو واط]	P2 [حصان]	I1/1 [أمبير]
3-35	1 x 230	50	0,80	0,72	3,8
3-45			1,05	0,83	4,8
3-35	1 x 115	60	0,80	0,75	8,4
3-45			1,05	1,00	9,8
3-35	1 x 230		0,74	0,75	3,4
3-45			0,90	1,00	4,1

SB HF	الجهد الكهربي [فولت]	التردد [هرتز]	P1 [كيلو واط]	P2 [حصان]	I1/1 [أمبير]
5-55	1 x 230	50	1,70	1,36	7,0
5-70			2,00	1,60	9,1
5-50	1 x 230	60	1,67	1,36	7,6
5-65			2,07	1,63	9,4

9.3.1 السرعة

السرعة	50 هرتز [min-1]	60 هرتز [min-1]
SB	2800	3400
SBA	2800	3400
SB HF	2800	3360

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9. البيانـــــات الفنيـــة

9.1 أحـــوال التشـــغيل

9.1.1 معـدل التـدفق

معـدل التـدفق الأقصـى	[متر3/ساعة]
SB	3
SBA	3
SB HF	5

الحـد الأدنـى لمعـدل التـدفق	[لتر/دقيقـــة]
SBA 3-35	1,0
SBA 3-45	1,0

9.1.2 الحـد الأقصـى لعمـود الضـغط

الحـد الأقصـى لعمـود الضـغط	[م]
SB 3-25	25
SB 3-35	35
SB 3-45	45
SBA 3-35	35
SBA 3-45	45
SB HF 5-55 (50 هـرتز)	55
SB HF 5-70 (50 هـرتز)	70
SB HF 5-5- (60 هـرتز)	50
SB HF 65-5- (60 هـرتز)	65

9.1.3 درجـة الحـرارة

درجـة حـرارة السـائل	[درجـة مئويـة]
SB	0 إلـى 40
SBA	0 إلـى 40
SB HF	0 إلـى 40

درجـة حـرارة التخـزين	[درجـة مئويـة]
SB	-10 إلـى +40
SBA	-10 إلـى +40
SB HF	-10 إلـى +40

9.1.4 الضـــغط

ضـــغط التشـــغيل	[بـار]	[ميجـا باســكال]
SBA 3-35	1,5	0,15
SBA 3-45	2,2	0,22

9.1.5 أقصـى عـدد لمـرات التشـغيل فـي السـاعة

الحـد الأقصـى مـن مـرات التشـغيل فـي السـاعة	
SB	20
SBA	20
SB HF	30

9.2 البيانـــــات الميكانيكيـــة

طـول الكابـل	[م]
SB	15
SBA	15
SB HF	20/30

عمـق التركيـب الأقصـى	[م]
SB	10
SBA	10
SB HF	15

درجـة الحمايـة	
فئـة الغـلاف	IP68
فئـة العـزل	F

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العطل	السبب	الإصلاح
3. المضخة تعمل بأداء منخفض.	a) الصمامات في أنبوب الخروج مغلقة جزئيًا أو مسدودة.	افحص ونظّف الصمامات أو استبدلها.
	b) أنبوب الخروج مسدود جزئيًا بالشوائب.	نظف أو استبدل الأنبوب.
	c) الصمام اللا رجعي في أنبوب الخروج مسدود جزئيًا.	نظف أو استبدل الصمام.
	d) المضخة وأنبوب الخروج مسدودان جزئيًا بالشوائب.	اسحب المضخة خارجًا. افحص ونظف المضخة أو استبدلها. نظف الأنابيب.
	e) مصفاة الدخول مسدودة.	نظف مصفاة الدخول.
	f) المضخة تالفة.	أصلح أو استبدل المضخة.
	g) يوجد تسريب في الأنابيب.	افحص الأنابيب وقم بإصلاحها.
	h) أنبوب الخروج تالف.	استبدل أنبوب الخروج.
	i) حدث انخفاض في الجهد الكهربي.	افحص إمداد الطاقة.
4. عمليات تشغيل وتوقف متكررة.	a) مفتاح العوامة لم يتم ضبطه على النحو الصحيح.	اضبط مفتاح العوامة لضمان زمن مناسب بين توصيل وفصل المضخة.
	b) صمام منع الارتداد يسرب أو هو عالق على وضع نصف الفتحة.	نظف أو استبدل الصمام اللا رجعي. أنظر الموضع في الملحق. SB: الشكل 1 (149) SBA: الشكل 2 (151) SB HF: الشكل 3 (لا يوجد صمام)
	c) الجهد الكهربي للإمداد غير مستقر.	افحص إمداد الطاقة.
	d) درجة حرارة المحرك عالية جدًا.	افحص درجة حرارة الماء.
	e) المضخة مسدودة.	افحص المضخة ونظفها. 1. افصل إمداد الطاقة للمضخة. 2. قم بإزالة البراغي من قاع المضخة بمفك براغي صليبي الرأس. أنظر الأشكال 1و2 (84b) و3 (115) في الملحق. 3. قم بفك قاعدة المضخة. أنظر الأشكال 1 و2 (56) و3 (104) في الملحق. 4. نظف مصفاة الدخول والأجزاء الهيدروليكية بفرشاة ورشاش ماء. 5. أعد تجميع المضخة.
	f) يوجد تسريب في الأنابيب.	افحص الأنابيب وقم بإصلاحها.

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8. تحديد أعطال التشغيل

خطر

صدمة كهربائية

الوفاة أو إصابة شخصية خطيرة
- افصل مصدر الإمداد بالطاقة قبل البدء في أي عمل على المنتج. تأكد من أن إمداد الطاقة لا يمكن تشغيله دون قصد.

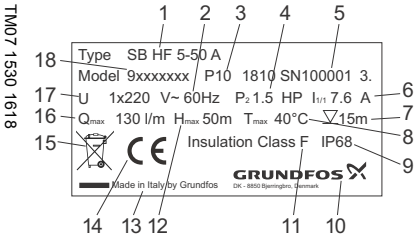
انظر أيضًا الدليل السريع.

العطل	السبب	الإصلاح
1. المضخة لا تعمل.	a) المصهرات في التركيب الكهربائي احترقت.	استبدل المصهرات. إذا انفجرت المصهرات الجديدة أيضًا، فتحقق من التركيب الكهربائي وكابل الطاقة.
	b) انفصل قاطع الدائرة الكهربائية المتبقي، RCCB.	افصل في قاطع الدائرة الكهربائية.
	c) لا يوجد إمداد بالطاقة.	اتصل بشركة إمداد الطاقة.
	d) فصلت وحدة حماية المحرك الإمداد بالطاقة بسبب الحمل الزائد.	تحقق من وجود انسداد في المضخة. مضخات SB وSBA فقط: 1. افصل إمداد الطاقة إلى المضخة. 2. قم بإزالة السدادة المطاطية. أنظر الأشكال من 1 إلى 3 (25) في الملحق. 3. حاول لف عمود إدارة المضخة بواسطة مفك. 4. إذا كان عمود إدارة المضخة عالقًا، فاتبع التعليمات المُوضحة في النقطة 1 وh. ملاحظة: تذكر إعادة تركيب السدادة المطاطية.
	e) المضخة أو كابل الإمداد تالفان.	أصلح أو استبدل المضخة أو الكابل.
	f) مفتاح العوامة في موضع الدوران الجاف.	تحقق من منسوب الماء ومن أن مفتاح العوامة يمكن أن يتحرك بحرية. ملاحظة: إذا كان الخزان فارغًا، ومفتاح العوامة يكون في أحيان كثيرة في هذا الموضع، ركب خزانًا أكبر.
	g) SBA: أوقفت خاصية الحماية من الدوران الجاف المضخة عن الدوران.	افحص منسوب الماء. افصل إمداد الطاقة وانتظر دقيقتين قبل توصيله مرة أخرى.
	h) المضخة مسدودة.	افحص المضخة ونظفها. 1. افصل إمداد الطاقة إلى المضخة. 2. قم بإزالة البراغي من قاع المضخة بمفك براغي صليبي الرأس. أنظر الأشكال 1 و2 (84b) و3 (115) في الملحق. 3. قم بفك قاعدة المضخة. أنظر الأشكال 1 و2 (56) و3 (104) في الملحق. 4. نظف مصفاة الدخول والأجزاء الهيدروليكية بفرشاة ورشاش ماء. 5. أعد تجميع المضخة.
2. المضخة تعمل لكنها لا تخرج أي ماء.	a) صمام الخروج مغلق.	افتح الصمام.
	b) لا يوجد مياه أو مستوى منخفض للغاية من المياه في الخزان.	قم بزيادة عمق تركيب المضخة. قلل أداء المضخة، أو استبدل المضخة بأخرى أقل أداء.
	c) صمام منع الارتداد عالق في وضع غلقه.	اسحب المضخة، ونظف أو استبدل الصمام.
	d) مصفاة الدخول مسدودة.	اسحب المضخة، ونظف مصفاة الدخول بفرشاة ورشاش ماء.
	e) المضخة تالفة.	أصلح أو استبدل المضخة.

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6.8 التعـــريف

6.8.1 لوحـة اسـم الموديـل



شـكل 10 مثـال للوحـة اسـم الموديـل

الموضـع	الوصـف
1	نـوع المنتـج
2	الـتردد [هـرتز]
3	رمـز الإنتـاج، السـنة والأسـبوع
4	50 هـرتز، P1: دخـل الطاقـة [واط] 60 هـرتز، P2: مخـرج المحـرك [HP]
5	الـرقم المسلسـل
6	تيـار الحمـل الكامـل [أمبـير]
7	عمـق التركيـب الأقصـى [م]
8	أقصـى درجـة حـرارة للسـائل [درجـة مئويـة]
9	فئـة الغـلاف
10	الشـركة المصـنعة
11	فئـة عـزل المحـرك
12	أقصـى ارتفـاع للسـائل المضـخوخ [م]
13	بلـد المنشـأ
14	علامـات الاعتمـاد
15	معـدات مناسـبة للمخلفـات الكهربائيـة والإلكترونيـات
16	أقصـى معـدل للتـدفق [لتر/دقيقـة]
17	فولتيـة الإمـداد [فولـت]
18	رقـم المنتـج

7. صـيانة المنتـج

خطر

صـدمة كهربائيـة

الوفـاة أو إصـابة شخصـية خطـيرة

- إذا كـان كابـل تغذيـة الطاقـة تالفًـا، يجـب اسـتبداله بواسـطة الشـركة المصـنعة، أو وكيـل خـدمتها أو أشـخاص مـؤهلين علـى نحـو مماثـل لتجنـب الخطـر.

نظـف المصـفاة والأجـزاء الهيدروليكيـة بفرشـاة ورشـاش مـاء إذا لـزم الأمـر. فـي حالـة التشـغيل العـادي، لا تتطلـب المضـخة أي صـيانة محـددة.

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6. تقديم المنتج

6.1 وصف المنتج

المضخات عبارة عن مضخات دافعة قابلة للغمر تتوفر بإصدارين رئيسيين:

- مضخة بمصفاة مدخل مُدمجة مع شبكة 1 مم
- مضخة بمدخل جانبي تتضمن خرطوم مدخل مرنًا مع مصفاة مدخل عائمة مُزودة بشبكة 1 مم.

وتتوفر النسختان بمفتاح عوامة أو دونه. ويمكن استخدام مفتاح العوامة للتشغيل الآلي أو حماية المضخة من الدوران الجاف.

6.2 مضخات SB

تتوفر المضخة الدافعة القابلة للغمر SB مع مصفاة مدخل مُدمج أو مصفاة مدخل عائمة. يجب توصيل المضخة SB بوحدة تحكم خارجية، أنظر القسم 3.6.2 التوصيل بوحدة التحكم الخارجية.

6.3 مضخات SB HF

مضخة SB HF هي مضخة عالية التدفق قابلة للغمر مُزودة بهيكل مقاوم للصدأ. تمكّن مصفاة المدخل المُدمجة المضخة من سحب المياه من مستوى منخفض في التركيب. يجب توصيل المضخة SB HF بوحدة تحكم خارجية، أنظر القسم 3.6.2 التوصيل بوحدة التحكم الخارجية.

6.4 مضخات SBA

المضخة SBA هي مضخة دافعة كاملة قابلة للغمر تتوفر مع مصفاة مدخل مُدمجة أو مصفاة مدخل عائمة مُدمجة.

مضخة SBA بها وحدة تحكم مُدمجة تُغني عن الحاجة إلى وحدة تحكم.

المضخة بها حماية مدمجة ضد السخونة الزائدة.

6.5 الحماية من الدوران الجاف لمضخة SBA

تشمل وحدة التحكم المُدمجة نظام الحماية من الدوران الجاف الذي يوقف المضخة آليًا في حالة الدوران الجاف.

تعمل وظيفة الحماية من الدوران الجاف بشكل مختلف أثناء التحضير والتشغيل.

6.5.1 الدوران الجاف أثناء التحضير

إذا لم تكشف وحدة التحكم عن أي ضغط أو تدفق في غضون 5 دقائق من توصيلها بإمداد للطاقة وتشغيل المضخة، فإنه يتم تفعيل خاصية الدوران الجاف ويتم إيقاف المضخة.

6.5.2 الدوران الجاف أثناء التشغيل

إذا لم تكشف وحدة التحكم عن أي ضغط أو تدفق في غضون 40 ثانية أثناء التشغيل العادي، فإنه يتم تفعيل خاصية التشغيل الجاف ويتم إيقاف المضخة.

6.5.3 إعادة ضبط إنذار الدوران الجاف

إذا تم تنشيط إنذار التشغيل الجاف، يمكنك حينها إعادة تشغيل المضخة يدويًا من خلال فصل إمداد الطاقة والانتظار لمدة دقيقتين ثم إعادة توصيل الطاقة مرة أخرى. إذا لم تكشف وحدة التحكم عن أي ضغط أو تدفق في غضون 40 ثانية من إعادة التشغيل، فإنه يتم إعادة تنشيط خاصية التشغيل الجاف.

6.6 الاستخدام المخصص

صُممت مضخات SB وSBA وSB HF لضخ مياه نظيفة. والمضختان مناسبتان خصيصًا لتطبيقات ماء المطر والآبار الخاصة الصغيرة.

التطبيقات الاعتيادية:

- الآبار التقليدية
- الآبار الضحلة
- تجميع مياه الأمطار في الخزانات
- زيادة المياه العامة
- تفريغ مستنقعات الحدائق
- الري.

6.7 سوائل الضخ

المضخات مناسبة للسوائل رقيقة القوام والنظيفة وغير الضارة أو المتفجرة التي لا تحتوي على جسيمات صلبة أو ألياف ربما تضر المضخة ميكانيكيًا أو كيميائيًا.

المضخة غير مناسبة للسوائل التالية:

- السوائل التي تحتوي على ألياف طويلة
- السوائل القابلة للاشتعال (السولار، والبنزين، إلخ.)
- السوائل المدمرة.

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4. بـــدء تشـــغيل المنتـــج

تحـــذير

مـــادة ســـريعة الاشـــتعال

الوفـــاة أو إصـــابة شخصـــية خطـــيرة
- لا تســـتخدم المضـــخة للســـوائل القابلـــة الاشـــتعال مثـــل الســـولار أو البـــنزين أو الســـوائل المماثلـــة.

خطر

صـــدمة كهربائيـــة

الوفـــاة أو إصـــابة شخصـــية خطـــيرة
- لا تســـتخدم المضـــخة فـــي حمامـــات الســـباحة أو بـــرك الحـــدائق أو الأمـــاكن المماثلـــة عنـــد وجـــود أشـــخاص فـــي المـــاء.

1. افتـــح صـــنبورًا فـــي النظـــام.
2. شـــغل إمـــداد الطاقـــة.
3. تحقـــق مـــن دوران المضـــخة وخـــروج الميـــاه مـــن الصـــنبور.
4. تحقـــق مـــن دوران المضـــخة وتـــراكم الضـــغط فـــي النظـــام.
5. أغلـــق الصـــنبور.
6. تأكـــد مـــن تـــراكم الضـــغط فـــي النظـــام.
7. تحقـــق مـــن توقـــف المضـــخة بعـــد ثـــوانٍ قليلـــة.

أثنـــاء التشـــغيل، يجـــب أن تكـــون مصـــفاة مـــدخل المضـــخة SB HF مغمـــورة دائمًـــا بالكامـــل فـــي الســـائل.
لا تشـــغل المضـــخة SB HF مقابـــل صـــمام خـــروج مغلـــق.

قـــم بتوصـــيل مضـــخات SB بوحـــدة تحكـــم خارجيـــة.

4.1 شـــروط تشـــغيل وإيقـــاف مضـــخة SBA

عنـــد اســـتهلاك المـــاء فـــي نظـــام إمـــداد المـــاء، ســـوف تعمـــل المضـــخة عنـــد اســـتيفاء شـــروط التشـــغيل. يحـــدث ذلـــك علـــى ســـبيل المثـــال عنـــد فتـــح صـــنبور ممـــا يجعـــل الضـــغط فـــي النظـــام ينخفـــض. تُوقـــف وحـــدة التحكـــم المضـــخة مـــرة أخـــرى عنـــدما يتوقـــف الاســـتهلاك، أي عنـــد غلـــق الصـــنبور.

شـــروط التشـــغيل

تعمـــل المضـــخة عنـــد اســـتيفاء الشـــروط التاليـــة:

- معـــدل التـــدفق يكـــون أعلـــى مـــن معـــدل التـــدفق الأدنـــى.
- الضـــغط يكـــون أقـــل مـــن ضـــغط التشـــغيل.

شـــروط الإيقـــاف

تتوقـــف المضـــخة بوقـــت تـــأخير قـــدره 10 ثـــوانٍ عنـــدما يكـــون معـــدل التـــدفق أقـــل مـــن أدنـــى معـــدل للتـــدفق.
ضـــغط التشـــغيل وأدنـــى معـــدل للتـــدفق موضـــحان فـــي القســـم 9. البيانـــات التقنيـــة.

إعـــادة التشـــغيل الآلـــي للمضـــخات SBA

تســـتأنف طـــرازات مضـــخة SBA المُـــزودة بمفتـــاح عوامـــة العمـــل مـــرة أخـــرى عنـــد إضـــافة الميـــاه. ســـتحاول الطـــرازات غيـــر المـــزودة بمفتـــاح العوامـــة اســـتئناف العمـــل مـــرة أخـــرى كـــل 24 ســـاعة.

5. التعامـــل مـــع المنتـــج وتخزينـــه

5.1 التعامـــل مـــع المنتـــج

لا تـــرفع المنتـــج مـــن كابـــل الطاقـــة. ارفـــع المنتـــج باســـتخدام حبـــل.
لا تســـقط المنتـــج أو ترجـــه.

5.2 تخـــزين المنتـــج

قـــم بتخـــزين المنتـــج بالـــداخل فـــي بيئـــة جافـــة وخاليـــة مـــن الغبـــار. قـــم بحمايـــة المنتـــج مـــن الاهـــتزازات. درجـــة حـــرارة التخـــزين: 10- إلـــى 40+ درجـــة مئويـــة.

5.3 الحمايـــة مـــن الثلـــج

إذا لـــم تُســـتخدم المضـــخة أثنـــاء فـــترات الصـــقيع، فقـــم بتفـــريغ المضـــخة ونظـــام الأنابيـــب قبـــل أن تبـــدأ اســـتخدامها.

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3.6 التوصـــيل الكهربائي

خطر

صـــدمة كهربائيـــة

الوفـــاة أو إصـــابة شخصـــية خطـــيرة
- افصـــل مصـــدر الإمـــداد بالطاقـــة قبـــل البـــدء فـــي أي عمـــل علـــى المنتـــج. تأكـــد مـــن أن إمـــداد الطاقـــة لا يمكـــن تشـــغيله دون قصـــد.
- يجـــب تـــأريض المضـــخة.

خطر

صـــدمة كهربائيـــة

الوفـــاة أو إصـــابة شخصـــية خطـــيرة
- يجـــب توصـــيل الأرضـــي الواقـــي للمقبـــس بالأرضـــي الواقـــي للمضـــخة. لـــذلك يجـــب أن يكـــون للقـــابس نفـــس نظـــام توصـــيل PE (الأرضـــي الواقـــي) مثـــل المقبـــس. وإذا لـــم يكـــن الأمـــر كـــذلك، اســـتخدم مهايئًـــا مناســـبًا.

نحـــن نوصـــي بتزويـــد التركيـــب الـــدائم بقـــاطع دائـــرة للتيـــار المتخلف، RCCB، بتيـــار إعتـــاق أقل من 30 مللـــي أمبـــير.

خطر

صـــدمة كهربائيـــة

الوفـــاة أو إصـــابة شخصـــية خطـــيرة
- إذا اســـتخدمت المضـــخة للتنظيـــف أو لأعمـــال الصـــيانة الأخـــرى لحمامـــات الســـباحة أو بـــرك الحـــدائق أو أمـــاكن مماثلـــة، تأكـــد مـــن أن المضـــخة يتـــم تزويـــدها بالطاقـــة مـــن خـــلال قـــاطع دائـــرة للتيـــار المتخلـــف، RCCB، بتيـــار إعتـــاق 30 مللـــي أمبـــير.

خطر

صـــدمة كهربائيـــة

الوفـــاة أو إصـــابة شخصـــية خطـــيرة
-/ وصـــل المضـــخات الـــتي تســـتلمها دون كابـــل و أو قـــوابس بمفتـــاح مصـــدر تيـــار خـــارجي لـــه فرجـــة تلامـــس 3 مـــم علـــى الأقـــل فـــي جميـــع الأقطـــاب.

تأكـــد مـــن وجـــود 3 أمتـــار علـــى الأقـــل مـــن الكابـــل حـــر الحركـــة فـــوق منســـوب الســـائل.

تأكـــد مـــن أن فولتيـــة وتـــردد مصـــدر التيـــار الرئيســـي يتوافقـــان مـــع القيـــم المـــذكورة بلوحـــة اســـم موديـــل المضـــخة.

يجـــب أن يتولـــى التوصـــيل الكهربـــائي فـــني كهربـــائي معتمـــد وفقًـــا للقـــوانين المحليـــة.

3.6.1 حمايـــة المحـــرك

المضـــخة بهـــا مفتـــاح حـــراري مـــدمج ولا تتطلـــب أي حمايـــة إضـــافية للمحـــرك. إذا كانـــت المضـــخة تعمـــل دون مـــاء، أو مـــن ناحيـــة أخـــرى زائـــدة الحمـــل، فـــإن المفتـــاح الحـــراري المـــدمج ســـوف يفصـــل توصـــيل الطاقـــة. عنـــدما يـــبرد المحـــرك إلـــى درجـــة الحـــرارة الطبيعيـــة، فإنـــه ســـوف يعيـــد تشـــغيل نفســـه آليًـــا.

3.6.2 التوصـــيل بوحـــدة التحكـــم الخارجيـــة

SB

يجـــب توصـــيل مضـــخات SB بوحـــدة تحكـــم خارجيـــة. نحـــن نوصـــي بوحـــدة إدارة للضـــغط مـــن جرونـــدفوس:
net.grundfos.com/qr/i/97506325

SBA

مضـــخات SBA بهـــا وحـــدة تحكـــم مُدمجـــة.

SB HF

يجـــب توصـــيل مضـــخات SB HF بوحـــدة تحكـــم خارجيـــة. نحـــن نوصـــي بوحـــدة إدارة للضـــغط مـــن جرونـــدفوس:
net.grundfos.com/qr/i/97506325

3.6.3 خلـــل فـــي إمـــداد الطاقـــة

فـــي حالـــة حـــدوث عطـــل بإمـــداد الطاقـــة، ســـوف تعيـــد المضـــخة تشـــغيل نفســـها آليًـــا عنـــد عـــودة إمـــداد الطاقـــة وتعمـــل لمـــدة 10 ثـــوان علـــى الأقـــل.

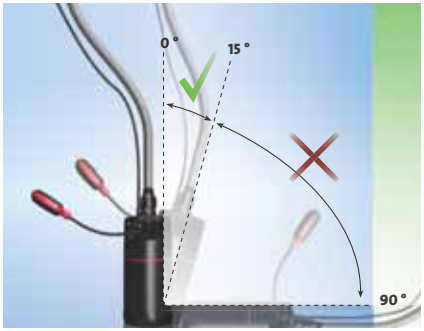
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3.3 موضع المضخة

3.3.1 وضع المضخات SB وSBA

استخدم المضخة في الوضع العمودي على النحو المُبين في الشكل 5.

TM06 7643 4016

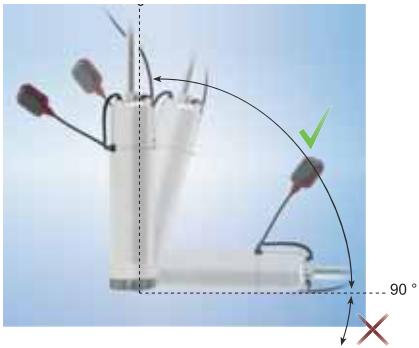


شكل 6 وضع المضخات SB وSBA

3.3.2 وضع المضخة SB HF

المضخة مناسبة للتركيب العمودي والأفقي على حدٍ سواء. لكن ينبغي ألا يكون عمود إدارة المضخة أدنى من السطح المستوي الأفقي. أنظر الشكل 7.

TM07 1400 1518



شكل 7 وضع المضخات SB HF

3.4 توصيل خرطوم أو أنبوب الخروج

المنتج	قنية الأنبوب الخارجية [بوصة]
SB	G 3/4 أو 1
SBA	G 3/4 أو 1
SB HF	G 1 1/4

يمكن توصيل خرطوم أو أنبوب الخروج إلى منفذ مخرج المضخة بواسطة مهايئ. يمكنك أيضًا توصيل أنبوب مباشرة بمخرج المضخة.

تتضمن مضخات SB وSBA مهايئًا. اقطع المهايئ بحيث يطابق قطر منفذ المخرج.

TM06 7645 2715



شكل 8 مهايئ المضخات SB وSBA

3.5 الصمام اللا رجعي لمضخات SB

وصل الصمام اللا رجعي بمخرج المضخة SB. الصمام اللا رجعي له لولبة G مقاس 1 بوصة للتوصيل بالمهايئ أو الأنبوب.

TM06 7646 4016



شكل 9 صمام لا رجعي

BCT2020001 DISTRICT COUNCIL - APPROVED 2022

3.1.4 الوضع الأمثل لمضخة SB HF

تركيب المضخة SB HF في الخزان

ضع المضخة في قاع الخزان. يجب تجنب تشغيل المضخة على الجاف.

تركيب المضخة SB HF في بئر

قم بتركيب المضخة بحيث يكون مدخل المضخة على ارتفاع 1 متر على الأقل من قاع البئر لتجنب امتصاص الرمل والشوائب. أنظر الشكل 3.

استخدم الأنابيب المعدنية الصلبة لتعليق المضخة وقم بتثبيت المضخات باستخدام كتائف في الجزء العلوي من البئر.



لا تستخدم كابل الطاقة لتعليق المضخة أعلى قاع البئر.

قم بتدعيم موضع المضخة بتثبيت سلك بالعين الرافعة في الجزء العلوي من المضخة. لا تقم بتعليق المضخة على السلك الرافع.

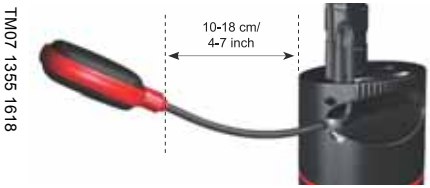
3.1.5 ضبط مفتاح العوامة

للتأكد من قدرة مفتاح العوامة على تشغيل المضخة وإيقافها، قم بضبط مستوى التشغيل والإيقاف من خلال تغيير طول الكابل الحر بين مفتاح العوامة والمقبض الرافع.

يؤدي طول الكابل الحر القصير إلى عمليات تشغيل وإيقاف تشغيل أكثر وفرق صغير في المنسوب. أقصى طول للكابل الحر يتراوح من 10-18 سم. أنظر الشكل 4.

- يؤدي طول الكابل الحر الأطول إلى عمليات تشغيل وإيقاف تشغيل أقل وفرق كبير في المنسوب. تأكد من قدرة مفتاح العوامة على الحركة بحرية.

تأكد من عدم انخفاض مستوى الإيقاف عن مستوى مصفاة دخول المضخة.



TM07 1355 1618

شكل 4 أدنى طول للكابل الحر لمفتاح العوامة

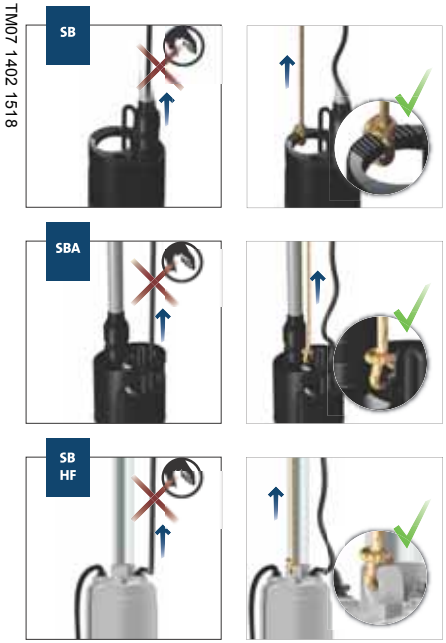
3.2 التركيب في البئر الجاف

3.2.1 رفع المنتج

ارفع المضخة عن طريق مقبض الرفع. لا ترفع المضخة أبدًا عن طريق كابل الإمداد بالطاقة. اربط حبلا بمقبض الرفع أو العين الرافعة بدلًا من ذلك.



لا ترفع المنتج من كابل الطاقة. ارفع المنتج باستخدام حبل.



TM07 1402 1518

شكل 5 رفع المضخة

BCT/2022/0001 DISTRICT COUNCIL - APPROVED 26/04/2022

3.1.1 عمـــق التركيـــب الأقصـــى

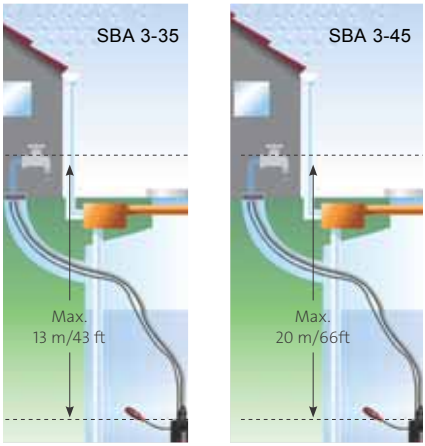
المنتـــج	عمـــق التركيـــب الأقصـــى [م]
SB	10
SBA	10
SB HF	15

3.1.2 أعلـــى نقـــاط تفـــريغ لمضـــخات SBA

قـــم بتركيـــب مضـــخات SBA بحيـــث لا يتجـــاوز الارتفـــاع بيـــن المضـــخة وأعلـــى نقطـــة تفـــريغ هـــذه القيـــم:

SBA 3-35: 13 م.

SBA 3-45: 20 م.



TM06 7648 4116

شـــكل 1 أعلـــى نقطـــة تفـــريغ لمضـــخة SBA

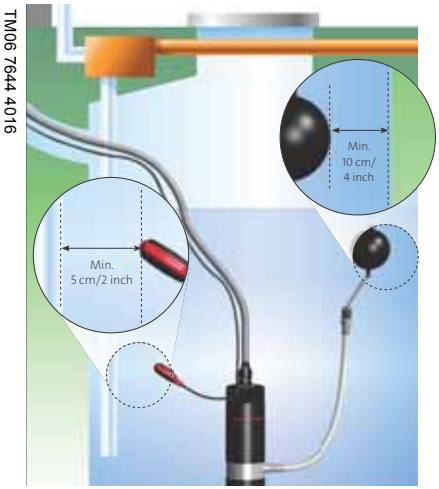
3.1.3 الحـــيز الأدنـــى

تحتـــاج المضـــخات الـــتي يتـــم تركيبهـــا باســـتخدام مفتـــاح العوامـــة إلـــى حـــيز خـــالٍ بيـــن مفتـــاح العوامـــة والحـــائط لضـــمان حريـــة الحركـــة.

تحتـــاج المضـــخات المُـــزودة بمـــدخل جـــانبي إلـــى حـــيز خـــالٍ بيـــن مصـــفاة الـــدخول العائمـــة والحـــائط.

إذا قمـــت بتركيـــب المضـــخة فـــي بـــئر أو خـــزان، يجـــب أن يكـــون أدنـــى حـــيز خـــالٍ علـــى النحـــو المُبيـــن فـــي الأشـــكال 2 و 3.

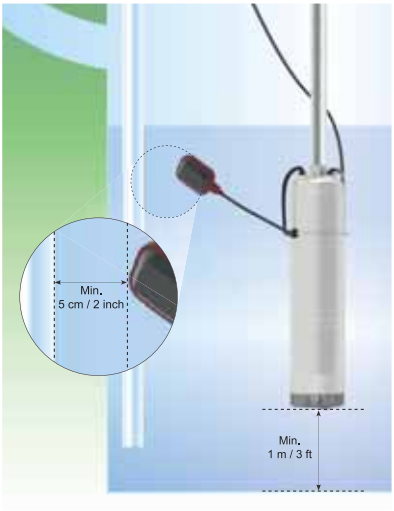
تتطلـــب المضـــخات المركبـــة دون مفتـــاح عـــائم حـــيزًا يطـــابق الأبعـــاد الماديـــة للمضـــخة.



TM06 7644 4016

شـــكل 2 أدنـــى حـــيز لمضـــخات SB وSBA فـــي بـــئر أو خزان

مضـخة SB HF مـزودة بمفتـاح عـائم



TM07 1399 1518

شـــكل 3 أقصـــى حـــيز لمضـــخة SB HF. يوضـــح هـــذا المثـــال التركيـــب فـــي بـــئر

BCT/2022/3431 BRACKNELL DISTRICT COUNCIL - APPROVED 2022

لقد تم تصميم المنتج للاستخدام على النحو التالي:

كلمة إشارية

وصف المخاطرة

عاقبة تجاهل التحذير.

- الإجراء لتجنب المخاطرة.

1.2 ملاحظات

قد تظهر الملاحظات والرموز الموجودة أدناه في تعليمات التركيب والتشغيل الخاصة بجروندفوس وفي تعليمات السلامة وتعليمات الخدمة.

التزم بهذه التعليمات للمنتجات الصامدة للانفجار.

دائرة زرقاء أو رمادية بها رمز بياني تدل على إجراء يجب اتخاذه.

تدل دائرة حمراء أو رمادية مع شريط قطري مائل، ربما مع رمز رسومي أسود، على ضرورة عدم الإقدام على فعل ما أو ضرورة إيقافه.

في حالة عدم الالتزام بتلك التعليمات، فقد يتسبب ذلك في تعطل المعدة أو تلفها.

نصائح أو إرشادات التي تجعل العمل أسهل.

2. استلام المنتج

2.1 فحص العبوة

عند استلام المنتج، قم بما يلي:

1. تأكد من أن المنتج مطابق للطلب. إذا لم يكن المنتج مطابقًا للطلب، فتواصل مع المورّد.
2. تأكد من أنه لم يحدث تلف لأي أجزاء ظاهرة. في حالة تلف أي من الأجزاء الظاهرة، فتواصل مع شركة النقل.

2.2 نطاق التسليم

يحتوي الصندوق على العناصر الآتية:

- مضخة واحدة
- مهايئ واحد
- تعليمات تركيب وتشغيل واحدة
- دليل للتشغيل السريع واحد
- مصفاة دخول عائمة واحدة، مُخصصة للطراز ذي المدخل الجانبي فقط.
- صمام لا رجعي واحد، للمضخة SB فقط.

3. تركيب المنتج

التزم باللوائح المحلية المتعلقة بقيود الرفع أو التعامل اليدوي.

تنبيه

سحق القدمين

إصابة شخصية بسيطة أو متوسطة

- استخدم أحذية السلامة عند التعامل مع المضخة.

خطر

صدمة كهربائية

الوفاة أو إصابة شخصية خطيرة

- افصل مصدر الإمداد بالطاقة قبل البدء في أي عمل على المنتج. تأكد من أن إمداد الطاقة لا يمكن تشغيله دون قصد.

3.1 المكان

قم بتركيب المضخة في مكان غير بارد.

قبل أن يتم غمر المضخة في البئر أو الخزان، تأكد من عدم احتواء البئر أو الخزان على الرمل أو الرواسب الصلبة.

قم بتركيب الأنبوب بحيث لا تُعرّض المضخة للضغط الميكانيكي.

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ترجمة النسخة الإنجليزية الأصل.

تصف تعليمات التركيب والتشغيل هذه مضخات جرونفوس SB وSBA وSB HF.

تقدم الأقسام 1-5 المعلومات الضرورية لكي تتمكن من إخراج المنتج من عبوته وتركيبه وتشغيله بطريقة آمنة.

تقدم الأقسام 6-10 معلومات مهمة عن المنتج، وأيضًا معلومات عن الخدمة وتحديد الأعطال والتخلص من المنتج.

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اقرأ هذه الوثيقة قبل أن تقوم بتركيب المنتج. يجب أن تمتثل عمليتا التركيب والتشغيل للوائح المحلية والقوانين المقبولة للممارسة الجيدة.

يمكن استخدام هذا الجهاز من قبل الأطفال الذين يبلغون من العمر 8 أعوام فأكثر والأشخاص الذين يعانون نقصًا في القدرات الجسدية أو الحسية أو العقلية أو تنقصهم الخبرة والمعرفة إذا كانوا تحت إشراف أو تم توجيههم بشأن طريقة استخدام الجهاز بطريقة آمنة وكانوا يفهمون المخاطر المرتبطة باستخدام الجهاز.

يجب ألا يعبث الأطفال بهذا الجهاز. يُحظر القيام بالتنظيف وصيانة المستخدم من قبل الأطفال دون توفير إشراف.

تأكد من أن النظام الذي تدمج فيه المضخة مصمم لضغط المضخة الأقصى.

لقد تم تقييم هذه المضخة للاستعمال مع الماء فقط.

1. معلومات عامة

1.1 البيانات الخاصة بالمخاطر

قد تظهر بيانات البيانات خاصة بالمخاطر والرموز الموجودة أدناه في تعليمات التركيب والتشغيل الخاصة بجرونفوس وفي تعليمات السلامة وتعليمات الخدمة.

خطر

يدل على وضع ينطوي على مخاطرة، إذا لم يتم تجنبه، سيؤدي إلى الوفاة أو إصابة شخصية خطيرة.

تحذير

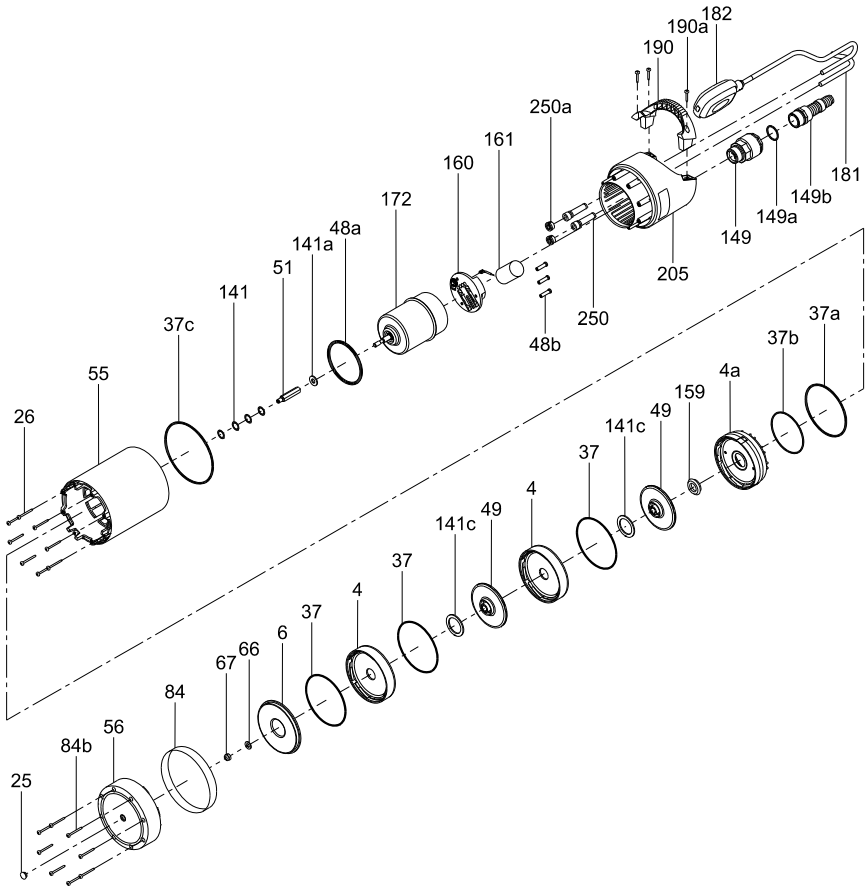
يدل على وضع ينطوي على مخاطرة، إذا لم يتم تجنبه، قد يؤدي إلى الوفاة أو إصابة شخصية خطيرة.

تنبيه

يدل على وضع ينطوي على مخاطرة، إذا لم يتم تجنبه، قد يؤدي إلى إصابة شخصية بسيطة أو متوسطة.

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SB pump



TM04 6209 5109

Fig. 1 SB pump

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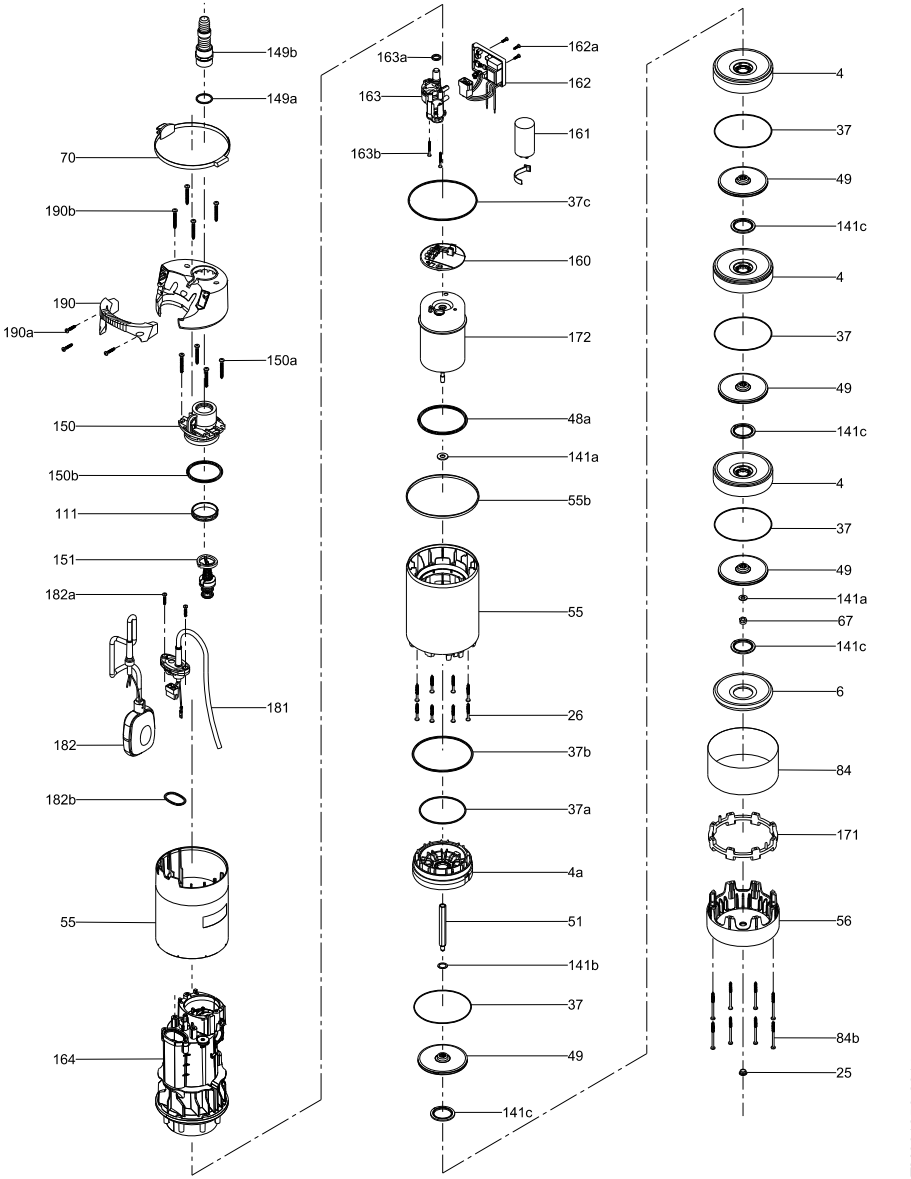


Fig. 2 SBA pump

BCT/2020/0230 DISTRICT COUNCIL - APPROVED 26/04/2022

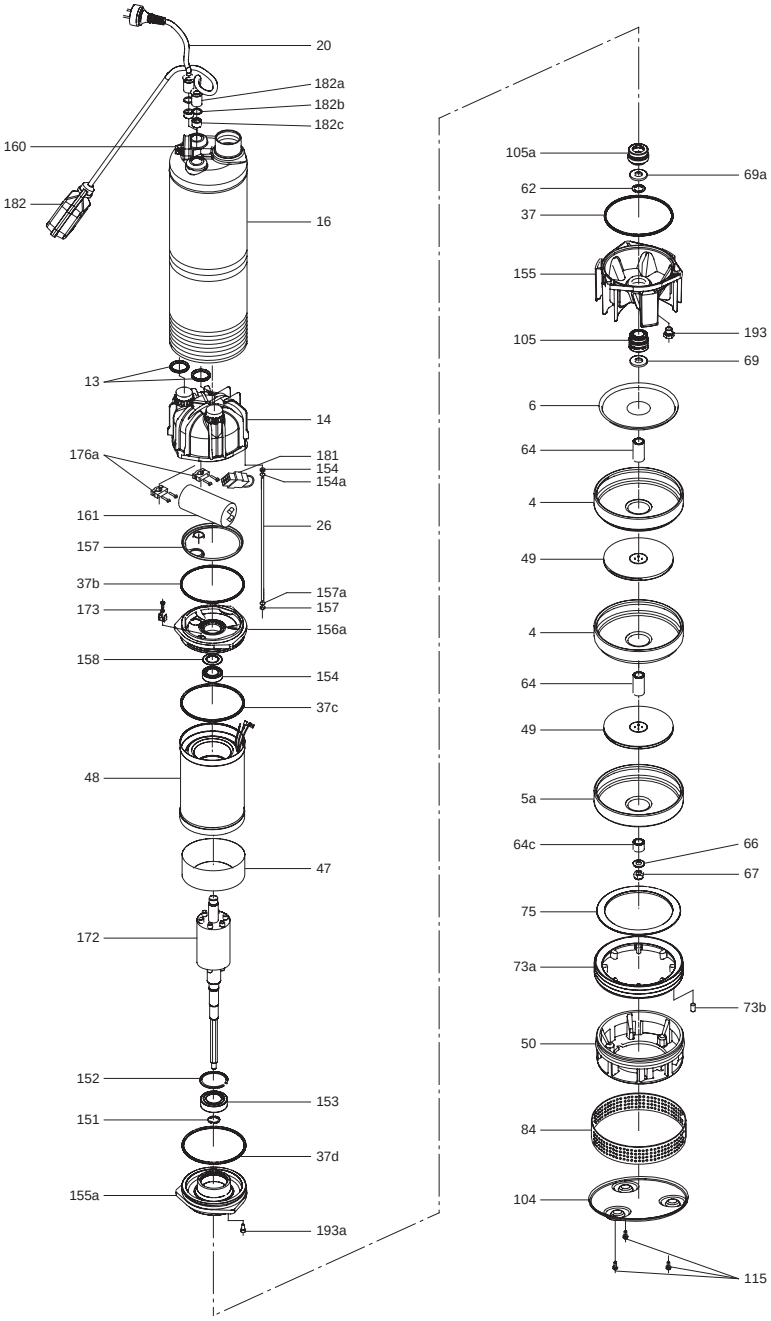


Fig. 3 SB HF pump

BCT/2830/21 ROCHDALE BOROUGH COUNCIL - APPROVED 26/04/2022

Declaration of conformity

GB: EU declaration of conformity

We, Grundfos, declare under our sole responsibility that the products SB, SBA & SB HF, to which the declaration below relates, are in conformity with the Council Directives listed below on the approximation of the laws of the EU member states.

AR: إقـرار مطابقـة الاتحـاد الأوروبـي (EU)

نقـر نحـن، جرونـدفوس، بمقتضـى مسـؤوليتنا الفرديـة بـأن المنتجيـن SB, SBA & SB HF، اللـذين يختـص بهمـا الإقـرار أدنـاه، يكونـان مطـابقين لتوجيهـات المجلـس المـذكورة أدنـاه بشـأن التقريـب بيـن قـوانين الـدول أعضـاء الاتحـاد الأوروبـي (EU).

– Low Voltage Directive: 2014/35/EU
  Standards used:
  EN 60335-1:2012 + A11:2014
  EN 60335-2-41:2003 + A1:2004 + A2:2010

– EMC Directive: 2014/30/EU
  Standards used:
  EN 55014-1:2006 +A1:2009 + A2:2011
  EN 61000-3-2:2006 + A1:2009 + A2:2009
  EN 61000-3-3:2008
  EN 55014-2:1997 + A1:2001 + A2:2008

– Applies from July 22, 2019
  RoHS Directives (2011/65/EU and 2015/863/EU).
  Standard used: EN 50581:2012

This EU declaration of conformity is only valid when published as part of the Grundfos installaton and operating instructions (publication number 98933472 0618).

Bjerringbro, 07/05/2018

Andreas Back-Pedersen
Senior Manager
Grundfos Holding A/S
Poul Due Jensens Vej 7
8850 Bjerringbro, Denmark

Person authorised to compile the technical file and empowered to sign the EC declaration of conformity.

BCTAS/2020 DISTRICT COUNCIL - APPROVED 26/04/2022

BCT2/2022 BASSETLAW DISTRICT COUNCIL - APPROVED 2022

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BRANZ Appraised

Appraisal No. 447 [2020]

LINEA™ WEATHERBOARD CAVITY CLADDING



Appraisal No. 447 (2020)

This Appraisal replaces BRANZ Appraisal No. 447 (2010)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

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

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

Scope

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

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

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

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

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

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

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

Readers are advised to check the validity of this Appraisal by

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BRANZ Appraised
Appraisal No. 447 [2020]

Building Regulations

New Zealand Building Code (NZBC)

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

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

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Linea™ Weatherboard Cavity Cladding meets these requirements. See Paragraphs 10.1-10.3.

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

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

Technical Specification

4.1 System components and accessories for Linea™ Weatherboard Cavity Cladding supplied by James Hardie New Zealand Limited are:

- **Linea™ Weatherboards** are bevel-back weatherboards with a tongue and groove at each end for jointing. The weatherboards are pre-primed with an acrylic primer on the front face and both edges. Linea™ Weatherboards are 16 mm thick and are available 135 mm, 150 mm and 180 mm wide. All boards are supplied 4,200 mm long. Linea™ Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a bevel is cut on the back face of the weatherboards, the front edge at the bottom of the board is chamfered and the ends are tongue and grooved for jointing. Linea™ Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

Accessories

- **Axent™ Trim** - a 16 mm thick fibre cement trim manufactured from a reduced density cellulose fibre cement formulation. Axent™ Trim is pre-primed with an acrylic primer on the front face and both edges, and is available in sizes of 84 mm and 100 mm wide by 2,600 mm long.
- **External and internal corner mouldings** - chromate treated aluminium external box corner, 90° internal corner 'W' mould and 135° internal corner 'W' mould. The mouldings are available in 2,700 mm and 4,000 mm lengths.
- **Corner soakers** - 90° soakers are available for 135 mm, 150 mm and 180 mm Linea™ Weatherboards. The soakers are available in chromate treated aluminium, copper and stainless steel.
- **Cavity vent strip** - uPVC, available in 3,000 mm lengths.
- **Rigid wall underlay** – HomeRAB™ Pre-Cladding, RAB™ Board, plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.

4.2 System components and accessories used with Linea™ Weatherboard Cavity Cladding which are supplied by the building contractor are:

- **Flexible wall underlay** – building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
- **Flexible building underlay support** – polypropylene strap at 300 mm centres fixed horizontally and drawn taut, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *[Note: Mesh and wire galvanising must comply with AS/NZS 4534. Additional vertical battens may also be installed to provide support.]*

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- **Flexible sill, head and jamb flashing tape** - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **Cavity battens** - nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) timber treated to Hazard Class H3.1.
- **Joinery head flashings** - folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Planted sill and scribers** - timber treated to Hazard Class H3.1, pre-primed before installation.
- **Window and door trim cavity air seal** - air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Flexible sealant** - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- **Cavity batten fixings** - 40 x 2.8 mm flathead hot-dip galvanised nails.
- **Linea™ Weatherboard fixings** - 60 x 3.15 mm flathead hot-dip galvanised HardieFlex nails or stainless steel ring shank HardieFlex nails (for concealed nailing in NZS 3604 Wind Zones up to, and including, Very High), 75 x 3.15 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in NZS 3604 Wind Zones up to, and including, Very High), and 90 x 3.55 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa).

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

- **Axent™ Trim fixings** - 60 x 3.15 mm or 75 x 3.15 mm hot-dip galvanised jolthead nails and stainless steel ring shank jolthead nails.
- **Aluminium joinery head flashing** - as supplied by the joinery manufacturer or the contractor.
- **Flashings** - balustrade and parapet cap flashings, and inter-storey joint flashings. Refer to NZS 3604 Section 4, and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.

Paint System Specification

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

4.4 All exposed faces, including top edges at sills and all bottom edges of Linea™ Weatherboard, Axent™ Trim and accessories must be finished with at least 2 coats of an exterior grade latex acrylic 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 Limited or the building contractor, whether on-site or off-site, is under the control of the building contractor. Linea™ Weatherboards must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. Weatherboards must always be carried on edge.

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

Technical Literature

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

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Design Information

Framing

Timber Treatment

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

Timber Framing

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

7.3 Timber framing must have a maximum moisture content of 20% at the time of the cladding application. *[Note: If weatherboards are fixed to framing with a moisture content of greater than 20%, problems may occur at a later date due to excessive timber shrinkage.]*

General

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

8.2 Punchings in the cavity vent strip provide a minimum ventilation opening area of 1,000 mm^2 per lineal metre of wall in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 b).

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

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

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

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

Inter-storey Junctions

8.7 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 m in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 b).

Structure

Mass

9.1 The mass of the 135 mm wide Linea™ Weatherboard when installed on the wall is 25.7 kg/m^2 at equilibrium moisture content (EMC). The mass of the 150 mm wide board is 24.93 kg/m^2 at EMC and the mass of the 180 mm wide board is 23.92 kg/m^2 at EMC. Linea™ Weatherboard Cavity Cladding is therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

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

Wind Zones

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

Durability

Serviceable Life

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

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

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

Maintenance

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

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

11.3 Regular cleaning (at least annually) of the paint coating surface is recommended to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Paint systems must be re-coated 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™ Weatherboard Cavity Cladding.)*

Fire Affecting Areas Beyond the Fire Source

Vertical Fire Spread

12.1 This Appraisal only covers buildings 10 m or less in height. NZBC Functional Requirement C3.2 identifies that external vertical fire spread to upper floors only needs be considered for buildings with a building height greater than 10 m. Control of external vertical fire spread is therefore outside the scope of this Appraisal.

Horizontal Fire Spread

12.2 Linea™ Weatherboards have a peak heat release rate of less than 100 kw/m^2 and a total heat released of less than 25 MJ/m^2. Testing was carried out as per Paragraph 5.4 of NZBC Acceptable Solution C/AS1 and Paragraph 5.8.1 of NZBC Acceptable Solution C/AS2, achieving a Type A performance. Linea™ Weatherboards can therefore be used within 1 m of the relevant boundary.

12.3 Refer to NZBC Acceptable Solutions C/AS1 and C/AS2 and Verification Method C/VM2 for fire resistance rating and control of external fire spread requirements for external walls.

Prevention of Fire Occurring

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

External Moisture

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

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

14.3 Linea™ Weatherboard Cavity Cladding allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC 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™ Weatherboard Cavity Cladding where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

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

Water Vapour

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

Installation Information

Installation Skill Level Requirements

16.1 All design and building work must be carried out in accordance with the Linea™ Weatherboard Cavity Cladding Technical Literature and this Appraisal by competent and experienced tradespersons conversant with the cladding system. 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.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

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

Cavity Battens

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

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

Linea™ Weatherboard Installation

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

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

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

17.8 The first course of weatherboards must be full length, i.e. 4,200 mm and commence from an external corner. Jointing of Linea™ Weatherboards is made off the stud using the pre-cut tongue and groove joint. Tongue and groove joints may be located centrally between the studs, but must be no closer than 100 mm to the edge of a stud. A bead of sealant must be applied to the front side of the tongue before the corresponding board is inserted. Subsequent courses of weatherboards must be installed so that the tongue and groove joints are staggered by 600 mm minimum from joints in the previous course.

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

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

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

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

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

Aluminium Joinery Installation

17.14 Aluminium joinery and associated head and sill (for direct fixed) 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.

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

Inspections

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

Finishing

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

Health and Safety

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

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

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

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Basis of Appraisal

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

Tests

19.1 The following testing has been completed by BRANZ:

- BRANZ expert opinion on NZBC E2 code compliance for Linea™ Weatherboard Cavity Cladding was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Linea™ Weatherboard Cavity Cladding was tested to E2/VM1 (as contained within NZBC Clause E2, Third Edition, Amendment 5).
- Uniform wind face load tests to simulate wind pressures on 12 mm thick Linea™ Weatherboards were carried out by BRANZ, and the results were used in assessing 16 mm thick Linea™ Weatherboard used in Linea™ Weatherboard Cavity Cladding.
- Cone calorimeter testing to determine the peak rate of heat release and total heat release of Linea™ Weatherboard was completed by BRANZ. The testing was carried out in accordance with AS/NZS 3837.

19.2 Linea™ Weatherboards have been tested by a National Association of Testing Authorities (NATA) accredited laboratory in accordance with AS/NZS 2908.2. The results have been reviewed by BRANZ and found to be satisfactory.

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

Other Investigations

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

20.2 Site inspections 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™ Weatherboards 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 Limited is the responsibility of James Hardie New Zealand Limited. The quality control system of James Hardie New Zealand Limited has been assessed and registered as meeting the requirements of ISO 9001: 2015.

21.3 Quality on site is the responsibility of the installer.

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

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

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Sources of Information

- AS 3730 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4534: 1998 Zinc and zinc/aluminium-alloy coatings on steel wire.
- AS/NZS 4680: 2006 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

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BRANZ

In the opinion of BRANZ, Linea™ Weatherboard Cavity Cladding is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to James Hardie New Zealand 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. James Hardie 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;
   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 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 James Hardie New Zealand Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
02 September 2020

Readers are advised to check the validity of this Appraisal by