

**COUNCIL
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SPECIFICATION FOR

BC ONLY
No 76172

PROPOSED ALTERATIONS & ADDITION FOR A RANDELL 15 MOREY ST ROTORUA

PLOTZ'N'PLANZ CAD DRAUGHTING SERVICE
ROB STEVENSON Ph/ Fax: 07-3501-208
PO BOX10085 Mob: 027 4814-866
ROTORUA pnnp@clear.net.nz



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1. PRELIMINARY AND GENERAL

1.1. GENERAL

The requirements of the Building Act, together with Local Authority By Laws shall also be taken as part of this Specification.

The security and weather proofing of the residence shall be maintained at all times when possible.

1.2. DRAWINGS AND SETTING OUT

The contractor shall be responsible for the verification of all dimensions and levels and for accurately setting out the building. Any discrepancies between drawings, specification and actual conditions met on site shall be reported to the designer for instructions before proceeding.

1.3. OBVIOUS WORK

Allow for and carry out all work shown on the drawings but not specified and vice versa which is obviously necessary for the completion of the work and compliance with the NZ Building Code and related codes, standards and good trade practice. This will include for all fixings and for leaving the works completely water tight, vermin and bird proof.

1.4. SITE DOCUMENTS

The consent documents must be kept on site and maintained in 'as new' condition, and not marked in any way. In addition a complete set of drawings and specification, for day to day reference, is to be kept on site at all times. No details may be altered without the written approval of the designer. Check all dimensions prior to commencing any work and mark all changes to the building on the site drawings.

The contractor shall give all notices required under the contract and pay all fees as required by local and supply authorities. Arrange to obtain all supply services.

1.5. STANDARDS

All materials, items and workmanship shall comply with the minimum requirements of the appropriate New Zealand Standard. In the event of there being no NZ standard the material, items or workmanship shall be of the best quality and standard to the approval of the designer.

Footing excavations are to be taken down to solid bearing, past all organic matter and to be not less than 300 mm deep or 450 mm in expansive clay below clear ground level. Should it be necessary to excavate deeper for solid foundations, the instructions of the designer shall be carried out. Trenches must be plumb and straight, bottoms level and solid, stepped as required and free of water and organic matter.

1.6. SOIL BEARING CAPACITY

Unless directed otherwise the contractor is to test the soil load bearing capacity and to advise the designer if the capacity is less than 100 KPa and of any concerns he may have in respect of ground conditions.

The Owner shall be responsible for the cost of any work additional to that provided for by this Specification and accompanying drawings, through encountering ground of doubtful bearing capacity from landslides resulting from causes beyond the control of the Contractor, the Owner will be responsible for any extra costs if work is encountered.

Stockpile any surplus soil on the site in a location approved by the owner.

2. CONCRETE WORK

2.1. FOOTINGS

All footings shall be cast in formwork and reinforced as detailed on the drawings.

2.2. HARDFILLING AND BASECOURSE

Hardfill shall be quarry basecourse material suitable for load bearing while providing free drainage when compacted.

COMPACTION OF LAYERS EXCEEDING 150mm AT A TIME WILL NOT BE TOLLERATED.

Compaction will be carried out using a vibrating roller & hardfilling must be watered during compaction. The layers of 150mm must be compacted to 100mm at each layer.

Beneath concrete slabs, etc provide basecourse to the extent shown on the drawings. Blind the surface of the basecourse with 25mm sand so as to provide a smooth, even and unyielding surface to the damp-proof membrane.

2.3. MATERIALS

Cement shall be ordinary Portland cement complying with NZS 3122.

Aggregate shall comply with the requirements of NZS 3111.

Water used shall be drinking quality.

Reinforcing steel shall comply with the relevant NZ Standards NZS 3402, NZS 3104, NZS 3421.

2.4. REINFORCING

Accurately place all reinforcing where shown on the drawings. Use deformed mild steel rods or reinforcing mesh. Before concrete is placed ensure that the reinforcement is free from loose flaky rust, oil, loose mill scale and paint or anything liable to prevent a proper bond.

Use 500E mesh correctly suspended for concrete cover in all floor slabs.

2.5. CONCRETE MIX

Only ready mixed concrete complying in all respects with NZS 3104 shall be used on the job. No hand mixing is permitted. Compressive strength for all concrete work shall be a minimum of 17.5 MPa.

A current grading certificate from the New Zealand Ready Mixed Concrete Association will be accepted as compliance with this standard.

2.6. PLACING OF CONCRETE

Concrete shall be placed, finished and cured in accordance with NZS 3109 section 7. Immediately before any concreting is commenced, formwork shall be cleaned of any debris and dampened down. Remove formwork after the recommended curing time. The designer shall be given 24 hours notice of concrete pours.

2.7. TOLERANCES AND SURFACE FINISHES

Tolerances shall be as in NZS 3109, table 4, Permissible Deviations

2.8. BUILDING IN

Allow to build in all holding down bolts, etc as required, prior to the pouring of concrete.

3. CARPENTRY

3.1. WORKMANSHIP

Work shall comply with methods, processes and practices covered by trade certificates in carpentry and joinery and relevant NZ standards and in particular NZS 3604 2011 & E2/AS1 & any other relevant sections of the New Zealand Building Code. All materials and levels shall match up with existing where possible, unless otherwise specified on the plans or in this specification.

3.2. TIMBER GENERALLY SG 8

Shall conform with NZS 3604 unless otherwise specified or shown on the drawings. Permitted defects are those limited to those in NZS 3631. All framing timber shall be pressure treated against insect infestation and decay. Timber shall be SG 8 Pinus Radiata, treated to the specification shown on the sections and details. Moisture content of the timber framing shall not exceed 15% at the time of lining

3.3. FRAMING

LOCATION	SIZE	GRADE
Studs & Top Plates or	90x45 140x45	H1.2 P. rad H1.2 P.rad
Bottom Plates	90x45	H3.1 P. rad
Framing adjacent to Wet Areas	90x45	H3.1 P. rad
Lintels	Built up width equal to framing and complying with the drawings or if not specified with NZS 3604	
Wall Nogs	90x45	H1.2 P. rad
Ceiling Battens	65x35	H1.1 P.rad. KD
Internal door Jambs	18mm+P.stops 30mm rebated	Finishing grade P.radiata, native or customwood.
Architraves	10mm Jambs to be rebated for 10mm gib-board	Finishing grade P.radiata
Skirtings	10mm Jambs to be rebated for 10mm gib-board.	Finishing grade P.radiata

Ceiling joists, studs and floor joists shall be spaced at a maximum as detailed on the drawings.

Maximum spacing of nogs in stud walls shall be 800 mm centres.

Provide all attendance, nogging, solid backing for other trades. Check drawings for items such as recessed lights, plumbing or hardware fittings and the like and trim out or provide solid backing as required.

Where alterations to existing work are shown, allow for all preparation, restoration and making good required to complete the junction of old to new.

Where ceiling linings are specified the maximum spacing of fixing battens, joists, rafters or purlins to which the lining is fixed shall be 400 mm centres.

Provide lintels to all openings in accordance with NZS 3604 2011.

Bracing shall be as specified on the bracing schedule & fixing details addended to this specification.

Generally the requirements of NZS 3604 2011 are minimum standards together with NZS 3631 Timber Grading. Refer to drawings for specific details.

3.4. ROOF FRAMING

Trusses as specified shall be attached to top plates & studs as specified on the cross sections. All other roof members shall be well spiked together and to bearing members. Roof shall be adequately supported, strutted, tied, braced to prevent any movement, deflection or uplift in wind.

3.5. 'HARDIES' SHEATHING

Sheath soffits with Hardies Soffit Lining to match existing.

3.6. PROTECTION

All timber shall be properly stacked clear of the ground upon arrival at the site to allow ventilation and prevent distortion in any way, and shall be adequately protected from the weather and other possible causes of damage.

3.7. FASTENINGS

All nails, bolts, etc for exterior work shall be galvanised. Generally secure all timbers and sheet linings as per NZS 3604 2011 sec. 4 or to the manufacturers recommendations where applicable. Provide also all plates and straps as shown on the drawings and as required to complete the installation. Fix as shown on the drawings and in accordance with NZS 3604 2011.

3.8. PRIMING

Prime all those timbers required to be painted. Those surfaces abutting other building materials, eg concrete shall be primed on all faces, backs, joints and end grain.

3.9. DAMP PROOF COURSE (DPC) AND BUILDING PAPER

A DPC of 2 ply bituminous fabric shall be placed between all timbers, plates, etc, and concrete.

Sheath exterior framing with fire-retardant breather type building paper as stated on the drawings complying with NZS 2296. Lay horizontally in single lengths lapped a minimum of 50 mm at joints.

3.10. EXTERIOR CLADDING

Hardies Fibre Cement weatherboards direct fixed to wall framing as per manufacturers specifications.

3.11. WALL LININGS

Interior wall linings generally to be 10mm Gibraltar board sheets, tapered edge fixed with vertical joints and **screwed and glued** in place as per the requirements of Winstone Wallboards. All joints, screw holes and other imperfections are to be stopped flush to a level 4 finish and left ready for the painting. Note Winstones details in this specification for nailing bracing gib.

Bathroom and shower linings shall be Gib Aqualine and installed according to manufacturer's instructions.

3.12. INSULATION

Provide R2.4 insulation to all ceilings & R3.6 insulation to all exterior walls. Insulation shall be installed to manufacturers' instructions.

4. JOINERY

4.1. WORKMANSHIP

Only skilled joiners shall do the work in properly equipped joinery workshops. Recognised jointing methods shall be used throughout with concealed nailing or screwing. Properly clamp glued members.

Nail in exposed surfaces shall not be used and secret fixing methods used instead. All doors, shelves, etc. where made of coreboard or particleboard, shall be clashed at edges. All joinery wood surfaces shall be sanded to a fine finish. Supply all beads and moulds required, avoiding joints where possible.

Properly frame and support all members so that movement is avoided. Allow satisfactory clearances for doors & sashes.

4.2. TIMBER GENERALLY

Generally all timber for frames, trim, facings etc. shall be Pinus Radiata, SG 8 grade. Refer to drawings for further details and special finishes sections and profiles, or members required. and to 'Painting' section for surface finish required.

All timber shall be selected from dry stock, free of knots, shakes or other defects. Select window and door frames for straight grain.

All timber shall be air or kiln dried to the following moisture content:

Exterior joinery and finishing timbers (excluding doors)	17 - 20%
Internal doors, joinery, finishing timber	12 - 14%

4.3. DELIVERY AND PROTECTION

No joinery shall be delivered to the site until it is required for fixing unless adequate approved dry storage can be provided on site. The joinery shall be kept under a waterproof cover during transit and shall be handled and stacked carefully and protected from damage at all times.

4.4. ALUMINIUM JOINERY

Allow for the supply and fixing of an approved brand of aluminium joinery. Fix joinery as detailed in the drawings. Flash heads using a proprietary aluminium flashing finished to match existing joinery, noting the details in the drawings & E2/AS1. Sizes are shown on the plans.

5. ROOFING

5.1. SCOPE

This section covers the supply and fixing of Colour Steel Longrun Roofing

5.1. WORKMANSHIP SCOPE

All work shall be carried out by tradesmen with proven experience in roofing work using methods of fixing and tools in accordance with the manufacturer's recommendations.

All flashings, spouting, downpipes and gutters are specified in 'Plumbing and Drainage'.

6. PLUMBING AND DRAINAGE

6.1. GENERAL

The whole of the work shall be carried out and completed in the best trade manner by licensed plumbers only, in accordance with the requirements of the Local Authority and Drainage and Plumbing regulations. Materials shall be of the best respective kinds.

6.2. SHEET METAL

Except where otherwise specified, sheets shall be of the following gauges.
Lead flashings 2 kg

6.3. FLASHINGS

Flash wherever needed to keep watertight and weathertight, extreme care being taken to keep dissimilar metals from making contact. Also, as much as possible, use flashings of same metals in adjacent areas.

7. DRAINLAYER

7.1. EXTENT OF WORK

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

7.2. STANDARD OF WORK

The whole of this work shall be carried out by experienced tradesmen to the satisfaction of the Local Drainage Inspector. It shall conform to requirements of the Drainage and Plumbing Regulations of 1959, and the Local Council specification.

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

7.3. INSPECTIONS

Inspection requirements of the Local Authority shall be complied with.

8. STOPPER

8.1. REQUIRED FINISH

Stop all gib-board ceilings and walls using PAPER tape to all joints. Assume that all finishes will be to paint quality and stop to a minimum of a LEVEL 4 finish. Use stopping & finishing compounds & tape recommended by the Gib-board manufacturer & apply tape & stop in accordance with their specification.

9. GLASS AND GLAZING

9.1. SCOPE

This work covers the site measurement, cutting and installation of glass to windows and doors and mirrors shown on the drawings.

Allow to supply and install glazing as required.

9.2. MATERIALS AND WORKMANSHIP

All glass shall be free from air bubbles, blemishes or flaws of any description. Glazing shall be generally in accordance with NZS 4223 Parts 1 & 2.

Glass shall be cut accurately to the sizes required and shall be finished with smooth and regular edges to ensure an even bearing all round. Allow sufficient clearance to compensate for thermal expansion.

Consult with the owners for a choice of any obscure glass.

9.3. GLASS THICKNESS

Glass thickness shall be determined by area of individual panes as recommended by the glass manufacturer and in accordance with best trade practice and NZS 4223.

Use toughened glass to all glazed doors & large window panels in accordance with best trade practice and NZS 4223.

9.4. PROTECTION AND CLEANING

The contractor shall take all steps to protect all glass whilst the site is under his control. At Practical Completion, all cracked, broken or scratched glass shall be replaced and all glass carefully cleaned on both sides.

James Hardie®
WEATHERBOARDS



Technical Specification

March 2010 / New Zealand



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WE VALUE YOUR FEEDBACK

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

Ask James Hardie™

Fax 0800 808 988

literaturefeedback@jameshardie.co.nz

1 Application and scope

1.1 APPLICATION

James Hardie Weatherboards are made of fibre cement and are pre-primed. They are categorised as a lightweight cladding product as per NZS 3604.

James Hardie Weatherboards are manufactured in different profiles ranging between smooth and patterned finishes such as:

SMOOTH WEATHERBOARD

Smooth Weatherboard (7.5mm) is available in three widths (180mm, 240mm and 305mm) and has a smooth finish.

RUSTICATED WEATHERBOARD

Rusticated Weatherboard (7.5mm) combines a rough-sawn texture with a smooth strip in the lap area. It is 205mm wide.

STYLELINE™ WEATHERBOARD

Styleline Weatherboard (7.5mm) has a texture of indented vertical and horizontal lines. It has a smooth strip in the area of the lap. It is 205mm wide.

COLONIAL® WEATHERBOARD

Colonial Weatherboard (7.5mm) reproduces the classic smoothness of traditional weatherboards. A recessed lap section provides a shadow line to enhance the horizontal definition of the finished cladding. It is 205mm wide.

FRONTIER WEATHERBOARD

Frontier Weatherboard (7.5mm) is available in two widths (245mm and 310mm). The board has a woodgrain textured surface.

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.

IF YOU ARE AN INSTALLER

Ensure that you follow the design, moisture management and associated details and material selection provided by the designer. All the details provided in this document must be read in conjunction with the specifier's specification.

MAKE SURE YOUR INFORMATION IS UP TO DATE

When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or you need more information, visit www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

1.2 SCOPE

This specification covers the use of James Hardie Weatherboard for buildings that fall within the scope of NZS 3604 and NZBC Acceptable Solution 'E2/AS1', paragraph 1.1. This specification covers the use of James Hardie Weatherboards in both direct fixed and cavity construction methods. Please refer to 'E2/AS1' for further information regarding the selection of construction method for claddings.

1.3 DETAILS

Various James Hardie Weatherboard details are provided in the Details section of this document. This specification and details in CAD file are also available to download from our website at www.jameshardie.co.nz

1.4 SPECIFIC DESIGN

For use of James Hardie Weatherboards outside the scope of this document, 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.

2 Design

2.1 COMPLIANCE

James Hardie Weatherboards comply with section 9.5.2 of 'E2/AS1'. Information contained in this document regarding the installation of James Hardie Weatherboards are aligned with 'E2/AS1' of New Zealand Building Code (NZBC).

2.2 RESPONSIBILITY

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

All dimensions shown are in millimetres unless noted otherwise. All New Zealand Standards referenced in this manual are current edition and must be complied with.

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

2.3 SITE AND FOUNDATION

The site on which the building is situated must comply with the NZBC Acceptable Solution 'E2/AS1' 'Surface Water'. Foundation design must comply with the requirements of NZS 3604 'Timber Framed Buildings' or be as per specific engineering design. The grade of adjacent finished ground must slope away from the building to avoid the possibility of water accumulation in accordance with NZBC requirements.

2.4 GROUND CLEARANCES

The bottom of claddings must comply with the NZBC Acceptable Solution 'E2/AS1', section 9.1.3. The floor must have a minimum clearance to paved or unpaved ground as required by NZS 3604.

James Hardie Weatherboards must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604.

James Hardie Weatherboard must have a minimum clearance of 100mm from paved ground and 175mm from unpaved ground.

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

Do not install external cladding such that it may remain in contact with water or ground.

2.5 MOISTURE MANAGEMENT

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

Wall construction design must effectively manage moisture, considering both the interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration or that are artificially heated or cooled.

Walls shall include those provisions as required by the NZBC Acceptable Solution 'E2/AS1' 'External Moisture'. In addition all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashing for waterproofing. The other materials, components and installation methods used to manage moisture in the walls, must comply with the requirements of relevant standards and the NZBC. For further information in relation to designing for weathertightness, refer to the Building Research Association of New Zealand (BRANZ) and the Department of Building and Housing (DBH) updates on the following websites, respectively www.branz.co.nz and www.dbh.govt.nz.

2.6 STRUCTURE

Timber-framed buildings must be designed in accordance with NZS 3604 (Timber Framed Buildings). When the framing is provided as per the specific engineering design, the framing stiffness must be equivalent to or more than the stiffness requirements of NZS 3604.

2.7 WIND LOADING

James Hardie Weatherboard cladding is suitable for use in all New Zealand wind zones up to and including VH as defined in NZS 3604.

A specific design is required for all situations where a building falls in a specific engineering design (SED) wind zone.

2.8 FIRE RATED WALLS

Walls clad with James Hardie Weatherboard using a direct fix or cavity construction method can achieve fire ratings of up to 60/60/60 when constructed in accordance with this literature, including the fire rated system requirements as specified in James Hardie 'Fire and Acoustic' Design Manual. Refer to this design manual for further information about fire rated systems.

2.9 ENERGY EFFICIENCY

External walls constructed using James Hardie Weatherboard, bulk insulation, where the area of glazing is 30% or less of the total wall area and constructed as per this technical specification complies with the requirements for walls in NZBC Acceptable Solution H1/AS1 (NZBC Clause H1 Energy Efficiency), Replacement Table 1. To meet thermal insulation requirements for the construction, the bulk insulation as specified in Table 1 must be used. This insulation may be substituted with insulations having higher R-values. The thermal insulation of a wall gets affected when the depth of the timber framing is increased or decreased. The calculation used in Table 1 is based on a timber framing size 90 x 45mm and using an internal lining material such as James Hardie Villaboard® Lining or a 10mm plasterboard.

Table 1

Insulation capability		
CLIMATE ZONE	CONSTRUCTION R-VALUE REQUIREMENT	MINIMUM R-VALUE OF INSULATION REQUIRED
1 and 2	1.9 m ² °C/W	#R2.0
3	2.0 m ² °C/W	#R2.2
Total construction R-Value depends on the insulation material used and the framing ratio. The insulation material R-Values specified in this table are for studs spaced at 600mm c/c and nogs spaced at 800mm c/c.		
# To achieve higher R-Values, the wall insulation must be replaced with an insulation material having higher R-Values to suit the requirements.		
For further guidance on insulation requirement refer to current edition of 'House Insulation Guide' published by BRANZ.		

3 Framing

3.1 GENERAL

This James Hardie Weatherboard technical specification is only suitable for timber-framed buildings. Other framing materials are outside the scope of this specification.

3.2 DIMENSIONS

A 35mm minimum stud width is required unless noted otherwise in this specification.

3.3 STRUCTURAL GRADE

Minimum timber grade requirements are No.1 framing or MSG6 grade in accordance with NZS 3631 'New Zealand Timber Grading Rules' or equivalent.

3.4 DURABILITY

To comply with the NZBC requirements the external framing must be treated to a minimum H1.2 treatment. Refer to the NZBC Acceptable Solution B2/AS1 'Durability' for further information about the durability requirements.

For timber treatment information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round and Sawn Timber) for minimum timber treatment selection and treatment requirements. Also refer to framing manufacturer's literature for further guidance on timber selection. Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturer's.

Note: Refer to NZS 3602 for information about the allowable moisture contents in timber.

3.5 FRAME CONSTRUCTION

All timber framing sizes and set-out must comply with NZS 3604 and stud, nogs / dwangs centres as required by this specification:

Use of timber framing must be in accordance with framing manufacturer's specifications.

3.5.1 DIRECT FIX CONSTRUCTION METHOD

The following framing must be provided for direct fixed construction method:

- Studs must be provided at 600mm centres maximum.
- Nogs must be provided at 1200mm centres maximum.
- Double studs will be required at internal corners for fixing weatherboards without drilling the weatherboard ends.

3.5.2 CAVITY CONSTRUCTION METHOD

The following framing must be provided for cavity construction method:

- When studs are at 600mm centres the nogs must be provided at 800mm centres maximum.
- When studs are at 400mm centres the nogs may be provided at 1200mm centres maximum.

- Double studs are required at internal corners.
- Extra packers may be required at external corners.

3.6 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.

4 Preparation

4.1 HOMERAB™ PRECLAD™ LINING OR BUILDING WRAP

HomeRAB PreClad Lining or building wrap must be provided as per the requirements of the NZBC Acceptable Solution 'E2/AS1' 'External Moisture' and NZS 3604.

The building wraps must comply with Table 23 of 'E2/AS1'. The building wraps must be fixed in accordance with 'E2/AS1', NZS 3604 and the wrap manufacturer's recommendations.

Walls which are not lined on the inside face e.g. garage walls or gable ends must include a rigid sheathing or an air barrier behind the cladding which complies with the requirements of the NZBC 'Acceptable Solution' 'E2/AS1'. HomeRAB PreClad Lining is suitable for use in these applications. It must be installed in accordance with HomeRAB PreClad Lining Installation Manual.

4.2 FLASHING

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to weatherboard installation. Please refer to moisture management requirements in Clause 2.5. The building wraps must be appropriately incorporated with penetration and junction flashings. Materials must be lapped in such a way that water tracks down to the exterior on the face of building wrap. James Hardie will assume no responsibility for water infiltration within the wall due to poor installation of flashings or building wraps.

The selected flashing materials must comply with the durability requirements of Table 20 of Acceptable Solution 'E2/AS1'.

4.3 VENT STRIP

The James Hardie uPVC cavity vent strip has opening area of 1000m²/m length and must be installed at the bottom of all walls constructed using the drained and ventilated cavity construction method. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities.

4.4 CAVITY BATTENS

Buildings with a risk score of 7-20 calculated in accordance with the NZBC Acceptable Solution 'E2/AS1' Table 2 requires James Hardie Weatherboards to be installed on a cavity.

The 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 in accordance with NZS 3640 (Chemical preservation of round and sawn timber) to comply with the durability requirements of B2/AS1.

Cavity battens must comply with 'E2/AS1' and

- be minimum 18mm thick
- be minimum as wide as the width of studs
- be fixed by the cladding fixings to the main framing through the building wrap
- until claddings are fixed the battens need only to be tacked to framing. (Batten fixing is required temporarily to keep them straight on the wall during construction.)

The cavity battens are installed as described below:

- Fix cavity battens to studs.
- Battens must be fixed with 40 x 2.8mm galvanised nails at 800mm centres maximum.

4.5 INTERMEDIATE SUPPORT

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

- intermediate cavity batten between the studs
- 75 mm galvanized mesh
- polypropylene tape

No intermediate supports are required where

- studs are at 400mm centres or
- rigid air barriers instead of building wraps are used.

4.6 CORNERS

Anticipated joist shrinkage must be allowed for in the design process. Do not run trims or aluminium extrusions continuously across solid floor joists. Trims or extrusions to be flashed to best trade practice at these locations.

4.7 EXTERNAL CORNERS

James Hardie Weatherboards can be finished at external corners using uPVC or aluminium corner mould, corner soakers and box corner. Refer to Figures 5, 6, 7, 19, 20 and 21.

4.8 INTERNAL CORNERS

James Hardie Weatherboards can be finished at internal corners using uPVC or aluminium 'W' mould. Refer to Detail 8, 9, 22 and 23.

4.9 JUNCTIONS AND PENETRATIONS

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for James Hardie Weatherboards which meet the requirements of E2 'External Moisture' approved document of the NZBC. Refer to Figures 11 to 13 and Figures 25 to 33.

5 Fixing James Hardie Weatherboards

5.1 GENERAL

The horizontal lap of James Hardie Weatherboards must be 30mm minimum. James Hardie Weatherboards must be kept dry and under cover whilst in storage prior to and during fixing.

Cut ends which are exposed or where sealant is applied to the boards such as box corners, internal corners etc. must be primed prior to installation. Dust and loose material must be removed before priming.

An H3.1 treated timber cant strip must be provided to support the bottom board on the wall. Refer to Figures 3 and 17.

5.2 FASTENER DURABILITY

Fasteners must meet the durability requirements of NZ Building Code. NZS 3604 specifies requirements for fixing material to be used in relation to the exposure conditions and are summarised in Table 2.

Table 2

Exposure conditions and nail selection prescribed by NZS 3604

NAIL MATERIAL		
Sea Spray Zones *	Zone 1 outside sea spray zone and Zones 2 – 4 and Geothermal hot spots	Bracing — All zones
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless	Grade 316 Stainless

* (Zone 1 areas where local knowledge dictates that increased durability is required, appropriate selection shall be made)

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.

7 Finishing

5.3 NAIL SIZES AND FIXING METHOD

James Hardie Weatherboards must be fixed to studs with the types of nails specified in Table 3, in accordance with the following requirements

- All nails must be driven flush with the board surface.
- When fixing weatherboard at the ends, nail must be driven at a minimum distance of 20mm from the end.
- For nails driven 50mm or closer from the end edges of James Hardie weatherboards, holes must be pre-drilled using a 3mm Titanium drill bit.

When using rigid air barrier like HomeRAB PreClad Lining or RAB Board, the cladding fixing nails must be increased in length equal to the thickness of the rigid air barrier.

Table 3

Nail requirements for James Hardie Weatherboards	
DIRECT FIXED TO FRAME	
Face Nailing	
50 x 2.8mm HardieFlex™ nails	Finish flush with the board surface
CAVITY CONSTRUCTION	
Face Nailing	
75 x 3.15mm HardieFlex™ nails	Finish flush with the board surface

5.4 GUN NAILING

James Hardie Weatherboard can also be gun-nailed for both concealed and face nailing fixing methods.

Round head nails must be used and the size of these nails must comply with the requirements of Table 3.

Nails must be fired at a minimum distance of 50mm from the ends of boards when gun nailing is used — double studs will be required.

Note: Do not use 'D' head nails.

6 Jointing

The ends of James Hardie Weatherboards are jointed off-stud using a back soaker. The joints may be located centrally between studs but no closer than 150mm from the studs. The joints must be staggered by 600mm minimum. Flexible silicone sealant must be used with back soakers for jointing. Refer to Figures 4 and 18.

Protective coating of James Hardie Weatherboards is required in order to meet the durability requirements of the New Zealand Building Code.

7.1 PREPARATION

Remove any surface dirt, grime or other contaminants and ensure the James Hardie Weatherboards are dry before painting.

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

James Hardie Weatherboards must be painted within 90 days of installation. All exposed faces, including the top edges under the sills and bottom edges of James Hardie Weatherboard and accessories must be finished with two coats of quality exterior paint system complying with any of parts 7, 8, 9, and 10 of AS 3730.

James Hardie Weatherboards can be painted dark colours when installed with aluminium mouldings only.

When using uPVC corner moulds or flashings, the light reflective value of the colour used must be more than 40% as required under section 4.3.1 of 'E2/AS1'. Dark colours cause excessive movements and deteriorate the cladding performance.

Some environments require special coatings. Paint selection and specifications is dependant on the paint system chosen. Refer to the paint manufacturer.

7.4 STAINING

Stains containing linseed oil are specifically designed for wood and may not be suitable for fibre cement cladding products, primed or unprimed. Semi-transparent stains can vary in uniformity of appearance depending on method of application and conditions and will require a high level of skill and craftsmanship to achieve a uniform appearance. Clear coats have not proven durable in exterior exposure and James Hardie considers them a maintenance item that may require application of a refurbishing sealer at regular intervals. James Hardie does not warrant the appearance and durability of the use of semi-transparent stains and clear coats.

For further information contact the stain manufacturers. Refer to Section 13 for stain manufacturer details.

8 Storage and handling

James Hardie Weatherboards must be laid flat on a smooth level surface. To ensure optimum performance, store weatherboards under cover and keep dry prior to fixing. If the weatherboards should become wet, allow to dry thoroughly before fixing.

Do not carry weatherboards on the flat, always carry in the vertical position to avoid excessive bending.

9 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements to comply with the NZBC Acceptable Solution B2/AS1.

The extent and nature of maintenance will depend on the geographical location and exposure of the building.

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*,
- Re-applying exterior protective finishes**,
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants.
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation which is close to or touching the building.

**Do not use a water blaster to wash down the cladding.*

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

10 Product information

10.1 MANUFACTURING AND CLASSIFICATION

James Hardie New Zealand is an ISO 9001(2000) Telarc certified manufacturer. James Hardie Weatherboard is manufactured to meet the requirements of AS/NZS 2908.2: 2000 'Cellulose-Cement Products'. James Hardie Weatherboard has a classification of Type A Category 3 in accordance with this standard.

The weatherboards are supplied pre-primed on their face and bottom edge with an acrylic primer. The bottom front edge is chamfered. The top covered edge is square water-jet trimmed.

James Hardie Weatherboards are identified by the printing of the name at regular intervals on the back face.

10.2 DURABILITY

James Hardie Weatherboard, when installed and maintained as per the technical specification, will meet the durability requirements for claddings as required in the NZBC Approved Document B2 'Durability'.

10.2.1 RESISTANCE TO MOISTURE/ROTTING

James Hardie Weatherboard demonstrates resistance to permanent moisture induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS2908.2

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

10.2.2 RESISTANCE TO FIRE

James Hardie Weatherboard has the following Early Fire Hazard Indices (tested to AS 1530 Part 3).

Table 4

Early fire hazard indices	
Flammability (FI)	0
Spread of Flame Index (SFI)	0
Heat evolved index	0
Smoke developed index (SDI)	0 - 1

10.2.3 ALPINE REGIONS

In regions subject to freeze/thaw conditions, James Hardie Weatherboards must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions must be protected where snow drifts over winter is expected.

The James Hardie Weatherboards have been tested in accordance with AS/NZS 2908.2 Clause 8.2.3.

10.3 PRODUCT SIZES AND MASS

Available sizes of James Hardie Weatherboards and their weights are given in Table 5. James Hardie Weatherboards are classified as a light weight wall cladding (not exceeding 30kg/m²) in accordance with NZS 3604.

11 Safe working practices

WARNING DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

James Hardie products contain respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) minimise dust when cutting by using either 'Score and Snap' knife, fibre cement shears or, where not feasible, use a HardieBlade™ Saw Blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area to avoid breathing dust; (4) wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods — never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheets available at www.jameshardie.co.nz.

Failure to adhere to our warnings, material safety data sheets, and installation instruction may lead to serious personal injury or death.

James Hardie recommended safe working practices

CUTTING OUTDOORS

Position cutting station so that wind will blow dust away from user or others in working area. Use one of the following methods based on the required cutting rate:

BEST

- Score and snap
- Hand guillotine
- Fibreshear

GOOD

- Dust reducing circular saw equipped with HardieBlade™ Saw Blade and HEPA vacuum extraction.

CUTTING INDOORS

- Cut only using score and snap, hand guillotine or fibreshears (manual, electric or pneumatic).
- Position cutting station in well-ventilated area

DRILLING/OTHER MACHINING

When drilling or machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

IMPORTANT NOTES:

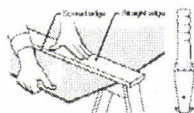
- For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"- level cutting methods where feasible
- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade™ logo
- NEVER dry sweep — Use wet suppression or HEPA Vacuum
- NEVER use grinders
- ALWAYS follow tool manufacturer's safety recommendations
- P1 or P2 respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.co.nz to help you determine the most appropriate cutting method for your job requirements. 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

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

SCORE AND SNAP

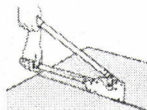
Score and Snap is a fast and efficient method of cutting the product using special tungsten tipped Score and Snap knife.



Preferably score on the face side of the product. Score against a straight edge and repeat the action to obtain adequate depth for clean break — normally 1/3 of sheet thickness. Snap upwards to achieve break. Smooth any rough edges with a rasp.

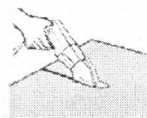
HAND GUILLOTINE

Make guillotine cut on the off-cut side of line to allow for the thickness of the blade.



FIBRESHEAR HEAVY DUTY

An electrically powered, fast, clean and effortless way of cutting James Hardie building products, especially around curves such as archways. Make Fibreshear cut on the "off-cut" side of the line to allow for the thickness of the shear.



HARDIEBLADE™ SAW BLADE

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



HOLE-FORMING

For smooth clean cut circular holes:
Mark the centre of the hole on the sheet.
Pre-drill a 'pilot' hole.

Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill.

For irregular holes:

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



STORAGE AND HANDLING

All James Hardie building products should be stored to avoid damage, with edges and corners of the sheets protected from chipping. James Hardie building products must be installed in a dry state and be protected from rain during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water or moisture, etc.

QUALITY

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

12 Product sizes

Table 5

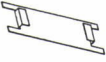
Product information								
Product	Length (mm)	Width (mm)	Thickness (mm)	COVERAGE INFORMATION				Pallet weight kg (60/120 units/ pack)
				Effective Cover	No. of planks/ metre height	Mass kg/ lineal m (approx. at EMC)	Mass kg/m2 approx. at EMC)	
Smooth	4200	180	7.5	150	6.7	2.4	16.0	600/1170
	4200	240	7.5	210	4.8	2.6	13.7	770/1540
	4200	305	7.5	275	3.6	3.6	12.9	950/1900
Rusticated	4200	205	7.5	175	5.7	2.6	14.9	700/1350
Styleline	4200	205	7.5	175	5.7	2.6	14.9	700/1350
Colonial	4200	205	7.5	175	5.7	2.6	14.9	700/1350
Frontier	4200	245	7.5	215	4.7	3.1	14.4	790/1580
	4200	310	7.5	280	3.6	3.8	13.6	970/1950

Note: All dimensions provided are based on nominal only and subject to manufacturing tolerances.

*The effective thickness of finished 7.5mm James Hardie Weatherboards on the wall at the lap is approx 17-19mm.

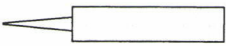
13 Accessories

Accessories supplied by James Hardie for James Hardie Weatherboards

	External Corner Soaker - 310 - 245 - 180	303930 303931 303932	310 245 180	Etch Primed Aluminium Self colour
	Concealed Back Soaker - 310 - 245 - 205 - 180	303933 303934 303935 303936	310 245 205 180	Etch Primed Aluminium Self colour
	External Flashing (box) - 3000 - 2700	300852 300851	3000 2700	uPVC
	External Corner (box) mould - 3000 - 2700 - 2400	300380 300378 300376	3000 2700 2400	Etch Primed Aluminium
	External Corner Mould 135° - 2700	300375	2700	Etch Primed Aluminium
	Weatherboard Cap Mould - 3000	300995	3000	uPVC
	Internal 'W' Corner Mould - 2700	300870	2700 long	uPVC
	Internal Corner Mould 135° - 2700	300383	2700 long	Etch Primed Aluminium
	Corner Underflashing - 50 x 50	303745	3000 long	uPVC
	Vent Strip	302490	3000 long	PVC White
	Internal 'W' corner - 2400 - 2700	300385 300386	2400 long 2700 long	Etch Primed Aluminium
	HardieFlex™ nail - 5kg	304253	75 x 3.15mm	316 Stainless Steel
	HardieFlex™ nail - 5kg	304251	75 x 3.15mm	Hot Dip Galvanised
	HardieDrive™ Screw - self drilling and embedding Timber screw 100 jar	300928	7g x 30mm	316 Stainless Steel

Accessories not supplied by James Hardie for James Hardie Weatherboards

James Hardie recommends the following products for use in conjunction with its Weatherboards. James Hardie does not supply these products. Please contact component manufacturer for information on their warranties and further information on their products.

	ACCESSORY AND MATERIAL NUMBER	SIZE (MM)	MATERIAL/APPEARANCE
	HardieFlex™ nail	40 x 2.8mm and 50 x 2.8mm	316 Stainless Steel
	HardieFlex™ nail	40 x 2.8mm and 50 x 2.8mm	Hot Dip Galvanised
	Flexible sealant ie: Sikaflex AT Facade	Tube	Cured rubberised compound
	PEF rod Sika Boom or similar	Polyethylene foam	Semi rigid foam
	Flashing tape Tyvek, Protecto Wrap or similar	Proprietary tape to adhere to building wrap	
	Flashing to Table 20 'E2/AS1'	Refer Figure 13	Flashing fabricator
	Timber Scriber	As required	H3.1 Treated Timber. Timber Merchant or cut on site
	Cant Strip Redway Developments 03 358 5775	To suit	uPVC
	Stain available from Timbercote Tel: 0800 724 642 Wattyl Tel: 0800 735 551	To suit	
	Scoring knife		

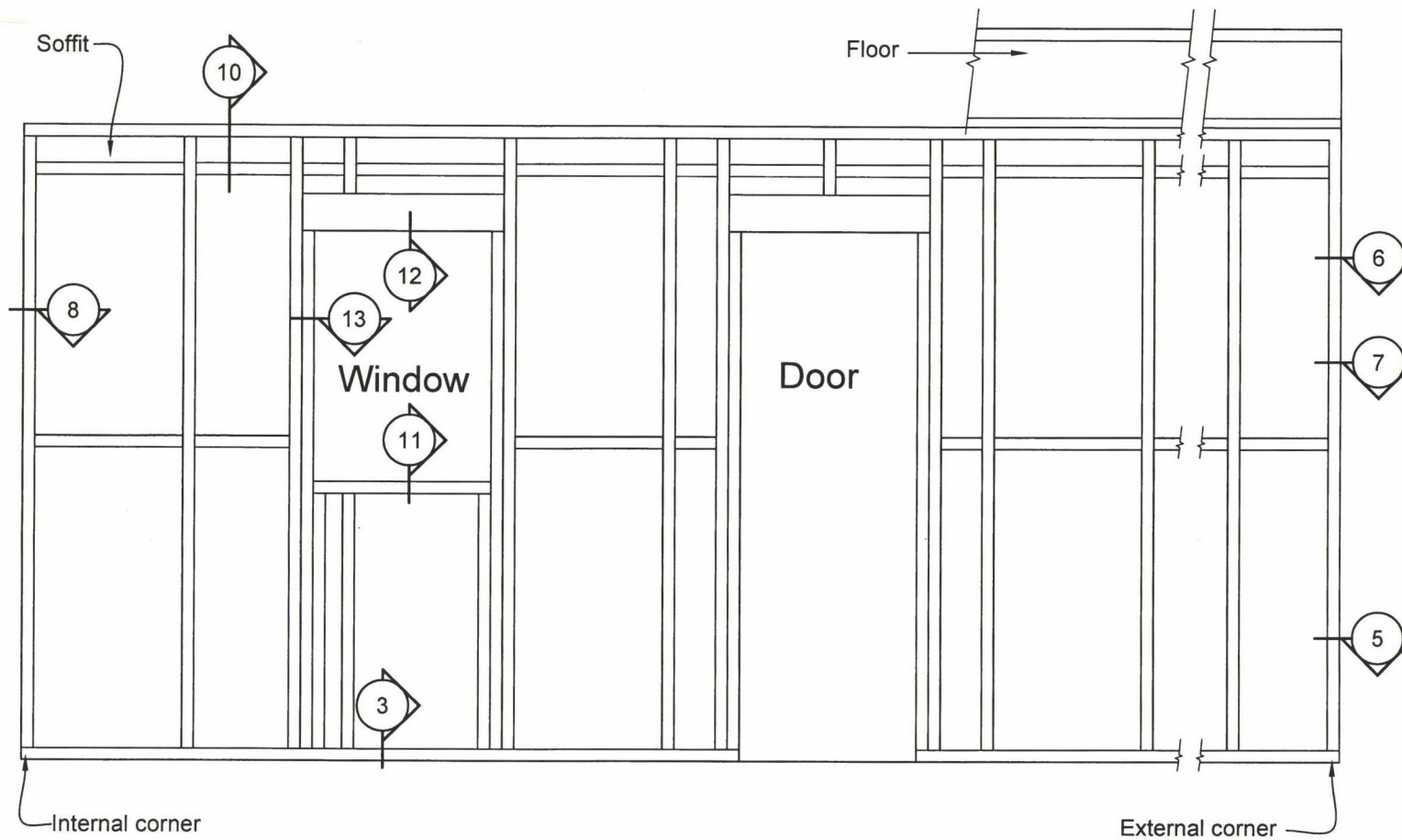
14 Details

Various details outlined in the following table are available on Pages 15 to 38.

Table 7

Details				
DESCRIPTION	DIRECT FIXED		CAVITY CONSTRUCTION	
	FIGURE	PAGE	FIGURE	PAGE
Framing Setout	Figure 1	15		
Sheet Fixing Setout	Figure 2	16	Figure 16	26
Concrete Footing	Figure 3	17	Figure 17	27
Weatherboard Fixing	Figure 4	18	Figure 18	28
uPVC or Aluminium Box Corner	Figure 5	19	Figure 19	29
External Boxed Corner	Figure 6	19	Figure 20	29
External Corner Soaker	Figure 7	20	Figure 21	30
Internal 90° uPVC or Aluminium 'W' Mould	Figure 8	20	Figure 22	30
Internal 135° Aluminium 'W' Mould	Figure 9	21	Figure 23	31
Soffit Detail	Figure 10	21	Figure 24	31
Sill Flashings without Facings	Figure 11	22	Figure 25	32
One Piece Head Flashing without Facings	Figure 12	22	Figure 26	32
Jamb Flashing without Facings	Figure 13	23	Figure 27	33
Batten Setout			Figure 14 and 28	24 and 34
Batten Fixing			Figure 15	25
Parapet Flashing			Figure 29	35
Meter Box at Head			Figure 30	35
Meter Box at Sill			Figure 31	36
Meter Box at Jamb			Figure 32	36
Pipe Penetration			Figure 33	37
One Piece Apron Flashing Joint			Figure 34	38

Figure 1: Direct fix framing setout



Wall Elevation

Note!
Section notations refer to dwg numbers.

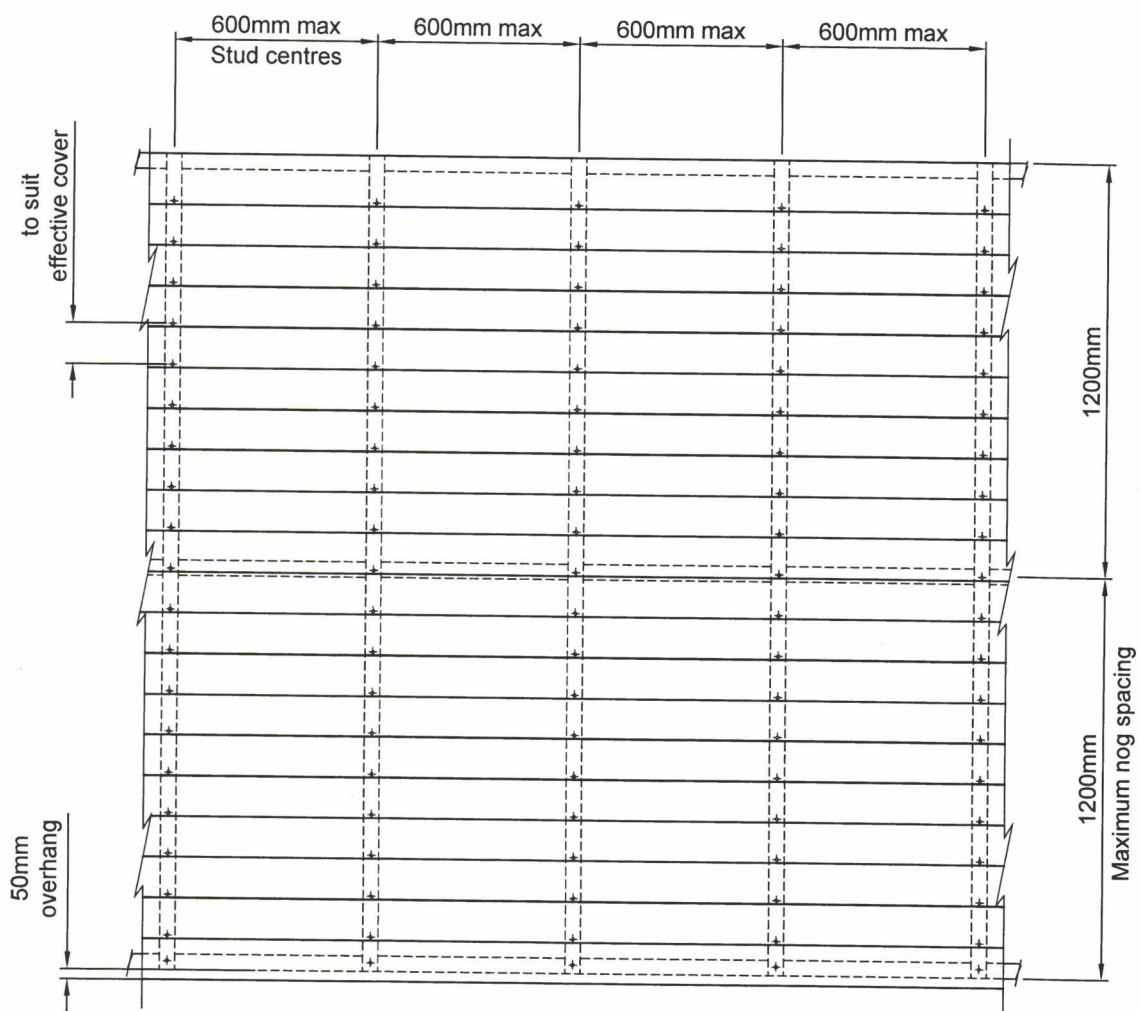


Figure 2: Direct fix sheet fixing setout

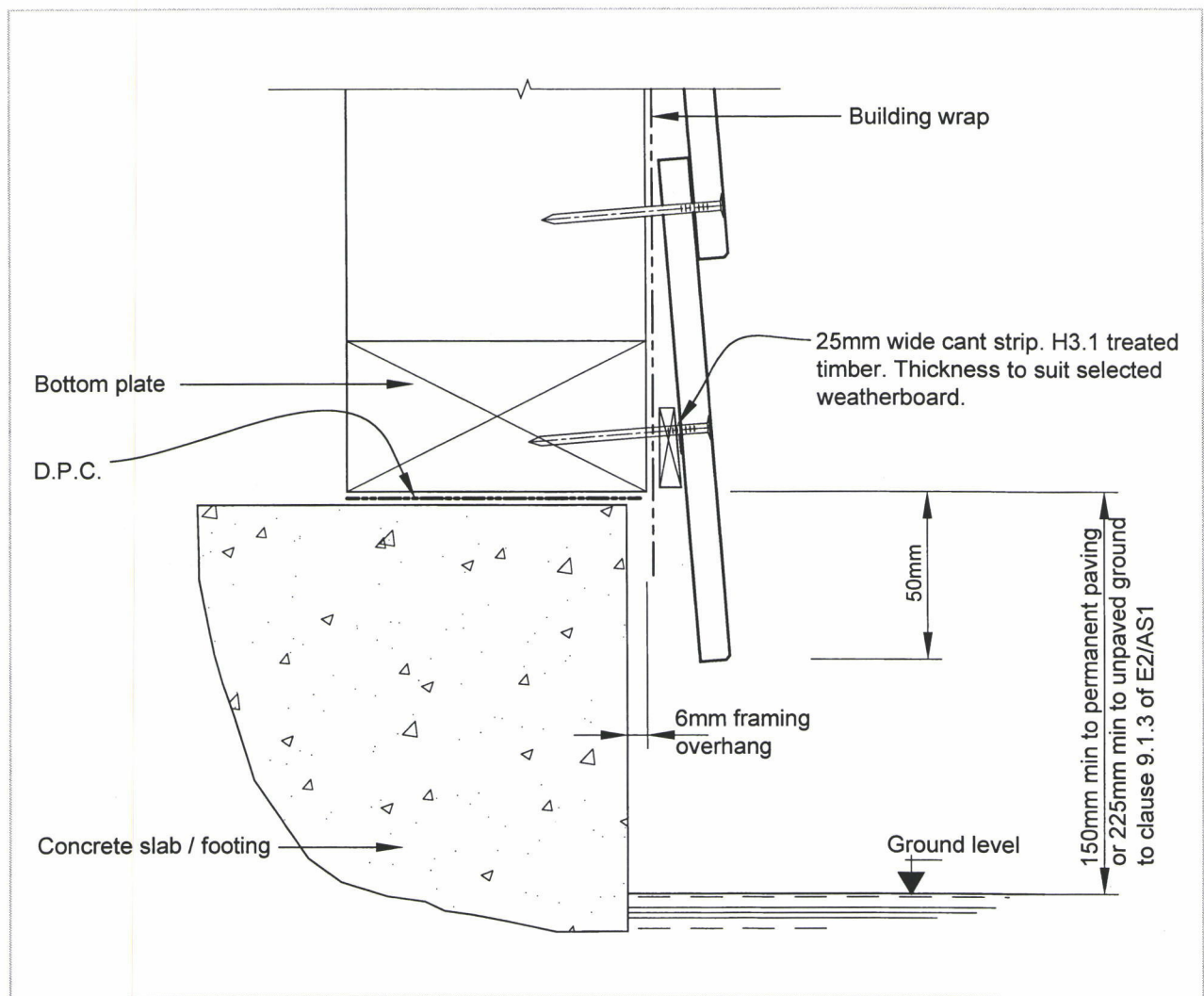
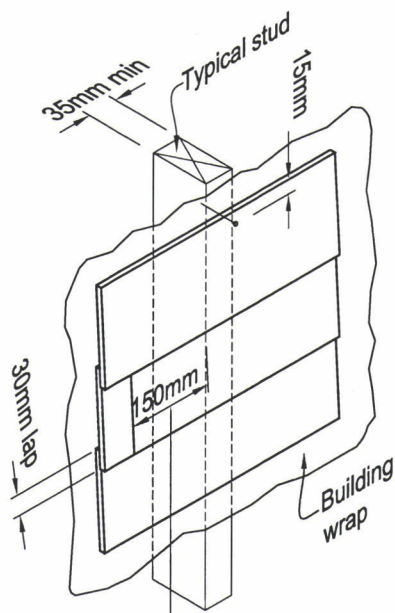
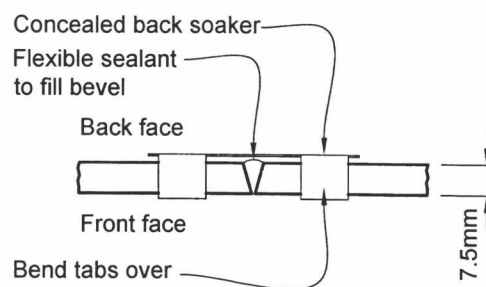


Figure 3: Direct fix concrete footing

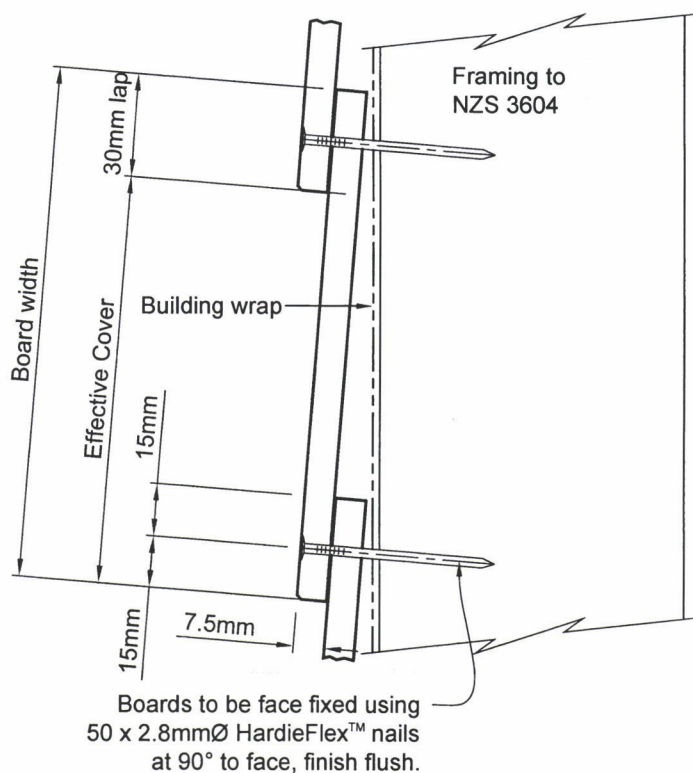


Concealed back soaker joint in weatherboard to be 150mm minimum from side of stud.
Joints must be staggered by 600mm minimum

Jointing Off Stud



Concealed Back Soaker Joint



Face Nailing

Figure 4: Direct fix weatherboard fixing

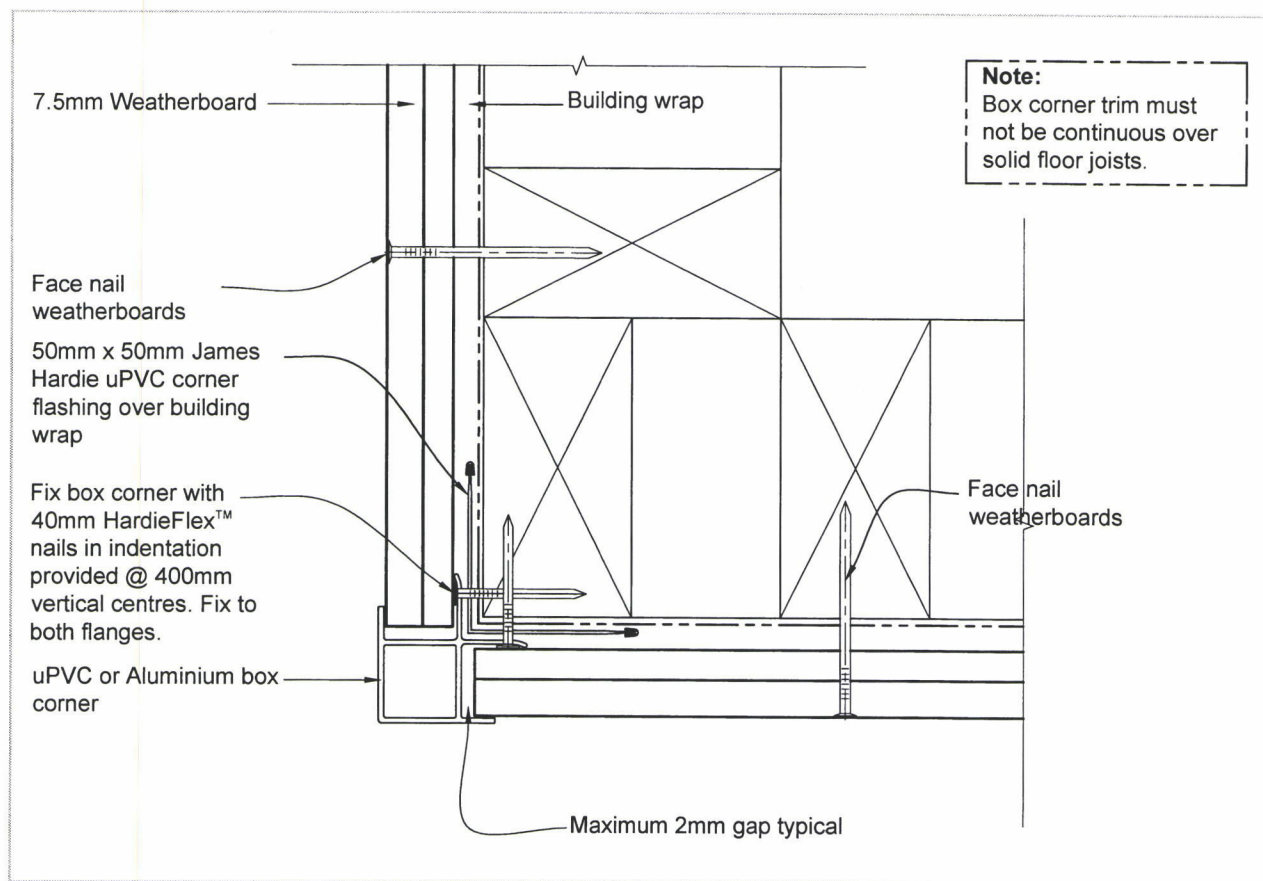


Figure 5: Direct fix uPVC or aluminium box corner

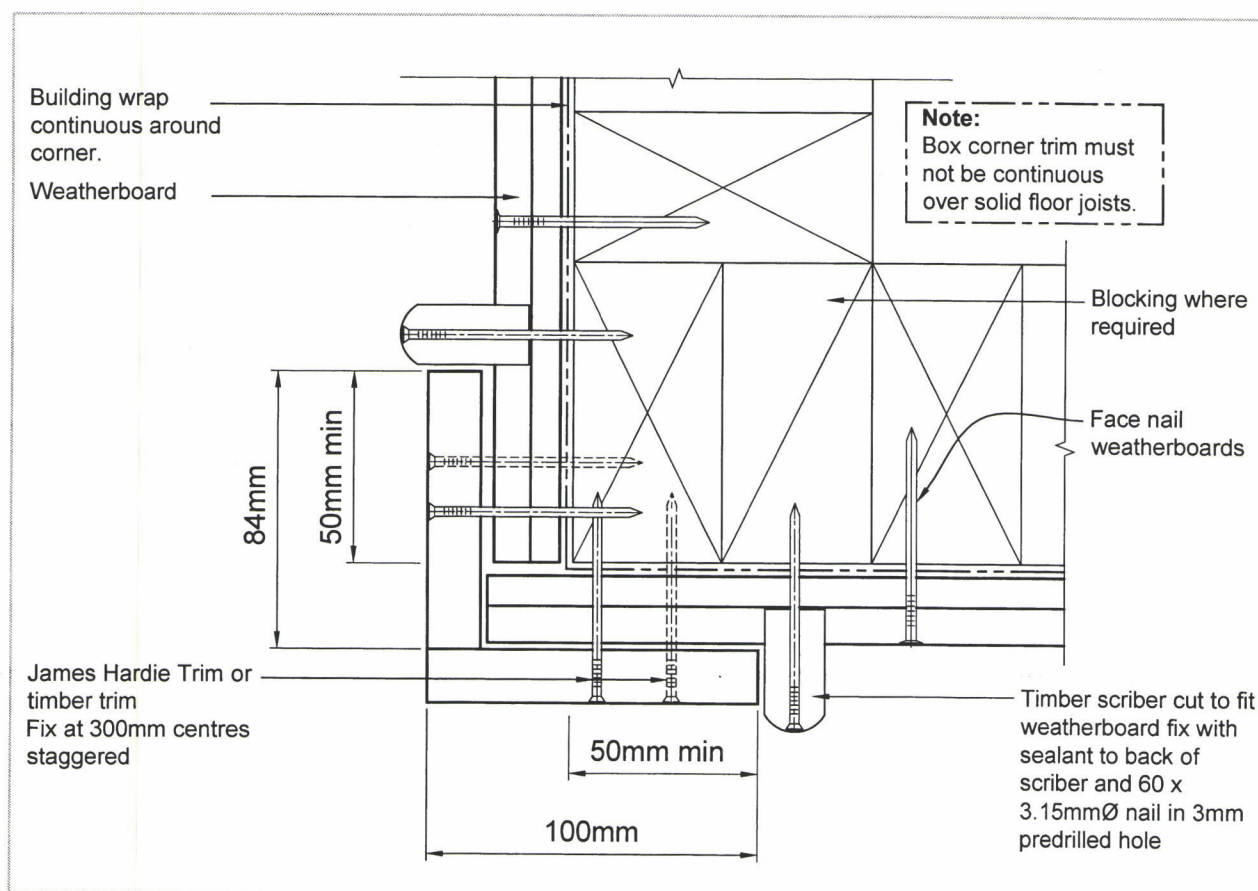
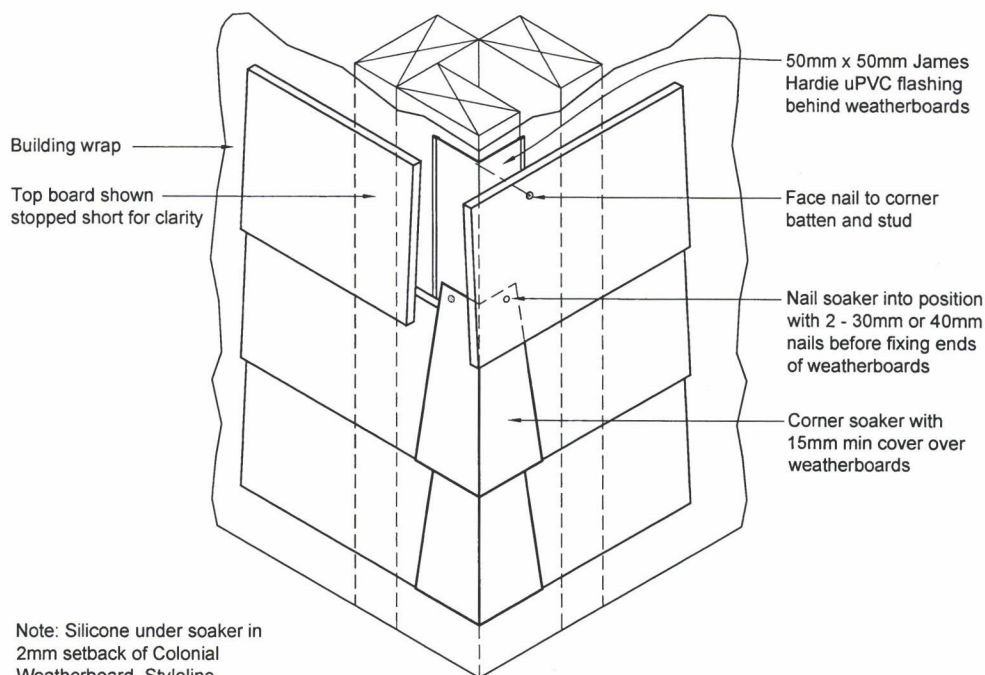


Figure 6: Direct fix external boxed corner

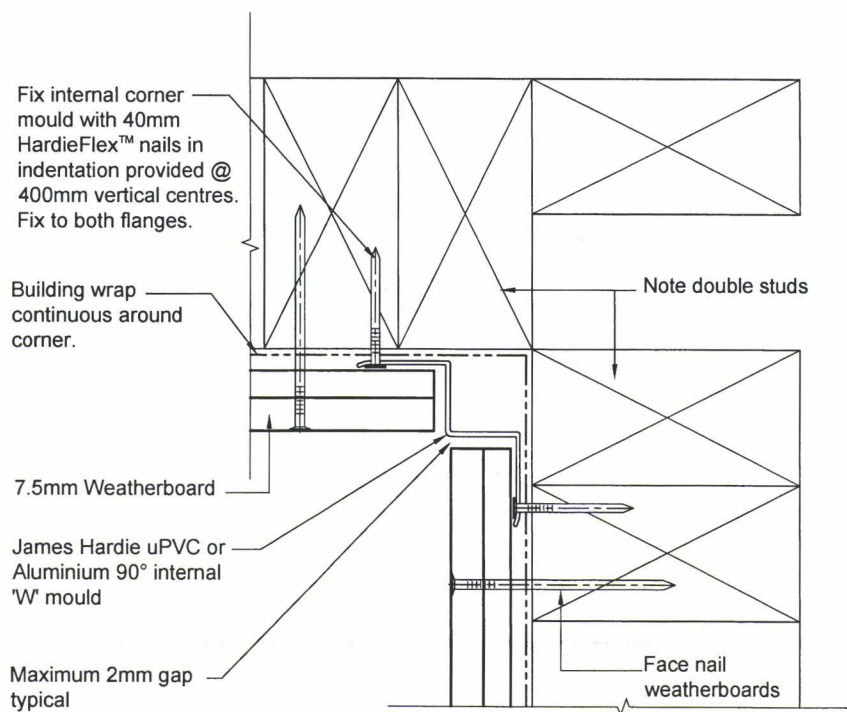


Note: Silicone under soaker in 2mm setback of Colonial Weatherboard, Styleline Weatherboard and Rusticated Weatherboard.

Corner Soaker

Soaker material	Nail material
Aluminium or Galvanised Steel	Hot dip galvanised or Stainless Steel as required for durability

Figure 7: Direct fix external corner soaker



Note:
uPVC or Aluminium mould must not be continuous over solid floor joists.

Figure 8: Direct fix internal 90° uPVC or aluminium 'W' mould

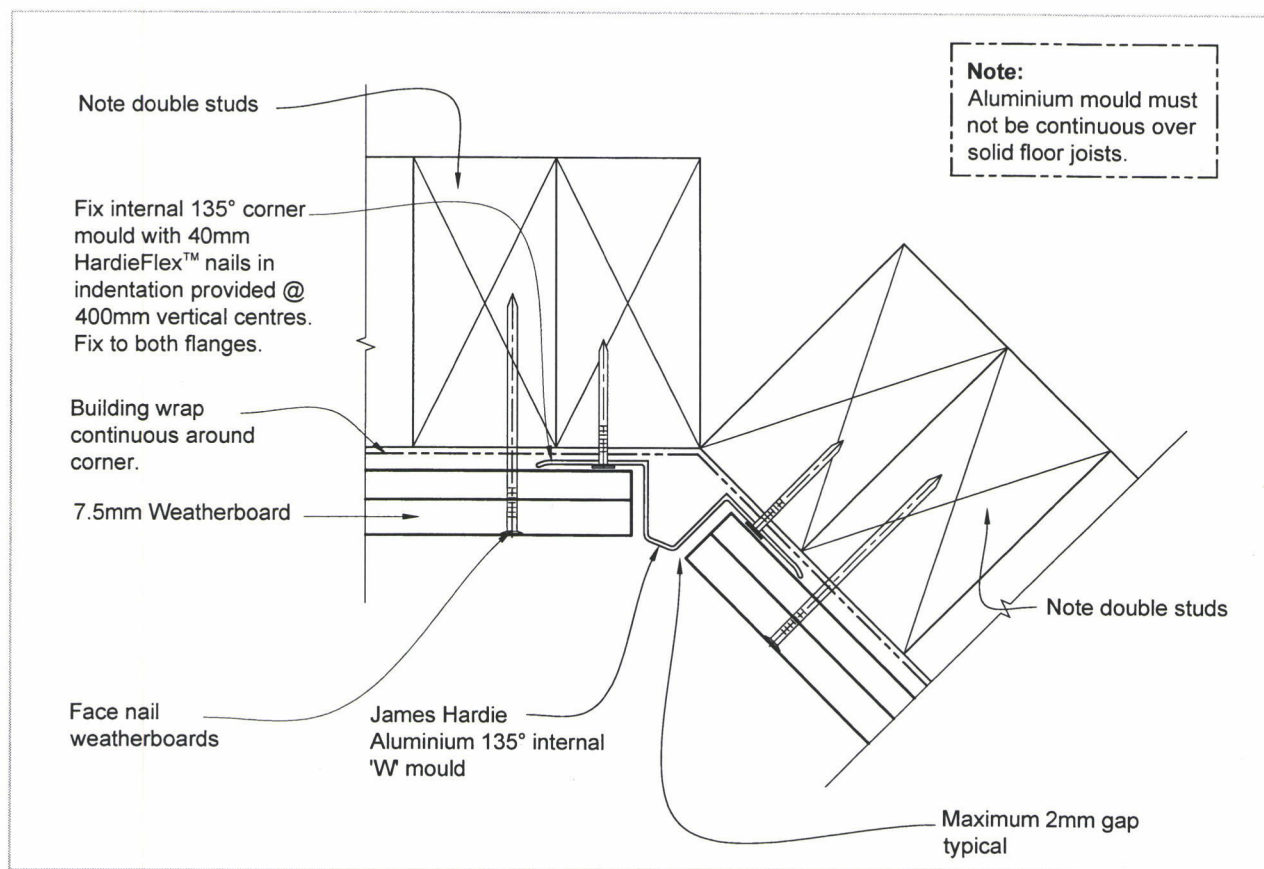


Figure 9: Direct fix internal 135° aluminium 'W' mould

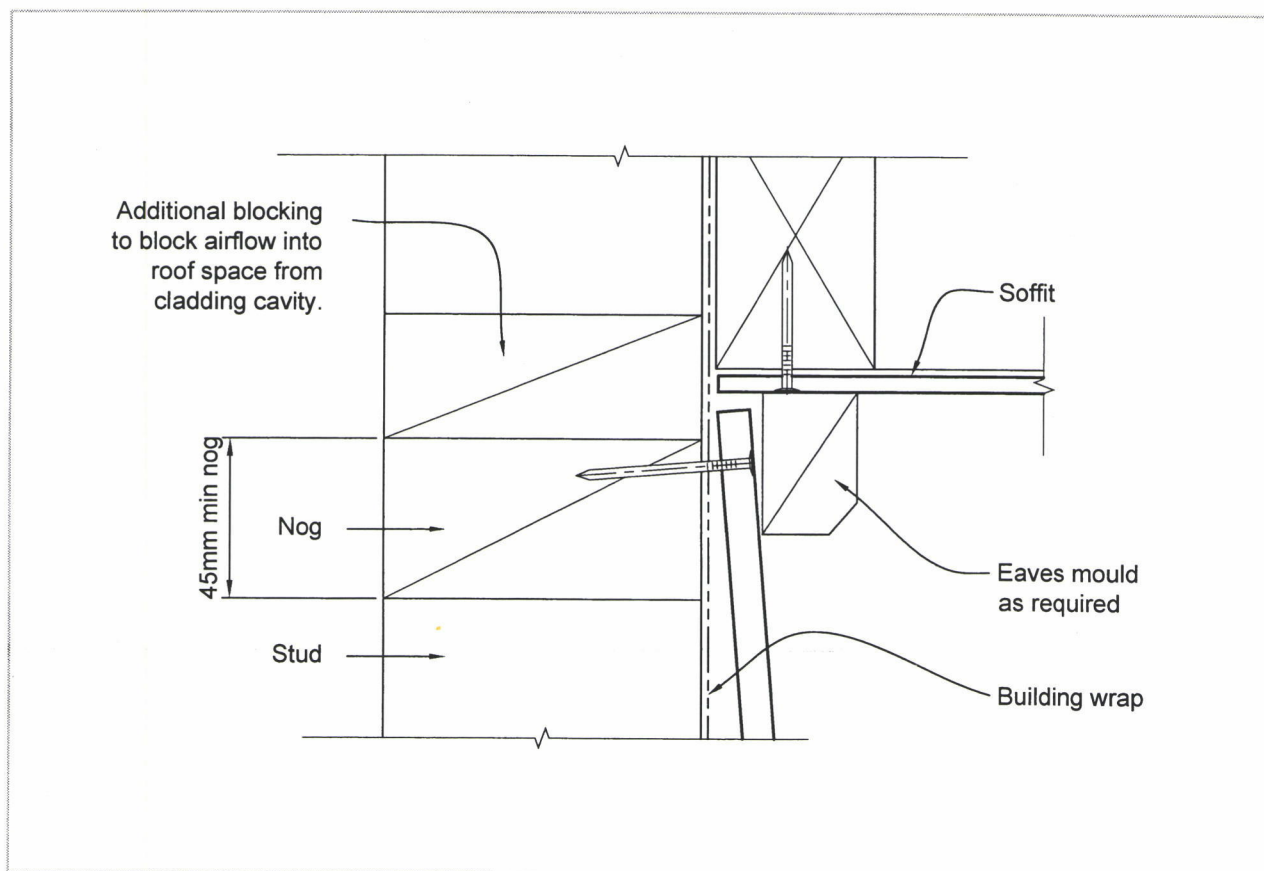
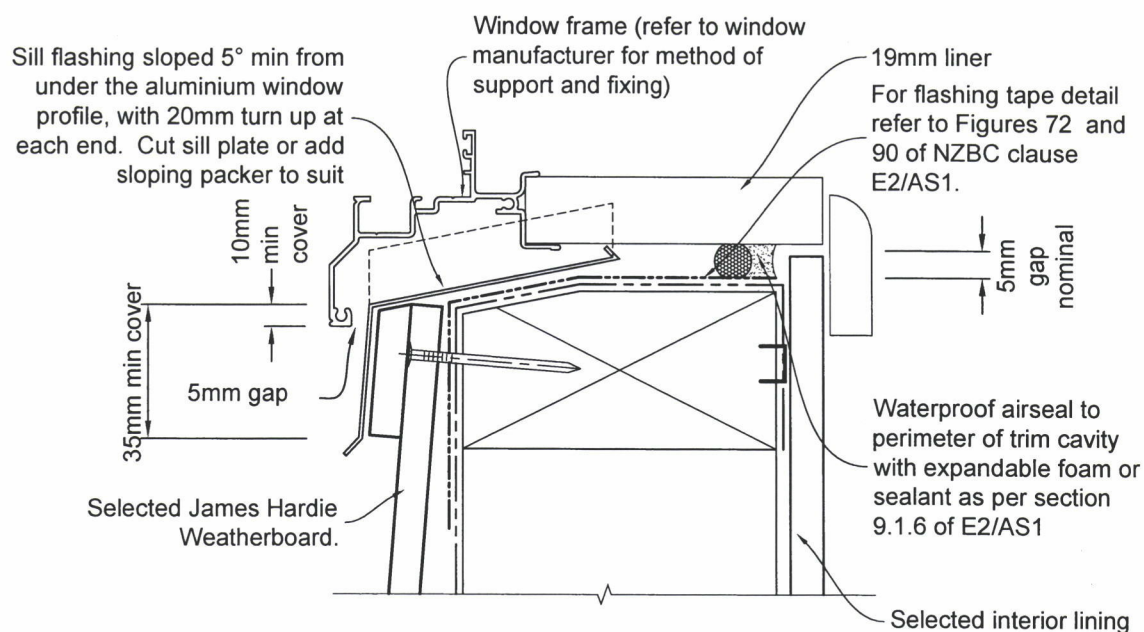


Figure 10: Direct fix soffit detail



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. Building wrap must comply with acceptable solution 'E2/AS1' and NZS 3604.
3. Flashing tape must have proven compatibility with the selected building wrap and other materials with which it comes into contact as per Table 21 of 'E2/AS1'.

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

Figure 11: Direct fix window sill flashings without facings

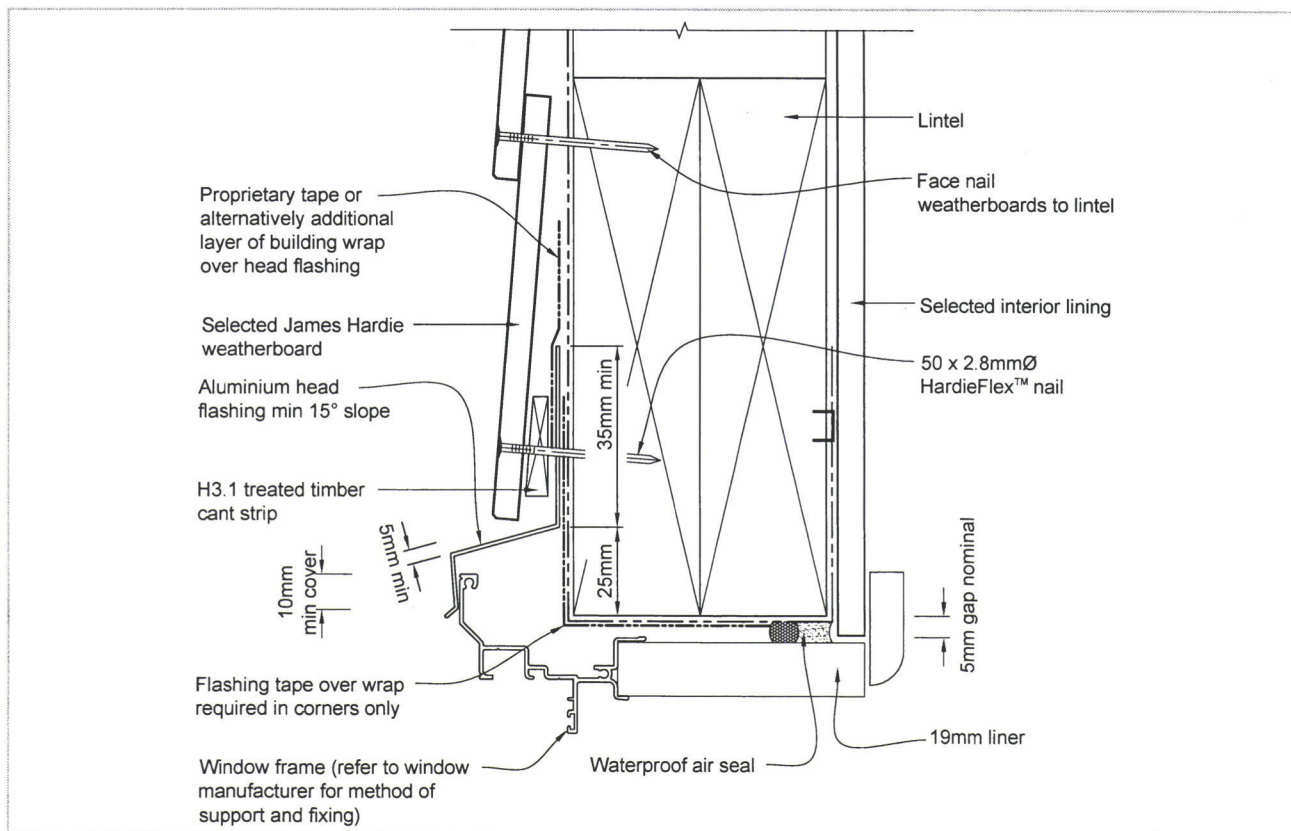


Figure 12: Direct fix one piece head flashing without facings

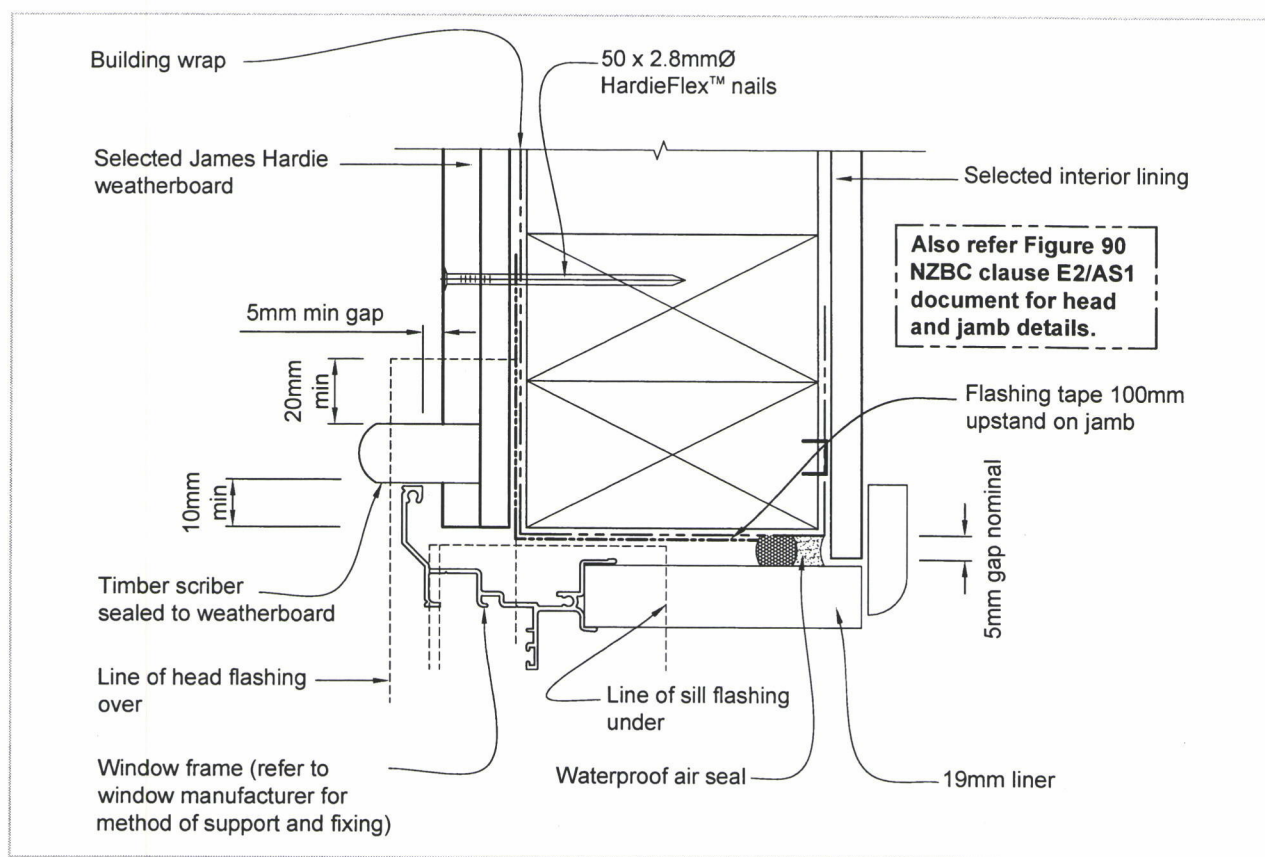


Figure 13: Direct fix jamb flashing without facings

Thermakraft

THERMAKRAFT 213 BITUMINOUS HEAVY WEIGHT BUILDING PAPER

APPLICATION AND INSTALLATION

Product Description

THERMAKRAFT 213 BITUMINOUS HEAVY WEIGHT BUILDING PAPER is specifically designed for use in Domestic and Commercial type buildings.

THERMAKRAFT 213 is a black breathable, absorbent bituminous wall and roofing underlay.

THERMAKRAFT 213 will provide the following functions:

- Reduce wind entry into the cavity, thereby assisting the performance of thermal insulation.
- Highly water vapour permeable, thereby allowing excess water vapour which might otherwise condense in the structure, to escape.
- Provides a temporary protection against wind, dust, rain and other weathering elements until the external cladding is applied.

THERMAKRAFT 213 is not designed for use in extreme weather conditions.

Applications

THERMAKRAFT 213 is suitable as a wall and roofing underlay with all cladding types, and it can be used as a wall and roofing underlay where Fire Retardancy is **NOT** required.

THERMAKRAFT 213 is suitable as a roofing underlay when installed to the Roofing Code of Practice, supported on **Thermakraft Safety Mesh** 300mm x 150m or hexagonal netting 50mm or 75mm, or **Thermakraft Arctic White Thermastrap 203**, or **Thermakraft Thermastrap 201**.

THERMAKRAFT 213 must not be left exposed to the elements for more than 7 days as a roofing underlay, or 28 days as a wall underlay. Cladding on the same day is recommended.

THERMAKRAFT 213 cannot be used as an Air Barrier. Use **Thermakraft Synthetic Wall Underlays** (refer **Thermakraft Customer Services** on **0800 806 595**) or use **Thermakraft 215 Bituminous Self Supporting Roofing Underlay**.

NOTE: THERMAKRAFT 213 must not be used with a roof pitch below 10 degrees. For applications with a Roof pitch <10 degrees, **Thermakraft** recommends **Thermakraft COVERIEK407** or **Thermakraft 215 Self Supporting Roofing Underlay**. If Fire Retardancy (F1 <5) is required, use **Thermakraft COVERIEK407**.

Installations Roofing

THERMAKRAFT 213 can only be used at pitches of 10 degrees or above, and may run horizontally on netting starting at the gutter and working up the roof slope with a minimum 150mm lap. **THERMAKRAFT 213** may be run vertically on netting starting at the gutter to the ridge with a minimum 150mm lap. Secure to rafters/trusses using appropriate fixing clouts or clips. Wire netting must be stretched and tight.

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.

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Thermakraft

CI/SfB			
MAY 2012			

THERMAKRAFT 213

BITUMINOUS HEAVY WEIGHT BUILDING PAPER

APPLICATION AND INSTALLATION

Installations Wall

THERMAKRAFT 213 should be fixed to the exterior face of the framing, running horizontally. Start at the lower edge 20mm past the perimeter joists and run to the top of the framing. A minimum of 75mm overlapping is recommended. Fix with **Thermakraft Arctic White Thermastrap 203** or **Thermastrap 201** to the outside face of the studs with 8-12mm staples at 300mm centres.

NOTE: For wall cavity systems, NZBC Acceptable Solution E2/AS1 Paragraph 9.1.5.5 requires where stud spacings are greater than 450mm centres, an intermediate means of restraining the building underlay and insulation from bulging into the drained cavity shall be installed. An acceptable means of achieving this is by fixing **Thermakraft Arctic White Thermastrap 203** or **Thermakraft Stud Strap** horizontally at 300mm centres.

Storage

THERMAKRAFT 213 should be stood on end in dry conditions. Protect from the weather and direct sunlight.

Roll Dimensions

1370mm x 73.0m = 100m ²	23kg
1370mm x 36.5m = 50m ²	11.5kg (2 per pack)
1340mm x 19.0m = 25m ²	5.7kg (3 per pack)

For more information regarding **Thermakraft COVERTEK₂₀₇ FIRE RETARDANT SELF SUPPORTING ABSORBENT BREATHABLE SYNTHETIC NON WOVEN ROOFING UNDERLAY** refer to the "DESIGNER and USER GUIDELINES" - Direct and Cavity Fix, or contact **Thermakraft Customer Services** on **0800 806 595**.

THERMAKRAFT 213 BITUMINOUS HEAVY WEIGHT BUILDING PAPER

TECHNICAL SPECIFICATIONS

Technical Data

THERMAKRAFT 213 BITUMINOUS HEAVY WEIGHT BUILDING PAPER complies with the requirements of NZBC E2/AS1 Table 23.

Nominal Grammage 230g/m2

NZBC E2/AS1 TABLE 23 AS A WALL UNDERLAY REQUIREMENTS		
NZBC E2/AS1 TABLE 23 WALL UNDERLAY PROPERTIES	PROPERTY PERFORMANCE REQUIREMENTS	PROPERTY PERFORMANCE
Absorbency	≥ 150 gsm	Pass
Vapour Resistance	≤ 7 MN.s/g	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	$\leq 0.5\%$	Pass
Water Resistance	≥ 100 mm	Pass

NZS2295:2206 Classification		
Flammability Index		Non Fire Retardant
Wind Zone	R1 and W2	Up to Very High
NZS2295:2006 Classification	R1 and W2	Heavy Weight

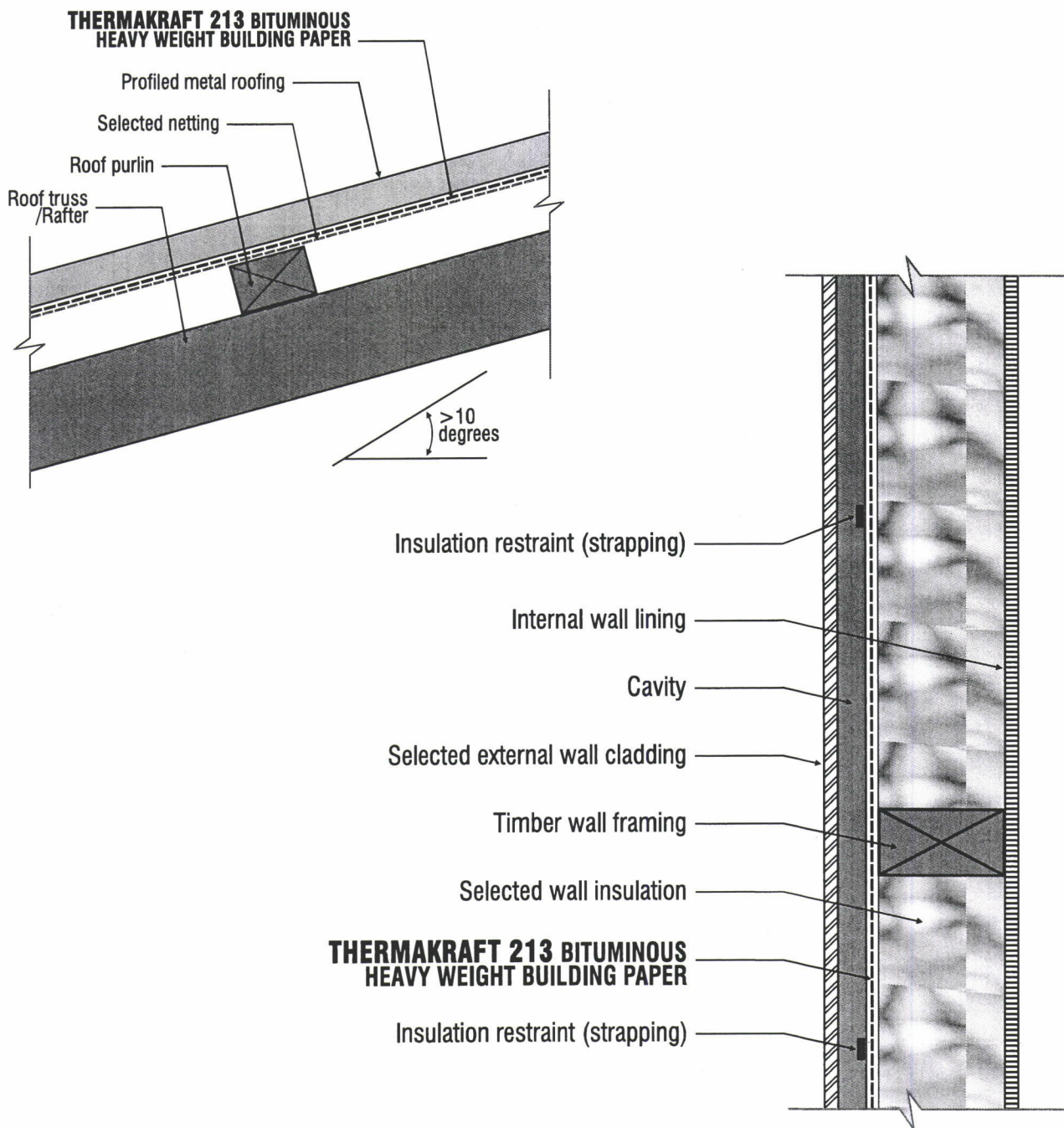
Durability/Limitations

For **THERMAKRAFT 213** to meet the Performance Requirements of NZBC Clause B2, Durability B2.3.1(a) 50 years and B2.3.1(b) 15 years, E2 External Moisture providing;

- installed in accordance to the Application and Installation Guidelines,
- run length no greater than 10 metres,
- is not left exposed for more than (7 days) roof,
- is not left exposed for more than (28 days) wall,
- installed in medium wind zones or below,
- when used on LOSP treated timber, the timber must be free of solvent,
- installed by a licensed building practitioner,
- installed in accordance with the Roofing Code of Practice.

THERMAKRAFT 213 BITUMINOUS HEAVY WEIGHT BUILDING PAPER

TECHNICAL SPECIFICATIONS



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.



Demand Calculation Sheet

Job Details

Name:	Aaron Randell
Street and Number:	15 Morey St
Lot and DP Number	Lot 1 DPS 72937
City/Town/District	Rotorua
Designer	Rob Stevenson
Company	Plotz 'N' Planz
Date	20-02-17

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Light
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	20
Roof Height above Eaves (m)	0.96
Building Height to Apex (m)	3.70
Ground to Lower Floor (m)	0.225
Average Stud Height (m)	2.90
Building Length (m)	2.20
Building Width (m)	3.31
Building Plan Area (m²)	7.30

Building Location

Wind Zone = Low

Wind Region	A
Lee Zone	No
Ground Roughness	Urban
Site Exposure	Sheltered
Topography Class	T1

Earthquake Zone 2

Soil Type	D & E (Deep to Very Soft)
Annual Prob. of Exceedance:	1 in 500 (NZS3604:2011 Default)

Bracing Units required for Wind

	Along	Across
Single Level	69	38

Bracing Units required for Earthquake

	Along & Across
Single Level	28

Single Level Along Resistance Sheet

Job Name: Aaron Randell

Wind	EQ
Demand	
69	28
Achieved	
297 430%	282 1008%

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind BUs	EQ BUs		
A	1	0.84		2.40	BL1-H	GIB®	93	86		
	2	0.84		2.40	BL1-H	GIB®	93	86		
									186 OK	172 OK
B	1	0.66		2.90	BL1-H	GIB®	56	55		
	2	0.66		2.90	BL1-H	GIB®	56	55		
									111 OK	111 OK

Single Level Across Resistance Sheet

Job Name: Aaron Randell

									Wind	EQ
									Demand	
									38	28
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind BUs	EQ BUs	314 825%	272 971%
M	1	1.20		2.90	BL1-H	GIB®	127	103		
									127 OK	103 OK
N	1	0.90		2.90	BL1-H	GIB®	84	76		
	2	0.90		2.40	BL1-H	GIB®	102	92		
									186 OK	169 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
CHH	EP1 400	0.4	80	95
CHH	EP1 600	0.6	95	105
CHH	EP1 1200	1.2	120	135
JNL	9mm STRAND	0.6	100	115
GAMMA	GBF 450	0.45	105	122.222



Specification Code	Minimum Length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING**Timber Floor**

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

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

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

Concrete floor

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

WALL LINING

One layer 10mm or 13mm GIB® Braceline.

Sheets can be fixed vertically or horizontally.

Sheet joints shall be touch fitted.

Use full length sheets where possible.

PERMITTED SUBSTITUTION

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

FASTENING THE LINING**Fasteners**

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

Fastener centres

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

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

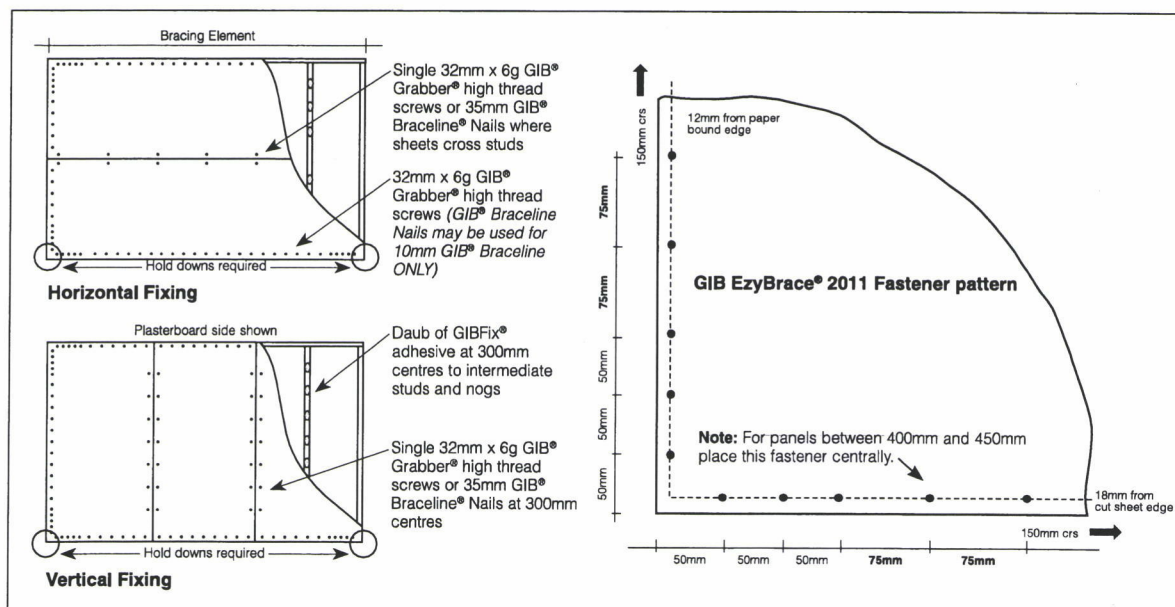
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

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

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

JOINTING

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



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





WATERGATE PLUS 295

SYNTHETIC WALL UNDERLAY

The ultimate wrap, all walls, all systems

Watergate Plus 295 is a fire retardant, absorbent, breathable wall underlay. It is a white composite Non-woven polypropylene, specifically designed as a wall underlay behind exterior wall cladding. Watergate Plus 295 also offers a high degree of water resistance, with a high level of water vapour permeability.

ADVANTAGES

- » Can be used as a wall underlay on timber and steel framed buildings with absorbent and non-absorbent wall cladding direct fixed to framing.
- » Can be used as a wall underlay on timber and steel framed buildings with absorbent and non-absorbent wall cladding installed over an 18mm minimum drained cavity.
- » Is suitable for use in all Wind Zones of NZS 3604 up to, and including, "Very High", when used as standalone flexible underlay, and Extra High when used as a flexible underlay over a rigid wall underlay.
- » Will provide temporary weather protection during construction. (Max 60 Days)
- » Can be used as a non-rigid backing material for Stucco Plaster*
- » May be used as a slip layer over rigid backing for Stucco*
- » Is fire retardant*
- » Unaffected by LOSP treated timber.
- » Is suitable as an air barrier in unlined walls

* Refer technical specifications



BRANZ Appraised
Appraisal No.695 [2010]



Thermakraft Watergate 295 - Technical Specification

Fire Retardant | Breathable | Absorbent | Non Woven | Wall Underlay

Thermakraft Watergate Plus 295 can be used as a wall underlay on timber and steel framed buildings within the following scope:

- » The scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, with regards to building height and floor plan area; and,
- » With absorbent wall claddings directly fixed to timber and steel framing; and,
- » With non-absorbent wall claddings directly fixed to timber and steel framing; and,
- » With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity;
- » With masonry veneer in accordance with NZS 3604, NZBC Acceptable Solution E2/AS1 for timber framed buildings, or specific engineering design for steel framed buildings; and,
- » Situated in NZS3604 Building Wind Zones up to, and including 'Very High' when used as a standalone flexible underlay, and "Extra High" when used as a flexible underlay over a rigid wall underlay.
- » Can be used as a non-rigid backing material for Stucco Plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1 Paragraph 9.3.5.1. The Underlay must be supported with 75mm galvanized mesh, or Thermakraft Stud Strap Hand Held or wire at 150mm centres run across cavity battens to limit deflection to a maximum of 5mm.
- » May also be used as a slip layer over rigid backing for Stucco Plaster in accordance with the requirements of NZBC E2/AS1 Paragraph 9.3.3(b).
- » Refer BRANZ Appraisal No 695 (2010) for full details.
- » May be used with LOSP treated timber.
- » Is suitable as an air barrier in unlined wall spaces.
- » Is suitable to be used in conjunction with thermal breaks on steel framed buildings.
- » Is suitable for direct fixing behind metal cladding.

Flammability Index

Thermakraft Watergate Plus 295 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/AS2 to C/AS6, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

Limitations

- » Must not be used as a roof underlay.

Durability

Meets 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
- » Installed in accordance with instructions
- » Is not left exposed for more than 60 days
- » Installed by or under guidance of Licensed Building Practitioners
- » Is compatible with cladding system used.

Table 1: NZBC E2/AS1 Alternative Solution to Table NZS2295 AS wall underlay requirements

NZBC E2/AS1 TABLE 23 (NZS2295) WALL UNDERLAY PROPERTIES	PROPERTY PERFORMANCE REQUIREMENTS	PROPERTY PERFORMANCE
Absorbency	≥ 100gsm	Pass
Vapour Resistance	≤ 7 MN.s/g	Pass
pH of Extract	≥ 5.5 and ≤ 8	Pass
Shrinkage	≤ 0.5%	Pass
Water Resistance	≥ 20mm	Pass
Air Resistance	≥ 0.1 MN.s/m ³	295 can be used as an air barrier

Roll Dimensions

WIDTH (MM)	LENGTH (M)	M ²
1370	18.5	25
1370	37.0	50
1370	73.0	100
2740	18.5	50
2740	36.5	100



For additional details and latest specifications www.thermakraft.co.nz



BRANZ Appraised
Appraisal No.695 [201]



Thermakraft Industries Ltd 11 Turin Place, East Tamaki, Auckland, New Zealand
P.O.Box 58-112, Botany, Auckland 2163 Phone 0800 806 595 or +64 9 273 3727
Fax +64 9 273 3726 Email info@thermakraft.co.nz www.thermakraft.co.nz

INTELLIGENT MEMBRANES FOR THE BUILDING INDUSTRY

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.

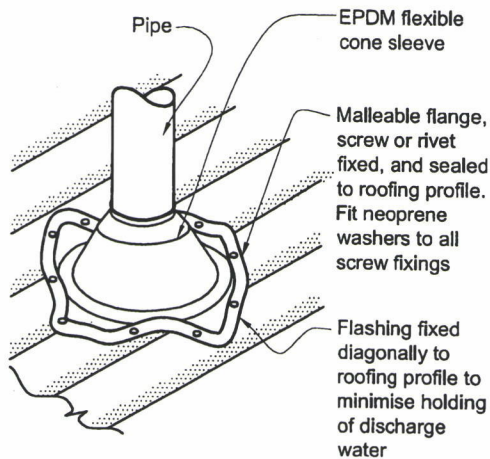
PENETRATIONS

Acceptable Solution E2/AS1

EXTERNAL MOISTURE

Figure 53: Flashing for small pipes

Paragraphs 8.3.10, 8.4.17, 9.6.8.5 and 9.6.9.6



NOTE:

- (1) Max. roof pitch for this flashing 45°, minimum pitch 10° if base of flange covers one or more complete troughs.
- (2) For pipes up to 85 mm diameter.

Amend 5
Aug 2011

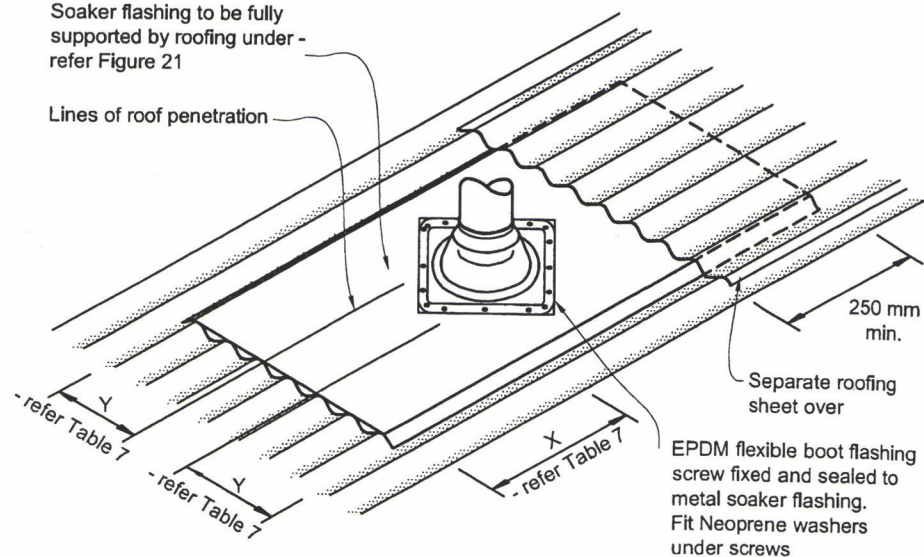
Figure 54: Soaker flashing for pipe penetrations

Paragraph 8.4.17

- NOTE:** (1) Suitable for pipes from 86 mm to 500 mm diameter.
(2) Suitable only for roof pitches of 10° or more.

Soaker flashing to be fully supported by roofing under - refer Figure 21

Lines of roof penetration

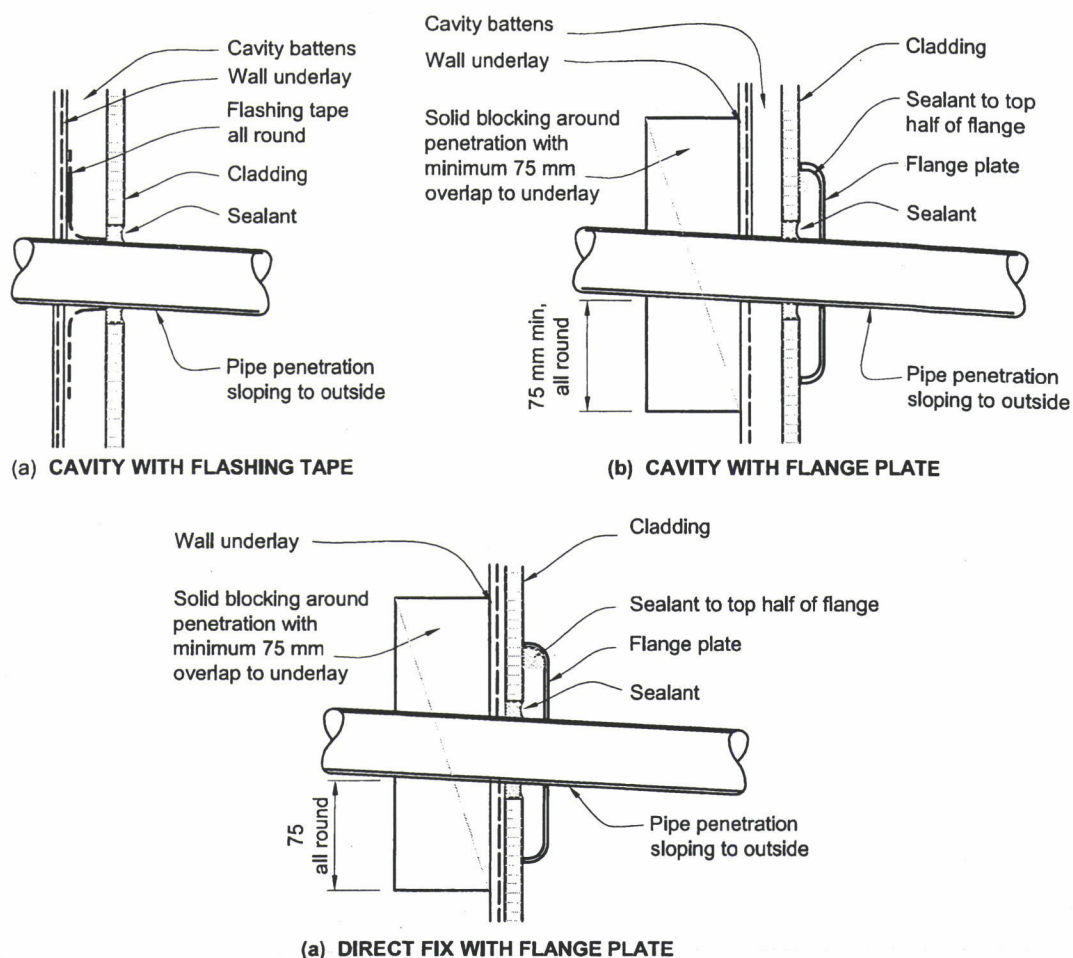


Amend 2
Jul 2005

Amend 2
Jul 2005

Amend 5
Aug 2011

Figure 68: General pipe penetration
Paragraph 9.1.9.3, Figure 126



Amend 5
Aug 2011

Amend 5
Aug 2011

COMMENT:

Where possible, pipe penetrations, meterboxes and similar penetrations should be located in sheltered areas of the *building*, such as a porch, or be installed behind a weatherproof glazed panel.

Amend 5
Aug 2011

Masport
Heating



MODELS:
OSBURN 1600 DRY
OSBURN 1600 WET
OSBURN 1600 MKII WET

Floor Protector Construction (Hearth)

For minimum Floor protector dimensions refer to following data. The floor protector must extend at least 300mm beyond the door opening of the heater (measured from glass) and 200mm to each side of the door opening. Floor protector specification (AS/NZS2918: 2001) minimum floor protector only eg. Ceramic tiles glued to a continuous sheet of 6mm fibre cement sheet. A provision has been made on the base (behind pedestal) for seismic restraint by bolting through the two holes through the hearth and floor.

Clearance Requirements

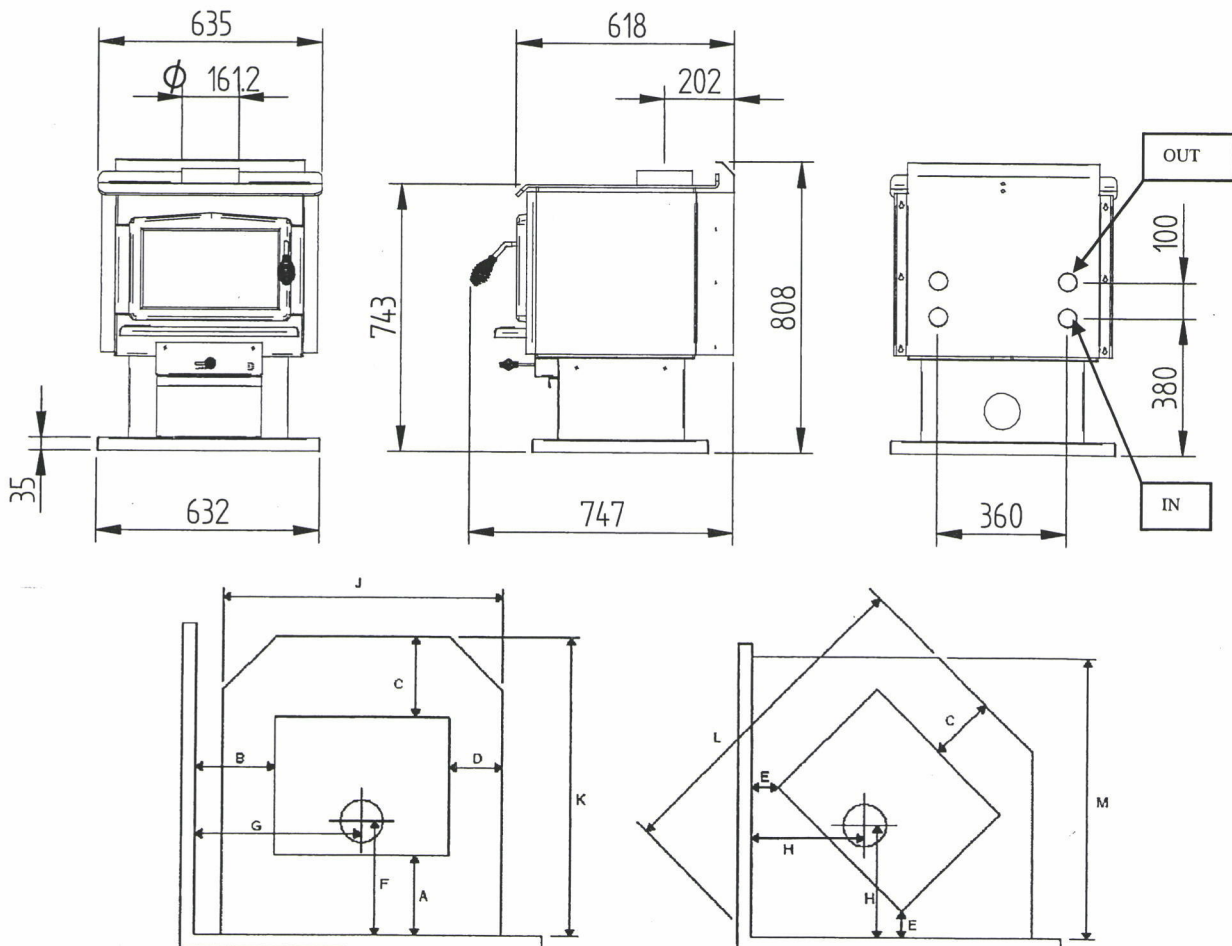
The Osburn 1600 (Dry or Wet) has been tested and complies to the Australian/New Zealand Standard AS/NZS 2918:2001 and all installations must be in accordance with the minimum clearances to combustibles indicated in these instructions.

The minimum clearances to combustibles may be reduced if the combustible walls are shielded with an approved non-combustible material. Details of suitable shielding materials and appropriate clearance reduction factors are present in Section 3 of AS/NZS 2918:2001.

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

NEW ZEALAND	A	B	C	D	E	F	G	H	J	K	L	M
With MASPORT double skin flue shield	100	360	300	81	150	300	678	483	796	1003	1386	1156

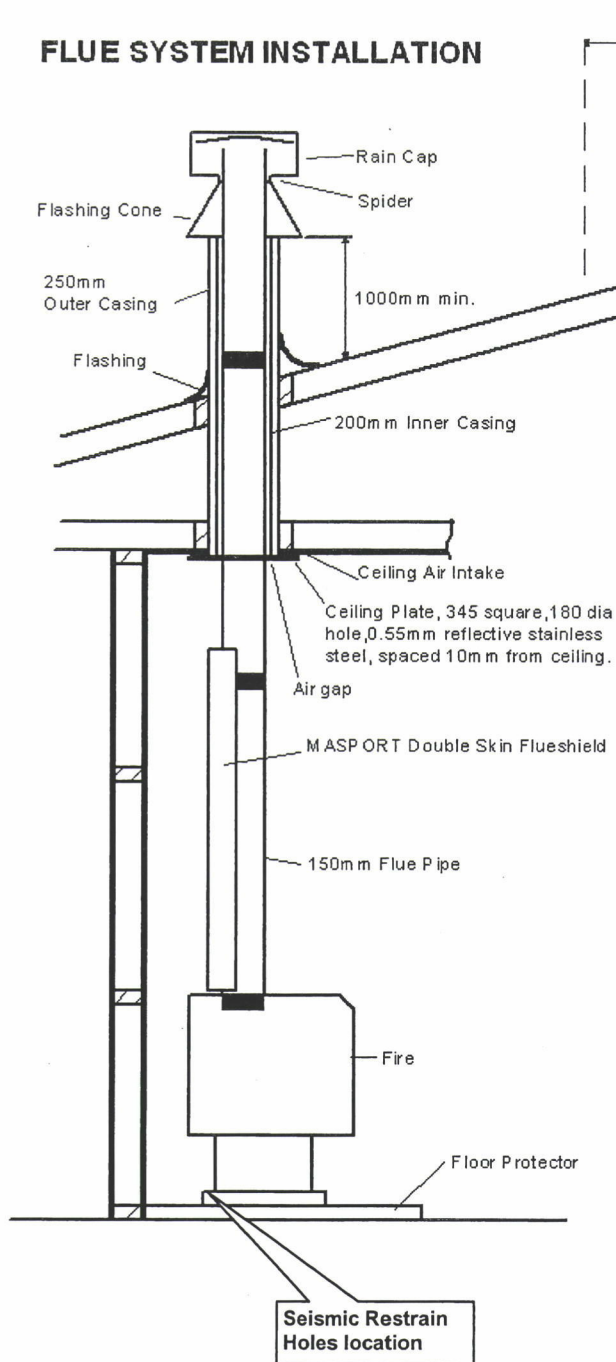
* Note : All specifications are subject to change or variation without notification.



GLEN DIMPLEX AUSTRALASIA LTD

38 Harris Road, East Tamaki * PO Box 58-473, Greenmount * Auckland, New Zealand
Ph: (09) 2748 2565 * Fax: (09) 274 8472 * Email: sales@glendimplex.co.nz

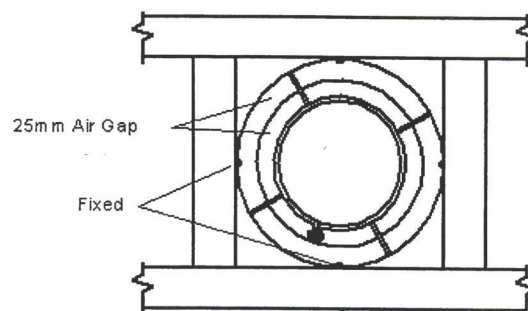
FLUE SYSTEM INSTALLATION



Installation shown complies with AS/NZS 2918:2001. If a flue exits out of the roof within 3 meters from the ridge, the outer shield height shall be not less than 600mm above the ridge. If the flue exits further than 3 meters out from the roof ridge then it must project at least 1000mm above roof penetration. This dimension may need increasing to ensure that the top of the flue is at least 3 meters away from the roof or other obstructions when measured horizontally.

The flue pipe shall extend not less than 4.6m above the top of the floor protector. Due to factors such as roof pitch, predominant winds, nearby obstructions (ie. trees, buildings), and fire placement, flue lengths and hats/cowls may vary.

CEILING PENETRATION PLAN



Above plan is valid only for flue manufactured by Sheetmetal Fabricated Products Ltd, Auckland, New Zealand. For other products, use specific flue installation specifications supplied by the manufacturer.

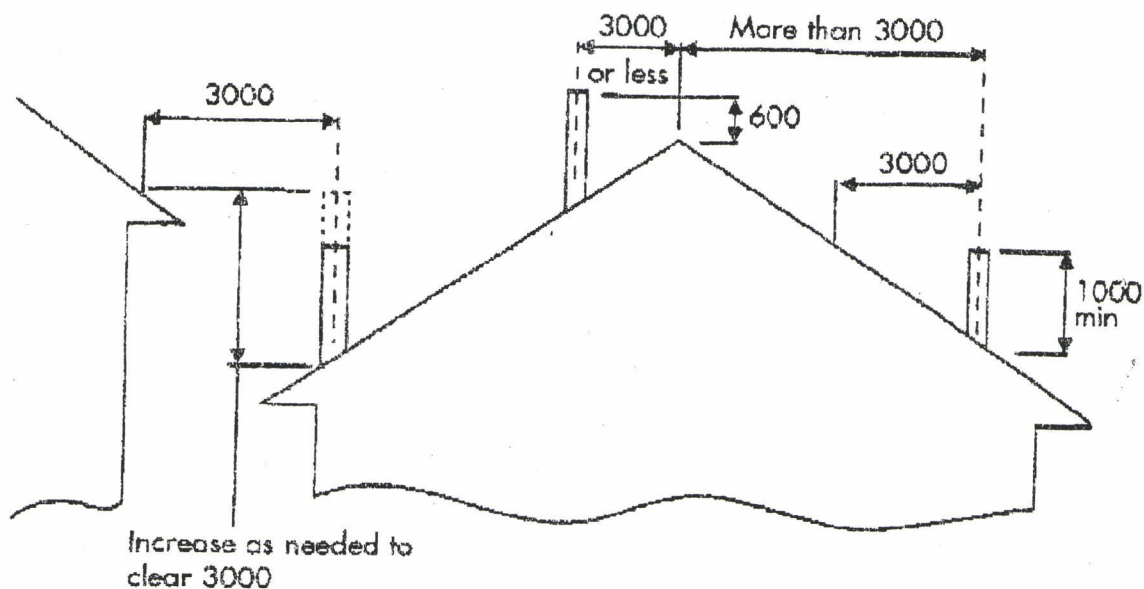
Seismic Restrain - In New Zealand and some part of Australia, it is required that the wood fire and floor protector are secured to prevent shifting in the event of an earthquake. This is best done by fastening the wood fire right through the protector to the floor, using two screws not less than 12 gauge or the equivalent size of coach bolts or toggle fasteners.

*The Flue Specialists***INSTALLATION**

PHONE (09) 274 4766 • FAX (09) 274 29

EMAIL enquiries@foleyind.coWEB www.foleyind.co**REFERENCE DIAGRAM**

(AS PER AS/NZS2913:2001)



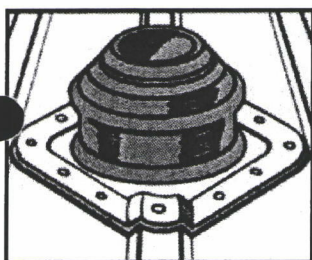
Dektite Premium

The versatile solution

- ✓ Most extensive range of Dektites for flashing penetrations 0 - 510mm, available in black and grey EPDM and silicone red for high temperatures.
- ✓ Designed to enable practically any pipe flashing operation to be carried out within minutes, simple to install and very effective.
- ✓ The low profile cone not only looks good but provides a generous internal clearance, so even the steepest roofs are handled with ease.
- ✓ Suitable for flashing pipes that penetrate wall claddings.
- ✓ Can also be used to flash square penetrations. Just add 30% to the pipe diameter and trim the cone to suit.
- ✓ EPDM withstands temperatures from -50°C to 115°C and up to 150°C intermittently.
- ✓ Silicone withstands temperatures from -60°C to 200°C and up to 250°C intermittently.

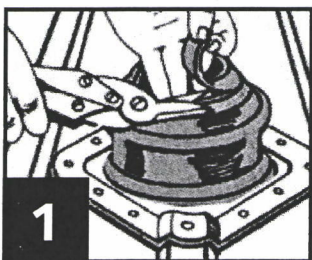


Installation Instructions:

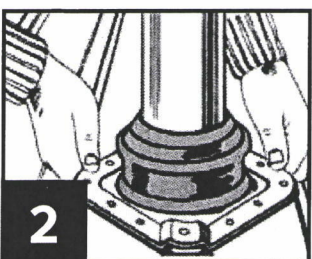


NOTE:

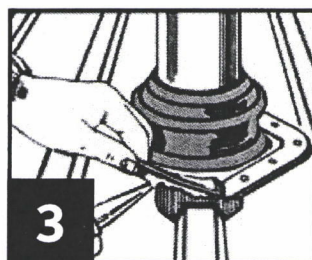
For more effective drainage, always fit the Dektite on the diamond or bias.
Dektites are suitable for flashing pipes that penetrate wall claddings.



Cut a neat hole in roofing sheet with minimum clearance for pipe and insert pipe through hole. Trim the cone to suit pipe size using sharp tin snips. Where required, support cut sections of sheet with additional framing.



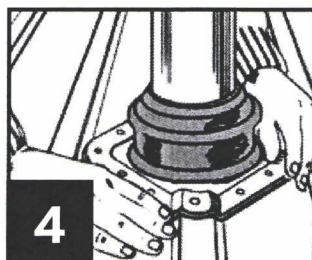
Slide Dektite flashing down over pipe. Lubricating the pipe with water allows the pipe to slide snugly into position.



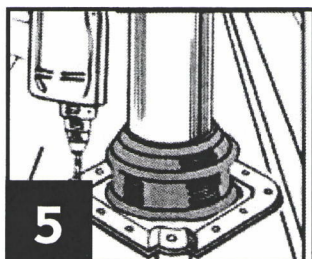
Apply a neutral-cure silicone sealant by turning back the flexible flange. The following silicones have been trialled and provided a suitable bond:

- OCI Roof & Gutter N-192
- Selleys roof & Gutter
- Bostik Findley Roof & Gutter
- Dow Corning 791
- Sikasil AP Multi Purpose

Press base to the roof profile by hand, smooth out any awkward creases. Don't fully extend to allow for vibration.



Fasten using self drilling washered screws or sealed rivets. Fit fasteners progressively outward in opposing pairs to avoid gaps.



Dektite Premium

The versatile solution

Code: Black EPDM	Code: Grey EPDM	Code: Red Silicone	Base (mm)	Pipe (mm)	Pitch
DFE10MB			71 x 71	0-20	0-60
DFE100B	DFE100G		100 x 100	0-35	0-60
DFE100BS			100 x 100	0-35	0-60
DFE101B	DFE101G		139 x 139	5-55	0-45
DFE101BS			139 x 139	5-55	0-45
DFE102BA	DFE102GA		181 x 181	50-70	0-45
DFE103B	DFE103G		218 x 218	5-127	0-45
DFE104B	DFE104G		279 x 279	75-175	0-45
DFE105B	DFE105G		309 x 309	100-200	0-45
DFE106B	DFE106G		363 x 363	125-230	0-45
DFE107B	DFE107G		456 x 456	150-300	0-45
DFE108B	DFE108G		495 x 495	170-355	0-45
DFE109B	DFE109G		680 x 680	230-508	0-45

