

Black Peak Design Ltd

P R O J E C T S P E C I F I C A T I O N

JDS Pembroke Heights Lot 39

11 CRAIGIE BURN LANE
PEMBROKE HEIGHTS
WANAKA

Issued for Consent

26-31

PROJECT OVERVIEW

Scope

To build new residentail home with high quality materials

Address

Site Address	11 CRAIGIE BURN LANE
Suburb	PEMBROKE HEIGHTS
Region	WANAKA
Lot #	39
DP #	DP 610757

Site Conditions

Wind Zone	H - High Wind Speed
Earthquake Zone	Zone 3
Exposure Zone	Zone B - Low
Snow Loading Zone	Zone N5

Related Parties

Designer

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Owner/ Builder

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Engineer

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1 STRUCTURAL STEEL

1.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

1.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1163:2016(AS/NZS)	Cold-formed structural steel hollow sections
1252.1:2016(AS/NZS)	High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Part 1: Technical requirements
1252.2:2016(AS/NZS)	High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Part 2: Verification testing for bolt assemblies
14341:2012(AS/NZS)	Welding consumables – Wire electrodes and weld deposits for gas shielded metal arc welding of non alloy and fine grain steels – Classifications
1554.1:2014 (AS/NZS)	Structural steel welding - Part 1: Welding of steel structures
1554.2:2003(AS/NZS)	Structural steel welding - Stud welding (steel studs to steel)
1554.4:2014(AS/NZS)	Structural steel welding - Part 4: Welding of high strength quenched and tempered steels
1554.5:2014(AS/NZS)	Structural steel welding - Part 5: Welding of steel structures subject to high levels of fatigue loading
1554.6:2012(AS/NZS)	Structural steel welding - Part 6: Welding stainless steels for structural purposes
1554.7:2014(AS/NZS)	Structural steel welding - Part 7: Welding of sheet steel structures
16834:2013(AS/NZS)	Welding consumables - Wire electrodes, wires, rods and deposits for gas shielded arc welding of high strength steels - Classification (ISO 16834:2012, MOD)
1897:1976(AS)	Electroplated coatings on threaded components (metric coarse series)
21952:2012(AS/NZS)	Welding consumables - Wire electrodes, wires, rods and deposits for gas shielded arc welding of creep-resisting steels - Classification
2312.1:2014(AS/NZS)	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 1: Paint coatings
2312.2:2014(AS/NZS)	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 2: Hot dip galvanizing
3404.1&2:1997(NZS)	Steel Structures Standard
3404:2018(SNZ TS)	Durability requirements for steel structures and components
3678:2016(AS/NZS)	Structural steel - Hot-rolled plates, floorplates and slabs

3679.1:2016(AS/NZS)	Structural steel - Part 1: Hot-rolled bars and sections
3679.2:2016(AS/NZS)	Structural steel - Part 2: Welded I sections
3750(AS/NZS):Parts 1-23	Paints for steel structures
4600:2018(AS|NZS)	Cold-formed steel structures
4680:2006(AS/NZS)	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
4781:1973(NZS)	Code of practice for safety in welding and cutting
5131:2016(AS/NZS)	Structural steelwork - Fabrication and erection

1.3 Structural Steelwork

1.3.1 Scope

Supply, fabricate, install and erect all Structural Steelwork as shown on the drawings and as required for the satisfactory completion of the works, complete with accessories, including all necessary weld plates, cleats, bolts, etc., for building into concrete and concrete blockwork. All aspects of this work shall be carried out to comply with the requirements of the New Zealand Building Code and relevant Standards, and in accordance with the project design documentation, and with any relevant product manufacturers' recommendations.

The following is a list and a general description of the extent of Structural Steelwork, which are more specifically defined in the contract documents, required for the completion of the contract works:

1.3.2 Requirements

1.3.2.1 Safety

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, including WorkSafe's General Risk and Workplace Management - Part 1 and Workplace and Facilities Requirements guidance.

Carry out all construction operations in accordance with the Contractor's project-specific Health and Safety Plan.

1.3.2.2 Quality Assurance - Option 1

Construction of all structural steelwork shall comply in all respects with the design drawings and the specifications.

Prepare and submit details of the fabrication and erection quality assurance procedures for approval. These procedures should encompass all aspects of fabrication.

The quality assurance procedures shall encompass all aspects of the structural steel construction including, but not limited to:
- compliance of materials; and
- welding procedures; and
- steel preparation prior to painting; and

- quality of painting/coatings; and
- erection of structural steelwork.

Maintain and adhere to the quality control procedures for the fabrication and erection of structural steelwork at all times, and ensure that work is performed to the required standard in accordance with the contract documents.

Notify the name of the Structural Steelworker's representative responsible for the quality control of all structural steelwork.

1.3.2.3 Shop Drawings

Prior to commencing steelwork fabrication, prepare and submit for review shop drawings of structural steelwork. The drawings shall provide complete details of each assembly in the steelwork together with all information relative to their fabrication, surface treatment and erection. Each component and connection shall show the relevant work points.

Allow 10 working days for the review of shop drawings. The review of shop drawings shall not relieve the Contractor of the responsibility for the accuracy of the shop drawings and for the correctness of the fabrication, setting out and erection of the steelwork. The cost of rectifying any errors shall be at the Contractor's expense.

Shop drawings shall be coordinated between disciplines and incorporate specific requirements shown on the Architectural, Structural and Building Services drawings.

Shop drawings shall include, but not be limited to:
- Design calculations;
- Fully dimensioned plans, elevations and sections of all structural steelwork elements relative to project grid and levels (at a suitable scale);
- Complete details of construction, connections and support systems relative to project grid and levels (at a suitable scale);
- Dimensions of all elements;
- Jointing details and method of fixing between individual elements and adjacent work;
- Provision for thermal movement;
- Provision for seismic movement and movement under wind loads;
- Installation sequence;
- Coordination requirements with other work and trades, including penetrations, fixings, etc.
- A full schedule of materials, finishes, and fasteners.

1.3.2.4 Materials & Workmanship

Adhere to all relevant requirements of NZS 3404, AS/NZS 1554.1 and AS/NZS 1554.2 for the supply of all materials and in workmanship both on and off site. The use of materials complying with any other Standard equivalent to those stated herein shall only be permitted with the prior approval of the Contract Administrator.

1.3.2.5 Welding Qualifications

All welders shall be suitably qualified to AS/NZS 2980, and familiar with the specified materials and welding techniques required in accordance with AS/NZS 1554. No welder shall carry out work for which he/she is not certified/qualified.

On request, provide evidence of welding qualifications, including a list of proposed welders and their welding certificates, prior to any welding being carried out.

1.3.2.6 Inspections

Provide opportunity to inspect the work on site, and give at least 24 hour's notice for the work to be inspected. Should further inspections and tests by a specialist inspector be required due to concerns about the quality of workmanship, then these shall be at the Contractor's expense.

1.3.2.7 Defective Materials & Work

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. All rejected structural steelwork shall be repaired and/or replaced to the satisfaction of the Contract Administrator - without delay, and at the expense of the Contractor.

If a field-weld is used to substitute (in place of) a shop-weld, the field-weld shall be deemed defective, unless it is subject to specific non-destructive examination (NDE) in accordance with AS/NZS 1554 and to the satisfaction of the Contract Administrator.

1.3.2.8 Producer Statement

Furnish a fully completed Producer Statement when the works are sufficiently complete and ready for application for a Code Compliance Certificate. The Producer Statement shall cover all structural steelwork completed under this section of the specification - Structural Steelwork.

1.3.3 Materials

1.3.3.1 Steel

All mild steel shall comply with the requirements of AS/NZS 3679.1.

Except where specified otherwise on the drawings, hot-rolled steel sections shall be Grade 300 complying with OneSteel 300PLUS specification and AS/NZS 3679.1. OneSteel 300PLUS specification shall take precedence where conflict exists with AS/NZS 3679.1.

Except where specified otherwise on the drawings, cold-formed structural steel hollow sections shall be Grade C350, and shall comply with AS/NZS 1163.

Except where specified otherwise on the drawings, structural steel welded I sections (welded beams and welded columns) shall be Grade 300, and shall comply with AS/NZS 3679.2.

Structural steel hot-rolled plate shall comply with AS/NZS 3678.

All structural steel to be welded shall be suitable for welding in accordance with the specified welding procedures of AS/NZS 1554: Parts 1, 2, 5 and 7.

The surface condition of steel shall be no worse than Rust Grade C in accordance with International Standard ISO 8501-1 or Swedish Standard SIS 05 5900.

Any unidentified steel shall not be used unless approved by the Contract Administrator. When the use of unidentified steel is approved for use, it shall only be used as specified in NZS 3404: Section 2.2.3.

Submit all mill certificates to the Contract Administrator prior to fabrication for all steel to be used.

1.3.3.2 Bolts, Nuts & Washers

Mild steel (black) bolts, nuts and washers shall comply with the requirements of AS 1110, AS 1111 and AS 1112.

High-strength bolts, nuts and washers shall comply with AS/NZS 1252.

Bolts, nuts and washers which form a permanent part of a structure subject to weather exposure shall be hot-dipped galvanised. Hot-dipped galvanised bolts shall be limited to those received from the bolt manufacturer. Where these are not available, the bolts, nuts and washers shall be electro-galvanised, but only in accordance with AS 1897.

Where necessary to ensure even bearing, tapered washers complying with BS 4320 shall be used.

Bolts and bolting procedures to be used shall be as noted on the drawings in abbreviated form, in accordance with the abbreviation list shown on the drawings.

All bolts shall be installed with one washer and one nut unless specified or shown otherwise on the drawings. A washer shall be placed under the rotating component.

Hardened or plate washers shall be used under both the bolt head and nut for any slotted and oversize holes.

Methods of tensioning bolts shall conform to the requirements of AS/NZS 5131.

1.3.3.3 Welding Consumables

Welding electrodes shall comply with the requirements of AS/NZS 1554.1 or AS/NZS 1554.5 as appropriate for the grade of steel being welded.

Welding wire type shall be as recommended by the manufacturer of the steel being joined and for the welding position. Wire showing signs of rust or contaminated with oil shall not be used.

Welding flux used from sealed containers must be dry. The use of unused flux recovered from welds shall only be as approved by the Contract Administrator. The use of reground flux is not permitted.

Material and welding of studs shall comply with AS 1554.2.

1.3.4 Fabrication

1.3.4.1 General

Fabrication of steel structures shall comply with the requirements of AS/NZS 5131.

Verify design dimensions against site measurements prior to fabrication of steelwork. Where new steelwork is being installed on or connecting to an existing structure, check and verify site dimensions and levels prior to fabrication of new steelwork. Refer any discrepancy between the drawings and the site dimensions to the Contract Administrator.

Fabrication tolerances shall be as given in AS/NZS 5131 Appendix F unless specified otherwise on the drawings.

As necessary and required, coordinate with other trades with regard to dimensions and setting-out of built-in items and fixings, etc., for peripheral elements. Supply and install all associated sundry fixings, weld plates, brackets, etc., necessary for the satisfactory completion of the contract works.

All steel members capable of holding water shall be provided with weep holes to prevent accumulation of water during construction or of condensation afterwards.

1.3.4.2 Holing

Comply with AS/NZS 3404.1 requirements for holing, including round and slotted holes, nominal sizes, alignment, finishing, punching and flame cutting of holes. Hand flame-cutting of a bolt hole is not permitted, except only when authorised by the Contract Administrator as a site rectification measure for holes in column base plates.

1.3.5 Welding

1.3.5.1 Welding Quality Management System (WQMS)

The structural steelworker shall implement and maintain a Welding Quality Management System (WQMS) for all welding procedures as recommended by NZS 3404.1 and in accordance with AS/NZS ISO 3834 according to the appropriate quality level. A copy of the WQMS shall be submitted to the Contract Administrator for review prior to commencing fabrication.

1.3.5.2 Welding

Weld quality shall be Category Structural Purpose (SP) unless specific reference is made on the drawings for a specific weld to be Category General Purpose (GP).

Welding shall comply with AS/NZS 1554.1 or AS/NZS 1554.5, as appropriate and in conjunction with AS/NZS 5131.

Submit for approval, details of the welding procedures to be used including details of the equipment and consumables before any welding is carried out.

All welding shall be shop-welds unless specified otherwise on the drawings. Shop-welds shall be welding carried out under controlled conditions, in an approved facility, by certified welders under the continuous supervision of certified welding inspectors.

Any field-weld made without prior written approval from the Contract Administrator will be deemed defective and subject to rejection - refer to Requirements clause.

All weld runs shall be as specified and not finish with a concave surface. Welds shall have proper penetration, with all slag deposits removed as work proceeds and the runs are completed. Welds shall be continuous around joints to prevent the ingress of moisture.

Butt welds shall be full penetration unless specified otherwise on the drawings, and shall be ground flush.

Welding of hollow sections shall incorporate internal sections or backing plates as necessary to complete the specified weld.

Open-ended hollow sections shall be capped using 3mm plate and seal welded unless specified otherwise on the drawings.

1.3.5.3 Qualification of Welding Procedures and Personnel

All welding procedures as a minimum shall be in accordance with AS/NZS 1554.1 or AS/NZS 1554.5 as appropriate. Welding of studs shall comply with AS/NZS 1554.2.

Welding supervisors shall hold Welding Supervisor qualifications from the New Zealand Institute of Welding or an equivalent qualification recognised by HERA NZ Welding Centre. In addition all personnel involved in welding shall only be employed on the types of weld for which they are suitably qualified and they shall hold current Welding Certificates in accordance with AS/NZS 2980. Should qualification testing be required it shall be the Contractor's responsibility for arranging and payment of such tests.

1.3.5.4 Welding Testing & Inspection

The minimum extent of inspection of welding shall be as specified below and in accordance with AS/NZS 1554.1, AS/NZS 1554.5, and AS/NZS 5131 Appendix I. All welds shall be subject to inspection and testing. The testing of welds will commence with the first joints to be fabricated. Test inspections shall be carried out by a CBIP Certified Welding Inspector (CWI). The cost of testing shall be borne by the Contractor. Give at least 24 hour's notice of any welding that will be closed in by subsequent work that will prevent its inspection afterwards.

Non-Destructive Testing (NDT) and Non-Destructive Examination (NDE).
Visual Scanning:
- The minimum level of testing shall be 100% visual scanning as defined by AS/NZS 1554: Parts 1 and 5.
- At the completion of the work, the welding supervisor shall complete and submit a written statement verifying that the visual scanning has been carried out and completed.

Visual Examination:
- A visual examination shall be carried out in accordance with AS/NZS 1554.1 to determine whether the required weld quality has been achieved.
- Where the proportion of visual examination required is less than 100%, agree on a programme of

testing with the Contract Administrator prior to the commencement of any welding.
- The programme shall involve full testing a specified percentage of welds, in order to pick up and correct the cause of any major defect at the commencement of welding.
- The frequency of testing may be progressively reduced on the basis of continuing compliance with the agreed testing programme and this specification.
- Welds with a Category A weld-failure-consequence shall be subject to a 100% visual examination in accordance with AS/NZS 1554.1.
- A record of all welds examined and tested shall be kept and made available on request.

Extent of Non-Destructive Examination (%)			
Weld Category	**Weld Failure Consequence Category**	**Visual Means**	
		Visual Scanning	**Visual Examination**
GP	C	100%	25% min.
SP	B or C	100%	25% min.
SP	A	100%	100%

Other Means:
- Other means of NDE include ultrasonic or radiographic (UT), magnetic particle (MT), liquid penetrant (LP).
- The extent of other means of non-destructive examination of welds shall be as indicated on the drawings and in accordance with AS/NZS 5131 and AS/NZS 1554.1.
- Agree on a programme of testing by other means with the Contract Administrator prior to the commencement of any welding.
- A record of all welds examined and tested shall be kept and made available on request.

1.3.5.5 Repair of Welding Defects

When a welding defect is disclosed by inspection or other investigation, the weld shall be cut out, remade and re-tested. The repair and re-testing of defective welds shall be carried out in accordance with AS/NZS 1554.1 or AS/NZS 1554.5, as appropriate, and to the satisfaction of the Contract Administrator. The cost of testing and repairs to all welding defects shall be at the Contractor's expense.

The welding inspector shall examine all seams from which defects have been cut out and their approval obtained prior to re-welding. Re-welding shall be carried out in a manner and by practices acceptable to the Contract Administrator, and where practicable, shall be by the same process used in the original welding.

The inspection records and re-testing records of all repaired welding defects shall be kept and made available on request.

1.3.6 Erection

1.3.6.1 Delivery & Handling

All steelwork components shall be suitably stacked clear of the ground, on bearers aligned so as to prevent any twisting, bending or other distortion of the items. Keep steelwork dry and protected from damage, moisture and contamination at all times while stored.

Store fasteners in watertight premises. Handle and store electrodes, electrode wire and flux in accordance with the manufacturer's recommendations.

As necessary, make all provisions to protect steelwork components from distortion during delivery and handling.

Do not use damaged, distorted or defective steelwork components, materials and accessories.

Handle steelwork components in a manner that prevents distortion and damage. Ensure that components maintain their manufactured shape and the integrity of corrosion protection at all times during handling.

Handlers shall be familiar with and comply with safe handling requirements, and shall use appropriate safety gear while handling steelwork.

Steelwork riggers and installers shall conform with all relevant WorkSafe NZ Guidelines and Codes of Practice.

1.3.6.2 Assembly

Erection of steel structures shall comply with the requirements of AS/NZS 5131.

Structural steelwork components shall be assembled free of damage and distortion, and so that any specified camber is maintained.

Erection tolerances shall be as given in AS/NZS 5131, Appendix F unless specified otherwise on the drawings.

Check all seatings for steelwork to ensure that they are at the correct level, truly flat and in a condition to receive the steelwork.

Field errors must not be corrected by gas cutting except with the approval of the Contract Administrator.

Each component of the structure shall be aligned as soon as practicable after it has been erected. Permanent connections shall be made when sufficient structure has been erected and the components temporarily connected and accurately aligned, levelled and plumbed, and to ensure that the structure will not be displaced during the erection or alignment of subsequent stages.

1.3.6.3 Temporary Bracing

Provide sufficient temporary bracing to keep the structure plumb and in true alignment until the structure is permanently braced. Failure to make proper and adequate provision against damage during erection shall be the full responsibility of the Contractor. All temporary bracing and guying shall be capable of resisting all loading, Including wind, liable to occur on the structure during the erection period.

Submit for review the method of erection and assembly of structural steelwork. The review shall not limit the Contractor's responsibility to ensure the safety and accurate alignment of the structure.

Connections for temporary bracing and temporary members shall be made so as not to weaken the permanent structure or reduce its performance.

Bracing shall not be used to force the structural frame into its correct position. Tighten bracing only after the frame has been squared, aligned and plumbed or, if inserted at an earlier time, loosen to permit these operations and tighten on completion.

1.3.6.4 Holding Down Bolts

Unless specified on the drawings, holding down bolts shall be of the size, number and length required to achieve the correct embedment and allow the final fixing to the base plate. To ensure correct placement and alignment, a template for each holding down bolt type and configuration shall used for placement. The bending or displacing of holding down bolts is not permitted.

All holding down bolts, nuts and washers which form a permanent part of a structure subject to weather exposure or contained within exterior wall framing shall be galvanised.

1.3.6.5 Bolting

Comply with AS/NZS 3404.1 requirements for bolting. All bolts and associated nuts and washers shall comply with the material properties specified - refer to Materials clause. All material within the grip of the bolt shall be steel and no compressible material shall be permitted in the grip.

Unless specified otherwise on the drawings, all bolts shall be:
- Strength Grade 8.8, Bolting Category 8.8S, complying with AS/NZS 1252; and installed to a snug-tight condition as specified in NZS 3404.1:Section 4.2.6.2(a).
- At least one clear thread run out shall be clear beneath the nut after tightening the bolts.
- Each bolt and nut shall be assembled with at least one washer.

Bolted connections specified on the drawings with the suffix /TB (bearing-type) or /TF (friction-type) shall be fully tensioned in accordance with NZS 3404.1:Sections 4.2.5 and 4.2.6.
- Bolts used for a fully tensioned bearing-type (/TB) connection shall be Strength Grade 8.8, Bolting Category 8.8/TB, complying with AS/NZS 1252
- Bolts used for a fully tensioned friction-type (/TF) connection shall be Strength Grade 8.8, Bolting Category 8.8/TF, complying with AS/NZS 1252.
- The contact surfaces of fully tensioned connections shall be prepared in accordance with NZS 3404.1:Section 4.2.4.3.

For fully tensioned bolts, the minimum number of clear threads run out beneath the nut after tightening shall be:
- Five threads for a bolt length up to and including 4 diameters;
- Seven threads for a bolt length over 4 diameters but not exceeding 8 diameters;
- Ten threads for a bolt length over 8 diameters.

The tightening pattern of fully tensioned joints shall proceed from the stiffest point, typically the centre, towards the outer free edges of the joint, to ensure that all bolts carry an equal proportion of the load.

The re-tensioning of Strength Grade 8.8 bolts that have been fully tensioned is not permitted without the written approval of the Contract Administrator, and shall only be carried out in accordance with the Contract Administrator's instruction.

1.3.7 Corrosion Protection

1.3.7.1 General

Comply with the requirements of NZS 3404.1 and SNZ TS 3404 for corrosion protection. Surface preparation and application and inspection of coating systems shall be in accordance with the requirements of AS/NZS 2312.1 and/or AS/NZS 2312.2 as appropriate.

All welds shall have slag removed, and welds exposed in the finished work shall have spatter removed and be ground to a neat, clean finish.

Steelwork to be sprayed for fire protection or to be cast more than 50mm into concrete shall have all rust and mill scale, etc., removed by power or manual wire brushing and shall be left unprimed.

Surface preparation shall be carried out after the fabrication of components has taken place, and the specified coating shall be applied as soon as possible after preparation in accordance with the manufacturer's specification. Surfaces that will be in contact or near-contact after fabrication or erection should receive the specified surface preparation and treatment prior to assembly. In all cases, the total coating shall be applied in the workshop in accordance with the manufacturer's instructions.

Where site-welds are necessary, protect adjacent surfaces during welding procedures, and prepare and coat site-welds in accordance with the coating manufacturer's instructions and as approved by the Contract Administrator.

1.3.8 Painting

1.3.8.1 Painting

Comply with the requirements of AS/NZS 2312.1 for corrosion protection of structural steel using paint coatings. All structural steel which is not to be treated otherwise shall be primed before delivery to the site.

Paint coating system for structural steel shall be as specified below and in accordance with AS/NZS 2312.1: Table 6.3.

The coating manufacturer may suggest alternative paint coating systems for the protection of structural steelwork in accordance with AS/NZS 2312.1 to meet specification requirements. The use of any such alternative paint coating system shall be subject to approval by the Contract Administrator.

All coating products shall be the of the same manufacturer, and supplied in unbroken packages clearly labelled with the product name and manufacturer. Do not used damaged or defective products, or products that are beyond their designated shelf life.

Maintain and comply with industry-recognised quality assurance procedures to ensure that all sections of the work are carried out in accordance with the manufacturer's requirements.

The preparation for and application of the specified coating systems and coatings shall be carried out by experienced and skilled specialist applicators, in strict accordance with the manufacturer's technical literature and to fully comply with the manufacturer's warranty requirements. All substrate preparation and coating application and finishing techniques shall be exactly as recommended by the manufacturer.

Ensure compatibility of the substrate material and the environmental exposure conditions with the protective coating system prior to commencing.

Handle coating products in accordance with the manufacturer's requirements as set out in the manufacturer's Product Data Sheets and in a manner that prevents deterioration of the product.

Applicators shall be familiar with and comply with the manufacturer's Material Safety Data Sheet precautions for use, and use appropriate safety gear when handling products.

The coating manufacturer's requirements for substrate material, substrate preparation, and coating system application methods and details, and coating thicknesses, as specified in the manufacturer's coating system specification sheet and product data sheets, shall be strictly adhered to during all stages of painting structural steelwork.

Carry out all substrate preparation and protective coating application under cover, in a well lit and ventilated, stable and weatherproof environment within the permitted temperature range. Comply with the manufacturer's parameters for application conditions for air temperature, substrate surface temperature, and relative humidity.

For on-site applications, mask off and adequately protect surrounding finished work and fixtures and fittings from contamination prior to substrate preparation and/or coating application.

Apply each coat in the manufacturer's specified sequence, uniformly to the recommended dry film thickness (DFT), and allow each coat the full drying time between coats. All over-coating and recoating must be undertaken within the manufacturer's specified recoat timeframe.

Adequately protect all work in progress from damage, contamination and exposure to the environment until complete and fully cured.

Leave finished coated surfaces clean, free from defects and blemishes of any kind, and to the required standard in accordance with manufacturer's requirements.

Dispose of coating products in accordance with local government requirements. Do not permit products to enter or contaminate the stormwater system.

Provide the completed Product Warranty and Applicator Warranty upon completion of the work.

1.3.8.2 Inspections

Allow to inspect the paint coating work at each stage. Provide a Schedule of Inspections, including notification of when each section and stage of the work is ready for inspection, prior to the work commencing. Permit the coating manufacturer's technical representative to inspect the work in progress and to take samples of their products from site.

1.3.8.3 ACRYLIC System ACL1 - Latex, single pack

ACRYLIC System ACL1 - Latex, single pack. As specified below. Applied to properly prepared substrates in accordance with the manufacturer's requirements and AS/NZS 2312.1.

ACL1 Coating System Details (in accordance with AS/NZS 2312.1: Table 6.3 - Painting System for Steel):

- Surface Preparation:
  - St 3.
- 1st Coat:
  - Type: Alkyd primer.
  - PRN: C05.
  - Nominal DFT: 40µm.
- 2nd Coat:
  - Type: Alkyd latex.
  - PRN: C21.
  - Nominal DFT: 40µm.
- 3rd Coat:
  - Type: Alkyd latex.
  - PRN: C21.
  - Nominal DFT: 40µm.
- Total DFT:
  - 120µm.

Product - 1st Coat:
Product - 2nd Coat:
Product - 3rd Coat:
Steelwork Location:

2 BRICKWORK

2.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

2.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1170.2:2011(AS/NZS)	Structural design actions - Wind actions
1170.5:2004(NZS)	Structural design actions - Earthquake actions - New Zealand
3604:2011(NZS)	Timber-framed buildings
4210:2001(NZS)	Masonry construction: Materials and workmanship
4236:2002(SNZHB)	Masonry veneer wall cladding

2.3 Firth Masonry Brick Veneer Cladding

2.3.1 Scope

Supply and lay the selected Firth Masonry Veneer brickwork as brick veneer cladding to the locations, layout and details shown on the drawings, complete with all associated lintels, ties, fixings and accessories for proper installation. All aspects of this work shall be in complete accordance with all Firth Masonry Veneer technical literature and relevant standards under the New Zealand Building Code (call 0800 800 576, or check www.firth.co.nz for the latest editions), BRANZ Appraisal No.967,and as shown on the drawings.

No substitutions are permitted for Firth Masonry Veneer bricks and associated Firth products.

2.3.2 Requirements

2.3.2.1 Safety

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

2.3.2.2 Substitutions

Firth masonry veneer bricks shall be as specified herein and as indicated on the design drawings. The substitution of Firth masonry veneer bricks for an alternative brand or material is not permitted under any circumstances.

The substitution of a specified Firth brick style for an alternative Firth brick style by the Contractor shall only be permitted with the Contract Administrator's written authorisation, and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate an alternative Firth style to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

2.3.2.3 Quality Assurance

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of the works are carried out to the highest standard.

2.3.2.4 Inspections & Reporting

BCA inspections of the works shall take place at each of the stages as scheduled in the Building Consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

Carry out all necessary pre-installation and installation inspections for each area of the works.

Complete all necessary Pre-Installation Checklists, and all necessary Installation Checklists.

Complete all necessary Sign-Off Certificates before handing over completed work.

2.3.2.5 Defective Materials & Work

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected Firth Masonry Veneer Cladding work shall be repaired and/or replaced to the satisfaction of the Contract Administrator, without delay and at no additional cost to the Principal.

2.3.3 Firth Masonry Veneer Range

Masonry veneer cladding shall be constructed from Firth Strata Brick® 70 Series concrete bricks. Slimline brick units with a fair face finish, manufactured to AS/NZS 4455.1. Installed as masonry veneer construction, to a stretcher bond pattern, in accordance with NZBC E2/AS1 Section 9.2 and NZS 4210 and Firth technical literature, to the locations and details shown on the drawings.

Product Details:
- Standard Unit Dimensions: 290mm long x 70mm high x 70mm deep.

- Coverage: 39 units p/m² wall face.
- Weight: 2.9kg per unit. 160kg/m² installed weight including 10mm mortar joints.
- Finish: Painted bagwash.
- Edges: Straight.
- Colour Tone: Graphite (South Island only) - *to the colour specified*.

Colour Tone: Selected Paint finish
Installed Location: As noted on Elevations

2.3.4 Co-operation

Co-operate with other trades in the setting out of the works and to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings; including all damp proofing and membranes, wraps, rigid air barriers, flashings, clearances to other building components and elements, and any other related works.

Coordinate with trades to form all necessary concrete slab rebates and wall openings to the required dimensions and locations, and for the locations of pipes, outlets, cables, meter boards and other fittings installed by others, and to install Firth Masonry Veneer Cladding as required.

2.3.5 Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All work shall only be carried out by Licensed Building Practitioners - Bricklaying and Blocklaying. Submit evidence on request of experience, relevant qualifications, LBP Licence - Bricklaying & Blocklaying, New Zealand Masonry Trades Association (NZMTA) Member Registration.

Workmanship and materials shall conform to the requirements of NZS 4210 in conjunction with NZS 4230, NZS 3604, NZS 4229 and NZBC E2/AS1. Brick veneer work shall be true to line, level and plumb, and within the tolerances tabled in NZS 4210 and SNZ HB4236.

During the progress of work every care must be taken to prevent moisture penetration of the bricks. No bricklaying shall proceed during wet weather. Upon completion of each day's work, exposed tops of brick veneers shall be protected from inclement weather. Comply with NZS 4210 Cold Weather Construction and Hot Weather Construction requirements.

Take precautions during the erection of the brick walls to avoid mortar splash and surface damage of surrounding finished work. Clean all brick face work as the work proceeds using clean water and sponges. Where scaffold planks are at an upper level, brickwork is to be protected from mortar stains and kept clean.

2.3.6 Delivery & Handling

All pallets of Firth masonry bricks shall be checked by the bricklayer on site for colour, batch number and quality prior to commencing any laying. Reject damaged and/or faulty bricks upon inspection and resolve with Firth before laying proceeds.

Store Firth Masonry Veneer bricks and associated brickwork materials on flat level ground on the delivery pallets. Keep dry and protect from damage and contamination until use.

Do not use damaged or defective materials and products, or products that are beyond the designated shelf life.

Should a problem be encountered with any Firth product during use or delivery, immediately contact Firth on 0800 347841. Do not continue to use the product that is not performing to specification or

expectation. Keep the product in question and where possible, the document batch numbers and/or manufacturing details.

Handle materials and products in accordance with the manufacturer's recommendations and in a manner that prevents damage.

Installers shall be familiar with and comply with the manufacturer's Material Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

Installers shall conform with all relevant WorkSafe NZ Guidelines and Codes of Practice - including the OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry.

2.3.7 Damp-proof Course

Install all brickwork related damp-proof courses in accordance with the requirements of NZBC E2/AS1 and to the details shown on the drawings.

Manufacturer & brand name:
Location:

2.3.8 Mortar

Mortar shall have a minimum compressive strength of 12.5 MPa, and be manufactured from cement, sand, lime (if required), and admixtures, and be accurately measured and mixed in accordance with NZS 4210.
Firth 'Dricon Trade Mortar' may be used in accordance with the manufacturer's requirements.

Mortar shall be mixed in a mechanical power mixer for 4 - 8 minutes, in the proportions specified to achieve a slump of 75mm ± 6mm. No re-tempering of mortar will be allowed after 1½ hours from mixing.
The use of an approved waterproofing and plasticising agent as a substitute for lime is permitted when used in accordance with the manufacturer's instructions only.
Mortar must be mixed by volume and the main contractor advised at the commencement of the contract of the ratio to be used.

Mortar shall incorporate the specified colouring agent. Ensure that the agent is well and evenly spread throughout the mix and is accurately batched between mixes. Coloured mortar shall incorporate 3% oxide weight - mineral oxide pigment dosages shall be to NZS 4210.
Allow to produce a sample panel 600mm wide x 5 brick courses high for the Architect's/Designer's approval - do not proceed until the sample has been approved.
Firth 'Dricon Coloured Trade Mortar' and 'Dricon Coloured Architectural Trade Mortar' may be used as pre-coloured mortar in accordance with the manufacturer's requirements.

Mortar colour:
Colourant manufacturer & brand:

2.3.9 Brickwork

Bricks shall be selected and laid from a minimum of three pallets, when practical, to provide a uniform spread of colour over the exposed face.

Keep all bricks covered to avoid saturation. Fully protect the tops of incomplete veneers from rain for a period of 6 hours after laying.
Bricks shall be laid dry, in stretcher bond with ½ bond pattern, true to line, plumb and level, and in accordance with best trade practice and in full accordance with Firth's recommended procedures. All bricks shall be fully bedded in mortar.
Cut bricks to a clean sharp edge using a diamond saw. It should not be necessary for any piece of brick less than 50mm in length to be laid.

Form a consistent cavity between the structural wall and brick veneer to the dimension shown on the drawings. Keep the cavity clear of mortar droppings and clean mortar from ties as the works progress. Clean off mortar dags and protrusions from the cavity face. Clean-out openings (wash outs) shall be provided along the base every 10th brick and at corners.

Install bricks with the appropriate screw-fixed wall ties to veneer walls as the bricks are laid. Wall tie type, spacing, fixing and installation shall be as defined in NZBC E2/AS1 Tables 18A, 18B, 18C, and NZS 4210 and meet the durability requirements as defined in NZS 3604. Wall ties shall be embedded in the mortar course and fixed to wall framing, or structural concrete, in accordance with the requirements of NZS 4210 and NZBC E2/AS1. Position wall ties along the wall at maximum 600mm centres and maximum 400mm vertically. Alternative spacings shall be as detailed in NZ Standards may be used. Check for specific tying patterns for the specified Firth Masonry Veneer brick. Place additional ties within 200mm of the edge around openings and at the end of unsupported wall panels.

All joints generally shall be 10 mm ±2mm wide. All joints, both horizontal and vertical (perpends), shall be consistent in thickness.

Form weepholes in the bottom course of walls at ground level, intermediate beams and ledges and wherever the cavity is closed at the base such as window and door openings. Weepholes shall be formed wherever the cavity is closed at the base. Weepholes will be kept free of mortar and other restrictions and unless noted otherwise deformed to achieve 1000mm m2 per lineal meter.

Window sills shall be laid at the same slope (15-20 degrees) with an overhang of 30 - 50mm unless detailed otherwise. Sill bricks shall be evenly spaced and of an even thickness and appearance. Provide soldier courses above window and door openings if and where shown on the drawings only.

As the work proceeds, build into brickwork all necessary bolts, metalwork items including steel angle lintel bars and other fittings and fixings shown on the drawings or otherwise required for the work. Steel angle lintels shall be sized and installed in accordance with NZBC E2/AS1 and as shown on the drawings, and meet the durability requirements as defined in NZS 3604.
Install all necessary flashings to window and door openings, and as required, to the details shown on the drawings and in accordance with NZBC E2/AS1 requirements. Install vermin stop as required.

Movement control joints shall extend through the brick veneer, be a continuous 10mm vertical or finger jointed gap, and formed and weatherproofed to the locations and details shown on the drawings at not more than 6m centres. Confirm the location of all control joints prior to installation of brickwork.
Seismic separation joints shall be formed and weatherproofed to the locations and details shown on the drawings.

2.3.10 Pointing

Mortar joints shall be tooled after initial setting has occurred and then made flush with the brickwork.

2.3.11 Surface Coating

Completed brickwork shall be treated with the specified water-based, penetrating masonry sealer. Applied to properly prepared brickwork in strict accordance with the masonry sealer manufacturer's requirements.

Manufacturer & brand:
Location:

2.3.12 Completion

Check that the brickwork has been installed correctly, true to line, plumb and level, and that all pointing work has been neatly finished.

Leave brickwork clean and free of damage, defects, marks, mortar and other contaminants. Repair any damaged or defective work where required.

Carry out any required surface cleaning of brickwork in strict accordance with Firth requirements.

Leave surrounding surfaces clean and free of contamination. Remove rubbish and excess material from site.

3 STONEWORK

3.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

3.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3604:2011(NZS)	Timber-framed buildings
4210:2001(NZS)	Masonry construction: Materials and workmanship
4236:2002(SNZHB)	Masonry veneer wall cladding

3.3 Schistwork

3.3.1 Scope

Supply the specified Schistwork and install as shown on the drawings.

3.3.2 Materials

Schist stone shall include variable colours ranging through ochres, umbers and greys. The schist shall be broken (and edge guillotined) into the finished stones before delivery to the site.

Mortar - Refer NZS 4210, strength 12.5 MPa at 28 days. Incorporate admixture exactly to the manufacturer's recommendations. Sand correctly graded to NZS 3103 and kept clean.

3.3.3 Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All work shall be by or under the direct supervision of Registered Masons certified by the NZ Mason's Registration Committee or, through reference to several completed projects, the Main Contractor must show that the proposed Subcontractor is fully competent to produce the required results. All aspects of the schistwork shall be to generally recognised best (local) trade practice.

Co-operate with the Contractor to ensure that all support foundations, nibs, and framed substrates are completely appropriate for the schistwork required, and that blockwork walls and fireplace insitu concrete walls have been fully waterproofed. Co-ordinate with all trades to build all necessary fixings, sleeves, or electrical or plumbing devices etc. into the schistwork and check that positions are correct before finish grouting. Coordinate with all trades to form all required holes, openings etc. in their exact positions.

Carefully select schist stones for sizes and faces and position to produce a well bonded (approximating stretcher bond) mass with the required face finish. Finish jambs and ends to clean straight lines.

Use mortar dry enough to avoid slurry trickles on the finished schist faces but moist enough to provide a good bond with the schist. No retempering of partially set or dried mortar. Keep the wall faces clean as work proceeds and regularly inspect for mortar droppings etc. Turn back scaffold planks at night and during rain. On completion thoroughly clean all surfaces affected by this work.

3.3.4 Schistwork Walls

Veneer (nominally 50-60mm thick) to timber framed walls shown on the drawings.

All wall faces shall have a random layout of the full range of different sized stones, and the long axis of the visible face of every stone shall be horizontal.

All stones carefully selected to neatly build the wall faces - average mortar bed depth approx. 15mm, and the minimum mortar bed for any stone shall be 6mm.

Maintain plumb corners and reasonable coursing throughout all vertical schistwork. Vertical surfaces shall be evenly true to face, variation +10mm for almost all of the stones. Fill solid to the substrate behind the facing stones so that all schist pieces are fully encased in well bonding mortar.

For veneer work to timber framing ensure that the substrate and timber framing has been installed correctly before commencing schistwork, and that the stud positions are accurately marked for ties fixing. Incorporate 16mm dia. conduit tube as drawn to form small weepholes at approx 400mm centres in the bottom course mortar (to drain any moisture that reaches the cavity. Install Duo King Size (or equal approved complying with NZS 4210) ties to the veneer schistwork, at 400mm centres above the first layer of stones, and averaging 400mm centres horizontal and vertical across the full surface of the schistwork veneer. Ties fixed with 14 x 100mm hot dip galvanized screws or equal approved through battens and into the timber studs.

4 WATERPROOFING

4.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

4.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3740:2010(AS)	Waterproofing of domestic wet areas
4858:2004(AS/NZS)	Wet area membranes
NZBC B2/AS1	Durability
NZBC E3/AS1	Internal Moisture

4.3 Interior Wet Area Waterproofing Membrane Systems

4.3.1 Scope

Supply and install the specified Interior Wet Area Waterproofing System, to the locations shown on the drawings, complete with all accessories. All aspects of this work shall be in strict accordance with the manufacturer's technical guidelines, installation specifications and details, other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for the specified Interior Wet Area Waterproofing System.

4.3.2 Waterproofing System

Liquid-Applied Waterproofing Membrane System. A liquid applied, modified polyurethane, high-build acrylic, flexible waterproof membrane, suitable for residential and commercial interior wet area floor and wall applications to be subsequently tiled or otherwise covered and protected.

Installed as an interior wet area undertile waterproofing membrane system in accordance with the manufacturer's requirements, NZBC E3/AS1, AS 3740, and as shown on the drawings.

Brand & Product:
Number of Coats:
Coverage per Coat (l/m²):
Location:

4.3.3 Primer

Primer - Liquid-Applied Waterproofing Membrane System. Apply the primer to properly prepared substrates for optimum waterproofing adhesion in accordance with the manufacturer's requirements. Use primers recommended by the waterproofing manufacturer only.

Limit priming to no more than can be covered by the waterproofing membrane in one working day or as recommended by the manufacturer, and allow the primer to properly dry before applying the waterproof membrane.

Protect primed surfaces from damage and contamination until the waterproofing membrane application is complete.

4.3.4 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install the specified Interior Wet Area Waterproofing System as required.

4.3.5 Workmanship

All installation work shall be carried out by experienced contractors, authorised by the manufacturer, familiar with the specified products and installation techniques, to fully comply with all of the manufacturer's warranty requirements in accordance with the manufacturer's installation requirements and as noted and detailed on the drawings.

4.3.6 Delivery & Handling

Store products off the ground on a flat surface undercover, keep materials dry and out of direct sunlight, and protect from damage. Do not use damaged or faulty products, or products beyond the designated shelf life. Handle materials and products in accordance with the manufacturer's recommendations.

4.3.7 Preparation

Check that the internal wet area substrate and any channel drains are to the falls and levels as shown on the drawings, and that any floor waste and drain outlets are correctly installed.
Check that crack control and movement joints are incorporated to the locations as shown on the drawings, and are constructed as recommended by the manufacturer - do not bridge or cover them with the waterproofing.
Ensure the substrate is clean and free of oil, grease, and other contaminants, and is smooth with any defects filled to an even surface prior to installation.

Ensure the concrete substrate surface is U3 finished to NZS 3114 (by steel trowel) and to the manufacturer's recommendations, that it has cured for at least 28 days, that the relative humidity of the concrete is 75% or less, and that it is surface dry at the time of waterproofing.
Grind off any high spots on the concrete slab, FLC (proprietary levelling compound) repair flush with

feathered edges any low spots or damaged areas then grind smooth. Lightly grind or shot blast any surface glazed to the extent that may compromise bonding.

Location:

Check that the plywood has been laid with staggered joints, and is supported on framing at maximum 400mm centres in each direction, that the plywood is 17mm minimum thickness, is CD grade (C face up), is H3 CCA treated (LOSP treated plywood must NOT be used), is installed and fixed exactly to the ply manufacturer's and membrane manufacturer's recommendations, and has a maximum moisture content of 20% at the time of installation.
Plywood must be fixed with countersunk head, 10g x 50 mm stainless steel screws at maximum 150mm centres along edges and maximum 200mm centres through the body of the sheets.

Plywood manufacturer, brand name & type:
Location:

Check that the plasterboard has been installed in accordance with the manufacturer's recommendations.
Check that fixings do not protrude above the plasterboard surface, and that sheet joints have been correctly stopped.

Plasterboard manufacturer, brand name & type:
Location:

4.3.8 Installation

Liquid Applied Waterproofing Membrane System. Install the undertile membrane waterproofing system, including surface priming, membrane application, jointing, flashing and sealing etc., and system-supplied accessories in strict accordance with the manufacturer's installation requirements and details, and as shown on the drawings. Application and workmanship shall be in accordance with AS/NZS 4858:2004 and AS 3740:2004.

Substrates shall be free of dust, grease, wax, oil, dirt, loose plaster, laitance, curing compounds, paint and other contaminants likely to prevent proper bonding, and shall be structurally sound, securely fastened and properly supported to eliminate any movement which may cause cracking. New concrete should be sufficiently aged for a minimum of 4 to 6 weeks. Allow proprietary floor levelling compounds and screeds to cure in accordance with the manufacturer's recommendations prior to application.

Seal substrate corner junctions and substrate joints and fixings and visible cracks, with a suitable sealant. Prepare all substrate floor/wall junctions and sheet joints with a system-approved pressure sensitive bond breaker tape. Prime all surfaces with the specified system primer.

Apply the specified liquid-applied membrane undiluted on to a dry and primed substrate uniformly by brush or roller in accordance with the manufacturer's instructions.
Finish the membrane at control joints, floor wastes and drain outlets to the manufacturer's

requirements. Consult the manufacturer regarding any detail where a standard system detail does not exist.

Allow to membrane dry in accordance with the manufacturer's requirements. Where required; carry out a full flood test prior to tiling. Protect the installed membrane as required; avoid puncturing or damaging when exposed - repair as necessary

4.3.9 Completion

Check that the internal wet area waterproofing system has been installed correctly, and that any system accessories are correctly installed and finished. Check for damage, repair or replace as necessary.
Leave the completed waterproofing system leak free and watertight.
Leave the working area clean and tidy ready for tiling, remove rubbish from site.

Advise the Main Contractor to protect the completed works from damage until tiling is completed.

Issue to the Owner a copy of the product and installation warranty for the completed works.

5 CARPENTRY

5.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

5.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2588:2018(AS|NZS)	Gypsum plasterboard
2589:2017(AS/NZS)	Gypsum linings - Application and finishing
2904:1995(AS/NZS)	Damp-proof courses and flashings
3404.1&2:1997(NZS)	Steel Structures Standard
3404:2018(SNZ TS)	Durability requirements for steel structures and components
3601:1973(NZS)	Metric dimensions for timber
3602:2003(NZS)	Timber and wood-based products for use in building
3603:1993(NZS)	Timber Structures Standard
3604:2011(NZS)	Timber-framed buildings
3622:2004(NZS)	Verification of timber properties
3631:1988(NZS)	New Zealand timber grading rules
3640:2003(NZS)	Chemical preservation of round and sawn timber
AS/NZS 1080.1:2012	Timber - Methods of test - Method 1: Moisture content
NASH 3405	An alternative solution for steel framed buildings
NASH Standard	Residential and Low-rise Steel Framing - Part 1: Design Criteria
NZBC C/AS2-AS6	Protection from Fire
NZBC E2/VM1	External Moisture
NZBC G6	Airborne and Impact Sound

5.3 General

This section includes the receiving, stacking and storage of all Carpenter's materials and the fabrication, erection and fixing of all framing, sheathings and finishing timbers, including all work incidental to neatly finishing in other trades and all temporary work and temporary bracing.

The Carpenter shall attend upon all trades, and shall supply and fix all obviously necessary but not specifically mentioned fixings and materials.

5.4 GIB® Plasterboard Linings

5.4.1 Scope

Supply and install GIB® Plasterboard Linings specified herein, as sheet lining materials to the walls, ceilings and other elements identified on the drawings, complete with all accessories required for proper installation, finishing and performance. All aspects of this work shall be in complete accordance with the current GIB® Site Guide and relevant GIB® Systems literature (check www.gib.co.nz, or call 0800 100 442 for the latest editions), and other relevant product manufacturers' recommendations.

No substitutions are permitted for GIB® Plasterboard Linings, GIB® Systems or GIB® System components and accessories.

This specification must be read in conjunction with relevant GIB® Systems specifications - GIB® EzyBrace® Systems, GIB® Fire Rated Systems, GIB® Noise Control Systems, GIB® Aqualine® Wet Area Systems, GIB® X-Block® Systems, GIB® Quietline®, GIB® Intertenancy Barrier System, and GIB® Rondo® Metal Batten Systems - and other specifications sections, as they are interrelated

5.4.2 Requirements

5.4.2.1 Safety

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

5.4.2.2 Warranty

GIB® Product & System Warranty:

GIB Systems Durability.
The following systems have, unless stated otherwise in GIB® technical literature, a serviceability life in excess of that stated and satisfy the requirements of NZBC Clause B2 Durability:
15 Years:
- GIB Aqualine® Wet Area Systems.

50 Years:
- GIB® Fire Rated Systems
- GIB EzyBrace® Systems
- GIB X-Block® Systems
- GIB Noise Control® Systems.

Provide the GIB® Product & System Warranty on the manufacturer's standard warranty form.
Commence the warranty from the date of practical completion of the contract works.

Include with the warranty: a copy of the completed GIB® Installation Sign-Off sheet, and the GIB® Plasterboard Lining Systems Care and Maintenance bulletin.

5.4.2.3 Quality Assurance

Ensure that the installation and finishing of GIB® Plasterboard Linings and associated GIB® Systems comply in all respects with the approved design drawings and specifications, and Building Consent.

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of work are carried out to the highest standard.

5.4.2.4 Inspection & Acceptance of GIB® Plasterboard Linings

Carry out all necessary pre-installation, installation and finishing inspections of GIB® Plasterboard Linings for each area of work in accordance with the requirements of the GIB® Site Guide and associated industry Code of Practice (AWCI) recommendations.

Complete the GIB® Site Guide Pre-Installation Checklist prior to installing GIB® plasterboard linings, and relevant GIB® Performance Systems Installation Checklists.

Complete the GIB® Interior Plasterer/Stopper Installation Sign-Off Certificate upon completion and before handover for subsequent decoration.

5.4.2.5 Defective Materials & Work

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected GIB® Plasterboard Linings and GIB® Systems materials and work shall be repaired and/or replaced to the satisfaction of the Architect/Designer, without delay and at no additional cost to the Principal.

5.4.2.6 Substitution of GIB® Plasterboard Linings

GIB® plasterboard linings shall be as specified herein and as indicated on the approved drawings. The substitution of GIB® branded plasterboard linings and GIB® System components for alternative brands is not permitted under any circumstances.

The substitution of a specified GIB® plasterboard lining for an alternative GIB® plasterboard lining by the Contractor shall be in strict accordance with the requirements of the GIB® Site Guide: 2.3 - Board Substitution Options, and relevant GIB® Systems literature. Such substitutions shall only be permitted with the Architect's/Designer's written authorisation, and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate alternative GIB® Plasterboard Linings to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

5.4.3 Performance

5.4.3.1 Limitations of GIB® Plasterboard

GIB® plasterboard products must NOT be:
- used in external situations, or
- exposed to water or be installed in situations where extended exposure to humidity above 90% RH can reasonably be expected, or
- exposed to temperatures in excess of 52°C for prolonged periods.

5.4.3.2 Bracing Performance - Timber Framing

Bracing Performance - GIB EzyBrace® Systems - Timber Framing. To the timber framed elements noted as 'Bracing' on the drawings, additionally comply with all relevant aspects of the GIB EzyBrace® Systems (2016) publication and GIB Ezybrace® Bracing Software according to the specified bracing unit rating, BRANZ Appraisal No.928, and other relevant product manufacturers' recommendations. Refer to separate specification GIB EzyBrace® Systems.

5.4.3.3 Wet Areas

Wet Area Plasterboard Linings - GIB Aqualine® Wet Area Systems. To the areas noted as 'Wet Area' on the drawings, additionally comply with all relevant aspects of the GIB Aqualine® Wet Area Systems publication, BRANZ Appraisal No.427 (2021), and other relevant product manufacturers' recommendations. Refer to separate specification GIB Aqualine® Wet Area Systems.

5.4.4 GIB® Plasterboard Linings

5.4.4.1 GIB® Standard Plasterboard, 10mm

GIB® Standard Plasterboard, 10mm. A 10mm thick standard plasterboard interior lining. Suitable for use in residential and commercial applications on walls. Manufactured to exceed the requirements of AS/NZS 2588. Refer to the GIB® Site Guide.

Installed Location:

5.4.4.2 GIB® Standard Plasterboard, 13mm

GIB® Standard Plasterboard, 13mm. A 13mm thick standard plasterboard interior lining. Suitable for use in residential and commercial applications on walls and ceilings. Manufactured to exceed the requirements of AS/NZS 2588. Refer to the GIB® Site Guide.

Installed Location:

5.4.4.3 GIB Braceline® & GIB Noiseline®, 10mm

GIB Braceline® & GIB Noiseline®, 10mm. A 10mm thick dual purpose plasterboard interior lining, with a high-density core for extra bracing and noise control performance. Suitable for use in residential and commercial applications on walls and ceilings where increased bracing and noise control performance is required. Manufactured to exceed the requirements of AS/NZS 2588. Refer to the GIB® Site Guide.

Installed Location:

5.4.4.4 GIB Aqualine®, 10mm

GIB Aqualine®, 10mm. A 10mm thick moisture resistant plasterboard interior lining, with a water resistant polymer impregnated core to help prevent moisture penetration. Suitable for use in residential and commercial applications on walls and ceilings in spaces at risk from water or moisture damage. Manufactured to exceed the requirements of AS/NZS 2588. Refer to the GIB® Site Guide.

Installed Location:

5.4.5 Components & Accessories

5.4.5.1 Metal Ceiling Battens

Metal Ceiling Battens - GIB® Rondo® Metal Batten Systems. Installed in accordance with the manufacturer's requirements to the layout and details shown on the approved drawings. Refer to the GIB® Site Guide, and to separate specification GIB® Rondo® Metal Batten Systems.

5.4.5.2 Plasterboard Fasteners

GIB® Plasterboard Fasteners. Fasteners for fixing GIB® Plasterboard Linings shall be selected and used according to best fixing practices and the GIB® Site Guide and relevant GIB® Systems literature. Fastener heads shall be set slightly below the plasterboard sheet surface without breaking the paper facing.

Screw Fixing to Timber Framing:
- GIB® Grabber® High Thread Drywall Screws: A coarse high-thread screw for fixing into timber with superior holding power and ease of penetration.
- GIB® Grabber® Self Tapping Drywall Screws: A fine self-tapping thread, needle point screw, suitable for fixing to timber and light gauge steel framing.
- GIB® Grabber® Dual Thread Drywall Screws: A dual coarse/fine threaded, needle point screw, as a component of the GIBFix® Framing System and for fixing to timber framing.

Nail Fixing to Timber Framing:
- GIB Nail: Passivated coated, annular grooved, bugle head drywall nails with chequer-keyed head.

Screw Fixing to Light Steel Framing:
- GIB® Grabber® Self Tapping Drywall Screws: A fine self-tapping thread needle point screw, suitable for fixing to light gauge (0.45-0.95mm) steel framing.
- GIB® Grabber® Dual Thread Drywall Screws: A dual coarse/fine threaded, needle point screw, suitable for fixing to light gauge (0.45-0.95mm) steel framing.

5.4.5.3 Adhesives

GIB® Adhesives. In addition to GIB® plasterboard fasteners, fix GIB® Plasterboard Linings using GIB® adhesives in accordance with the requirements of the GIB® Site Guide and GIB® System literature.

GIB® Adhesives:
- GIBFix® One: An acrylic based plasterboard adhesive with ultra low VOC, suitable for use on timber and metal substrates, including all treated timber. Minimum application temperature - 10°C.
- GIBFix® All-Bond: A solvent based plasterboard adhesive, suitable for use on timber and metal substrates, including all treated timber. Do not use on polystyrene surfaces.

5.4.5.4 Paper Faced Metal Trims

GIB® Goldline® Paper Faced Metal Trims. Paper-faced metal corner beads and edge trim made with a patented, high quality paper laminated to galvanised steel forms. Paper faced metal trims shall be embedded in jointing compound - do not mechanically fasten paper faced trims. Installed in accordance with the requirements of the GIB® Site Guide and GIB® Systems literature.

GIB® Goldline® Profiles:
- External 90° Corner Trim (G1-W): profile available in 2.4/2.7/3.0m lengths.
- External 135° Corner Trim (G1-O): profile available in 2.4m lengths.
- Internal 90° Corner Trim (G2): profile available in 2.4/2.7/3.0m lengths.
- Internal 135° Corner Trim (G2-O): profile available in 2.4m lengths.
- Bullnose External 90° Corner Trim (G1-B): profile available in 2.4/2.7/3.0m lengths.
- Reveals (GR): profiles available for 10mm thick and 13mm thick plasterboard.
- L-Trims (G4): profiles available for 10mm thick and 13mm thick plasterboard.

5.4.5.5 Joint & Finishing Compounds

GIB® Compounds. Use the most suitable GIB® Compounds to joint and finish GIB® Plasterboard Linings according to the plasterboard type, location, application, durability, and quality of finish required. GIB® Compounds shall be applied and finished in accordance with the manufacturer's requirements to the specified finish level, and used in conjunction with GIB® Paper Joint Tape and GIB® Plasterboard Trims.

GIB® Compounds:
- GIB TradeSet®: Setting type compound. Suitable for Tape Coat, 2nd Coat. Easy to scrape. 20/45/90/150 minute working/set times.
- GIB MaxSet®: Setting type compound. Suitable for Tape Coat, 2nd Coat. Scrape while 'green'. 90 minute working/set time.
- GIB Lite Blue®: Setting type compound. Suitable for 2nd Coat. Easy sanding. 90 minute working/set time.
- GIB Trade Finish® Heavy Weight: Air drying ready-mix type compound. Suitable for Finishing Coat. Moderate sanding.
- GIB Trade Finish® Multi: Air drying ready-mix type compound. Suitable for Tape Coat, 2nd Coat; Finishing Coat. Easy sanding.
- GIB Trade Finish® Lite: Air drying ready-mix type compound. Suitable for Finishing Coat. Very easy sanding.
- GIB Promix® Lite: Air drying ready-mix type compound. Suitable for Finishing Coat. Very easy sanding.
- GIB® U-Mix: Air drying powder-mix type compound. Suitable for Finishing Coat. Easy Sanding.
- GIB Plus 4®: Air drying ready-mix type compound. Suitable for Tape Coat, 2nd Coat, Finishing Coat. Very easy sanding.
- GIB Promix® All Purpose: Air drying ready-mix type compound. Suitable for Tape Coat, 2nd Coat, Finishing Coat. Moderate sanding.
- GIB-Cove® Bond: Setting type compound. Suitable for bonding GIB-Cove® cornice, back-blocking plasterboard linings, and direct-bonding plasterboard to concrete and masonry walls. Hard to scrape. 45/90 minute working/set times.
- GIB X-Block® Jointing Compound: Used in conjunction with GIB X-Block® plasterboard wall and ceiling linings in accordance with the GIB X-Block® Radiation Shielding publication.

5.4.5.6 Joint Tape

GIB® Paper Joint Tape. A 50mm wide, spark perforated paper joint tape used to strengthen joints between plasterboard sheets. Centre-creased for internal and external corner applications.

Recommended for jointing GIB® plasterboard wall and ceiling linings in accordance with the GIB® Site Guide and GIB Systems literature.

5.4.5.7 Wet Area Sealant

Wet Area Sealant. A mould resistant, flexible, neutral curing silicone sealant with strong adhesion, suitable for wet area applications and where there is high humidity, including bathrooms, toilets, showers, wash-down areas, kitchens, laundries.

Applied in accordance with the sealant manufacturer's instructions, as required by the GIB® Site Guide and GIB® System literature. Sealant joints shall be in accordance with the sealant manufacturer's joint design width-to-depth ratio.

Manufacturer & Brand:

5.4.5.8 Gap Filler

GIB® Gapfiller. A general purpose, gun applied, one-part water based, paintable acrylic gap filler. Provides excellent adhesion for gaps and cracks and other low movement joints. Used in strict in accordance with the manufacturer's requirements. Refer to the GIB® Site Guide.

5.4.6 Level of Finish

5.4.6.1 Level of Finish

To the areas noted as a specific Level of Finish (3-5) on the drawings, additionally comply with all relevant aspects of the GIB® Site Guide and AS/NZS 2589, complete with all system accessories, and other relevant product manufacturers' recommendations.

NOTE: Unless stated otherwise, Level 4 is the default Level of Finish.

5.4.6.2 Acceptance of Levels of Finish

Carry out all necessary inspections and assessments of completed plasterboard jointing and finishing prior to hand-over for subsequent decoration.

Do not apply surface sealers and decorative treatments until written agreement between the Contractor and Painter/Decorator is given confirming the specified Finish Levels have been achieved and the plasterboard linings are ready for subsequent sealing and decoration.

5.4.7 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Co-operate with the Decorator to ensure that the specified Finish Levels for plasterboard jointing and finishing is achieved before decorating commences.

Coordinate with other trades to install GIB® Plasterboard Linings as required, and to ensure that:
- appropriate tolerances and clearances allow for adjacent internal linings, fixtures, fittings, services, etc; and
- the linings correctly allow for proper door and window installation; and

- penetrations for building services are correctly handled to maintain sheet integrity and system performance.

5.4.8 Workmanship

Where required by the NZ Building Act 2004, it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

Installation and finishing work of GIB® Plasterboard Linings shall be carried out by qualified and experienced tradespersons, familiar with the specified materials and installation and finishing techniques, in accordance with the GIB® Site Guide and the relevant GIB® product technical literature, and to fully comply with all warranty requirements. Submit evidence of experience on request, e.g. National Certificate of Interior Systems, or Certified Business Member of AWCINZ.

GIB® Plasterboard Linings shall be jointed and finished to the specified Finish Levels in accordance with AS/NZS 2589 and GIB® Site Guide. Make all necessary arrangements for the quality assessment of plasterboard jointing and finishing Finish Levels prior to commencing decorating.

All cutting, fixing, jointing, finishing and sealing techniques shall be exactly as recommended by the manufacturer. All work shall be such as to leave a neat, efficient and robust installation, to the required standard and free from damage and defects.

Protect surrounding surfaces and areas from jointing compound splashes and sanding dust.

5.4.9 Delivery & Handling

Store GIB® Plasterboard Linings indoors, in neat, flat stacks off the floor, in dry conditions and without any sagging or distortion, in accordance with the GIB® Site Guide. Keep plasterboard linings, compounds and accessories dry, out of direct sunlight, and protected from damage, moisture and contamination at all times.

Do not use damaged or defective materials and products, or products that are beyond the designated shelf life.

Should a problem be encountered with any GIB® product during installation or delivery, immediately contact the GIB® Helpline on 0800 100 442. Do not continue to use the product that is not performing to specification or expectation. Keep samples of the product in question and where possible, document batch numbers and/or manufacturing dates.

Handle all products and materials in accordance with the manufacturer's requirements and relevant Product Data Sheets and GIB® Site Guide, and in a manner that prevents damage. Carry plasterboard sheets on edge, and avoid damage to sheet edges, ends, and surfaces.

Installers shall be familiar with and comply with the requirements of the GIB® Site Guide precautions for use, and use appropriate safety gear when handling materials.

Installers shall conform with all relevant WorkSafe NZ Guidelines and Codes of Practice.

5.4.10 Preparation

5.4.10.1 General

All framing and substrates shall be complete and ready for GIB® Plasterboard Lining installation.

Timber framing shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content 18% at the time of plasterboard lining installation.

Light structural steel framing shall comply with the requirements of AS/NZS 4600 or the NASH Standard for Residential and Low-rise Steel Framing, Part 1: Design Criteria. All light structural steel framing members shall satisfy the requirements of AS/NZS 1170. Comply with the steel framing fabricator's specifications and requirements for plasterboard installation.

Steel stud partitioning shall comply with AS 1397 and as specified and shown on the drawings. Comply with the manufacturer's specifications and requirements for plasterboard installation.

Concrete substrates shall comply with the CCANZ CP 01:2011 or with NZS 3109. New concrete must have aged for a minimum of 28 days. Ensure that concrete surfaces are within the tolerances specified. For of direct bonded plasterboard linings, concrete substrates must below 75% relative humidity prior to installation.

Concrete masonry substrates shall comply with NZS 4229, or with NZS 4230 and AS/NZS 1170 for specific design. For of direct bonded plasterboard linings, concrete masonry substrates must below 75% relative humidity prior to installation.

Carry out all necessary moisture readings. Do not commence installation until the moisture readings are below the required level.

Carry out all necessary substrate inspections and preparatory work in accordance with the manufacturer's recommendations and the GIB® Site Guide prior to installation. Complete and sign the GIB® Site Guide Pre-Installation Checklist.

Check that the building envelope has been finished at all penetrations including doors, windows, services, etc., and the building is weathertight.

Check junctions to all other building elements and ensure that all necessary works have been completed, including cavity insulation.

Check that all fixtures, fittings and built-in items are correctly installed, and that all framing and substrate edges are completed as detailed.

Confirm the location and details of movement control joints, as indicated on the drawings, prior to installation.

Ensure all pre-wiring and service piping is installed and complete.

Check that any required cavity insulation has been installed correctly and its bulk thickness does not exceed the framing thickness.

Remove all debris and rubbish from framing voids prior to installing linings.

The commencement of work on each section/area shall be deemed to indicate full acceptance by the installer that all preparatory works by other trades is complete.

5.4.10.2 Framing Check

Framing - check all aspects of preparatory works, including but not limited to:
- Check that the framing is straight and true to line, and is plumb/level and correctly aligned.
- Check that the framing is within the required deviation tolerances defined in AS/NZS 2589 according to the specified Finish Level.
- Check that vertical and horizontal framing members are at the spacings shown on the drawings, and that any required battens or furring channels are installed to the required layout.
- Check that the framing has no projections due to structural and bracing bracketry, etc. Ensure that framing brackets, plates, braces, hold-downs, etc., are correctly installed.

5.4.10.3 Work above Ceilings

Check that all building work, mechanical, plumbing, electrical, fire protection and other services installed above the ceiling are completed and independently supported by the building structure - not by the ceiling system.

5.4.11 Installation

5.4.11.1 General

Install GIB® Plasterboard Linings and accessories in accordance with the requirements of the GIB® Site Guide and product technical literature and associated fixing schedules, to the locations and details shown on the drawings. For GIB® Performance Systems, refer to the relevant GIB® system specification.

Prior to installation, confirm:
- The locations and construction details of all movement control joints;
- The locations and installation details of all building services items within framed structures;
- The specified GIB® plasterboard installation and fixing requirements;
- The specified Finish Level(s) for the plasterboard linings.
- Subsequent surface treatments and finishes applied to GIB® plasterboard.

5.4.11.2 Standard Ceiling Fixing - Metal Ceiling Battens

GIB® Plasterboard Ceiling Linings - Standard Ceiling Fixing with Metal Ceiling Battens. Metal ceiling battens shall be from the GIB® Rondo® Metal Batten Systems - refer to separate specification GIB® Rondo® Metal Batten Systems.

Unless independently supported, uniformly distributed loads (fixtures and fittings and/or overlaid insulation) supported by GIB® plasterboard ceiling linings shall not exceed 3.0 kg/m².

Metal ceiling batten spacings shall be shall be as given in the GIB® Site Guide according to the specified plasterboard thickness - 600mm for 13mm or greater thickness, 450mm for 10mm thickness. Ceiling battens shall all run in the same direction within the ceiling area. In no case shall ceiling battens be continuous over movement control joints in the structure.

Install GIB® Plasterboard sheets right angles to ceiling battens, with sheet end-joints staggered minimum 600mm and located off battens and back-blocked. Fully support sheets during positioning and fixing - for ceiling installations, the use of a mechanical lifting machine is recommended.

Plasterboard sheets shall be fixed to ceiling battens in conjunction with GIBFix® adhesive applied at maximum at 200mm centres. Do not apply adhesive at sheet edges or within 200mm of fasteners. Firmly press the plasterboard where adhesive has been applied to ensure full contact.

Fix sheets to timber ceiling battens with GIB® Grabber® Self Tapping Screws in accordance with GIB® Site Guide fastener schedule according to the plasterboard thickness. Position fasteners no closer than 12mm from a tapered edge or 18mm from a cut sheet edge.

Install all necessary paper-faced metal beads, casing beads, shadow and reveal beads and other edge trims to plasterboard corners and edges as necessary and as detailed on the drawings.

Form movement control joints to the locations and details shown on the approved drawings. Where not indicated on the drawings, movement joints shall be positioned at maximum 12m intervals in both directions on any single ceiling, and where there is a change in ceiling lining material, and shall coincide with the junctions between adjoining spaces.

Accommodate recessed light fittings, heating and ventilating diffusers and grilles and other utility fixtures and fittings that penetrate the ceiling lining.

5.4.11.3 Wall Linings - Horizontally Fixed - Timber Frame

GIB® Plasterboard Wall Linings Horizontally-Fixed to Timber Framing. Install GIB® plasterboard sheets horizontally, at right angles to studs, with any end-joints staggered, and with the bottom edge of the lower sheet gapped 5–10mm off finished floor level.

All joints between sheets shall be touch fitted. Eliminate or minimise the butting of sheet end-joints by using full-length or long-length sheets. Give careful consideration to the placement of sheet joints. Where possible, place joints in situations where they are less likely to be affected by critical lighting.

It is recommended that sheet end joints in horizontally fixed plasterboard be unsupported, off-stud and back blocked - stud centres must not exceed 600mm. For plasterboard linings with Level 3 Finish and Level 4 Finish, sheet end joints can be located on-stud.

Sheet end joints at openings, such as window and door openings, shall not coincide with the vertical edges of the opening - sheets shall be fitted so that the vertical end joint falls minimum 200mm either side of the edge of the opening.

Plasterboard sheets shall be fixed to timber framing in conjunction with GIBFix® adhesive applied at maximum at 300mm centres to intermediate studs. Do not apply adhesive at sheet edges or within 200mm of fasteners. Firmly press the plasterboard where adhesive has been applied to ensure full contact.

Fix sheets to timber framing with GIB® Grabber® High Thread Screws or GIB® Nails in accordance with GIB® Site Guide fastener schedule. Place fasteners at 300mm centres to top and bottom plates and to perimeter studs, and to each stud where the horizontal joint crosses the stud, with screws no closer than 12mm from sheet edges. It is recommended that fasteners at wall corners are placed 50mm in from the corner in each direction (horizontal/vertical).

Install all necessary paper-faced and metal beads, casing beads, shadow and reveal beads and other edge trims to plasterboard corners and edges as necessary and as detailed on the drawings.

Form movement control joints to the locations and details shown on the approved drawings. Where not indicated on the drawings, movement joints shall be positioned at maximum 12m intervals in both directions (horizontally/vertically), and shall coincide with movement joints in the primary structure, and where there is a change in wall lining material.

Accommodate piped and cabled services and other building services fixtures and fittings that penetrate the wall lining.

5.4.11.4 Jointing & Finishing

Joint and finish GIB® Plasterboard Linings with GIB® joint and finishing compounds appropriate for the plasterboard type and durability, and the finish level required. Refer to Joint & Finishing Compounds clause.

Carry out jointing and finishing according to the specified Finish Level in accordance with the GIB® Site Guide and GIB® Compounds brochure. Reinforce sheet joints and internal corners with joint tape or paper-faced trim embedded into the Taping (first) Coat.

Sheet joints, internal and external corners, and fastener heads shall be evenly finished with GIB® compounds. When dry, lightly sand to a smooth finish with 220 grit sandpaper or drywall sanding screen to remove tool marks, ridges and other imperfections prior to subsequent sealing and decorating.

5.4.12 Completion

Check that GIB® Plasterboard Linings have been installed in accordance with the GIB® Site Guide and GIB® Systems literature, and are finished to the specified finish levels.

Check for any damage and defective work - repair or replace as necessary to the required standard.

Ensure that inspection and assessment of the plasterboard Finish Level has been carried out, and that written agreement stating the completed jointing and finishing is acceptable for subsequent surface sealing and decoration has been provided.

Ensure that the GIB® Installation Sign-Off Certificate has been completed and signed by the Interior Plasterer/Stopper.

Leave all of this work complete and to the required standard in accordance with the manufacturer's warranty requirements, as shown on the drawings and the conditions of the Building Consent.

Clean up thoroughly and leave the finished work and surrounding surfaces clean and free of contamination from compound splashes and dust. Remove all associated rubbish and excess material from the site.

Issue to the Owner a copy of the GIB® Plasterboard Lining Systems Care and Maintenance bulletin, and a copy of the GIB® Product and System Warranty.

Preparation and painting (by others) of GIB® Plasterboard Linings shall be carried out in accordance with AS/NZS 2311 and with the paint manufacturer's recommendations. Refer to separate specification section Painting & Decorating.

Preparation, including application of under-tile waterproofing membranes, and tiling (by others) of GIB® Plasterboard Linings shall be carried out in accordance with AS 3589.1 and the BRANZ Good Practice Guide: Tiling. Refer to separate specification section Tiling.

5.5 Masons NZ Ltd UNI Flexible Air Barrier Systems

5.5.1 Scope

5.5.1.1 Scope

Supply and install the specified Membranes, Wraps, Ventilated Cavity Battens and Flashing Tape from Masons NZ Ltd to the locations identified on the drawings, complete with all accessories required for proper installation and performance. All aspects of this work shall be in complete accordance with Masons NZ Ltd technical information and installation requirements (check mpb.co.nz, or call 0800 522 533 for the latest editions), other relevant product manufacturers' recommendations, and as shown on the drawings.
No substitutions are permitted for the specified Membranes, Wraps, Ventilated Cavity Battens and Flashing Tape from Masons NZ Ltd.

5.5.2 Damp-Proof Course (DPC)

5.5.2.1 DRY-FIX Damp-Proof Course

Masons DRY-FIX™ DPC. A 0.75mm thick, high-impact, single-layer Polyethylene film, embossed on both sides, complying with AS/NZS 2904. Available in 50, 75, 90, 100, 150, 200, 250, 300, and 400mm roll widths.
Masons DRY-FIX™ DPC is CodeMark assured with the NZ Building Code: CodeMark Certificate of Conformity No:CMA-CM40072, issued by CertMark Australasia Pty Ltd.
Applications:
- DRY-FIX™ DPC is approved for use for separating timber and wood-based products and metal from concrete, masonry or brick.

- DRY-FIX™ DPC can be used as a moisture barrier and flashing in masonry veneer constructed in accordance with NZBC E2/AS1 and NZS 4229.
- DRY-FIX™ DPC is approved for use as a concealed flashing at jambs and sills of aluminium window and door joinery in masonry veneers walls constructed in accordance with NZBC E2/AS1.

DRY-FIX™ installed as a general Damp-Proof Course:
- The substrate must be flat and free from sharp ridges likely to puncture the DPC.
- The DPC must fully cover the width of material in contact with concrete or masonry.
- Where a bolt or fixing will penetrate the DPC, make a small cut with a sharp knife.

DRY-FIX™ installed as a Flashing:
- Fix to framing members at maximum 300mm centres with small hot-dip galvanised clouts.
- Avoid joining DRY-FIX™ flashings. Where necessary, form joins with minimum 75mm overlap, lapped such that any water will be shed to the outside. Keep any required joining to an absolute minimum.

Installed in accordance with the manufacturer's requirements to the locations and details shown on the drawings.
Installed Location:

5.5.3 Wall Underlay

5.5.3.1 UNI Pro Flexible Air Barrier

UNI PRO Flexible Air Barrier is a non-woven, water resistant, breathable, synthetic flexible air barrier designed to provide temporary weather protection and reduce air infiltration to timber and steel framing prior to the installation of claddings. When installed in accordance with the manufacturer's requirements, it allows continuation of internal works for **up to 150 days exposure**. Nominal weight 230g/m².

UNI PRO Flexible Air Barrier is CodeMark certified: CodeMark Certificate of Conformity No: CM70117 Version 1, issued by Bureau Veritas Australia Pty Ltd.

To achieve the stated performance, UNI PRO Flexible Air Barrier shall be installed as part of a complete system using Masons 40 Below FlashingTape for sealing laps, joins, penetrations and detailing. Installation strictly in accordance with the current UNI PRO Flexible Air Barrier Installation Guide and any compatible proprietary accessories as specified by the manufacturer. Substitution of system components shall only be permitted where approved in writing by the manufacturer or project engineer.

UNI PRO Flexible Air Barrier can be used behind absorbent and non-absorbent direct-fixed wall claddings, absorbent and non-absorbent wall claddings over a 18mm drained cavity and masonry veneer cladding over drained cavities. All applications shall be in accordance with E2/AS1, E2/AS4, NASH Building Envelope Solutions, and the relevant CodeMark Certificate requirements and the manufacturer installation requirements.

UNI PRO Flexible Air Barrier can be installed in NZS 3604 Wind Zones up to and including 'Very High' as a flexible air barrier over timber or steel wall framing in accordance with the manufacturer's requirements and CodeMark Certificate of Conformity.

UNI PRO Flexible Air Barrier can be installed in NZS 3604 Wind Zones up to and including 'Extra High' as a flexible air barrier over a rigid wall underlay in accordance with NZBC E2/AS1 9.1.7.2 to the manufacturer's requirements and CodeMark Certificate of Conformity.

UNI PRO Flexible Air Barrier can be installed in NZS3604 Wind Zone 'Extra High' using a specific fixing method. See the current UNI PRO FLEXIBLE AIR BARRIER INSTALLATION GUIDE. N.B. this is an Alternative Solution and falls outside the scope of the Codemark Certificate.

Do not leave UNI PRO Flexible Air Barrier exposed on walls for more than a total of 150 days prior to cladding. Exposure duration shall be tracked from date of installation.

Installed strictly in accordance with the manufacturer's current installation guide, specifications, CodeMark Certificate conditions and good trade practice for weathertight detailing to the locations and details shown on the drawings.

Installed Location:

5.5.4 Ventilated Wall Cavity Battens

5.5.4.1 Masons Ventilated Wall Cavity Battens

Proprietary Masons NZ Ventilated Wall Battens are made of non-absorbent, extruded polypropylene. Their cellular construction is non-conductive, resistant to capillary action and are dimensionally stable, helping to reduce thermal bridging. Each batten has a self-adhesive strip for easy placement before nailing
Masons NZ Ventilated Wall Battens are designed to form a ventilation pathway for both absorbant and non absorbant claddings, either horizontally and vertically fixed.

Available size 45 mm x 18 mm x 1800 mm (box of 25)

5.5.5 Hydro Flashing Tape

5.5.5.1 Flashing Tape

nstall Masons Hydro™ Flashing Tape in accordance with the manufacturer's requirements, to the locations and details shown on the approved drawings.
Window Sills:
- Fit Masons Corner Guard to the bottom corners of the opening, over the underlay. Alternatively, apply triangular pieces of Masons Hydro™ Flashing Tape to bottom corners in accordance with Masons instructions.
- Cut Masons Hydro™ Flashing Tape to the length of the sill trimmer plus an additional 400mm.
- Apply the tape over the underlay along the sill trimmer, with the back edge flush with the inside edge of the framing, and returned minimum 200mm up both trimming studs.
- Fold the tape minimum 50mm over the face of the underlay on the outside of the opening.
- Press the tape firmly in place over the underlay to ensure a continuous weathertight seal is maintained.
Window & Door Lintels:

- Install Masons Hydro™ Flashing Tape to the top corners of framed window and door openings, over the underlay and 200mm along the lintel and 200mm down the trimming stud, with the back edge flush with the inside edge of the framing.
- Fold the tape minimum 50mm over the face of the underlay on the outside of the opening.
- Press firmly in place over the underlay to ensure a weathertight seal.
- Apply a 75mm wide x 150mm long strip of Masons Hydro™ Flashing Tape at 45° over the taped outside face of each corner.

Avoid joining Masons Hydro™ Flashing Tape. Where necessary, form joins with minimum 100mm overlap, keep any required joining to an absolute minimum.
Do not stretch Masons Hydro™ Flashing Tape during installation, and ensure adequate adhesion and weathertightness is maintained against the underlay.
Do not leave Masons Hydro™ Flashing Tape exposed to weather and UV light for more than 30 days after installation - replace with new window flashing tape if 30 days' exposure is exceeded.

5.5.6 Fixing

5.5.6.1 Masons UNI Fasteners

UNI Fasteners is a Nail & screw washer – It is important to secure UNI with Masons UNI 32mm Nail/washer fasteners. Fasten at 600mm centres over normal 8-10mm stapes. For steel frame use UNI washers with either a Phillips or square drive self-drilling screw.

5.5.7 Window Flashing Tape

5.5.7.1 40 Below Flashing Tape

Masons 40 Below™ Flashing Tape. Masons 40 Below Flashing Tape is a self adhesive, hot melt, flexible, foil-backed tape that is extremely strong and will adhere to most surfaces, and is designed to be used in conjunction with Masons Corner Guard and branded building wraps.
Masons 40 Below™ Flashing Tape is CodeMark assured with the NZ Building Code: CodeMark Certificate of Conformity No:CMA-CM40098 (Rev1), issued by CertMark Australasia Pty Ltd.
Masons 40 Below™ Flashing Tape is suitable for use on timber or steel framed buildings, in conjunction with a compatible flexible wall underlay or rigid wall underlay, in NZS 3604 Wind Zones up to and including 'Very High'.
Masons 40 Below™ Flashing Tape can be used on the sill and lintel of framed joinery openings, and to seal flashing upstands to a flexible underlay.
Masons 40 Below™ Flashing Tape can be used to seal junctions and penetrations in rigid wall underlays.
Physical Properties:
- Thickness:
- Installation Temperature Range: From -40°C to +65°C.
- Maximum UV Exposure: 6 months.
- Tape Width: Available in 75mm, 100mm, 150mm, and 230mm wide rolls.

Masons 40 Below™ Flashing Tape should not be applied directly or indirectly (over flexible underlay) to timber that has been freshly LOSP treated. Always allow LOSP solvent to fully flash off before covering with underlay and applying Masons 40 Below™ Flashing Tape.
Installed in accordance with the requirements of the manufacturer's requirements, and CodeMark certification, to the locations and details shown on the approved drawings.

Frame Depth:
Installed Location:

5.5.7.2 Hydro™ Flashing Tape

Masons Hydro™ Flashing Tape. Masons Hydro Flashing Tape is a self adhesive, bituminous, flexible, foil-backed tape that is extremely strong and will adhere to most surfaces, and is designed to be used in conjunction with Masons Corner Guard and branded building wraps.
Masons Hydro™ Flashing Tape is CodeMark assured with the NZ Building Code: CodeMark Certificate of Conformity No:CMA-CM40125, issued by CertMark Australasia Pty Ltd.
Masons Hydro™ Flashing Tape is suitable for use on timber or steel framed buildings, in conjunction with a compatible flexible wall underlay or rigid wall underlay, in NZS 3604 Wind Zones up to and including 'Very High'.
Masons Hydro™ Flashing Tape can be used on the sill and lintel of framed joinery openings, and to seal flashing upstands to a flexible underlay.
Physical Properties:
- Thickness: 1.2mm.
- Minimum installation temperature: +5°C.
- Maximum UV exposure: 30 days.
- Tape width: Available in 75mm, 100mm, 150mm, and 200mm wide rolls.

Masons Hydro™ Flashing Tape should not be applied directly or indirectly (over flexible underlay) to timber that has been freshly LOSP treated. Always allow LOSP solvent to fully flash off before covering with underlay and applying Masons Hydro™ Flashing Tape.
Installed in accordance with the requirements of the manufacturer's requirements, and CodeMark certification, to the locations and details shown on the approved drawings.
Frame Depth:
Installed Location:

5.5.8 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Coordinate with other trades to install the specified membranes, wraps and flashing tape as required.

5.5.9 Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.
All installation work shall be carried out by experienced and competent tradespersons, familiar with the specified products and installation techniques, in accordance with the manufacturer's requirements, and to fully comply with all warranty requirements.
All cutting, joining, and fixing techniques shall be exactly as recommended by the manufacturer, and carried out with the use of suitable tools and equipment appropriate for the application. All work shall be such as to leave a neat, efficient, and weathertight installation.

5.5.10 Delivery & Handling

Store underlay rolls on end, undercover, on a flat, clean and dry surface. Keep stored materials dry, out of direct sunlight, and protected from damage and contamination at all times.

Handle materials in accordance with the manufacturer's requirements and in a manner that prevents damage to or deterioration of the material.
Do not used damaged or defective materials, or products that are beyond their designated shelf life.
Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear when handling materials.

Installers shall conform with all relevant WorkSafe NZ Guidelines and Codes of Practice - including General risk and workplace management - part 1.

5.5.11 Installation

5.5.11.1 General

Prior to installation, carry out all necessary inspections and preparatory work required, and ensure that all preliminary works by other trades has been completed to specification and as shown on the approved drawings.
Do not commence installation until all necessary preliminary works by others is complete and to the required standard. The commencement of work shall be deemed to indicate full acceptance by the installer that all preliminary works by other trades is complete.
Supporting timber structures shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content in accordance with the requirements of NZS 3602 at the time of installation.
Supporting lightweight steel framed structures shall comply with NASH 3405, or the NZBC for specific design.
Supporting steel structures shall comply with NZS 3404.

5.5.11.2 Timber Frame

Masons Building Wraps installed over Timber Framing - check all aspects of preparatory works, including but not limited to:
- Check that timber framing has been completed as shown on the drawings, complies with NZS 3604 or AS/NZS 1170 for specific design for timber framing, and is in accordance with Masons requirements.
- Check that framing is securely fixed, true to line and plane, is plumb and level where required, and is trimmed at edges, openings and penetrations as required.
- Check that timber framing has a maximum moisture content of 20% at the time of installation.
- Check that there are no projections due to structural bracing and bracketry etc.

5.5.11.3 Uni Flexible Air Barrier

Install UNI Flexible Air Barrier in accordance with the manufacturer's installation instructions, to the locations and details shown on the approved drawings.
UNI Flexible Air Barrier must be installed, printed face out, to the exterior face of the wall framing, run horizontally, starting from the bottom edge and finishing at the top edge, extending 50mm or as detailed below slab bottom plates or framed floor structure, and sufficiently tensioned to prevent sagging or bulging.
Lap UNI Flexible Air Barrier such that any water will be shed to the outside of the underlay.
Horizontal side-laps must be no less than 75mm wide and sealed with Masons 40 Below Flashing

Tape. Vertical end-laps must be no less than 150mm wide, made over solid framing and sealed with Masons 40 Below Flashing Tape.
Fix UNI Flexible Air Barrier to timber framing with Masons UNI Fasteners at maximum 600mm centers using a hammer or gun. Fix UNI Flexible Air Barrier to steel framing at maximum 600mm centres with Masons UNI Washers and self-drilling metal screws. The underlay must be pulled taut over the framing before fixing.
Framed openings should be left covered with UNI Flexible Air Barrier until window and door joinery is ready to be installed Carefully cut UNI Flexible Air Barrier at window and door openings just prior to joinery installation; cut underlay at 45º angle away from each corner and return full framing depth and fasten to inside of frame.
For drained cavity wall construction where studs are spaced more than 450mm apart, install Masons WrapStrap™ 19mm/25mm wide polythene embossed strap - horizontally at 300mm centres, or vertically mid-way between battens/studs - as additional restraint to prevent bulk insulation from pushing the underlay into the cavity space.
Install Masons 40 Below Flashing Tape to window and door openings in accordance with Masons requirements.
UNI Flexible Air Barrier can be added as a second layer over the upstand of head flashings and inter-storey flashings, in lieu of flexible flashing tape, when extended up to and lapped under the nearest underlay lap above.
Install all necessary flexible flashing tapes required to seal the underlay at openings, around pipes, ducts and other services penetrating the underlay, at parapet and balustrade junctions, along head flashings and inter-storey flashings, as shown on the drawings.
Do not leave UNI Flexible Air Barrier exposed to weather and UV light for more than 90 days after installation - replace with new underlay if 90 days' exposure is exceeded.

5.5.11.4 Masons Hydro™ Flashing Tape

Install Masons Hydro™ Flashing Tape in accordance with the manufacturer's requirements, to the locations and details shown on the approved drawings.
Window Sills:
- Fit Masons Corner Guard to the bottom corners of the opening, over the underlay. Alternatively, apply triangular pieces of Masons Hydro™ Flashing Tape to bottom corners in accordance with Masons instructions.
- Cut Masons Hydro™ Flashing Tape to the length of the sill trimmer plus an additional 400mm.
- Apply the tape over the underlay along the sill trimmer, with the back edge flush with the inside edge of the framing, and returned minimum 200mm up both trimming studs.
- Fold the tape minimum 50mm over the face of the underlay on the outside of the opening.
- Press the tape firmly in place over the underlay to ensure a continuous weathertight seal is maintained.

Window & Door Lintels:
- Install Masons Hydro™ Flashing Tape to the top corners of framed window and door openings, over the underlay and 200mm along the lintel and 200mm down the trimming stud, with the back edge flush with the inside edge of the framing.
- Fold the tape minimum 50mm over the face of the underlay on the outside of the opening.
- Press firmly in place over the underlay to ensure a weathertight seal.
- Apply a 75mm wide x 150mm long strip of Masons Hydro™ Flashing Tape at 45° over the taped outside face of each corner.

Avoid joining Masons Hydro™ Flashing Tape. Where necessary, form joins with minimum 100mm overlap, keep any required joining to an absolute minimum.
Do not stretch Masons Hydro™ Flashing Tape during installation, and ensure adequate adhesion and weathertightness is maintained against the underlay.
Do not leave Masons Hydro™ Flashing Tape exposed to weather and UV light for more than 30 days after installation - replace with new window flashing tape if 30 days' exposure is exceeded.

5.5.11.5 Masons Ventilated Cavity Battens

Install instructions

5.5.11.6 DRY-FIX™ DPC

DRY-FIX™ installed as a general Damp-Proof Course:
- The substrate must be flat and free from sharp ridges likely to puncture the DPC.
- The DPC must fully cover the width of material in contact with concrete or masonry.
- Where a bolt or fixing will penetrate the DPC, make a small cut with a sharp knife.

DRY-FIX™ installed as a Flashing:
- Fix to framing members at maximum 300mm centres with small hot-dip galvanised clouts.
- Avoid joining DRY-FIX™ flashings. Where necessary, form joins with minimum 75mm overlap, lapped such that any water will be shed to the outside. Keep any required joining to an absolute minimum.

Installed in accordance with the manufacturer's requirements to the locations and details shown on the drawings.
Installed Location:

5.5.12 Completion

Check that all underlays have been installed correctly and are properly supported, and that all underlay edges, joins and ends are correctly finished prior to closing off with claddings - all in accordance with the manufacturer's installation requirements.
Check installed underlays and flashing tapes for defective work and damage before covering - replace and/or repair as necessary to the required standard.
Leave all of this work complete and free of defects, and to the required standard in accordance with the manufacturer's warranty requirements.
Complete the UNI Flexible Air Barrier System On-SITE Checklist and issue to the owner.
Issue to the Owner a copy of the Masons NZ Ltd Product Warranty for all Masons products installed.

5.6 Timber Framing

5.6.1 Scope

Supply and install timber framing to the floors, walls, roofs, and other timber framed elements, as identified and detailed on the drawings. All aspects of this work shall be in accordance with NZS 3604, product manufacturers' recommendations, and as shown on the drawings and the specification.

Supply and install timber framing components, as specified herein, to the locations and details shown on the design drawings, complete with all necessary accessories required for proper installation and

performance. All aspects of this work shall comply with the NZ Building Code, NZS3604:2011 and its updates, related technical literature and other relevant product manufacturers' recommendations.

This specification covers timber framing of sub-floors, floors, walls and roofs. No substitution is allowed where a specific manufactured component is noted on the drawings.

Extend of work:

The following is a list and/or general description of the extent of works, which are more specifically defined in the contract documents, required for the completion of the contract works:

5.6.2 Requirements

5.6.2.1 Safety:

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

5.6.2.2 Warranty:

Provide Timber Component Warranty in according with the manufacturer's warranty terms and conditions:

- Commence the warranty from the date of permanent installation of the component.

Include a copy of the manufacturer's maintenance requirements where applicable.

5.6.2.3 Inspection & Reporting:

BCA inspections shall take place at each of the stages as scheduled in the Building Consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

Carry out all necessary pre-installation and installation inspections for each area of the works.

Complete all necessary Pre-Installation Checklists prior to installation, and all necessary Installation Checklists.

Complete all necessary Final Checklists and Installation Sign-Off Certificates before handing over completed work.

5.6.2.4 Quality Assurance:

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of the work are carried out to the highest standard.

5.6.3 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades, as required, the assembly and installation of the timber framing to the required layout, details and tolerances.

5.6.4 Workmanship

5.6.4.1 Workmanship:

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All work shall be carried out to current best trade practise by experienced and competent tradesmen, familiar with the materials and installation techniques, in accordance with NZS 3604:2011 and as shown on the drawings.

5.6.5 Timber Framing General

5.6.5.1 Timber Grade and Quality:

Unless otherwise noted or specified on the drawings or specification, all framing timber shall be minimum structural grade SG 8 Radiata pine in accordance with NZS 3622.

Framing timber shall be seasoned or kiln dried, and be straight and true and free from wind, warp and distortion, and in lengths suitable for the members required, and shall have a moisture content of between 12% and 18% before installation.

Do not used damaged, faulty or defective materials.

5.6.5.2 Timber Treatment:

All non-durable timber framing shall be appropriately treated against moisture and/or insect decay by treatment plants with recognised quality assurance systems that are administered by the Timber Preservation Council (NZTPC). Treatment of timber and wood-based building products shall be to the requirements of NZS 3602 as an absolute minimum, and all treated timber shall be identified and marked as required.

Carefully manage treated framing during installation to avoid accidental use of timber with a lower performance or durability treatment than that required or specified.

5.6.5.3 Storage & Handling:

Check timber framing upon delivery and reject sub-standard or damaged material.

Store timber framing dry under cover, fillet stacked and well clear of the ground, and protect from damage, moisture, and contamination.

Ensure all appropriate personal protection equipment is worn at all times when handling and cutting treated framing.

5.6.5.4 Concrete Separation:

Separate timber framing with an approved continuous damp proof course when in direct contact with concrete or masonry. Ensure that the DPC material is compatible with the timber treatment.

Free draining separations to external vertical faces shall be 12mm minimum and as noted on the drawings.

5.6.5.5 Timber Re-treatment:

All cut or drilled surfaces of H4 and H5 treated timber framing shall be flood coat re-treated, with a suitable product recommended by the original treatment plant, before installation.

5.6.5.6 Framing Protection:

Protect timber framing as required during installation against damage and moisture, and against significant variation of moisture content until ready for lining. Avoid ponding of water around floor plates.

5.6.5.7 Built-up Framing Members

Except for jack studs, bottom plates and top plates, framing members may be substituted with built-up members in accordance with the limitations of NZS 3604 2.4.4.7. All built up members must meet or exceed the requirements of their specific application as shown on the plans.

5.6.6 Timber Framing Fixing, Fasteners & Connectors

5.6.6.1 Durability:

The minimum durability of timber framing fixings and fastenings, nails and screws, shall comply with the durability requirements of NZS 3604.

- Galvanised steel fixing components shall have galvanised coating masses in accordance with NZS 3604 Table 4.2.
- Unless noted or specified otherwise, the materials for nails and screws shall be as given in NZS 3604 Table 4.3.
- Steel fixings and fastenings in contact with timber treated with copper based timber preservatives (H3.2 or higher) shall be in accordance with NZS 3604 4.4.4.
- Unless noted or specified otherwise, Stainless steel nails shall be minimum Grade 304.

5.6.6.2 Fastenings and Connectors:

Unless otherwise noted or specified, timber framing fastenings and connectors shall be as specified in the relevant fixing schedules of NZS 3604 or have an equivalent capacity as specified therein.

Timber framing connectors and fixings shall comply with the product information as required in NZS 3604 2.4.6, and shall be used and installed in accordance with the manufacturer's recommendations.

Pre-drill nail holes in split-prone framing as necessary.

5.6.6.3 Bolts and Screws:

Unless specified or shown otherwise, all bolted and screwed connections shall be M12 or M16 in accordance with the relevant fixing requirements given in NZS 3604.

Bolted and screwed connections shall have either a 50mm x 3mm square, or a 55mm x 3mm round, washer to each head and nut for M12 and M16 fixings. Washers shall be of the same material and durability as the bolt or screw.

5.6.7 Floor Framing

Unless specified or shown otherwise, timber floor joists shall be to the dimensions and spacings given in NZS 3604 Table 7.1.

Floor joists shall be laid on edge true to line and level, have a minimum support bearing of 32mm (except when cantilevered), and so that any crook will straighten under load.

Floor joists shall be jointed over supports (except when cantilevered beyond the support) in accordance with NZS 3604 7.1.1.7.

Unless specified or shown otherwise, boundary joists shall be continuous 25mm thick x joist depth as lateral support, and fixed to each end of the floor joists in accordance with NZS 3604 Table 7.5.

Boundary joist size:

Unless specified or shown otherwise, solid blocking shall be 45mm thick x joist depth and installed between joist ends at maximum 1.8m centre spacings as lateral edge support, and fixed in accordance with NZS 3604 Table 7.5. Floor joists supported by by a foundation wall shall have solid blocking over a distance of minimum 1.8m at joist ends.

Floor joists with a span of 2.5m or greater and a depth of at least 4 times the joist thickness shall have 45mm thick continuous solid blocking at mid span, fixed in accordance with NZS 3604 Table 7.5.

Loadbearing walls run parallel to the line of joists shall be supported directly over double joists located at no more than 200mm centre-to-centre from a pile row.

Loadbearing walls run at right angles to the line of joists shall be located at no more than 200mm centre-to-centre from a bearer or subfloor loadbearing wall (running parallel to the loadbearing wall).

Non-loadbearing walls, without a bracing element, within 150mm and parallel to a floor joist, shall be supported by minimum 90mm x 45mm solid blocking on-edge at maximum 1.2m centres and at each side of door openings.

Non-loadbearing walls, with a bracing element, parallel to floor joists and not supported by a floor joist, shall be supported by minimum 90mm x 45mm solid blocking on-edge at maximum 1.2m centres and at each side of door openings.

Unless specified or shown otherwise trimmers shall be fixed to trimming joists by half housing not less than 25mm deep and fixed with 3/100x3.75 nails in accordance with NZS 3604 7.1.6.5(a).

Unless specified or shown otherwise trimmers shall be fixed to trimming joists by proprietary joist hangers in accordance with NZS 3604 7.1.6.5(b).

Hanger brand name & type:

5.6.8 Wall Framing

5.6.8.1 Bottom Plate:

Bottom plates shall be to the dimensions and layout shown on the drawings. Unless specified or shown otherwise, bottom plates shall be fixed in accordance with NZS 3604 7.5.12 and Tables 8.18 and 8.19, true to line and level or angle.

Joints in bottom plates shall be made over a stud or over blocking between studs, and all bottom plate connections shall be in accordance with NZS 3604 8.7.3. Form all holes and edge notches in bottom plates in accordance with NZS 3604 8.7.5.

5.6.8.2 Top Plate:

Top plates shall be to the dimensions and layout shown on the drawings. Unless specified or shown otherwise, top plates shall be fixed in accordance with NZS 3604 7.5.12 and Tables 8.18 and 8.19, true to line and level or angle.

Joints in top plates shall be made over a stud or over blocking between studs, and all top plate connections shall be in accordance with NZS 3604 8.7.3. Form all holes and edge notches in top plates in accordance with NZS 3604 8.7.5.

5.6.8.3 Studs:

Studs shall be to the dimensions and spacings shown on the drawings, and installed true to line and plumb in both directions between top and bottom plates.

Unless noted otherwise, non-load bearing wall studs shall be to the spacings given in NZS 3604 Table 8.4, stud width as shown on the drawings.
Form all holes and edge notches in studs in accordance with NZS 3604 8.5.1.5. Do not notch, check, cut, or bore holes in the middle third of any trimming stud.

Should the need arise, studs shall be straightened in accordance with NZS 3604 8.5.3 with prior approval from the Architect/Designer only.

Unless noted otherwise, studs in loadbearing walls for 3 kPa floor loads shall be in accordance with NZS 3604 Table 14.10.

5.6.8.4 Lintels:

Lintels shall be to the dimensions and locations shown on the drawings, and installed true to line and level, and shall be supported by a 45mm thick doubling stud or jack stud fixed to a trimming stud, and secured against uplift in accordance with NZS 3604 8.6.1.8 as required.

The thickness of a lintel may be made from two or more members, where each member is the length of the lintel, in accordance with NZS 3604 2.4.4.7.

5.6.8.5 Sill & Head Trimmers:

Unless specified or shown otherwise, sill and head trimmers to openings shall be the same width as the wall stud and to the thickness given in NZS 3604 Table 8.15, and installed at the required opening height true to line and level, and supported by a 45mm thick doubling stud or jack stud fixed to a trimming stud.

5.6.8.6 Dwangs:

Dwangs shall be the same width and thickness as the wall stud, and installed at the centres noted on the drawings, and accurately cut and fixed in place true to line and level and flush with stud edges. Dwangs fixed in accordance with NZS 3604 Table 8.19.

5.6.9 Roof Framing

5.6.9.1 Purlins:

Purlins shall be to the dimensions and spacings shown on the drawings and as required by the cladding material, and fixed to rafters and/or trusses in accordance with NZS 3604 Table 10.10 (purlins on their flat) and/or Table 10.11 (purlins on their edge).

Purlins on their flat shall be continuous over a minimum of two spans.

Provide all necessary blocking and lateral support to purlins laid on edge in accordance with NZS 3604 10.2.1.16.6, and as detailed.

Extend purlins to form gable verges as detailed and in accordance with NZS 3604 10.2.1.15.

5.6.9.2 Roof Trusses:

Roof trusses shall be Specific Engineering Design (SED) in accordance with NZBC B1/VM1 and manufactured by an accredited fabricator, and shall comply with all aspects of NZS 3604 10.2.2. Roof trusses shall be fabricated to meet the specific design requirements of the roof including, but not limited to; roof layout, pitch, and details, in accordance with the drawings and specification.

Roof trusses shall be supported and fixed to the truss fabricator's specifications but shall be no less than that required by NZS 3604 Tables 10.14 and 10.15. Roof trusses shall be braced as shown on the drawings and in accordance with NZS 3604 10.3.

5.6.9.3 Roof Bracing:

Roof bracing shall be as shown on the drawings and in accordance with NZS 3604 10.3 and 10.4 as necessary.

5.6.10 Preparation

5.6.10.1 Preparation:

Prior to installation, carry out all necessary inspections of the supporting structure to ensure all preliminary work is complete. Do not commence installation until all necessary preliminary work by others is complete and to the required standard. The commencement of work on each section of the installation shall be deemed to indicate full acceptance by the Installer that all preliminary work by other trades is complete and to the required standard.

Supporting structures shall comply with the NZ Building Code, and must be structurally sound and dimensionally stable and in the correct alignment, true to line and level (and grade for sloped balustrades).

Confirm the location of all movement control joints prior to the commencement of the works.

Concrete:
- Supporting reinforced concrete elements shall comply with NZS 3101, or NZS 3604.
- New concrete must have aged for a minimum of 28 days prior to installation.

Concrete Masonry:
- Supporting reinforced concrete masonry elements shall comply with NZS 4229, or NZS 4230 and AS/NZS 1170.

Timber Framing:
- Supporting timber-framed structures shall comply with NZS 3604, or NZS 3603 and AS/NZS 1170.

Structural Steel:
- Supporting steel structures shall comply with NZS 3404.

5.6.11 Installation

5.6.11.1 Installation:

All timber framing members, including all dwanging, strutting, blocking, bracing etc, shall be sized, setout, fitted and fixed to the requirements of NZS 3604 and as shown on the drawings to accommodate structural loadings, cladding and lining setout and support, and the installation of other building components, fixtures and fittings.

All framing shall be erected without deviation, true to line, level, angle and plumb, and evenly aligned and square, and within the tolerances allowed in NZS 3604 Table 2.1. Framing members accurately cut, lapped, housed, joined, and seated so as to provide full contact over the bearing surfaces.

Temporarily prop, brace, tie, and secure framing members and elements as required until the framing is complete and self supporting. Leave in place for safety purposes as long as required.

Edge notching and centre holes:

The notching, checking, and boring of framing members shall be in strict accordance with the requirements of NZS 3604.

Avoided checking and cutting where possible and keep to such dimensions so as not to prejudice the purpose for which the member is used. Keep edge notching to a minimum and where possible use centrally bored holes instead.

Concealed services pipes and wiring shall not project beyond the framing face and where possible shall be beyond the lining's fixing reach.

5.6.12 Completion

5.6.12.1 Completion:

Check the timber framing and its components have been correctly installed in accordance with the manufacturer's requirements to the locations, layout and details shown on the design drawings.

Check the installation for damage and defects. Carry out any necessary repairs in accordance with the manufaturers requirements to the required standard. Replace timber framing components where repair is not possible or will not be accepted.

Leave all of this work complete, clean and free from damage and defects, and to the required standard in accordance with the manufacturer's requirements.

Leave surrounding surfaces clean and free of rubbish and debris. Remove all rubbish and excess material from the site.

6 CLADDING

6.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

6.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1170.0:2002 SUPP1(AS/NZS)	Structural design actions - General principles - Commentary
1170.2:2011(AS/NZS)	Structural design actions - Wind actions
2728:2013(AS|NZS)	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
3602:2003(NZS)	Timber and wood-based products for use in building
3603:1993(NZS)	Timber Structures Standard
3604:2011(NZS)	Timber-framed buildings
3617:1979(NZS)	Specification for profiles of weatherboards, fascia boards, and flooring
NZBC B2/AS1	Durability
NZBC F2	Hazardous Building Materials
NZMRM Code of Practice	NZ Metal Roof and Wall Cladding Code of Practice - Version 3.0

6.3 Hermpac Weatherboard Cladding Systems

6.3.1 Scope

Scope

Supply and install the Hermpac Pacific Limited Weatherboard System, as specified herein, to the walls identified on the drawings, complete with all accessories and trim. For the purpose of this specification, Hermpac Pacific Limited shall be referred to as Hermpac. All aspects of this work shall be complete in accordance with the Hermpac product specifications and technical literature (check www.hermpac.co.nz, email: technical@hermpac.co.nz, or call 09 421 9840 for the latest editions), and as shown on the drawings.

No substitutions or deletions are permitted for the Hermpac product.

6.3.2 Vertical Weatherboard

Vertical Random Width Weatherboard

Supply and install the Hermpac Vertical Random Width Weatherboard Cavity System, as specified herein, to the walls identified on the drawings, complete with all accessories and trim. All aspects of

this work shall be completed in accordance with the Hermpac product specifications and technical literature (check www.hermpac.co.nz, email: technical@hermpac.co.nz, or call 0800 329 423 for the latest editions), NZBC E2/AS1, other relevant product manufacturers' recommendations, and as shown on the drawings.
The Hermpac Vertical Random Width Weatherboard Cavity System is CodeMark assured.
No substitutions or deletions are permitted for the Hermpac Vertical Random Width Weatherboard Cavity System

6.3.3 Timber Species & Profile

Western Red Cedar
Weatherboard Profile ~*as identified on the accompanying drawings*
Grade PC1 ~as identified on the accompanying drawings
Grain/Cut -Mixed-Grain ~*as identified on the accompanying drawings*
Face Finish ~*as identified on the accompanying drawings*
Coating ~*as identified on the accompanying drawings*

6.3.4 Accessories

Hermpac Aluminium Corner Back Flashings
Hermpac Aluminium Corner Back Flashings - internal and external corner back flashings, sized to suit specific corner details in accordance with Hermpac requirements and as shown on the drawings.

6.3.5 Cavity Batten & Base Closer

Vertibat 18mm thick Timber Cavity Battens - to form a nominal 18mm deep drained cavity for Hermpac vertical weatherboards. Vertibat V1 - 40 x 20mm thick, and Vertibat V2 - 70mm x 20mm thick, bevelled and castellated timber cavity battens; incorporating 20mm wide x 5mm deep, alternating rebates at 100mm centres either side of the batten. Manufactured from minimum H3.1 treated Radiata pine or H3.2 Micropro V8 18x45mm cavity battens. Select Vertibat cavity battens is also available manufactured from Western Red Cedar.
Fix Vertibat 20mm thick cavity battens along dwang lines, etc., with 40 x 2.5mm hot-dipped galvanised flat head nails or 50 x 2.8mm Hot-dipped galvanised gun nails, or stainless-steel finishing brads.
Installed horizontally, at minimum 400mm to maximum 480mm vertical centres, to the layout and details shown on the drawings and in accordance with the Hermpac VertiLine Installation Specification.

uPVC
uPVC Cavity Base Closer. Punched with 3-5mm holes or slots complying with NZBC E2/AS1 Paragraph 9.1.8.3. Fitted to the base of the drained cavity, above window and door heads, and inter-storey junctions. Installed in accordance with E2/AS1 to the locations and details shown on the drawings.

6.3.6 Co-operation

Co-operation
Co-operate with other trades to ensure that all preliminary and preparatory works, including membranes, flexible underlays, rigid air barriers, and trims and any other related works are

completed in accordance with the Hermpac Cavity System Installation Specification and Construction Drawings
Coordinate with trades the locations of pipes, outlets, cables, meter boards and other fittings installed by others, and to install Hermpac Weatherboard Cladding System as required.

6.3.7 Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.
Installation work shall be carried out by suitably qualified and experienced tradespersons, familiar with the specified products and the required construction and installation techniques, in accordance with the requirements of the Hermpac technical literature and associated BRANZ Appraisal, NZBC E2/AS1, and as noted and detailed on the approved construction drawings.
Upon completion of the installation, the installing LBP shall complete and sign a Restricted Building Work (RBW) memorandum and the associated Hermpac Weatherboard Cladding System, Product Installation Check List. Issue a copy of the RBW document to the Building Consent Authority and to the Main Contractor.
All work shall be such as to leave a neat, efficient, robust and weathertight installation, to the required standard, free from damage and defects, including surface marking.
Make all necessary provisions to protect adjacent finished work and surfaces from damage during installation.
Refer www.hermpac.co.nz, email: technical@hermpac.co.nz, or call 0800 329 423 for any technical assistance required, and ensure that current Hermpac technical literature is referenced and followed when installing Hermpac weatherboards.

6.3.8 Delivery & Handling

Delivery & Handling
Store weatherboards and accessories undercover, flat and true, clear of the ground by at least 150mm and supported on dry and clean timber bearers at maximum 900mm centres in accordance with Hermpac recommendations. Keep stored weatherboards and accessories dry and protected from damage and contamination, and free from bending or excessive compression.
Do not use damaged or defective weatherboards or accessories.

Dock any oversized knots, unacceptable or unrequired grade characteristic, or damaged areas of weatherboard. Do not install weatherboards during periods of wet weather. Double seal all cut ends and fresh cut timber with selected exterior coating. Some grades of timber will require more docking than others. Please check NZ Grading Rules to ensure that all timber installed meets the NZBC requirements.
Handle weatherboards in accordance with the manufacturer's recommendations and in a manner that prevents damage and surface marking.
Installers shall be familiar with, and comply with, the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear when handling materials.
Installers shall conform with all relevant WorkSafe NZ Guidelines and Codes of Practice - including the Best practice guidelines for working at height in NZ, and the OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry.

6.3.9 Preparation and Installation

General Requirements

Install the specified Hermpac Weatherboard Cladding System, complete with accessories, in accordance with the Hermpac installation requirements and technical literature and as shown on the approved construction drawings.

Confirm the layout and location of all control joints; the layout of cavity battens; and any specific cladding detailing requirements prior to installation.

Ensure that all associated preliminary and preparatory works are completed to the required standard and specification, and as shown on the drawings.

Ensure that the current and up-to-date Hermpac installation and technical literature is readily available on site for reference during installation.

Weatherboard soaker and/or flashing material compatibility shall be in accordance with NZBC E2/AS1 2.2, and as shown on the drawings.

Ensure all cut ends and fresh timber is double coated and sealed in accordance with Hermpac requirements before fixing.

Refer to Fixing for fixing type and placement etc.

All internal and external weatherboard corner junctions, inter-storey junctions, and weatherboard trim and accessories, shall be constructed and installed to the details shown on the drawings.

Always keep Hermpac weatherboard cladding lines consistent and true along walls and around corners.

All flashings around windows, doors and other openings, at corner junctions, inter-storey junctions, soffit junctions, and pipe penetrations, shall be carefully constructed, fixed and finished to the details shown on the drawings.

Hermpac Vertical Shiplap Weatherboard Cavity-Fixed over a Flexible Wall Underlay on Timber framing

Preparation

- Check all aspects of preparatory works, including, but not limited to:
- Check that the timber wall framing complies with NZS 3604, has studs at maximum 600mm centres and Nogs/Dwangs as per design specification and NZBC (or at 400mm min. - 480mm max. centres) for vertical cladding, is plumb and in true alignment, includes all blocking required for cavity battens and fixing at openings, joints, corners, soffits, etc., and has a maximum moisture content of 18% at the time of cladding installation.
- Check that the flexible wall underlay, as specified, has been installed in accordance with NZBC requirements and the manufacturer’s recommendations, and with all finishing tapes, flashings etc. at windows, doors, corners and penetrations all correctly incorporated to provide a continuous seal.
- Where the studs are at greater than 450mm centres, check that appropriate additional restraint is correctly installed to the wrap to keep bulk insulation from pushing the underlay into the cavity space.
- Check that all preparatory materials are lapped such that any water will run down to the exterior.

Installation

Hermpac Vertical Shiplap Weatherboards installed over a cavity drain (20mm/40mm/45mm) over a flexible wall underlay:

Over the flexible wall underlay, install and fix the specified cavity battens to the timber framing to the layout and details shown on the drawings.

Back flash all internal and external corners with Hermpac aluminium corner flashings.

Carefully set-out cladding vertically to straight plumb lines with side laps directed away from prevailing weather.
As specified and shown on the drawings, fix shiplap weatherboards to the timber framing through 20mm thick Vertibat cavity battens, or fix to Vertibat 40mm or 45mm thick cavity battens, and maintain the base overhang minimum 50mm, or as detailed, below the bottom plate or floor structure.
Install full length weatherboards where possible. Where joints are unavoidable, scarf the weatherboards at 30º over a cavity batten line, and fix weatherboard ends, with the top board fixed through the top overlapping board above the joint - not through the joint.
Overlap, joint and fix cavity-installed Hermpac Shiplap Weatherboards in accordance with Hermpac installation requirements and as detailed on the drawings. NB: Ensure weatherboard end-grains are double coated.

6.3.10 Fixing

Fix Hermpac Shiplap Weatherboards
Fix Hermpac Shiplap Weatherboards with Grade 316 Stainless Steel finish as identified on the accompanying drawings, Hermpac Starcap Screws in accordance with Hermpac fixing requirements and as shown on the drawings.
When fixing with Starcap screws (used most often for an oil/stain finish), the shank length must allow minimum 21mm penetration of the wall frame.
All screw fixings shall be pre-drilled a maximum of 1mm diameter smaller than the screw gauge.
Ensure the weatherboards are set-out with an overlap of 32mm.
Single fix weatherboards at every fixing point, with screws driven in a slight upward slope, located 35-40mm from the bottom edge of the weatherboard, and no closer than 32mm from the end of the board.
Screws shall be set flush onto the board surface - not into or below the surface.
Finish - *as identified on the accompanying drawings*

6.3.11 Completion

Check that the specified Hermpac Weatherboard System has been correctly installed and fixed to the layout and details shown on the drawings; that all joints, associated trim and accessories finished correctly; and that all openings and penetrations have been properly flashed and sealed.
Check for damaged materials and defective work - carry out repairs as necessary to the required standard.
Ensure that the work of other trades does not negatively impact on or reduce the minimum clearances required by the NZ Building Code, between the cladding and ground, roof and/or deck junctures.
Leave all of this work complete and weathertight and to the required standard in accordance with Hermpac requirements and NZBC E2/AS1.
Leave the completed works and surrounding surfaces clean and free of debris and rubbish. Remove all rubbish and excess material from the site.
Complete and sign the Restricted Building Work (RBW) memorandum, and the Hermpac Weatherboard Cladding System Product Installation Check List. Issue a copy of the RBW document to the Building Consent Authority and to the Main Contractor.

6.4 Metalcraft Profiled Metal Wall Cladding

6.4.1 Scope

Supply and install Metalcraft Profiled Metal Wall Cladding, as specified herein, to the locations and details shown on the design drawings, complete with all necessary components and accessories required for proper installation and performance. All aspects of this work shall comply with the NZ Building Code, related Metalcraft Profiled Metal Wall Cladding technical literature and publications (check http://www.metalcraftgroup.co.nz or call (0800) 766 369 for the latest editions), and other relevant product manufacturers' recommendations.

No substitutions are permitted for Metalcraft Profiled Metal Wall Cladding.

For the purpose of this specification, Metalcraft Profiled Metal Wall Cladding is referred to as 'Wall Cladding', and all 'Metalcraft' associated technical literature and publications, including the 'Metalcraft Product Technical Statement', installation instructions and drawings, are collectively referred to as the 'technical literature'.

Extent of work:

The following is a list and/or general description of the extent of the Metalcraft Profiled Metal Wall Cladding works, which are more specifically defined in the contract documents, required for the completion of the contract works:

6.4.2 Requirements

6.4.2.1 Safety:

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

6.4.2.2 Warranty:

Please refer to Metalcraft specifications for applicable warranty terms and conditions.

6.4.2.3 Substitutions:

The Metalcraft Profiled Metal Wall Cladding shall be as specified herein and on the design drawings. The substitution of the Metalcraft Profiled Metal Wall Cladding for an alternative brand is not permitted under any circumstances.

The substitution of the specified Metalcraft Profiled Metal Wall Cladding or ancillary component for an alternative Metacraft Profiled Metal Wall system or ancillary component by the Contractor shall only be permitted with the Contract Administrator's written authorisation and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate an alternative Metalcraft Profiled Metal Wall Cladding or ancillary component to

satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

6.4.2.4 Inspections & reporting:

Inspections shall take place at each of the stages as scheduled in the building consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

Carry out all necessary pre-installation and installation inspections for each area of the works.

Complete all necessary pre-installation checklists prior to installation, and all necessary installation checklists.

Complete all necessary final checklists and installation sign-off certificates before handing over completed work.

6.4.2.5 Quality assurance:

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of the work are carried out to the highest standard.

6.4.2.6 Defective materials & workmanship:

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected Metalcraft Profiled Metal Wall Cladding materials and work shall be repaired and/or replaced to the satisfaction of the Contract Administrator without delay and at no additional cost to the Principal.

6.4.3 Profile

Metalcraft - TRib Wall Cladding - a trapazodial profile; 29mm pan height and 760mm effective cover based on the selected BMT.

Material type - Refer to ‘Wall Sheet Material’ clause.
Thickness - 0.40mm BMT (G550), 0.55mm BMT (G550) and 0.9mm Aluminum (H36 5052)
Windload - Refer to 'technical literature'
Mass (KG/M2) - Refer to 'Metalcraft'
Orientation - Horizontal & Vertical

Installed in accordance with the manufacturer's requirements to the locations and details shown on the drawings.

Installed Location:
Thickness:

6.4.4 Wall Sheet Material

COLORSTEEL® Maxam™ to selected BMT. Pre-painted hot dipped aluminium/zinc/magnesium alloy coated steel coil, with a minimum coating weight of 150g/m², conforming with AS/NZS 2728 Class 6.
COLORSTEEL®

Colour:

6.4.5 Cavity Batten & Closures

6.4.5.1 Castellated Cavity Battens - Vertically Orientated Wall Cladding:

Castellated Cavity Battens for vertically orientated wall cladding over framing should be installed horizontal over the wall underlay and directly over nogs or girts at maximum spacing to suit the cladding profile and as shown on the drawings. Fix to timber framing with 40 x 2.5mm hot-dipped galvanised flat head nails or fix to lightweight steel framing with 6g x 30mm self-drilling (AS 3566 Corrosion Class 3) countersunk screws. Do not use battens treated with copper azole or AQC treatment. Where shown and as specified on the drawings, install a separation layer over the face of timber cavity battens to ensure isolation of materials between the cladding and the cavity batten. Closures to be UPVC installed as per design details and manufacturers requirements.

6.4.6 Proprietary Battens

6.4.6.1 CAVIBAT Cavity Batten System

Provide castellated cavity battens forming a nominal 20mm in accordance with NZBC E2/AS1 requirements. Install battens in accordance with manufacturer’s requirements and project specifications, including fixing methods, spacing, separation layers, and compatibility requirements.

6.4.7 Wall Ancillary Components & Accessories

Cladding screw fastener type and durability shall comply with AS 3566 Class 4 or Class 5, as appropriate, and be no less than the durability of the material being fixed. Fastener type and placement (frequency) shall be appropriate for the environmental conditions and the specified cladding profile and material and the supporting structure material; all in accordance with the NZMRM Code of Practice and E2 External Moisture.

Metal Flashings. Profiled metal cladding flashings shall be fabricated from material with the same coating as the cladding material, to maintain durability and compatibility requirements. Flashings shall be 0.55BMT G300 steel or H34 Aluminium coated to the same standards as the profiled cladding sheets, and notched/scribed when installed across the cladding profile or provided with a soft edge – in accordance with COLORSTEEL® and NZMRM Code of Practice requirements.

Flashings, flashing fastenings and fastening frequency shall be in accordance with the NZMRM Code of Practice.

Do not construct flashing joints and flashing junctions in a manner that relies entirely on sealant to maintain weathertightness.

Rivet Fastenings. Rivets shall be sealed aluminium minimum 4mm diameter.

Use only neutral-curing silicone or MS polymer sealant, compatible with the specified metal cladding and flashing materials and finishes, that is suitable for the required application and use in accordance with the sealant manufacturer's instructions and to NZMRM Code of Practice requirements. All sealed joints must be mechanically fastened, and excess sealant neatly removed to prevent unnecessary dirt

build-up. Sealant shall only be used to seal between two metal surfaces, do not fill holes or gaps with sealant.

Proprietary Collar Flashings. EDPM or silicone-polymer proprietary flexible collar flashings for weatherproofing cladding-penetrating pipes/flues/ducts. Sized to suit the applicable pipe/flue/duct and installed in strict accordance with the manufacturer's requirements and the NZMRM Code of Practice.

Profiled Foam Closure Strip. Non-bituminous, compressible, closed-cell foam strips profiled to fit the specified cladding profile. Installed to the details shown on the drawings and in accordance with NZMRM Code of Practice recommendations.

6.4.8 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades, as required, on the assembly and installation of the Metalcraft Profiled Metal Wall Cladding to the required layout, details and tolerances.

6.4.9 Qualifications & Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All installation work shall be carried out by experienced and competent tradespersons, familiar with the specified products and installation techniques and suitably qualified to install Metal Wall Cladding, to fully comply with all warranty requirements in accordance with the manufacturer's requirements.

All cutting, fixing and installation techniques, fastenings and sealants shall be exactly as recommended by and in accordance with the NZMRM Code of Practice, and carried out with the use of suitable tools and equipment appropriate for the application.

Always maintain isolation of dissimilar materials in accordance with the NZMRM Code of Practice Section 4.10. Isolate dissimilar materials (metal and non-metal) in close proximity as necessary by fitting separator strips. Place isolators between metals and treated timber or cement-based materials. Do not allow unpainted lead-sheet or copper materials to come in contact with, or allow water run-off from these onto Zincalume or galvanised materials.

All work shall be such as to leave a neat, efficient, robust and weathertight installation.

6.4.10 Delivery & Handling

Store Metal Wall Cladding, flashings and accessories clear of level ground, on bearers at evenly spaced centres as recommended by the NZMRM Code of Practice. Keep stored materials and accessories dry and protected from damage and contamination at all times.

Do not use damaged or defective materials or products, or products that are beyond their designated shelf life.

Handle materials in accordance with the manufacturer's requirements and in a manner that prevents damage to or deterioration of the material, including surface marking.

6.4.11 Preparation

Check that the specified building underlay (to NZS 2295) has been installed in accordance with NZBC requirements and the manufacturer's recommendations, and with all finishing tapes, flashings etc. at windows, doors, corners and penetrations all correctly incorporated to provide a continuous seal.

Check that appropriate additional restraint is correctly installed over the underlay to keep bulk insulation from pushing the underlay into the cavity space.

Ensure that all underlays directly behind Metal Wall Cladding are of absorbent type as required in E2/AS1 Table 23. Check that all preparatory materials are lapped such that any water will run down to the exterior.

Check that ground levels and drains are constructed so that there will be no ponding water against the building, and that the ground will always remain clear of the cladding by at least 100mm in accordance with E2/AS1.

6.4.12 Installation

Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use and shall use appropriate safety gear when handling materials. Installers shall conform with all relevant WorkSafe NZ Guidelines Working at Heights.

Ensure cavity battens and closures are installed in accordance with specifications and suitable separation is provided between treated battens and Profiled Metal Wall Cladding.

Install Metal Wall Cladding in accordance with the design drawings. Confirm the layout and location of all control joints; the layout of the cavity battens; and any specific cladding detailing requirements prior to installation.

Prevent contact with, or run-off from, incompatible materials in accordance with the recommendations in the NZMRM Code of Practice.
Protect the coated surface from damage at all times; replace the whole sheet where a significant depth of the coating has been damaged (including flashings).

Accurately set-out the planned cladding layout prior to fixing to ensure true and accurate cladding lines and incorporate correct relationships with other design features shown on the drawings; maintain this accurate set-out throughout installation.

Keep cladding lines consistent and true along walls and around corners; with side-laps of vertically orientated sheets directed away from the prevailing wind and/or line of sight; to straight, true and accurately aligned lines in both directions - vertical and horizontal. Check for and eliminate any creep and/or spread of sheets during installation.

Cut metal cladding and flashings by shear only - do not use abrasive cutting tools. Do not use black lead pencils for marking pre-finished metal cladding and flashings.

Screw fastenings for pre-painted metal must be pre-painted prior to installation for an accurate colour match.

All cladding jointing techniques and sealants shall be in accordance with the NZMRM Code of Practice and shall be compatible with the cladding material and finish. Joints shall be sealed with an approved neutral-cure sealant or approved closed-cell lap tape.

Install fasteners in a straight line with a consistent fastening pattern on each sheet to achieve a flat surface and resist design wind loads. Fasteners into timber are to have a minimum of 30mm embedment into structural framing. For pierce fastened profiles, fasteners are to be positioned in the pan adjacent to a rib unless otherwise specified.

Install fasteners in a straight line with a consistent fastening pattern on each sheet to achieve a flat surface and resist design wind loads. Fasteners into steel are to have a minimum penetration of three threads through the steel member. For pierce fastened profiles, fasteners are to be positioned in the pan adjacent to a rib unless otherwise specified.

Fasteners are to be set using a snug fitting socket and a setting tool that does not unduly damage the finish coating of the screw. Depth of setting is to be sufficient to achieve slight compression of the sealing washer without distorting the profile or the sealing washer itself.
Aluminium rivets are to be sealed type pre-painted to match cladding, minimum 4mm diameter. Clip-fastened sheets shall be fixed with concealed proprietary fastening clips appropriate for the cladding profile and material, substrate/structure and the environment in accordance with the NZMRM Code of Practice recommendations.

Install flashings to internal and external corner junctions, window/door and other openings, eave and soffit junctions, parapets and at junctions with other cladding systems and building elements as detailed on the drawings and in accordance with the Zealand Metal Roofing Code of Practice. All flashings shall be neatly formed and finished, securely fastened to the structure, weatherproof, and lapped such that any water will run down to the exterior. For highly visible flashings, plan each flashing joint and/or junction with specific regard to aesthetic requirements. Penetration flashings shall be as per the design details and shall not rely solely on silicone sealant to achieve weathertightness of the flashing.

Form vertical movement control joints to the locations, layout and details shown on the drawings. Movement control joints shall be aligned with control joints in the structural framing. Confirm the location of movement control joints prior to installation.

Handle sheets carefully to avoid scratching and denting. Do not walk on wall cladding sheets prior to installation. Remove strippable film, if applied, immediately after installation of wall cladding to avoid resin staining. All accessories are to be colour matched prior to installation, do not use colour match paint for repairing any blemishes. Ensure sealant is trapped between joint surfaces and not exposed to the visual surface.

6.4.13 Compatibility

Ensure material is isolated from incompatible materials. It must not be in contact with, or receive run off from, less noble metals such as copper, brass and lead. It should not be in wet contact with stainless steel. Sustained wet contact with timber, either treated or untreated, must be avoided.

6.4.14 Completion

Check that the Metalcraft Profiled Metal Wall Cladding and associated components and flashings have been installed and finished correctly. Check for defective work, damage and surface marking - replace and/or repair as necessary. Ensure that the work of other trades does not reduce the clearances of the cladding to ground, deck or roof that are required by the NZ Building Code.

Leave all work complete and weathertight and to the required standard. Leave the completed works and surrounding surfaces clean and free of debris and rubbish. Remove all rubbish and excess material from the site.

Maintenance should be carried out in accordance with Metalcraft's maintenance requirements.

7 EXTERNAL WINDOW & DOOR JOINERY

7.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

7.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1170.2:2011(AS/NZS)	Structural design actions - Wind actions
1734:1997(AS/NZS)	Aluminium and aluminium alloys - Flat sheets, coiled sheet and plate
1866:1997(AS/NZS)	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
3604:2011(NZS)	Timber-framed buildings
4211:2008(NZS)	Specification for performance of windows
4223.3:2016(NZS)	Glazing in buildings - Part 3: Human impact safety requirements
4303:1990(NZS)	Ventilation for acceptable indoor air quality
4680:2006(AS/NZS)	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
NZBC B1	Guidance on Barrier Design
NZBC B1/VM1	Structure
NZBC B2/AS1	Durability
NZBC E2/VM1	External Moisture
NZBC F2	Hazardous Building Materials
NZBC F4	Safety from Falling
NZBC G4/AS1	Ventilation
NZBC H1	Energy Efficiency

7.3 APL Residential Aluminium Windows & Doors

7.3.1 Scope

7.3.1.1 APL Aluminium Window & Door Systems

APL Aluminium Window & Door Systems

Supply and install the specified Aluminium Windows and Doors from APL- Window Solutions to the locations and details shown on the drawings; complete with all components (flashings, support mechanisms, brackets, etc) where required, for proper installation and operation; and commissioned to the required performance and functionality. All aspects of this work shall be in strict accordance with the manufacturer's technical literature and installation requirements (check www.aplnz.co.nz,

call 07 849 8888, or email techinfo@aplnz.co.nz for the latest editions), other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for the specified Aluminium Windows and Doors from APL - Window Solutions

7.3.2 Warranty

Warranty APL - Window Solutions Materials & Workmanship Warranty:
- 12 Years Warranty on Materials – AGP® Insulated glass units (Warrant glass under normal environmental and use conditions against failure of materials).
- 5 Years Warranty on Materials and Workmanship - for all APL window and door products.
- 2 Years Warranty on Materials and Workmanship – for all mirror glass and hardware.
- Provide the Materials & Workmanship Warranty on the Manufacturer's Standard Warranty Form.
- Commence the warranty from the date of practical completion of the contract works.

View the "Care and Maintenance for Windows and Doors". Terms and Conditions are here www.AGPL.co.nz

7.3.3 Requirements

Safety
Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

Shop Drawings
Prepare and submit to the Main Contractor for verification and approval prior to the commencement of works, Shop Drawings describing the general arrangement and connection to the building envelope of the specified window & door systems.

These shall include, but not be limited to:
- Design calculations - where required;
- Dimensioned elevations of all aluminium joinery elements (typical scale = 1:50; minimum scale = 1:100);
- Complete details of the installation construction, connections and all support systems (typical scale = 1:2; minimum scale = 1:5);
- Sealant types and backing rods, etc;
- Provision for movement, thermal, wind load and/or seismic - where required;
- Coordination requirements/issues with other works and trades - where applicable;
- A schedule of materials, finishes, componentry, fittings, fixings and fastenings - where required.

7.3.4 Performance Criteria - Wind Zone - Durability

General Performance - Wind Zone: High
The specified APL Aluminium Window and Door Systems shall comply with the requirements of NZS 4211 for all relevant clauses.

Wind Load - Non-Specific Design Wind Zone Classification. The specified APL Aluminium Window and Door Systems joinery installation is located in a NZS 3604 Wind Zone: H - High; with a maximum pressure of 0.97kPa SLS and 1.36kPa ULS.

Durability - Exposure Zone B: Low
Durability. The specified APL Aluminium Window and Door Systems joinery installation is located in a NZS 3604 Exposure Zone B: Low - within an inland area with little risk from wind-blown sea-spray salt deposits.

ISO 9223 Category: C2 Low: Characterised by no obvious marine influences. Typically, more than 1000 metres from the exposed coasts or more than 500 metres from industrial emissions.

All aspects of the specified APL Aluminium Window and Door System, including surface finishing and hardware, shall meet the durability requirements for the given Exposure Zone in accordance with NZBC B2.

7.3.5 Performance Criteria - Energy Efficiency for All Small Buildings Under 300m2

Thermal Performance - Climate Zone 6
Thermal Performance. The APL Aluminium Residential Window & Doors joinery, installation is located within the boundaries of Climate Zone 6, as defined by H1 Energy Efficiency. Unless specified otherwise, the combination of insulation, should meet the minimum H1 requirements tabled below and in accordance with, H1 Energy Efficiency for this Climate Zone.

Building Element	Construction R-values [m^2K/W] No embedded heating Climate Zone 6		Construction R-values [m^2K/W]
Roof	R6.6	Heated Ceiling	R6.6
Wall	R2.0	Heated Wall	R2.9
Slab-on-ground Floors	R1.7		
Floor other than slab-on-ground floor	R3.0	Heated Floor	R3.0
Window and Doors	R0.50		
Skylights	R0.62		

7.3.6 APL Aluminium Joinery Range

Residential Series ThermalHEART
'Residential Series ThermalHEART' Windows and Doors, fully glazed, finished, and complete with hardware and other specified components - all as specified in the following clauses. Manufactured and installed in accordance with the manufacturer's requirements to the locations, configurations and details shown on the drawings and schedules.

7.3.7 Awning & Casement Windows

Residential Series ThermalHEART
Awning and casement windows shall be manufactured using Residential Series ThermalHEART frame,

with a 44mm platform incorporating a polyamide thermal break, and a cover facing to overlap the wall cladding.
Specification:
- Mullions, Transoms: with/without external fins, with guidance from APL Span Tables, shall be selected by the manufacturer for compliance with the project wind load.
- Maximum Glass Thickness: 32mm IGU
- Thermal Values: U-value 4.083 R-value 0.2.72
- Performance: Tested to Very High wind zone
- Beads: Square (default) or Sloping - (if not specified, the default shall apply).
- Sashes: Pocket Glazed or Bead Glazed - as specified below (if not specified, the default shall apply).
- Glass: Double glazed; complying with NZS 4223.1., NZS4223.3 & NZS4223.4 Refer to Glazing and Glass clauses.
- Finish: Refer to Aluminium Finish clause.
- Reveals: Refer to Jamb Liner clause.

Refer to the Window & Door Schedule drawings for specific requirements of individual elements. Manufactured and installed in accordance with the manufacturer's requirements to the locations, configurations and details shown on the drawings and schedules.

7.3.8 Sliding Windows

Residential Series ThermalHEART - Horizontal Sliding Windows
Horizontal sliding windows shall be manufactured from Residential Series ThermalHEART sliding window frames incorporating a polyamide thermal break. Residential Series ThermalHEART roller is rated to 80kg, carrying 160kg window.
Specification:
- Mullions, Transoms, Stiles, Interlockers: with guidance from APL Span Tables, shall be selected by the manufacturer for compliance with the project wind load.
- Maximum Glass Thickness: 25mm IGU
- Thermal Values: U-value 3.993 R-value 0.250
- Performance: Tested to Very High wind zone
- Glass: Single glazed or double glazed; complying with NZS 4223.1., NZS4223.3 & NZS4223.4 Refer to Glazing and Glass clauses.
- Finish: Refer to Aluminium Finish clause.
- Reveals: Refer to Jamb Liner clause.

Refer to the Window & Door Schedule drawings for specific requirements of individual elements. Manufactured and installed in accordance with the manufacturer's requirements to the locations, configurations and details shown on the drawings and schedules.

7.3.9 Hinged & French Doors

Residential Series ThermalHEART - Hinged & French Doors
Glazed aluminium hinged doors shall be manufactured from Residential Series ThermalHEART hinged door frames incorporating a polyamide thermal break, and outward-opening and/or inward-opening door leaves, detailed in the accompanying drawings.
Specification:
- Maximum Glass Thickness: 27mm IGU
- Thermal Values: U-value 4.123 R-value 0.243

- Performance: Tested to Extra High wind zone
- Glass: Single glazed or double glazed; complying with NZS 4223.1., NZS4223.3 & NZS4223.4 Refer to Glazing and Glass clauses.
- Finish: Refer to Aluminium Finish clause.
- Reveals: Refer to Jamb Liner clause.

Refer to the Window & Door Schedule drawings for specific requirements of individual elements.
Manufactured and installed in accordance with the manufacturer's requirements to the locations, configurations and details shown on the drawings and schedules.

7.3.10 Sliding Doors

Residential Series ThermalHEART - Sliding Doors
Sliding doors shall be manufactured from Residential Series ThermalHEART sliding door frames incorporating a polyamide thermal break. Residential Series sliding door frames incorporating fixed panels and sliding door panels
Specification:
- Mullions, Transoms, Stiles, Interlockers: with guidance from APL Span Tables, shall be selected by the manufacturer for compliance with the project wind load.
- Maximum Glass Thickness: 27mm IGU
- Thermal Values: U-value 3.833 R-value 0.261
- Performance: Tested to Very High wind zone
- Glass: Single glazed or double glazed; complying with NZS 4223.1., NZS4223.3 & NZS4223.4 Refer to Glazing and Glass clauses.
- Finish: Refer to Aluminium Finish clause.
- Reveals: Refer to Jamb Liner clause.

Refer to the Window & Door Schedule drawings for specific requirements of individual elements.
Manufactured and installed in accordance with the manufacturer's requirements to the locations, configurations and details shown on the drawings and schedules.

7.3.11 Aluminium Finish

Powder Coated Aluminium - DULUX Duralloy®
The specified aluminium joinery shall be powder coated with DULUX Duralloy® to the specified colour. Nominal 50 - 90 micron thick coating (minimum 50 microns). Duralloy® has a 10-year warranty on film and colour integrity.
DULUX Duralloy® meets the performance requirements for AAMA 2603-05.

DULUX Duralloy® is suitable for use on residential projects, within three floors from the ground, and situated within NZS 3604 Exposure Zone B or C.

DULUX Duralloy® coatings shall be factory-applied by a Dulux Registered Applicator to the requirements of AS 3715 and to fully comply with all Dulux NZ Ltd warranty requirements.
All substrate preparation and treatments, and powder coating application and finishing techniques, shall be exactly as recommended by the manufacturer.
DULUX Duralloy® colour: TBC by Client

7.3.12 Glazing

AGP® SOLUX-E® - Low E Thermal and Solar Control Glass
Location: ALL IGUs
Brand/type: AGP SOLUX-E®
Outer glass type: Clear float
Coated surface: #2
Outer glass: ~ mm
Spacer width: ~ mm
Spacer type: ATS-Architectural Thermal Spacer®
Space gas: Argon
Inner glass type: Clear
Inner glass: ~ mm

7.3.13 Jamb Liner

Paint-Quality Timber - 19mm thick, Grooved - H3.1 Treated
Paint-quality Timber Jamb Liners - Grooved. Manufactured from 19mm thick, dressing-grade, finger-jointed or clear Radiata pine complying with NZS 3602, H3.1 treated. Mitred corner joints; factory pre-primed on all faces.
Jamb liners shall be straight and true and free of warp or distortion. The depth of the jamb liners shall be sized to suit the wall construction thickness and grooved to suit the interior lining thickness as shown on the drawings. Jamb liners will be grooved for 10mm plasterboard unless nominated otherwise.
Except where indicated otherwise on the drawings and schedules, jamb liners shall be fitted to the head, jambs and sill of each aluminium joinery element.

7.3.14 Flashings & Support Bars

Aluminium Head Flashings
Aluminium Head Flashings shall be selected from the APL range of extruded aluminium flashings, suitably sized to suit the claddings and construction types in accordance with NZBC E2/AS1 and shown on the drawings; and finished and colour-matched with the aluminium windows and doors. All aluminium joinery flashings shall be supplied and installed by the APL aluminium joinery manufacturer.

Aluminium Sill Support Bar - Cavity Construction
Aluminium Sill Support Bar for Installations in Drained Cavity Construction. Extruded aluminium sill support bar, with built-in drainage and ventilation, for continuous support to the window or door unit. Mill finish aluminium. Sill support bars shall be used and installed in accordance with the requirements of NZBC E2/AS1, and comply with BRANZ Evaluation Method EM6, and be sized to suit the cladding thickness and weight of the window or door.

Support Angles
Support Angles. Where required support angles shall be provided. Either extruded aluminium or galvanised mild steel, used to support window and door frames. Support angle sizes, fixing and installation requirements as shown on the drawings.

7.3.15 Hardware Range

Urbo™ Hardware
APL aluminium window and door hardware and furniture shall be selected from the Urbo™ Hardware range. Manufactured from die-cast zinc and powder coated to the specified colour. Supplied and installed by the APL aluminium joinery manufacturer to the windows and doors as indicated on the drawings and schedules.
Powder coat colour:

7.3.16 Co-operation Workmanship & Delivery

Co-operation
Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to establish exact sizes for all aluminium window and door frames; and to ensure that each element correctly allows for the installation and finishing of exterior claddings and interior linings and any specific detailing shown on the drawings; and generally, to install all APL aluminium windows, doors and accessories as required.

Workmanship
Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

Aluminium window and door joinery fabrication, assembly and installation work shall be carried out by experienced and competent tradespersons, authorised to manufacture and install APL - Window Solutions aluminium windows and doors, under controlled supervision and procedures, to fully comply with all warranty requirements and in accordance with the manufacturer's requirements.

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of work are carried out to the highest standard.

All fabrication and assembly processes and techniques, materials and accessories shall be exactly as recommended by the manufacturer and shall be carried out using suitable machinery, tools and equipment, in a factory workshop.

All work shall be such as to leave a neat, efficient, robust and weathertight installation.

Leave aluminium joinery and glazing clean and free from damage and defects of any kind.

Delivery & Handling
Aluminium joinery frames shall be braced and restrained as necessary for transportation and delivery to site. All surfaces, including glass, shall be appropriately protected from marking and damage during manufacture, delivery and installation.

Inspect all aluminium joinery units upon delivery and reject any damaged or defective items. Contact the manufacturer for replacement of rejected items at time of delivery to site. Do not use or install damaged or defective materials, products and joinery elements.

Store aluminium windows, doors and accessories undercover, off the floor, on a flat, even and level surface as recommended by the manufacturer and in a manner that prevents any frame distortion and surface damage and deterioration. Keep stored aluminium joinery dry and protected from damage, moisture and contamination at all times.

Handle aluminium joinery units and accessories in accordance with the manufacturer's requirements and in a manner that prevents distortion to joinery frames and any damage to the elements - including surface marking. Retain manufacturer's protective coverings for as long as possible, and remove them upon completion.

Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear and equipment during all stages of manufacture and installation.

Installers shall conform with all relevant WorkSafe NZ Guidelines and Codes of Practice - including the Best practice guidelines for working at height in NZ, and the OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry.

7.3.17 Preparation

General
Prior to installation, carry out all necessary inspections and preparatory work required, and ensure that all preliminary works by other trades has been completed to specification and as shown on the drawings.
Do not commence installation until all necessary preliminary works by others is complete and to the required standard. The commencement of work shall be deemed to indicate full acceptance by the installer that all preliminary works by other trades is complete.
Check that all window openings and door openings are correctly sized for fitting tolerances, are square and correctly aligned, with all sides plumb, level and true to line and plane.
Check window and door openings adjoining other building elements to ensure that all necessary works have been completed that will enable the windows and/or doors to be installed correctly and as shown on the drawings.
Supporting concrete structures shall be within the scope of NZBC E2/AS3, and comply with NZS 3109.
New concrete must have aged for a minimum of 28 days prior to installation.
Supporting concrete masonry structures shall be within the scope of NZBC E2/AS3, and shall comply with NZS 4229, or with NZS 4230 and AS/NZS 1170 for specific design, and NZS 4210.
Supporting timber structures shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content in accordance with the requirements of NZS 3602 at the time of installation.
Supporting lightweight steel framed structures shall comply with NZ NASH 3405, or the NZBC for specific design.
Supporting steel structures shall comply with NZS 3404.

Timber Framed Walls - Flexible Underlay
Timber Framed Walls (within the scope of NZBC E2/AS1) - check all aspects of preparatory works to window and door openings, including but not limited to:
- Check that the timber framing is complete at window and door openings, and is in accordance with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design.
- Check that timber framing has a maximum moisture content of 20% at the time of joinery installation.
- Check that flexible wall underlay has been correctly finished around framed window and door openings in accordance with E2/AS1 and the underlay manufacturer's requirements.
- Check that flexible flashing tape has been correctly applied and finished to window and door openings in accordance with E2/AS1 and the manufacturer's requirements.

7.3.18 Fabrication

Fabrication
Do not commence production and fabrication of the joinery elements until the 'For Fabrication and Installation' shop drawings have been verified and approved by the Architect/Designer.
Fabricate and install aluminium window and door joinery in accordance with the approved shop drawings, design calculations, and the project documentation.

Unless noted otherwise on the approved shop drawings, joinery fabrication shall include the installation of all glazing, hinges, stays, running gear, and other hardware items scheduled on the approved shop drawings.

Glass shall be cut true and square, sized to provide correct edge clearances, blocked into place as required. All glazed joinery units shall be delivered either pressure fit, pocket glaze, or beaded/wedged, unless site glazing is required. Glazing gaskets shall be compatible with all adjacent materials, and cut 1% over-length to absolutely avoid stretching during installation.

Window and door hardware shall be fixed true to line and position, and adjusted and oiled as required for correct operation. The aluminium joinery manufacturer shall notify the Architect/Designer if any scheduled hardware item or fixing position appears incorrect. Account for all keys and deliver separately to the site manager.

Factory-fit safety stays as scheduled to all opening windows, and to opening windows where safety stays are required to comply with the requirements of NZBC F4/AS1.
Factory-fit all required and scheduled passive ventilation systems to NZBC G4/AS1, 1.3.9 - Trickle ventilators, NZS 4303, and the manufacturer's requirements.

As necessary, provide protection and temporary bracing required for the transportation and general handling of the joinery elements. Ensure that all opening doors and windows are temporarily secured for transportation and general handling.

7.3.19 Installation

Flashings - Framed Openings
Install metal flashings to window and door openings, accurately level and plumb, and to the required tolerances as detailed - with the head flashing weathering jamb flashings, jamb flashings weathering

sill flashing, and sill flashings open (draining) to the exterior.
Overlap and the top edge of head flashings with flexible flashing tape, or a section of additional flexible wall underlay, along the top edge to ensure water drains to the exterior.
Except where windows and doors are recessed, and where detailed otherwise, all head flashings shall extend minimum 30mm beyond the edge of the window/door frame.

Weather Sealing
Weather-seal frame jambs etc. to adjacent surfaces (or to each other) as detailed or as required by the window manufacturer, to achieve a fully weathertight installation.
Sealants shall be BRANZ approved for the application and be compatible with all surfaces and any applied finish.
Insert closed cell PEF backing rods or a polyethylene bond breaker tape slip where required and as shown on the drawings.
Ensure substrates are clean and dry; mask off adjacent surfaces; prime substrates and apply sealant in accordance with the sealant manufacturer's requirements and tool finish to a smooth, even surface.
Where required and as shown on the drawings, install aluminium wind deflection or pressure relief angles, over the head and jambs of frames installed within a recessed opening, prior to weather-sealing frames.

Temporary Safety Indicators
As necessary, provide temporary safety indicators to clear glass until completion of adjacent work.
Do not use masking tape or materials incompatible with the glass for this purpose.

7.3.20 Completion

Defective Materials & Work
Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected APL Aluminium Windows & Doors work shall be repaired and/or replaced to the satisfaction of the Contract Administrator, without delay and at no additional cost to the Principal.

Completion
Check that APL aluminium window and door joinery and accessories have been installed, glazed and finished correctly and fully tested for weathertightness.
Check that all opening window sashes, doors, sliding carriage assemblies and all moving components have been commissioned to the required operating performance and functionality.
Check that all hardware, locks, latches and handles are firmly fixed in place without restricting the operation of their moving parts, and that latches and locks fully engage with strikes and keepers and are free of slack when engaged.
Check all aluminium joinery elements for damage, defects, faults and weathertightness - carry out repairs and/or replace elements as necessary in accordance with the manufacturer's instructions to the required standard.
Remove applied safety indicators and protective coverings, and clean all joinery surfaces inside and out and leave perfectly clean.
Leave this work complete, weathertight and leak-free, and in full working order to the required operating performance and functionality in accordance with the manufacturer's warranty requirements. Leave all locking keys with the Contractor.

Leave the surrounding work area clean and free of rubbish. Remove rubbish and waste material from the site.

Complete the manufacturer's warranty and maintenance requirements, online process **FOUND HERE**. APL Product and Installation Warranty for the installed aluminium windows and doors can be **FOUND HERE**.

Provide all necessary Producer Statements.

8 INSULATION

8.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

8.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

4218:2009(NZS)	Thermal insulation - Housing and small buildings
4220:1982(NZS)	Code of practice for energy conservation in non-residential buildings
4243.1:2007(NZS)	Energy efficiency - Large buildings - Building thermal envelope
4246:2016(NZS)	Energy efficiency - Installing bulk thermal insulation in residential buildings
4859.1:2018(AS|NZS)	Thermal insulation materials for buildings - Part 1: General criteria and technical provisions

8.3 Pink Batts Insulation

8.3.1 Scope

Supply and install Pink® Batts® Insulation, as specified herein, to the locations identified on the drawings, complete with all accessories required for proper installation and performance. No substitutions are permitted for Pink® Batts® Insulation. All aspects of this work shall be in complete accordance with Pink® Batts® technical information and installation requirements and as shown on the drawings:
https://www.pinkbatts.co.nz/resources/downloads/product-data-sheets

8.3.2 Requirements

8.3.2.1 Safety

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

8.3.2.2 Warranty - applies to BRANZ Appraised Pink® Batts® Ceiling & Wall products

Pink® Batts® Lifetime Product Warranty:
- 50 Years Warranty for BRANZ Appraised Pink® Batts® ceiling and wall products installed according to the warranty conditions.
- Provide the Pink® Batts® Lifetime Product Warranty on the manufacturer's standard warranty form.
- Commence the warranty from the date of permanent installation.

8.3.2.3 Substitutions

Pink® Batts® Insulation shall be as specified herein and as indicated on the approved drawings. The substitution of Pink® Batts® branded products for alternative brands is not permitted under any circumstances.

The substitution of a specified Pink® Batts® product for an alternative Pink® Batts® branded product by the Installer (PinkFit® or other) shall only be permitted with the Contract Administrator's written authorisation, and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate alternative Pink® Batts® branded products to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Installer.

8.3.3 Wall Thermal Insulation

8.3.3.1 Pink® Batts® Ultra® R2.8 Wall

Pink® Batts® Ultra® R2.8 Wall - product code 7127128. A non-combustible, resin bonded fibrous glasswool insulation manufactured from recycled and virgin glass and cured urea extended phenolic resin. R-value R-2.8. 90mm thick x 560mm wide x 1140mm long segments.

BRANZ Appraised for use as a thermal insulating material for framed or part-framed walls, ceilings and roofs of domestic and commercial buildings according to the conditions and limitations of BRANZ Appraisal No.238. Refer to product data - https://www.pinkbatts.co.nz/assets/Products/April-2022-changes-/Wall-Product-Sheet_April22_1075-RevF.pdf

Pink® Batts® Ultra® R2.8 Wall is licenced with Environmental Choice New Zealand: Thermal Building Insulants Licence No.2504017.

Installed as wall cavity thermal insulation to the locations shown on the drawings in accordance with the manufacturer's requirements.

Installed Location:

8.3.4 Ceiling Thermal Insulation

8.3.4.1 Pink® Batts® Superbatts® R7.0 Ceiling

Pink® Batts® Superbatts® R7.0 Ceiling - product code 7113170.

Glasswool insulation manufactured from over 80% recycled New Zealand glass.

Product is BRANZ Appraised, and supported by an EPD and Eco Choice certification.

275mm thick x 460mm wide x 1220mm long segments.

8.3.5 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with trades to install Pink® Batts® Insulation as required.

8.3.6 Workmanship

All installation work shall be carried out by registered PinkFit® installers; the preferred Pink® Batts® installers, or by experienced and competent installers, familiar with the specified products and installation techniques, in accordance with the manufacturer's requirements, and to fully comply with all warranty requirements. For more information on best practice Pink® Batts® installation refer to:
https://www.pinkbatts.co.nz/resources/downloads/product-data-sheets

8.3.7 Delivery & Handling

Store the Pink® Batts® Insulation materials undercover, in a weatherproof environment, off the floor, on a flat, even surface in accordance with the manufacturer's requirements. Keep materials dry and protected from damage, moisture and contamination at all times.

For best practice, refer to Pink Batts Product and Installation Guides.
Further assistance contact 0800 746 522

Store the Pink® Batts® Insulation materials undercover, in a weatherproof environment, off the floor, on a flat, even surface in accordance with the manufacturer's requirements. Keep materials dry and protected from damage, moisture and contamination at all times.

Conform with all relevant WorkSafe NZ Guidelines and Codes of Practice - including the Workplace and facilities requirements

8.3.8 Installation

8.3.8.1 General

Install Pink® Batts® Insulation in accordance with NZS 4246.
All installation work shall be carried out by experienced and competent installers, familiar with the specified products and installation techniques, in accordance with the manufacturer's requirements, and to fully comply with all warranty requirements. For more information on best practice Pink® Batts® installation refer to:
https://www.pinkbatts.co.nz/resources/downloads/product-data-sheets

8.3.8.2 Pink® Batts® Wall

Install Pink® Batts® Wall Insulation in accordance with NZS 4246.

All installation work shall be carried out by experienced and competent installers, familiar with the specified products and installation techniques, in accordance with the manufacturer's requirements, and to fully comply with all warranty requirements. For more information on best practice Pink® Batts® installation refer to:

https://www.pinkbatts.co.nz/resources/downloads/product-data-sheets

8.3.8.3 Pink® Batts® Ceiling - Truss/Framed Roof

Install Pink® Batts® Ceiling Insulation in accordance with NZS 4246.

All installation work shall be carried out by experienced and competent installers, familiar with the specified products and installation techniques, in accordance with the manufacturer's requirements, and to fully comply with all warranty requirements. For more information on best practice Pink® Batts® installation refer to:

https://www.pinkbatts.co.nz/resources/downloads/product-data-sheets

8.3.9 Completion

Check that all specified Pink® Batts® Insulation products have been installed correctly in accordance with the manufacturer's requirements.

Check for damage and defects - replace damaged and defective insulation as necessary to the required standard.

Ensure the installed insulation will be adequately protected for durability and performance in accordance with the manufacturer's warranty requirements.

Leave all of this work complete, and in the condition required for proper performance, including for the installation of subsequent linings, in accordance with the manufacturer's warranty requirements.

Leave adjacent surfaces and finished work clean and free of damage. Remove all associated rubbish and waste material from site.

Issue to the Owner a copy of the Pink® Batts® Lifetime Product Warranty for all Pink® Batts® Insulation products installed.

9 ROOFING

9.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

9.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1170.0:2002 SUPP1(AS/NZS)	Structural design actions - General principles - Commentary
1170.2:2011(AS/NZS)	Structural design actions - Wind actions
2295:2006(NZS)	Pliable, permeable building underlays
2728:2013(AS|NZS)	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
3604:2011(NZS)	Timber-framed buildings
4200.1:2017(AS|NZS)	Pliable building membranes and underlays - Part 1: Materials
NZBC F2	Hazardous Building Materials
NZBC G12	Water Supplies
NZMRM Code of Practice	NZ Metal Roof and Wall Cladding Code of Practice - Version 3.0

9.3 Metalcraft Longrun Roofing

9.3.1 Scope

Supply and install Metalcraft Longrun Roofing, as specified herein, to the locations and details shown on the design drawings, complete with all necessary components and accessories required for proper installation and performance. All aspects of this work shall comply with the NZ Building Code, related Metalcraft Longrun Roofing technical literature and publications (check http://www.metalcraftgroup.co.nz or call (0800) 766 369 for the latest editions), and other relevant product manufacturers' recommendations.

No substitutions are permitted for Metalcraft Longrun Roofing.

For the purpose of this specification, Metalcraft Longrun Roofing is referred to as 'Longrun Roofing', and all 'Metalcraft' associated technical literature and publications, including the 'Metalcraft Product Technical Statement', installation instructions and drawings, are collectively referred to as the 'technical literature'.

Extent of work:

The following is a list and/or general description of the extent of the Metalcraft Longrun Roofing works, which are more specifically defined in the contract documents, required for the completion of the contract works:

9.3.2 Requirements

9.3.2.1 Safety:

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

9.3.2.2 Warranty:

Please refer to Metalcraft specifications for applicable warranty terms and conditions.

9.3.2.3 Substitutions:

The Metalcraft Longrun Roofing shall be as specified herein and on the design drawings. The substitution of the Metalcraft Longrun Roofing for an alternative brand is not permitted under any circumstances.

The substitution of the specified Metalcraft Longrun roofing or ancillary component for an alternative Metalcraft Longrun Roofing system or ancillary component by the Contractor shall only be permitted with the Contract Administrator's written authorisation and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate an alternative Metalcraft Longrun Roofing or ancillary component to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

9.3.2.4 Producer statement (PS3):

The Metalcraft Longrun Roofing installer shall furnish a fully completed PS3 Producer Statement (Construction) at time of application for Code Compliance Certificate. The Producer Statement shall accurately reflect the scope of the installation of the Metalcraft Longrun Roofing in accordance with the consented drawings and specifications.

9.3.2.5 Inspections & reporting:

Inspections shall take place at each of the stages as scheduled in the building consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

Carry out all necessary pre-installation and installation inspections for each area of the works.

Complete all necessary pre-installation checklists prior to installation, and all necessary installation checklists.

Complete all necessary final checklists and installation sign-off certificates before handing over completed work.

9.3.2.6 Quality assurance:

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of the work are carried out to the highest standard.

9.3.2.7 Defective materials & workmanship:

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected Metalcraft Longrun Roofing materials and work shall be repaired and/or replaced to the satisfaction of the Contract Administrator without delay and at no additional cost to the Principal.

9.3.3 Profile

Metalcraft - T-Rib roof sheet - a trapazoidal profile; 29mm rib height and 760mm effective cover based on the selected BMT.

Material type - Refer to ‘Roof Sheet Material’ clause.
Thickness - 0.40mm BMT (G550), 0.55mm BMT (G550) and 0.9mm (Aluminium)
Windload – Refer to 'technical literature'
Mass (KG/M2)- Refer to 'Metalcraft'
Minimum pitch - 3 degrees

- Sheets shall be continuous from ridge to gutter, or where a step is designed into the roof, sheets shall be continuous from ridge to step and step to gutter.
- Sheet ends must be stop-ended under flashings.

Installed in accordance with the manufacturer's requirements to the locations and details shown on the drawings.

Installed Location:
Thickness:

9.3.4 Roof Sheet Material

COLORSTEEL Maxam ® to selected BMT. Pre-painted hot dipped aluminium/zinc/magnesium alloy coated steel coil, with a minimum coating weight of 150g/m², conforming with AS/NZS 2728 Class 6. COLORSTEEL®

Colour:

9.3.5 Roof Ancillary Components & Accessories

Fit and lap roofing underlay over the netting/mesh or use a self-supporting underlay. Lay underlay horizontally or vertically with a 150mm side lap, over-sailing the spouting and/or gutters by 10mm, in accordance with 'technical literature'.

Non self-supporting underlay must be supported by hexagonal wire mesh, safety mesh or alternative support, as specified and/or as shown on the approved drawings, in accordance with the roofing underlay manufacturer's recommendations.

Underlay shall be installed in a manner so that it is sufficiently tensioned without sagging, overhangs fascia boards 20mm - 25mm, and finished along roof edges, ridges, valley gutters, roof/wall junctions and at penetrations to the details shown on the drawings.

Underlayment for fully-supported roofing shall be in accordance with NZMRM Code of Practice.

Separate roof underlay from chimneys and flues in accordance with the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 7.5.9.

Cladding screw fastener type and durability shall comply with AS 3566 Class 4 or Class 5, as appropriate, and be no less than the durability of the material being fixed. Fastener type and placement (frequency) shall be appropriate for the environmental conditions and the specified cladding profile and material and the supporting structure material; all in accordance with the NZMRM Code of Practice and E2 External Moisture.

Metal Flashings. Profiled metal cladding flashings shall be fabricated from material with the same coating as the cladding material, to maintain durability and compatibility requirements. Flashings shall be 0.55BMT G300 steel or H34 Aluminium coated to the same standards as the profiled cladding sheets, and notched/scribed when installed across the cladding profile or provided with a soft edge – in accordance with selected roof sheet material and NZMRM Code of Practice requirements.

Flashings, flashing fastenings and fastening frequency shall be in accordance with the NZMRM Code of Practice.

Do not construct flashing joints and flashing junctions in a manner that relies entirely on sealant to maintain weathertightness.

Rivet Fastenings. Rivets shall be sealed aluminium minimum 4mm diameter.

Use only neutral-curing silicone or MS polymer sealant, compatible with the specified metal cladding and flashing materials and finishes, that is suitable for the required application and use in accordance with the sealant manufacturer's instructions and to NZMRM Code of Practice requirements. All sealed joints must be mechanically fastened, and excess sealant neatly removed to prevent unnecessary dirt build-up. Sealant shall only be used to seal between two metal surfaces, do not fill holes or gaps with sealant.

Proprietary Collar Flashings. EDPM or silicone-polymer proprietary flexible collar flashings for weatherproofing cladding-penetrating pipes/flues/ducts. Sized to suit the applicable pipe/flue/duct and installed in strict accordance with the manufacturer's requirements and the NZMRM Code of Practice.

9.3.6 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades, as required, on the assembly and installation of the Metalcraft Longrun Roofing to the required layout, details and tolerances.

9.3.7 Qualifications & Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All installation work shall be carried out by experienced and competent tradespersons, familiar with the specified products and installation techniques and suitably qualified to install Metalcraft Longrun Roofing, to fully comply with all warranty requirements in accordance with the manufacturer's requirements.

Installers of COLORSTEEL Maxam® shall be supervised by an accredited COLORSTEEL Maxam® installer.

All cutting, fixing and installation techniques, fastenings and sealants shall be exactly as recommended by and in accordance with the NZMRM Code of Practice, and carried out with the use of suitable tools and equipment appropriate for the application.

Always maintain isolation of dissimilar materials in accordance with the NZMRM Code of Practice Section 4.10. Isolate dissimilar materials (metal and non-metal) in close proximity as necessary by fitting separator strips. Place isolators between metals and treated timber or cement-based materials. Do not allow unpainted lead-sheet or copper materials to come in contact with, or allow water run-off from these onto Zincalume or galvanised materials.

All work shall be such as to leave a neat, efficient, robust and weathertight installation.

9.3.8 Delivery & Handling

Store Metalcraft Longrun Roofing, flashings and accessories clear of level ground, on bearers at evenly spaced centres as recommended by the NZMRM Code of Practice. Keep stored materials and accessories dry and protected from damage and contamination at all times.

Do not use damaged or defective materials or products, or products that are beyond their designated shelf life.

Handle materials in accordance with the manufacturer's requirements and in a manner that prevents damage to or deterioration of the material, including surface marking.

9.3.9 Preparation

Prior to installation, carry out all necessary inspections and preparatory work required, and ensure that all preliminary works by other trades have been completed to specification and as shown on the approved drawings.

Do not commence installation until all necessary preliminary works by others are complete and to the required standard. The commencement of work shall be deemed to indicate full acceptance by the installer that all preliminary works by other trades are complete.

Supporting timber structures shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content in accordance with the requirements of NZS 3602 at the time of installation.

Supporting light-gauge steel framed structures shall comply with the requirements of AS/NZS 4600 or the NASH Standard for Residential and Low-rise Steel Framing, Part 1: Design Criteria.

Supporting heavy steel structures shall comply with NZS 3404 and the NZ Building Code.

Roof Structure - check all aspects of preparatory works, including but not limited to:

- Check that the purlins are installed to the required set-out and spacings, are straight and true to line and plane, and are securely fixed.
- Check that all barge and fascia boards have been installed to the correct line and plane with all edge blocking complete and secure.
- Check that valley gutter and hidden gutter framing is to the required dimensions with solid backing supports securely fixed, true to line and plane.
- Check that internal gutter membrane linings are properly dressed back and adhered to a solid substrate along the roof edge as shown on the design drawings.
- Check that all trimming for roof penetrations, all roof/wall junction blocking, and all necessary work by other trades are complete.
- Check that solid backing required for fully supported roofing is complete and securely fixed in accordance with the design drawings.

9.3.10 Installation

Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use and shall use appropriate safety gear when handling materials. Installers shall conform with all relevant WorkSafe NZ Guidelines Working at Heights.

Prevent contact with, or run-off from, incompatible materials in accordance with the recommendations in the NZMRM Code of Practice.

Protect the coated surface from damage at all times; replace the whole sheet where a significant depth of the coating has been damaged (including flashings).

Accurately set-out the planned cladding layout prior to fixing to ensure true and accurate cladding lines and incorporate correct relationships with other design features shown on the drawings; maintain this accurate set-out throughout installation.

Keep cladding lines consistent and true along the roof; with side-laps of sheets to be straight, true and accurately aligned up and down. Check for and eliminate any creep and/or spread of sheets during installation.

Cut metal cladding and flashings by shear only - do not use abrasive cutting tools. Do not use black lead pencils for marking pre-finished metal cladding and flashings.

Screw fastenings for pre-painted metal must be pre-painted prior to installation for an accurate colour match.

All cladding jointing techniques and sealants shall be in accordance with the NZMRM Code of Practice and shall be compatible with the cladding material and finish. Joints shall be sealed with an approved neutral-cure sealant or approved closed-cell lap tape.

Install fasteners in a straight line with a consistent fastening pattern on each sheet in accordance with 'technical literature' requirements. Fasteners are to be set using a snug fitting socket and a setting tool that does not unduly damage the finish coating of the screw. Depth of setting is to be sufficient to achieve slight compression of the sealing washer without distorting the profile or the sealing washer itself.

Aluminium rivets are to be sealed type pre-painted to match cladding, minimum 4mm diameter. Clip-fastened sheets shall be fixed with concealed proprietary fastening clips appropriate for the cladding profile and material, substrate/structure and the environment in accordance with the NZMRM Code of Practice recommendations.

Install flashings as detailed on the drawings and in accordance with the Zealand Metal Roofing Code of Practice. All flashings shall be neatly formed and finished, securely fastened to the structure, weatherproof, and lapped such that any water will run down to the exterior. For highly visible flashings, plan each flashing joint and/or junction with specific regard to aesthetic requirements. Penetration flashings shall be as per the design details and shall not rely solely on silicone sealant to achieve weathertightness of the flashing.

Handle sheets carefully to avoid scratching and denting. Do not walk on wall cladding sheets prior to installation. Remove strippable film, if applied, immediately after installation of roof cladding to avoid resin staining. All accessories are to be colour matched prior to installation, do not use colour match paint for repairing any blemishes. Ensure sealant is trapped between joint surfaces and not exposed to the visual surface.

9.3.11 Compatibility

Ensure material is isolated from incompatible materials. It must not be in contact with, or receive run off from, less noble metals such as copper, brass and lead. It should not be in wet contact with stainless steel. Sustained wet contact with timber, either treated or untreated, must be avoided.

9.3.12 Completion

Check that the Metalcraft Longrun Roofing and associated components and flashings have been installed and finished correctly. Check for defective work, damage and surface marking - replace

and/or repair as necessary. Ensure that the work of other trades does not reduce the clearances of the cladding to ground, deck or roof that are required by the NZ Building Code.

Leave all work complete and weathertight and to the required standard in accordance with the New Zealand Metal Roofing Code of Practice.

Leave the completed works and surrounding surfaces clean and free of debris and rubbish. Remove all rubbish and excess material from the site.

Maintenance should be carried out in accordance with Metalcraft maintenance requirements.

9.4 Metalcraft Rainwater & Fascia Systems

9.4.1 Scope

Supply and install Metalcraft Rainwater & Fascia Systems, as specified herein, to the locations and details shown on the design drawings, complete with all necessary components and accessories required for proper installation and performance. All aspects of this work shall comply with the NZ Building Code, related Metalcraft technical literature and publications (check http://www.metalcraftgroup.co.nz or call (0800) 766 369 for the latest editions), and other relevant product manufacturers' recommendations.

No substitutions are permitted for Metalcraft Rainwater & Fascia Systems.

For the purpose of this specification, Metalcraft Rainwater & Fascia Systems is referred to as 'Rainwater & Fascia Systems', and all 'Metalcraft' associated technical literature and publications, including the 'Metalcraft Product Technical Statement', installation instructions and drawings, are collectively referred to as the 'technical literature'.

Extent of work:

The following is a list and/or general description of the extent of the Metalcraft Rainwater & Fascia Systems works, which are more specifically defined in the contract documents, required for the completion of the contract works:

9.4.2 Requirements:

9.4.2.1 Safety:

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

9.4.2.2 Warranty:

Please refer to Metalcraft specifications for applicable warranty terms and conditions.

9.4.2.3 Substitutions:

The Metalcraft Rainwater & Fascia Systems shall be as specified herein and on the design drawings. The substitution of the Metalcraft Rainwater & Fascia Systems for an alternative brand is not permitted under any circumstances.

The substitution of the specified Metalcraft Rainwater & Fascia Systems or ancillary component for an alternative Metalcraft Rainwater & Fascia ancillary component by the Contractor shall only be permitted with the Contract Administrator's written authorisation and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate an alternative Metalcraft Rainwater & Fascia ancillary component to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

9.4.2.4 Inspection and reporting:

Inspections shall take place at each of the stages as scheduled in the building consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

Carry out all necessary pre-installation and installation inspections for each area of the works.

Complete all necessary pre-installation checklists prior to installation, and all necessary installation checklists.

Complete all necessary final checklists and installation sign-off certificates before handing over completed work.

9.4.2.5 Quality Assurance:

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of the work are carried out to the highest standard.

9.4.2.6 Defective Material & Workmanship:

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected Metalcraft Rainwater & Fascia System materials and work shall be repaired and/or replaced to the satisfaction of the Contract Administrator without delay and at no additional cost to the Principal.

9.4.3 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades, as required, the assembly and installation of the Rainwater & Fascia system to the required layout, details and tolerances.

9.4.4 Product

COLORSTEEL® Maxam™ - Pre-painted hot dipped aluminium/zinc/magnesium alloy coated steel coil, with a minimum coating weight of 150g/m², conforming with AS/NZS 2728 Class 6. COLORSTEEL®

Colour:

9.4.5 Spouting Profile

A proprietary quarter round guttering system manufactured from Zinc/alum coated steel substrate conforming with AS 1397:2013.

System:

- 125 x 60 X 77 high
- Cross-section area - 5958 mm/2
- Cross section capacity – 4264 mm/2

Accessories:

- External brackets
- Stop ends

Installed in accordance with ‘technical literature’ requirements.

9.4.6 Fascia Profile

A proprietary metal fascia system manufactured to Metalcraft standard fascia design.

System:

- 155mm x 29mm (bottom) x 21mm (top)

Accessories:

- Fixing bracket

Installed in accordance with ‘technical literature’ requirements.

9.4.7 Downpipe Profile

Metalcraft COLORSTEEL MAXAM downpipe system including round down pipes, bends and clips to the the requirements of the plans.

- 80mm round - internal dimension 79mm. Total cross sectional area = 4902mm/2
- 100mm round - internal dimension 101mm. Total cross sectional area = 8012mm/2
- 150mm round - internal dimension 158mm. Total cross sectional area = 19607mm/2

Installed in accordance with ‘technical literature’ requirements.

9.4.8 Preparation

Check all aspects of preparatory works, including but not limited to:-

Check that the timber framing complies with NZS 3604, is in true alignment and includes all blocking required for joints, corners and soffits etc., and has a maximum moisture content of 24% at the time of Metalcraft Rainwater & Fascia Systems installation.

Check that all preparatory materials are lapped such that any water will run down to the exterior.

9.4.9 Installation

9.4.9.1 Workmanship

All installation work shall be carried out by experienced and competent tradesmen who are familiar with the techniques and materials specified. All handling and fixing techniques, and all jointing and sealing materials and techniques, shall be exactly as required by Metalcraft.

Handle spouting and fascia without scratching, distorting or damaging.

Protect the coated surface from damage at all times; replace the whole section where a significant depth of the coating has been damaged. Completely clean off all drill and power saw swarf as the work proceeds.

Screw fixings shall be in accordance with Metalcraft requirements and as noted on the drawings, and of a compatible material and finish with the fascia, spouting, and spouting brackets. Exposed screws should be factory prepainted for an accurate colour match. Support brackets fixed in accordance with Metalcraft 'Technical literature' requirements.

9.4.9.2 Spouting

Screw fix spouting brackets, true to line, at maximum 900mm centres and to falls as shown on the drawings. Form spouting joints and downpipe droppers in strict accordance with Metalcraft 'technical literataure' requirements. Locate downpipe droppers to the set-out shown on the drawings.

9.4.9.3 Downpipes

Downpipes and spreaders setout and installed complete with bends as shown on the drawings. All joints lapped and sealed to Metalcraft 'technical literature' requirements. Screw fix down pipes plumb to walls with matching support brackets. Direct downpipes into stormwater system as noted on the drawings.

9.4.10 Completion

9.4.10.1 Completion:

Clean up thoroughly and remove debris and unused material from the site.

Issue to the Main Contractor a copy of the Metalcraft Rainwater Systems maintenance requirements together with the Metalcraft Rainwater Systems Warranty for the completed works.

10 PAINTING & DECORATING

10.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

10.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2310:2002(AS/NZS)	Glossary of paint and painting terms
2311:2017(AS/NZS)	Guide to the painting of buildings
2588:2018(AS|NZS)	Gypsum plasterboard
2589:2017(AS/NZS)	Gypsum linings - Application and finishing
3750.0:2008(AS/NZS)	Paints for steel structures - Introduction and list of Standards

10.3 Plasterboard Finish

10.3.1 Scope

Plasterboard linings shall be finished to the specified finish level.

10.3.2 Plasterboard Finish Level

Level 4 Finish, in accordance with AS/NZS 2589. Unless specified otherwise, all decorated plasterboard shall be finished to Level 4 Finish.
All joints and interior angles shall have shall have jointing tape embedded in jointing compound and minimum of two separate coats of jointing compound applied over all joints, angles, fastener heads and accessories.
Jointing and finishing compounds shall be applied and finished evenly and free of ridges and tool marks in preparation for decoration in accordance with the manufacturer's requirements.
Agree in writing with the Decorator that a Level 4 Finish has been achieved when complete and before decorating commences.

Location:
Manufacturer, brand name and type:

10.3.3 Jointing Tape

Plasterboard sheet joints shall be reinforced with a suitable paper jointing tape compatible with the jointing and finishing compounds.

Manufacturer, brand name & type:

10.3.4 Workmanship

Plasterboard finishing work shall be carried out by experienced applicators familiar with the application and finishing techniques and materials specified and in accordance with the manufacturer's requirements.
Plasterboard linings shall be finished to the specified finish level in accordance with AS/NZS 2589.
Make all necessary arrangements for the quality assessment of plasterboard finishes prior to commencing decorating.
Protect surrounding surfaces from jointing compound splashes and sanding dust.

Handle and store plasterboard finishing materials and accessories in accordance with the manufacturer's requirements. Keep products dry and protect from damage. Do not use damaged or faulty products or products beyond their expiry date.
Dry powder compounds mixed to the manufacturer's instructions.

10.3.5 Installation

Ensure that plasterboard sheets have been installed correctly to the sheet manufacturer's requirements, that they are clean and dry, and that fixing heads are correctly set.
Install all necessary metal beads and trim to corners and edges and metal control joints as required and as shown on the drawings.
Apply jointing and finishing compounds to the required build and specified finish level in accordance with the manufacturer's instructions. Reinforce joints with the selected jointing tape. Where required sand top coats smooth and even with fine sandpaper, as recommended by the manufacturer, when completely dry.

10.3.6 Completion

Ensure that the plasterboard sheets have been finished correctly to the specified finish level. Check for damage and repair as necessary. Ensure that assessment of the plasterboard finish level has been carried out and that agreement that the finish level is acceptable for subsequent decorating has been provided.
Clean up thoroughly on completion and remove all waste and rubbish from site.

10.4 General

10.4.1 Alternatives

The materials specified in this section or on the drawings indicate the required standards for these works. Alternatives which are considered equal to or superior to these may be tendered for approval (in writing, and they must NOT be used unless they are approved in writing).

10.4.2 Co-operation

Co-operate with all trades and attend upon Concretor, Joiner, Carpenter, etc. to ensure that the surfaces provided by these trades are completely suitable for the Painter works that are required.

10.4.3 Preparation

No painting or varnishing or other surface coating work shall be undertaken unless the surfaces to be coated are in a correct and proper condition to ensure first class results.

Inspect the works of other trades on which Painter work is scheduled and report to the Main Contractor and the Architect/Designer any defects or irregularities that would affect the permanency or finish of the painting work, and do not proceed until the defects or irregularities have been completely rectified. Failure to examine and report will be construed as an acceptance that all preparatory works are completely satisfactory.

This clause does not relieve the Painter of any of the usual preparatory work to surfaces customarily performed by this trade.

Clean down all surfaces with sugar soap, strippers, mould killers, etching agents, etc. as required. Sand or rub all sharp edges off exterior timbers and other materials as appropriate before painting. Finish rub down ALL surfaces. Ensure that the moisture content of all substrates is appropriate. Remove locks, fastenings, and similar hardware before painting and refix on completion. Remove all electrical switch and power plates before painting and refix them on completion. Mask adjacent surfaces as required to a true line and remove the masking on completion. Dust and wipe down all surfaces for Painter work and completely remove all dust, rubbish, dirt etc. from areas involved immediately prior to commencement. To each area of the works complete all surface preparation before applying paint to any surface.

10.4.4 Protection

Take adequate precautions to prevent paint spots falling on prefinished or similar surfaces, and extreme care to keep absorbent materials (e.g. cedar, sawn framing, decking, paving) completely clean during all adjacent painting work. Correction of any such disfigurement shall be to the Architect/Designer's approval.

10.4.5 Qualifications

The Painting Subcontractor must be a member of the Master Painters Association. All work shall be of the highest reasonable standard, and executed by experienced and competent tradesmen to the Architect/Designer's approval.

10.4.6 Workmanship

Strictly adhere to all Manufacturers' instructions.

Strictly observe Manufacturers' requirements with regard to surface and air temperatures for painting. No work shall be carried out on surfaces that are not completely dry, and no external work shall be carried out during damp or wet conditions.

In all finishes any irregularities or brushmarks or dust etc. in each preceding coat shall be rubbed down to provide a smooth clean surface for the following coat. Each coat shall be finished over all surfaces before a further coat is applied, and each coat shall be completely dry before subsequent coats. Finish broad areas before painting trim, paint ceilings before walls and walls before joinery, trim and other items.

Each coat and the full completed system shall be of uniform finish, colour, texture and sheen, shall have proper covering of thin edges, corners, end grain etc. and shall be free of blemishes such as runs, sags, fat edges, entrained hairs, brush marks, starved patches etc.

10.4.7 Wallpapers & Lining Papers

Wallpapers and lining papers, where scheduled, shall be hung plumb, true and square, and with precise butts. Patterns shall be accurately matched at each join. All rolls used in any one area shall be from the same batch. Use a fungicide incorporated adhesive that is recommended by the supplier. Edges neatly and precisely cut to the adjacent element. Finish free of air bubbles, wrinkles, gaps or stains.

10.4.8 General

The schedules indicate the general extent of the works to be carried out but are in no way exhaustive in their description of the actual items for painter work. Complete all work necessary for the proper and entire completion of the works. All items and portions of items reasonably inferable but not specifically mentioned are deemed included, i.e. cupboard interiors, the top and bottom of doors, unseen cabinetry tops, etc. All doors shall have equal painter work on ALL surfaces.

Where timber work is specified for priming before fixing the priming shall be thoroughly brushed in to all surfaces, and all exterior timber work for paint finishing shall be fully primed within one week of fixing. Should more than one month elapse between priming and undercoating the timber shall be fully reprimed.

Stopping up work shall be carried out immediately the priming or sealing coat is dry, and shall be solidly placed to finish clean and dry. Stopping tinted to match the timber for clear finished work.

Paint putties within one month of glazing timber frames; paint to impinge on glass to assist sealing.

10.4.9 Materials

All Painter materials shall be ready mixed and delivered in unopened containers. Materials shall be used only for the purpose and in the manner intended by the manufacturer; any apparent scheduled discrepancy in this respect shall be referred to the Architect/Designer immediately for clarification.

Where surfaces are specified to be finished in a particular manner or material, all preparatory work, priming, or undercoating, that is necessary to ensure a proper finish shall be provided, irrespective of any apparent omission herein.

Thinning shall only be to manufacturer's specification. Thoroughly stir as required to lift any settled pigment and ensure the paint is homogeneous. Paints shall be factory or shop tinted to the colour required. Undercoats shall be fully tinted to match the final colour scheduled. All paints shall have the finished film thickness that is specified by the manufacturer (checked by monitoring the coverage per litre).

10.4.10 Completion

Allow to touch up to approval any Painter work which is damaged during the finishing works of other trades. Replace all hardware, remove all masking, covers, containers etc., thoroughly clean all affected surfaces, and leave all spaces ready for immediate occupation. Avoid scratching or abrading glass or hardware during any cleaning.

11 DRAINAGE

11.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

11.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1254:2010(AS/NZS)	PVC-U pipes and fittings for stormwater and surface water applications
1260:2017(AS|NZS)	PVC-U pipes and fittings for drain, waste and vent applications
2032:2006(AS/NZS)	Installation of PVC pipe systems
3500.0:2003(AS/NZS)	Plumbing and drainage - Glossary of terms
3500.2:2018(AS|NZS)	Plumbing and drainage Part 2: Sanitary plumbing and drainage
3500.2:2021 (AS|NZS)	Plumbing and drainage Part 2: Sanitary plumbing and drainage
3500.3:2018(AS|NZS)	Plumbing and drainage Part 3: Stormwater drainage
NZBC G13/AS2	Foul Water Drainage

11.3 General

Carry out all required works to leave the sewer and stormwater systems shown on the drawings in correct working order complete with all normal incidentals.

Comply with Local Authority By-laws and Health Department Regulations as appropriate. Obtain all necessary permits and consents, serve all necessary notices, arrange all tests and pay all fees and customary charges in connection with the works.

11.4 Foul Water Drainage

11.4.1 Scope

Supply, install, test and commission new, gravity-flow foul water drains on the site, to the locations, layout and details shown on the drawings, complete with all necessary components and accessories required for satisfactory completion and performance of the foul water drainage system. All aspects of this works shall comply with the requirements of the NZ Building Code, related compliance Standards, Regulations and Acts, and to the requirements of the Territorial Authority, and as specified herein and on the approved drawings and schedules. Ancillary work and/or services not specifically mentioned but necessary to complete the work to specified levels of performance shall be deemed included.

Install foul water drains in natural ground, beneath and external to the building, for the distances indicated on the drawings. Allow for all ventilation requirements, inspection openings, bends, branches, manholes, inspection chambers, overflow gully traps, etc., as required and indicated on the drawings. Unless shown otherwise, the foul water drains shall be connected to the building's sanitary drainage system, and discharge to the foul water network.

The foul water drainage plans are diagrammatic only. Allow for all necessary vents, inspection fittings, cleaning eyes, traps and venting in accordance with AS/NZS 3500.2 and to comply with the New Zealand Building Code, and as required by the Territorial Authority. Refer to the drawings for the dimensioned locations of sanitary waste pipes and outlets.

The following is a list and a general description of the extent of Foul Water Drainage works, which are more specifically defined in the contract documents, required for the completion of the contract works:

11.4.2 Requirements

11.4.2.1 Safety

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, including WorkSafe's General Risk and Workplace Management - Part 1 and Workplace and Facilities Requirements guidance.

Carry out all construction operations in accordance with the Contractor's project-specific Health and Safety Plan.

11.4.2.2 Compliance

Obtain all necessary permits and consents, serve all necessary notices, arrange all tests and pay all fees and customary charges in connection with the foul water drainage works.

The Drain Layer shall be deemed to have allowed for all work associated with the safe and orderly execution of the foul water drainage work, including complying with all Territorial Authority requirements, Building Consent, Building Act, Health and Safety requirements, and all other acts, laws, by-laws and regulations that may affect the execution of the work.

11.4.2.3 Work on Public Property

Excavation and reinstatement of public property shall comply with the requirements of the relevant controlling authorities.

Obtain all necessary approvals and permits from the controlling authorities before commencing work on public property.

Arrange and pay for any excavation and reinstatement inspections of public property required by the controlling authorities.

Before commencing any excavation in or reinstatement work to public footpaths, driveway crossings, roads or other public property, make all necessary enquiries to the relevant controlling authority for their standards for excavation and reinstatement.

Provide at all times, adequate safeguards to the public in respect of temporary fences, signals, signs and lights. Where traffic signs are necessary, these shall be provided and operated in accordance with the Regulatory Authority or NZ Transport Agency (NZTA) guidelines, as applicable, but erected only with the prior written approval of the Regulatory Authority or NZTA and the Contract Administrator.

Where a Traffic Management Plan (TMP) is required, prepare, operate and update this plan as necessary throughout the duration of the works. The TMP shall conform to the requirements of the Regulatory Authority or NZTA, as applicable. Obtain TMP prior-approvals, and maintain the TMP for the entire construction duration.

Remove dirt and contamination deposited on public property to the satisfaction of the controlling authorities.

11.4.2.4 Notifiable Work

Notify WorkSafe NZ of work that is notifiable (particular hazardous work) under the Health and Safety in Employment Regulations 1995, 24 hours before starting the work.

11.4.2.5 Explosives

The use of explosives is NOT permitted.

11.4.2.6 Inspections

Inspections of foul water drainage works shall take place at each of the stages as scheduled in the Building Consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

Obtain and pay all fees for any required inspections which are additional to the Building Consent.

11.4.2.7 Testing

Carry out all necessary testing of the foul water drainage installations, and demonstrate to the Contract Administrator and the controlling Territorial Authority that the installations are watertight and comply with the requirements of the New Zealand Building Code, related compliance Standards, and the design documents.

11.4.2.8 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades as necessary to install foul water drains to the required locations and layouts.

11.4.2.9 Workmanship

Foul water drainage work shall be carried out by qualified and experienced tradespersons, familiar with the required installation requirements, under the direct supervision of a NZ certified Registered Drainlayer, in accordance with AS/NZS 3500.2 in compliance with the New Zealand Building Code, and all local codes and regulatory authority requirements, and the conditions of the Building Consent.

All pipe cutting, jointing, and supporting techniques shall be exactly as recommended by the pipe manufacturer. Pipes, fittings and accessories shall be handled and installed in such a manner that prevents any damage to the component.

All work shall be such as to leave a neat, efficient, robust and watertight installation.

Carry out all necessary inspections and tests during installation to ensure compliance with the design specifications and regulatory requirements. Provide test result sheets to the Contract Administrator to show compliance has been achieved.

Take all necessary measures during installation to protect the foul water drainage system from damage, and to prevent the entry of:
- extraneous water;
- soil, sand, or rock,
- the contents of any septic tank; or
- any other substance, the discharge or which could impede the operation of the foul water drainage network.

Ensure that any installed drain is adequately protected from any damage and excessive loading during the remaining construction period.

Protect adjacent finished work and surfaces from damage and contamination during installation. Any damage to fittings or finished surfaces shall be made good by the appropriate trade at the Drain Layer's expense.

Any associated electrical wiring and prescribed electrical work (by others) shall be carried out by a qualified electrician in accordance with the electrical standards and regulations and the Electrical specification.

11.4.2.10 Defective Materials & Work

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. All rejected foul water drainage materials and work shall be repaired and/or replaced to the satisfaction of the Contract Administrator, without delay and at no additional expense to the Principal.

11.4.2.11 Delivery & Handling

Store foul water drain pipes and accessories undercover, out of direct sunlight, clear of the ground, on an even surface, and protected from damage and contamination in accordance with the manufacturer's requirements. Keep pipes and accessories out of direct sunlight and protected from damage and contamination at all times.

Where possible, store pre-packed PVC pipes in the original delivery crate.
Store loose PVC pipes on evenly spaced bearers at maximum 1.0m centres, with pipe sockets alternated so the the sockets do not bear on each other, and with side supports if pipes are stacked more than two layers high. When loose PVC pipes are stacked in a pyramid, the maximum stack height shall be 1.0m and the bottom pipes shall be chocked.

Do not used damaged or faulty materials or products, or products that are beyond their designated shelf life. Do not use PVC materials that have been exposed to or stored in direct sunlight longer than the period specified by the manufacturer.

Handle all products and materials in accordance with the manufacturer's requirements, and in a manner that prevents damage or deterioration of the material/product.

Installers shall be familiar with and comply with manufacturer's Material Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, including WorkSafe's General Risk and Workplace Management - Part 1 and Workplace and Facilities Requirements guidance.

11.4.2.12 As-Built Drawings

On completion and before application for Code Compliance Certificate, prepare As-Built Drawings of the foul water drainage system, that accurately record the new and/or modified foul water drainage installation.

Information shall include, but not limited to, type, class and size of all pipes, the location, grade and direction of flow of all pipes, the location of all bends, changes in direction, cleaning access positions, manholes, and all dimensions, levels, inverts, etc.

Submit prepared as-built drawings to the Contract Administrator for review. Issue as-built drawings in accordance with the Contract Administrator's instruction, and in the required format.

11.4.2.13 Warranties

On completion and before Practical Completion, provide all relevant manufacturer/supplier warranties in favour of the Principal, covering materials, equipment, proprietary products, etc., supplied and installed.

11.4.3 Materials

11.4.3.1 General

Supply and deliver to the site all pipes, fittings, precast manholes, granular bedding material and other materials required for incorporation in the drainlaying work. All drainlaying materials shall be fit for purpose and intended use, new, of good quality and free from defects, and as specified herein and on the approved drawings and schedules.

11.4.3.2 PVC-U Pipes & Fittings

PVC-U foul water drain pipes and fittings for non-pressure applications shall comply with AS/NZS 1260: 'PVC-U pipes and fittings for drain, waste and vent application'. Installed in accordance with AS/NZS 3500.2, and AS/NZS 2032 or AS/NZS 2566.2.

Pipe Classification:
Class SN4-SN6 - Rubber Ring Joint or Solvent Welded Joint. For domestic and residential applications, and low load areas.
Class SN8-SN10 - Rubber Ring Joint or Solvent Welded Joint. For commercial and industrial applications, and medium load areas.
Class SN16 - Rubber Ring Joint or Solvent Welded Joint. For heavy traffic load areas.

11.4.3.3 Gullies

Gully traps shall be of an approved type and installed in accordance with AS/NZS 3500.2 and the requirements of the Territorial Authority.

Gully traps shall be PVC construction, including dish and lid.

The overflow level of gully dishes shall be set no less than 25mm above paved surfaces, and no less than 100mm above unpaved surfaces.

Provide adequate support to gully riser and dish with compacted bedding or concrete.

Where subject to damage, protect gully traps with a smooth-finished concrete surround, or with 2:1 sand/cement mortar, surrounding the entire gully and separated from the building foundation, in accordance with AS/NZS 3500.2 and as shown on the drawings.

11.4.3.4 Bedding & Surround Material

Except where specified otherwise on the drawings, bedding (underlay, side support, overlay) material shall be compacted clean granular non-cohesive material - crushed rock or gravel screenings - of nominal particle size range of 7-10mm with a maximum particle size of 20mm, that is free from organic material and clay, and have a moisture content appropriate to the degree of compaction required. If the bedding material is contaminated or an excessive amount of oversized particles are present, the bedding material shall be rejected and not used.

11.4.3.5 Backfill Material

Except where specified otherwise, backfill material above the pipe embedment layer (150mm above the top of pipe) shall be selected excavated material that is free from any builder's waste, any organic material, any rocks or hard matter larger than 20mm, and any soil lumps larger than 75mm.

Except where specified otherwise, pipes beneath private roadways and where subject to vehicular traffic - all backfill from the top of the embedment layer (150mm above top of pipe) to the underside of the pavement layer shall be GAP 65 - General All Passing 65mm.

Mechanically compact backfill material in layers not exceeding 300mm to a relative compaction no less than 95% of the NZ Standard Compaction.

Trenches in public footpaths and roads shall be backfilled in accordance with the requirements of the controlling authority.

11.4.3.6 Marking Tape

Marking tape shall be located just above the top of the pipe embedment zone, and centred over the pipe.

Non-Detectable Marking Tape:
- Non-detectable marking tape shall comply with AS/NZS 2648.1.
- Tape width shall be 100mm minimum.
- Height of message letters shall be 40mm minimum.

Detectable Marking Tape:
- Detectable marking tape shall comply with AS/NZS 2648.1.
- Tape width shall be 100mm minimum.
- Tracer wire shall be stainless steel grade 316 or copper alloy designation 122.
- Tracer wire shall allow at least 25% elongation of the plastic tape before breakage of the wire.
- Height of message letters shall be 40mm minimum.

11.4.4 Trench Excavation

11.4.4.1 Clearing of Surfaces

Where trenches are to be excavated in a grassed area, garden or a berm, the topsoil shall be stripped from the area of the excavation and stockpiled separately adjacent to the trench for use in reinstating the surface.

Where trenches are to be excavated in existing concrete or asphalt paved areas, the paving shall be cut to neat, straight lines, parallel to the trench prior to excavation, with a nominal 100mm trimming allowance either side of the excavation width. The excavation shall be carried out with minimal damage to the existing paved surface.

Where trenches are to be excavated in existing segmental paved areas, the pavers shall be removed by hand, cleaned and set aside for later reinstatement.

Subsequent trench backfill shall be adequately compacted to avoid subsidence of reinstated surfaces.

11.4.4.2 Excavation

Locate all existing buried services before commencing excavation work in any area.

Excavations for trenches and pits shall be properly executed and supported in accordance with the requirements of AS/NZS 3500.2.

Carry out excavation work to comply with all relevant health and safety regulations and guidelines, including the 'Excavation Safety - Good Practice Guidelines' where appropriate.

Unless specified otherwise, the excavation of trenches shall be taken out by open cut to the levels and grades shown or implied on the drawings. Excavate trenches to the depths which will provide for the appropriate type of bedding.

Trench excavations shall be of sufficient width to allow all operations necessary for the jointing of pipes and placing of the specified backfill. The bottom width of the trenches shall at least the combined measurement of the outside diameter of the pipe plus 200mm - with a minimum clearance of 100mm on each side of the drain barrel. The trench width at the top of the pipe shall not exceed the outside diameter of the pipe plus 600mm unless the pipe in the trench is covered with concrete. The trench above the top of the pipe may be cut wider, either by excavating a wider bench or by battering the trench wall.

11.4.5 Pipe Laying

11.4.5.1 Bedding Pipes

Provide a minimum 75mm thick underlay layer of well compacted bedding material for all pipes. A chase shall be excavated in the bedding to accommodate any jointing socket or fitting in the drain. The pipe embedment material shall be laid and compacted so that the pipe is evenly and continuously supported along its length on either side of the pipe, and with an overlay layer minimum 150mm thick.

When trench support systems are used, the bedding material shall be placed and compacted in a manner so that no loss of compaction results from removal of the trench side support systems. The trench support shall be removed in such a way as to ensure that the placing and compaction of the bedding material occurs below the trench supports and directly against the undisturbed ground of the trench walls.

After completion of the jointing and inspection of drain pipes, place and compact the bedding surround material around the pipe to the required depth over the pipe. The material shall be carefully placed around and over the pipe using hand tamping and in a manner that ensures the pipe is uniformly supported all round its perimeter and without voids. Take care during placement and compaction to ensure the pipe is not displaced or damaged.

11.4.5.2 Laying Pipes

Install foul water drains in accordance with AS/NZS 3500.2 to the layout, levels and grades shown on the drawings Drain pipes shall be laid to provide maximum falls, in straight lines and at an even grade, without obstruction to flow, and with full allowance for bedding.

Before installing the pipes, check the bore of each pipe is free from foreign matter and that the pipe exterior and the socket have not been damaged in handling or storage. All pipelines shall be kept clean and free of dirt and debris at all times during installation, testing and commissioning.

PVC-U foul water drain pipes shall be properly jointed (rubber ring joint or solvent welded joint) to produce a watertight seal in accordance with the manufacturer's instructions.

Start laying main drains at the point of outfall and insert junctions for branch drains as the work proceeds. Pipes shall be laid with the least number of bends, in the centre of the trench, in straight lines between bends, and to the grades and locations shown on the drawings.

Install all necessary fittings, including vents, inspection openings and access points, bends and junctions, to the locations shown on the drawings and in accordance with the manufacturer's instructions. Where not specified on the drawings or schedules, fittings for inspection openings, bends, junctions, etc., shall be selected from the PVC pipe system range of products and installed in accordance with the manufacturer's instructions.

Other than precautions against damage by displacement or floating pipes, no bedding surround material or backfill shall be placed until the laying of the drain has been inspected by the Territorial Authority.

11.4.5.3 Steep Gradients

Where the gradient of a foul water drain pipe exceeds 1:5 (20%), anchor blocks shall be installed at the bend or junction at the top and bottom of the inclined drain, and at intervals not exceeding 3m. Anchor blocks shall be constructed in accordance with AS/NZS 3500.2: Section 3.4.4.

11.4.5.4 Underground Drains Near & Under Buildings

Protect underground drains near and under buildings against damage in accordance with AS/NZ 3500.2 where the minimum cover specified cannot be provided.

11.4.5.5 Jointing - Solvent Cement Welded Joints

Solvent welded joints shall only be used for jointing PVC-U pipes and fittings where rubber-ring jointed fittings are not manufactured. Use only cleaner primers and solvent cements specified by the manufacturer for the application and socket type. Only sockets complying with the relevant Standard shall be installed. Do not use cleaner primers or solvent cements if the 'use by' date has expired. The marking of pipes by scoring is not permitted. All joints shall be watertight and prevent the infiltration of groundwater and the intrusion of tree roots.

Solvent welded joints shall be assembled in accordance with the manufacturer's instructions and generally as follows:

- Solvent welding shall only be carried out in dry conditions above 5°C.
- Ensure the components are dry, clean and free of dust, dirt, grease and surface contaminants during all stages of the jointing process.
- Prior to welding, the components shall be assembled dry and checked for position and alignment to ensure accurate re-assembly in the correct position.
- Mark the spigot with a witness mark (pencil, not scored) at a distance equivalent to the internal depth of the socket.
- Dry the spigot end, up to the witness mark, and the socket interior, then clean and degrease with a clean cloth moistened with the pipe or fitting manufacturer’s specified priming fluid.
- Apply an even coating of solvent cement to the internal surface of the socket for the full engagement length, and to the external section of the spigot up to the witness mark.
- Only use the minimum amount of solvent cement in the socket necessary for a fully solvent-welded joint.

- Insert the spigot close to, but not beyond, the witness mark. Do not use excessive force. Firmly restrain the joint for the minimum period recommended by the pipe manufacturer.
- Wipe off excess solvent cement from the outside of the joint, and where possible from the inside.
- Adhere to the manufacturer's specified procedures and time frames for filling and testing pipework.
- Allow all solvent welded joints to fully cure before subjecting pipework to any imposed load or testing.

11.4.5.6 Pipe Cover

Unless specified otherwise on the drawings, the minimum pipe cover (finished surface to top of pipe) shall be:
- where not subject to vehicular loading: 300mm.
- where subject to vehicular loading - not in roadways: 500mm.
- where subject to vehicular loading - in sealed roadways: 500mm.
- where subject to vehicular loading - in unsealed roadways: 500mm.
- pipes in embankment conditions or subject to loading from heavy construction equipment: 750mm.

11.4.5.7 Marking Tape

Install marking tape on top of the pipe embedment zone and centred over the pipe before commencing backfilling.

11.4.6 Connection

11.4.6.1 Public Network - Boundary Connection

Connect to discharge the foul water drainage line directly to the public mains street-edge/boundary connection in accordance with the requirements of the Territorial Authority and as shown on the drawings.

11.4.7 Testing

11.4.7.1 Foul Water Drains

Test the foul water drainage installation, including all drains, connections and system components, for water tightness in accordance with the requirements of the Territorial Authority (TA).

Where required by the Territorial Authority, the testing shall be undertaken in the presence of a representative of the TA. Demonstrate to the Contract Administrator and the Territorial Authority that the installation complies with the requirements of the contract documents, related standards and regulatory bodies. Lodge all certificates of approval with the Contract Administrator.

Unless specified otherwise by the Territorial Authority, the test method shall be the Water Test procedure for non-pressure pipelines as defined in AS/NZS 2302. Where appropriate, the procedures in NZBC E1/VM1 may be used as an alternative. The acceptability of other test methods are be subject to the approval of the Territorial Authority and the Contract Administrator.

Provide all necessary plant, equipment and instruments required for the specified testing procedure. All testing and commissioning shall be undertaken by suitably skilled and experienced technicians.

Pressure testing shall be carried out after the pipes have been laid and the bedding material has been placed over the pipes as specified.

Prior to testing ensure that all pipe junctions and inspection eyes are exposed, and pipelines have been flushed and all residual debris cleaned out.

Foul water manholes shall be tested for watertightness by plugging all pipes and filling with water. After absorption has taken place the water level shall remain constant for thirty minutes.

Test results shall be recorded clearly on properly formatted Test Result sheets, and submitted to the Contract Administrator within 48 hours of completion of testing.

Repair or replace any materials or workmanship found to be defective or faulty during testing, and repeat the test until a satisfactory test result is achieved.

Leave the installation watertight and free of defects, and operating to the required performance standard.

The work shall be deemed incomplete unless all required testing and commissioning has been carried out and has passed the requirements of the testing specification and the Territorial Authority.

11.4.8 Backfilling

11.4.8.1 Backfilling

Trenches shall be backfilled as soon as possible after the laying, inspecting and testing of the pipeline.

Where required, lay marker tape along the length of the drain, just above the top of the pipe embedment zone, before backfilling.

Trench backfill materials shall be placed over the pipe embedment, and compacted to restore the trench as near as practicable to the normal surrounding ground surface level and reduce the likelihood of subsidence. Backfill material shall be placed in uncompacted layers not exceed 300mm, then mechanically compacted to the required density.

Temporary trench support systems shall be lifted progressively above each layer of backfill to ensure each layer is compacted against undisturbed ground.

Any deficiencies of trench filling exposed by settlement shall be corrected to the required standard.

11.4.9 Reinstatement of Surfaces

11.4.9.1 Reinstatement of Surfaces

Refer to separate specification section - Siteworks - Reinstatement of Surfaces.

Ground and paved surfaces above excavated foul water drainage trenches shall be reinstated to the standard specified. Reinstatement shall generally achieve a standard equal to or better than the pre-existing situation - in no case will a lower standard be accepted.

Hedges, fences and other features to be retained that have been damaged or removed during the work shall be reinstated to the satisfaction of the Contract Administrator.

11.5 Stormwater Drainage

11.5.1 Scope

Supply, install, test and commission new, gravity-flow stormwater drains on the site, to the locations, layout and details shown on the drawings, complete with all necessary components and accessories required for the satisfactory completion and performance of the stormwater system. All aspects of this works shall comply with the requirements of the NZ Building Code, related compliance Standards, Regulations and Acts, and to the requirements of the Territorial Authority, and as specified herein and on the design drawings and schedules. Ancillary work and/or services not specifically mentioned but necessary to complete the installation shall be deemed included.

Install stormwater drains in natural ground, beneath and/or external to the building, for the distances indicated on the drawings. Allow for all inspection openings, bends, branches, manholes, inspection chambers, etc., as required and indicated on the drawings. Unless shown otherwise on the drawings, the stormwater drains shall be connected to the roof and surface stormwater installations, and discharge to the stormwater network.

The stormwater drainage plans are diagrammatic only. Allow for all necessary inspection fittings, cleaning eyes, and traps in accordance with AS/NZS 3500.3 and to comply with the New Zealand Building Code, and as required by the Territorial Authority. Refer to the drawings for the dimensioned locations of roof drainage system rainwater pipes and outlets, and surface drainage outlets, etc.

The following is a list and a general description of the extent of Stormwater Drainage works, which are more specifically defined in the contract documents, required for the completion of the contract works:

11.5.2 Requirements

11.5.2.1 Safety

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, including WorkSafe's General Risk and Workplace Management - Part 1 and Workplace and Facilities Requirements guidance.

Carry out all construction operations in accordance with the Contractor's project-specific Health and Safety Plan.

11.5.2.2 Compliance

Obtain all necessary permits and consents, serve all necessary notices, arrange all tests and pay all fees and customary charges in connection with the stormwater drainage works.

The Drain Layer shall be deemed to have allowed for all work associated with the safe and orderly execution of the stormwater drainage work, including complying with all Territorial Authority requirements, Building Consent, Building Act, Health and Safety requirements, and all other acts, laws, by-laws and regulations that may affect the execution of the work.

11.5.2.3 Explosives

The use of explosives is NOT permitted.

11.5.2.4 Inspections

Inspections of stormwater drainage works shall take place at each of the stages as scheduled in the Building Consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

Obtain and pay all fees for any required inspections which are additional to the Building Consent.

11.5.2.5 Testing

Carry out all necessary testing of the stormwater drainage installations, and demonstrate to the Contract Administrator and the Territorial Authority that the installations are watertight and comply with the requirements of the New Zealand Building Code, related compliance Standards, and the design documents.

11.5.2.6 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades as necessary to install stormwater drains to the required locations and layout.

11.5.2.7 Workmanship

Stormwater drainage work shall be carried out by qualified and experienced tradespersons, familiar with all required installation requirements, under the direct supervision of a NZ certified Registered Drain Layer, in accordance with AS/NZS 3500.3 and to comply with the New Zealand Building Code, and all local codes and regulatory authority requirements, and the conditions of the Building Consent.

All pipe cutting, jointing, and supporting techniques shall be exactly as recommended by the pipe manufacturer. Pipes, fittings and accessories shall be handled and installed in such a manner that prevents any damage to the component.

All work shall be such as to leave a neat, efficient, robust and watertight installation.

Carry out all necessary inspections and tests during installation to ensure compliance with the design specifications and regulatory requirements. Provide test result sheets to the Contract Administrator to show compliance has been achieved.

Take all necessary precautions during installation to protect the stormwater drainage system from damage, and to prevent the entry of:

- soil, sand, or rock;
- sewage, including the contents of any septic tank, or trade waste; or
- any other substance that could damage or impede the operation of the stormwater drainage network.

Ensure that any installed drain is adequately protected from any damage and excessive loading during the remaining construction period.

Protect adjacent finished work and surfaces from damage and contamination during installation. Any damage to fittings or finished surfaces shall be made good by the appropriate trade at the Drain Layer's expense.

Any associated electrical wiring and prescribed electrical work (by others) shall be carried out by a qualified electrician in accordance with the electrical standards and regulations and the Electrical specification.

11.5.2.8 Defective Materials & Work

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. All rejected stormwater drainage materials and work shall be repaired and/or replaced to the satisfaction of the Contract Administrator, without delay and at no additional expense to the Principal.

11.5.2.9 Delivery & Handling

Store stormwater drain pipes and accessories undercover, out of direct sunlight, clear of the ground, on an even surface, and protected from damage and contamination in accordance with the manufacturer's requirements. Keep pipes and accessories out of direct sunlight and protected from damage and contamination at all times.

Store loose PVC-U pipes on evenly spaced bearers at maximum 1.0m centres, with pipe sockets alternated so the the sockets do not bear on each other, and with side supports if pipes are stacked more than two layers high. When loose PVC-U pipes are stacked in a pyramid, the maximum stack height shall be 1.0m and the bottom pipes shall be chocked.

Do not used damaged or faulty materials or products, or products that are beyond their designated shelf life. Do not use PVC-U materials that have been exposed to or stored in direct sunlight longer than the period specified by the manufacturer.

Handle all products and materials in accordance with the manufacturer's requirements, and in a manner that prevents damage or deterioration of the material/product.

Installers shall be familiar with and comply with manufacturer's Material Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes

of Practice and WorkSafe Information and Guidance, including WorkSafe's General Risk and Workplace Management - Part 1 and Workplace and Facilities Requirements guidance.

11.5.2.10 As-Built Drawings

On completion and before application for Code Compliance Certificate, prepare As-Built Drawings of the stormwater drainage system, that accurately record the new and/or modified stormwater drainage installation.

Information shall include, but not limited to, type, class and size of all pipes, the location, grade and direction of flow of all pipes, the location of all bends, changes in direction, cleaning access positions, manholes, and all dimensions, levels, inverts, etc.

Submit prepared as-built drawings to the Contract Administrator for review. Issue as-built drawings in accordance with the Contract Administrator's instruction, and in the required format.

11.5.2.11 Warranties

On completion and before Practical Completion, provide all relevant manufacturer/supplier warranties in favour of the Principal, covering materials, equipment, proprietary products, etc., supplied and installed.

11.5.3 Materials

11.5.3.1 General

Supply and deliver to the site all pipes, junctions, precast manholes, granular bedding material and other materials required for the satisfactory completion of the stormwater drainage works. All drainlaying materials shall be fit for purpose, new and free from damage and defects.

11.5.3.2 PVC-U Pipes & Fittings

PVC-U stormwater drain pipes and fittings for non-pressure applications shall comply with AS/NZS 1254: 'PVC-U pipes and fittings for stormwater and surface water applications'. Installed in accordance with AS/NZS 3500.3 and AS/NZS 2032 or AS/NZS 2566.2

Pipe Classification:
Class SN4-SN6 - Rubber Ring Joint or Solvent Welded Joint. For domestic and residential applications, and low load areas.
Class SN8-SN10 - Rubber Ring Joint or Solvent Welded Joint. For commercial and industrial applications, and medium load areas.
Class SN16 - Rubber Ring Joint or Solvent Welded Joint. For heavy traffic load areas.

11.5.3.3 Backfill Material

Except where specified otherwise, backfill material above the pipe embedment layer (150mm above the top of pipe) shall be selected ordinary excavated material that is free from any builder's waste, any organic material, any rocks or hard matter larger than 20mm, and any soil lumps larger than 75mm.

Except where specified otherwise, pipes beneath private roadways and where subject to vehicular traffic - all backfill from the top of the embedment layer (150mm above top of pipe) to the underside of the pavement layer shall be GAP 65 - General All Passing 65mm.

Mechanically compact backfill material in layers not exceeding 300mm to a relative compaction no less than 95% of the NZ Standard Compaction.

Trenches in public footpaths and roads shall be backfilled in accordance with the requirements of the controlling authority.

11.5.4 Trench Excavation

11.5.4.1 Clearing of Surfaces

Where trenches are to be excavated in a grassed area, garden or a berm, the topsoil shall be stripped from the area of the excavation and stockpiled separately adjacent to the trench for use in reinstating the surface.

Where trenches are to be excavated in existing concrete or asphalt paved areas, the paving shall be cut to neat, straight lines, parallel to the trench prior to excavation, with a nominal 100mm trimming allowance either side of the excavation width. The excavation shall be carried out with minimal damage to the existing paved surface.

Where trenches are to be excavated in existing segmental paved areas, the pavers shall be removed by hand, cleaned and set aside for later reinstatement.

Subsequent trench backfill shall be adequately compacted to avoid subsidence of reinstated surfaces.

11.5.4.2 Excavation

Locate all existing buried services before commencing excavation work in any area.

Excavations for trenches and pits shall be properly executed and supported in accordance with the requirements of AS/NZS 3500.3.

Carry out excavation work to comply with all relevant health and safety regulations and guidelines, including the 'Excavation Safety - Good Practice Guidelines'.

Unless specified otherwise, the excavation of trenches shall be taken out by open cut to the levels and grades shown or implied on the drawings. Excavate trenches to the depths which will provide for the appropriate type of bedding.

Trench excavations shall be of sufficient width to allow all operations necessary for the jointing of pipes and placing of the specified backfill. The bottom width of the trenches shall at least the combined measurement of the outside diameter of the pipe plus 200mm - with a minimum clearance of 100mm on each side of the drain barrel. The trench width at the top of the pipe shall not exceed the outside diameter of the pipe plus 600mm unless the pipe in the trench is covered with concrete. The trench above the top of the pipe may be cut wider, either by excavating a wider bench or by battering the trench wall.

Where a trench has been excavated deeper than required without authorisation, the excess depth shall be filled either with bedding material compacted to achieve a density as near to the original soil density as possible, or with concrete.

11.5.5 Pipe Laying

11.5.5.1 Bedding Pipes

Provide a minimum 75mm thick underlay layer of well compacted bedding material for all pipes. A chase shall be excavated in the bedding to accommodate any jointing socket or fitting in the drain. The pipe embedment material shall be laid and compacted so that the pipe is evenly and continuously supported along its length on either side of the pipe, and with an overlay layer minimum 150mm thick.

When trench support systems are used, the bedding material shall be placed and compacted in a manner so that no loss of compaction results from removal of the trench side support systems. The trench support shall be removed in such a way as to ensure that the placing and compaction of the bedding material occurs below the trench supports and directly against the undisturbed ground of the trench walls.

After completion of the jointing and inspection of drain pipes, place and compact the bedding surround material around the pipe to the required depth over the pipe. The material shall be carefully placed around and over the pipe using hand tamping and in a manner that ensures the pipe is uniformly supported all round its perimeter and without voids. Take care during placement and compaction to ensure the pipe is not displaced or damaged.

11.5.5.2 Laying Pipes

Install stormwater drains in accordance with AS/NZS 3500.3 to the layout, levels and grades shown on the drawings. Drain pipes shall be laid to provide maximum falls, in straight lines and at an even grade, without obstruction to flow, and with full allowance for bedding.

Before installing the pipes, check the bore of each pipe is free from foreign matter and that the pipe exterior and the socket have not been damaged in handling or storage. All pipelines shall be kept clean and free of dirt and debris at all times during installation, testing and commissioning.

PVC-U stormwater drain pipes shall be properly jointed (rubber ring joint or solvent welded joint) to produce a watertight seal in accordance with the manufacturer's instructions.

Start laying main drains at the point of outfall and insert junctions for branch drains as the work proceeds. Pipes shall be laid with the least number of bends, in the centre of the trench, in straight lines between bends, and to the grades and locations shown on the drawings.

Install all necessary fittings, including inspection openings, bends and junctions, to the locations shown on the drawings and in accordance with the manufacturer's instructions. Where not specified on the drawings or schedules, fittings for inspection openings, bends, and junctions shall be selected from the PVC-U pipe system range of products and installed in accordance with the manufacturer's instructions.

Other than precautions against damage by displacement or floating pipes, no bedding surround material or backfill shall be placed until the laying of the drain has been inspected by the Territorial Authority.

11.5.5.3 Steep Gradients

Where the gradient of a stormwater drain pipe exceeds 1:5 (20%), anchor blocks shall be installed at the bend or junction at the top and bottom of the inclined drain, and at intervals not exceeding 3m. Anchor blocks shall be constructed in accordance with AS/NZS 3500.3: Section 7.9.

11.5.5.4 Jointing - Solvent Welded Joints

Solvent welded joints shall be used for jointing PVC-U pipes and fittings where rubber-ring jointed fittings are not manufactured. Use only cleaner primers and solvent cements specified by the manufacturer for the application and socket type. Only sockets complying with the relevant Standard shall be installed. Do not use cleaner primers or solvent cements if the 'use by' date has expired. The marking of pipes by scoring is not permitted. All joints shall be watertight and prevent the infiltration of groundwater and the intrusion of tree roots.

Solvent welded joints shall be assembled in accordance with the manufacturer's instructions and generally as follows:
- Solvent welding shall only be carried out in dry conditions above 5°C.
- Ensure the components are dry, clean and free of dust, dirt, grease and surface contaminants during all stages of the jointing process.
- Prior to welding, the components shall be assembled dry and checked for position and alignment to ensure accurate re-assembly in the correct position.
- Mark the spigot with a witness mark (pencil, not scored) at a distance equivalent to the internal depth of the socket.
- Dry the spigot end, up to the witness mark, and the socket interior, then clean and degrease with a clean cloth moistened with the pipe or fitting manufacturer’s specified priming fluid.
- Apply an even coating of solvent cement to the internal surface of the socket for the full engagement length, and to the external section of the spigot up to the witness mark.
- Only use the minimum amount of solvent cement in the socket necessary for a fully solvent-welded joint.
- Insert the spigot close to, but not beyond, the witness mark. Do not use excessive force. Firmly restrain the joint for the minimum period recommended by the pipe manufacturer.
- Wipe off excess solvent cement from the outside of the joint, and where possible from the inside.
- Adhere to the manufacturer's specified procedures and time frames for filling and testing pipework.
- Allow all solvent welded joints to fully cure before subjecting pipework to any imposed load or testing.

11.5.5.5 Pipe Cover

Unless specified otherwise on the drawings, the minimum pipe cover (finished surface to top of pipe) shall be:
- where not subject to vehicular loading: 300mm.
- where subject to vehicular loading - not in roadways: 450mm.
- where subject to vehicular loading - in sealed roadways: 600mm.
- where subject to vehicular loading - in unsealed roadways: 750mm.

- pipes in embankment conditions or subject to loading from heavy construction equipment: 750mm.

11.5.6 Connection

11.5.6.1 Public Network - Street Kerb Connection

Connect to discharge the stormwater drainage line directly to the street kerb outlet in accordance with the requirements of the Territorial Authority and as indicated on the drawings.

11.5.7 Testing

11.5.7.1 Stormwater Drains

Test the stormwater installation, including all drains, connections and system components, for water tightness in accordance with the requirements of the Territorial Authority (TA).

Where required by the Territorial Authority, the testing shall be undertaken in the presence of the representative of the TA. Demonstrate to the Contract Administrator and the Territorial Authority that the installation complies with the requirements of the contract documents, related standards and regulatory bodies. Lodge all certificates of approval with the Contract Administrator.

Unless specified otherwise by the Territorial Authority, the testing procedure shall be the Water Test procedure as defined in AS/NZS 3500.3: Section 9. Where appropriate, the procedures in NZBC E1/VM1 may be used as an alternative. The acceptability of other test methods are be subject to the approval of the Territorial Authority and the Contract Administrator.

Provide all necessary plant, equipment and instruments required for the specified testing procedure. All testing and commissioning shall be undertaken by suitably skilled and experienced technicians.

Pressure testing shall be carried out after the pipes have been laid and the bedding material has been placed over the pipes as specified.

Prior to testing ensure that all pipe junctions and inspection eyes are exposed, and pipelines have been flushed and all residual debris cleaned out.

Stormwater manholes shall be free of visible faults, or permeable zones, and jointing or penetration repairs shall be to best trade practice and standards.

Test results shall be recorded clearly on properly formatted test result sheets, and submitted to the Contract Administrator within 48 hours of completion of testing.

Repair or replace any materials or workmanship found to be defective or faulty during testing, and repeat the test until a satisfactory test result is achieved.

Leave the installation watertight and free of defects, and operating to the required performance standard.

The work shall be deemed incomplete unless all required testing and commissioning has been carried out and has passed the requirements of the testing specification and the Territorial Authority.

11.5.7.2 Water Test Procedure - to AS/NZS 3500.3

Water test procedure of stormwater drains (non-pressure) - to AS/NZS 3500.3: Section 9.4: The head of water on any section of drain shall not exceed 3m.

The procedure shall be as follows:
- Seal all openings except the top of the section of the below-ground drain to be tested.
- Fill the below-ground drain with water to the highest level in that section.
- 10 minutes for vitrified clay drains; or
- 5 minutes for drains of any other material.

The drain shall be deemed to have passed the test if no make-up water is required.

11.5.8 Backfilling

11.5.8.1 Backfilling

Trenches shall be backfilled as soon as possible after the laying, inspecting and testing of the pipeline.

Where required, lay marker tape along the length of the drain, just above the top of the pipe embedment zone, before backfilling.

Trench backfill materials shall be placed on the pipe embedment, and compacted to restore the trench as near as practicable to the normal surrounding ground surface level and reduce the likelihood of subsidence. Backfill material shall be placed in uncompacted layers not exceed 300mm, then mechanically compacted to the required density.

Temporary trench support systems shall be lifted progressively above each layer of backfill to ensure each layer is compacted against undisturbed ground.

Any deficiencies of trench filling exposed by settlement shall be corrected to the required standard.

11.5.9 Reinstatement of Surfaces

11.5.9.1 Reinstatement of Surfaces

Refer to separate specification section - Siteworks - Reinstatement of Surfaces. Ground and paved surfaces above excavated stormwater drainage trenches shall be reinstated to the standard specified. Reinstatement shall generally achieve a standard equal to or better than the pre-existing situation - in no case will a lower standard be accepted.

Hedges, fences and other features to be retained that have been damaged or removed during the work shall be reinstated to the satisfaction of the Contract Administrator.

12 ELECTRICAL

12.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

12.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

4512:2010(NZS)	Fire detection and alarm systems in buildings
4514:2009(NZS)	Interconnected smoke alarms for houses
4514:2021(NZS)	Interconnected smoke alarms for houses

12.3 Interconnected Smoke Alarms

12.3.1 Scope

Supply, install, and commission Interconnected Smoke Alarms to the locations and layout shown on the drawings, complete with accessories. All aspects of this work shall be in accordance with the smoke alarm manufacturer's product specification and installation requirements, other product manufacturers' recommendations, the electrical specification, and as shown on the drawings.

12.3.2 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Co-ordinate with other trades to install Interconnected Smoke Alarms as required.

12.3.3 Workmanship

All work shall be carried out by experienced and competent tradesmen in accordance with the manufacturer's requirements, the electrical specification and drawings, and the related standards, electrical regulations and code requirements.
All work shall be such as to leave a neat, efficient and robust installation.

12.3.4 Power Supply

Interconnected smoke alarms shall be powered from a permanently energised 230 v a.c. mains power supplied from the unswitched side of a commonly used circuit, and shall include either a long-life battery backup or long life (10yr minimum) built-in rechargeable energy storage device.

Interconnected smoke alarms shall be powered from an external d.c. power supply continuously maintained from a 230 v a.c. mains supply, with battery backup, compliant with NZS 4512 or AS/NZS 2201.1.

12.3.5 Alarm Type

Install interconnected Ionisation type smoke alarms.

12.3.6 Heat Alarms & Heat Detectors

In addition to installing interconnected smoke alarms; install heat alarms or heat detectors, interconnected to the smoke alarms, to the locations shown on the drawings.

Manufacturer, brand name & type:

12.3.7 Installation

Install the interconnected smoke alarms on ceilings, or as shown otherwise, to the layout shown on the drawings in strict accordance with the manufacturer's instructions. Do not install smoke alarms in dead air spaces or obstructions where dead air spaces may be created.

Do not install smoke alarms closer than 400mm to any forced-air supply opening or to any blade of a ceiling fan.

12.3.8 Completion

Check that the smoke alarms have been correctly installed and wired.
Commission smoke alarms to the required operation in accordance with the manufacturer's instructions. Test alarms to ensure that the warning signal is heard in all bedrooms when all doors between the alarm and bedrooms are closed.
Check for faults and damage, repair/replace as necessary.

Issue to the Owner a copy of the manufacturer's testing and maintenance requirements and product warranty.

1. Masons Ventilated Cavity Battens
2. BRANZ Appraisal 650 – Vertical Shiplap
3. Product Technical Statement – Vertical Shiplap
4. CODEMARK CMNZ30036 Vertical Shiplap
5. Installation Specifications - Vertical Shiplap Cavity Fixed
6. Product installation Check List
7. Pink® Batts® Wall Installation
8. Pink® Batts® Ceiling - Truss/Framed Roof
9. BRANZ Appraisal No. 238 PINK® BATTS® INSULATION
10. BRANZ Appraisal No.967 - Firth Two Storey Masonry Veneer Solutions
11. BRANZ Appraisal No.928 - GIB EzyBrace Systems
12. BRANZ Appraisal No.427 (2021) - GIB Aqualine Wet Area Systems
13. CodeMark Certificate CMNZ70116 – Masons NZ Ltd - UNI® and UNI® PLUS Flexible Air Barriers
14. CodeMark Certificate CMNZ70117 - Masons NZ Ltd - Masons UNI® PRO Flexible Air Barrier

MASONS VENTILATED BATTENS AS CAVITY BATTENS BEHIND WALL CLADDING
INSTALLATION GUIDE

MASONS
Designed Smart, Built Tough.

V1.0 May 2026

General product information / purpose

Masons Ventilated battens are specially designed battens that are made of tough, non-absorbent polypropylene and have a self-adhesive strip for convenient placement before nailing off.

Ventilated battens are used to form a cavity behind the cladding and over the wall underlay, by allowing the consistent free flow of air and moisture, assisting with effective ventilation of a wall cavity* to prevent moisture which can lead to mould growth, timber rot or damage. This helps to keep the wall space dry and cool even during hot weather.

The cellular construction is non-conductive, capillary action resistant, and dimensionally stable, and assists with reducing thermal bridging. They are robust with a high compressive strength so they are effective packers. They are not suitable to be used as structural battens. UV Exposure Walls 60 days.

Always check the cladding manufacturer's requirements as to acceptable batten types, and any fixing requirements, before specifying or installing Mason's Ventilated battens.

AVAILABLE SIZES

Masons Roof and Wall batten 18mm x 45 x 1.8m

Product code BATNVENT45x18x1800 Sold as a Box of 25 battens

CROSS VENTILATION/AIRFLOW RATES

BATNVENT 45X18X1800: 12,300mm^2 / Lm or 22140mm^2 / 1.8m length

DESIGN CONSIDERATIONS

Wall cavity must comply with:

- E2/AS1 drained and ventilated cavity requirements
- Minimum equivalent open area for ventilation as per E2/AS1, typically >10,000mm^2/m length of cavity
- Free airflow along the cavity to promote drying
- Prevent direct airflow into roof or ceiling cavities
- Ensure horizontal airflow along the wall cavity is maintained via the slots in the battens.
- Can be installed over rigid or flexible wall underlay.
- Ensure full cavity depth is always maintained.

Installation

For conventional pliable wall underlays (house wrap – building paper)

STEP 1: **PREPARATION**

- Prior to fixing ensure wall framing is complete and wall cavities are free of debris.
- Confirm drainage path at the bottom of the cavity.

STEP 2: **FIXING**

- Fix Masons Ventilated Battens over underlay to framing and fix with hand or gun-driven batten nails. Use flat Galv or SS head batten nails fitted flush, avoid breaking the top of the batten.
- Fixings to be of sufficient length to penetrate the batten depth, underlay plus at least 30mm into framing.
- Where used, adjust nail guns to seat nails flush or just proud, avoid over driving and rupturing the top layer
- Fix vertically or horizontally, and around joinery openings as required by E2 AS1, and in conjunction with any additional cladding manufacturer's requirements.

STEP 3: **COMPATIBILITY**

- Masons Ventilated Plastic Battens may be used with all Masons underlay products for wall applications. They are likely to be suitable for use with many other underlays except where specified otherwise by the underlay or cladding suppliers. Always read the manufacturer's instructions, appraisals and certificates of conformity to ensure a ventilated plastic batten may be used.
- Use in conjunction with Mason's Redway E2 cavity closers and Redway E2 Top Vent for the best possible cavity drainage drying and cooling of the cavity.
- Masons Ventilated batten may be used in place of a vermin strip or cavity closer where this suits the cladding set out. The Ventilated battens must not be exposed to direct or reflected UV light if used as cavity closer – vermin strip.
- Do not use at the wall cavity - roof space junction. Use solid batten instead to block off the wall cavity from the roof space as required in E2/ AS1.
- Can be used in conjunction with Masons Wrap Strap (blue strap – 'Dan Band') 19 or 25mm wide to restrain flexible wall underlay (house-building wrap) at 300mm intervals.
- When using UNI systems, Masons Wrap Strap may be needed, and is recommended when studs are at 600mm centres behind lightweight cladding to maintain the 18mm cavity. For Brick veneer and all other stud spacings wrap strap is not necessary if the UNI product has been installed taut (pulled tight across the studs).
- Masons ventilated plastic battens must be covered by cladding at 60 days UV exposure, or before. Make note of when battens are installed and do not exceed the UV – daylight exposure time.

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Masons Plastic Ventilated Cavity Battens

Typical Batten Layout

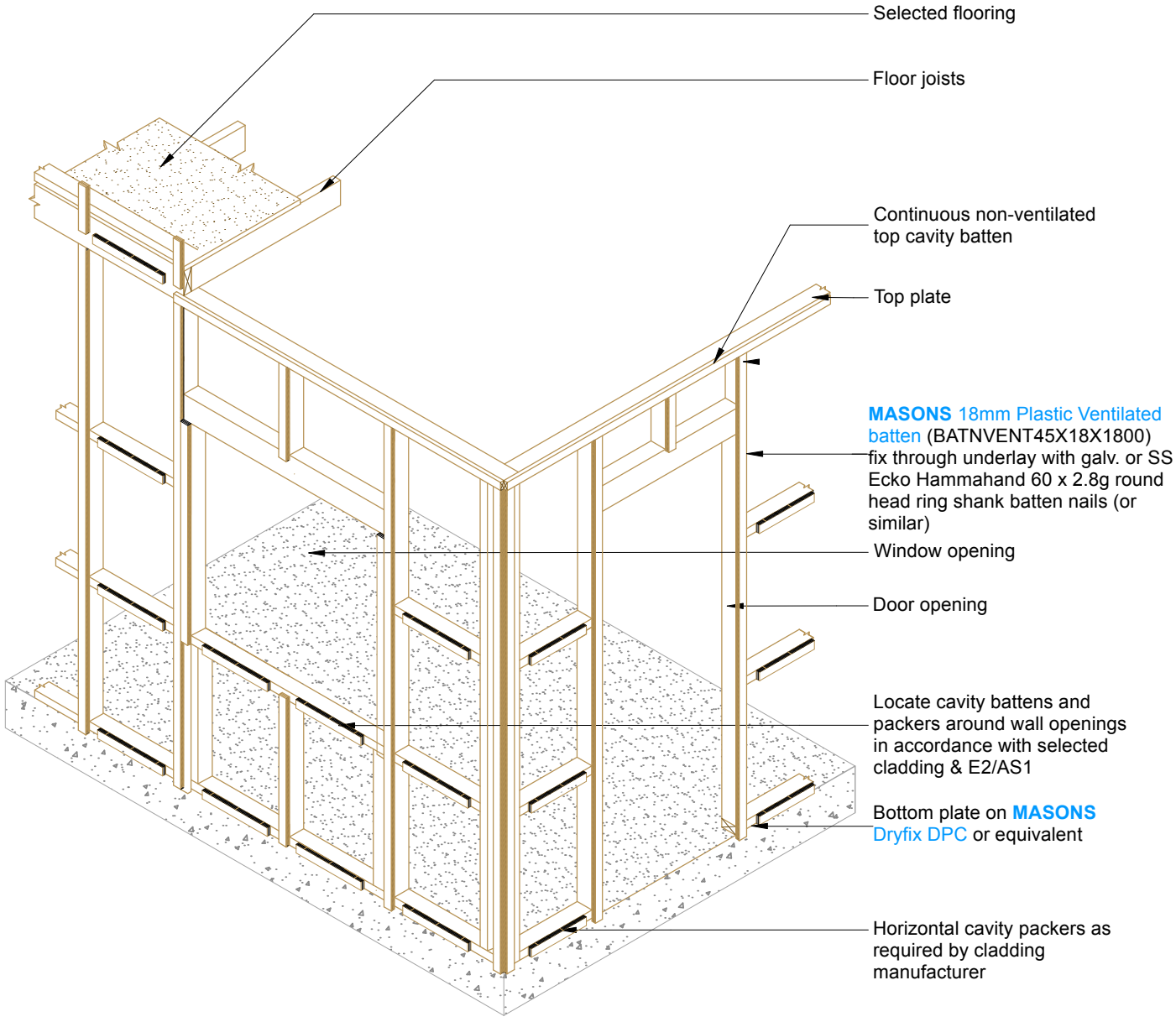
Vertical

Scale:

Date: 20/04/26

Product Code: BATNVENT 45X18X1800

Drawing No. **MVCB.01**



NOTE:
Installation must be to E2/AS1 cl.9.1.8 & Fig. 67 and in line with Cladding & Underlay Manufacturers specifications (which superceed any generic detailing)

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Masons Plastic Ventilated Cavity Battens

Typical Batten Layout

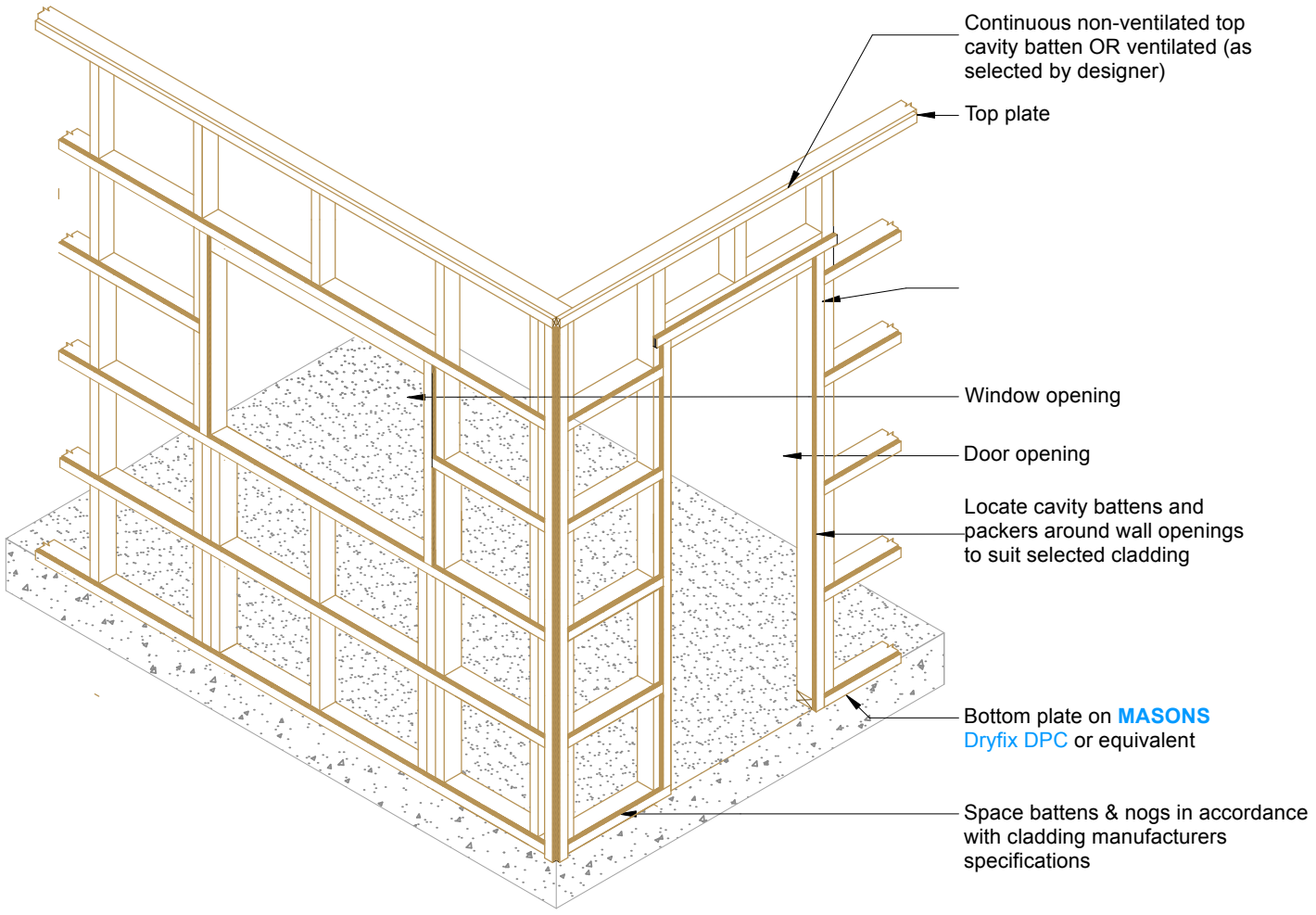
Horizontal

Scale:

Date: 20/04/26

Product Code: BATNVENT 45X18X1800

Drawing No. **MVCB.02**



NOTE:
Installation must be to E2/AS1 cl.9.1.8 & Fig. 67 and in line with Cladding & Underlay Manufacturers specifications (which superceed any generic detailing)

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Masons Plastic Ventilated Cavity Battens

Drained Cavity

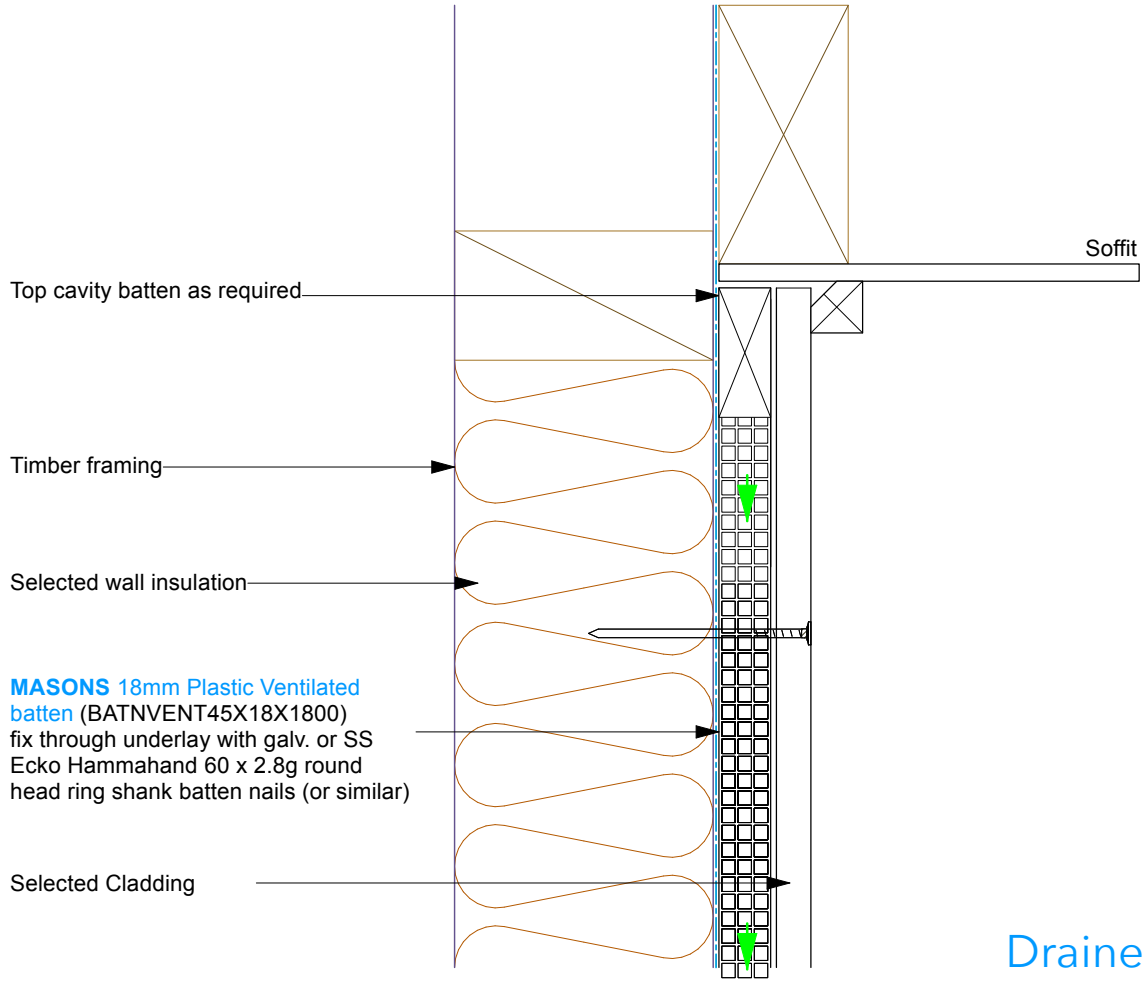
Option A

Scale:

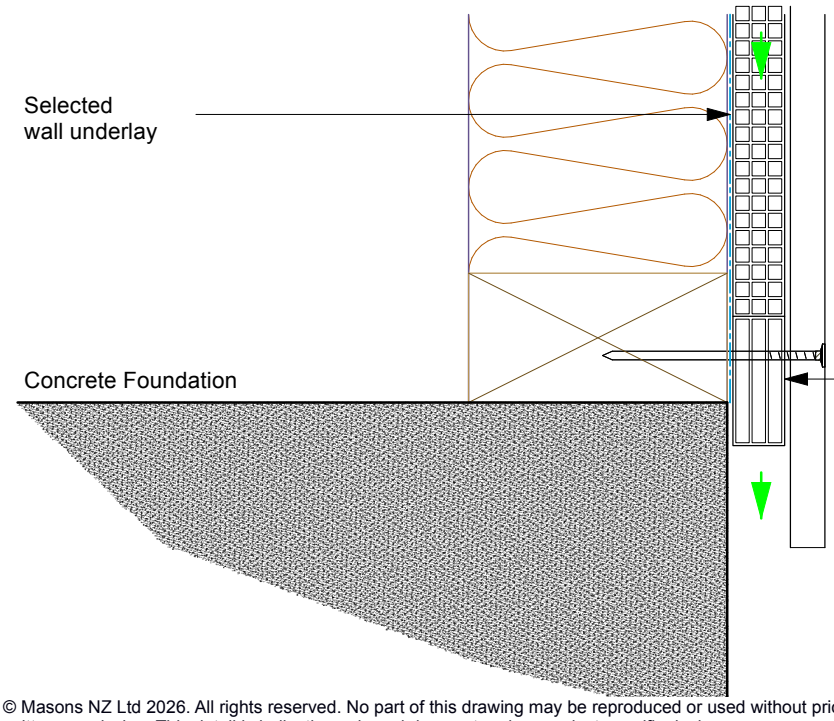
Date: 20/04/26

Product Code: BATNVENT45X18X1800

Drawing No. **MVCB.03**



Drained Cavity



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Ground Level to E2/AS1

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Drained Cavity

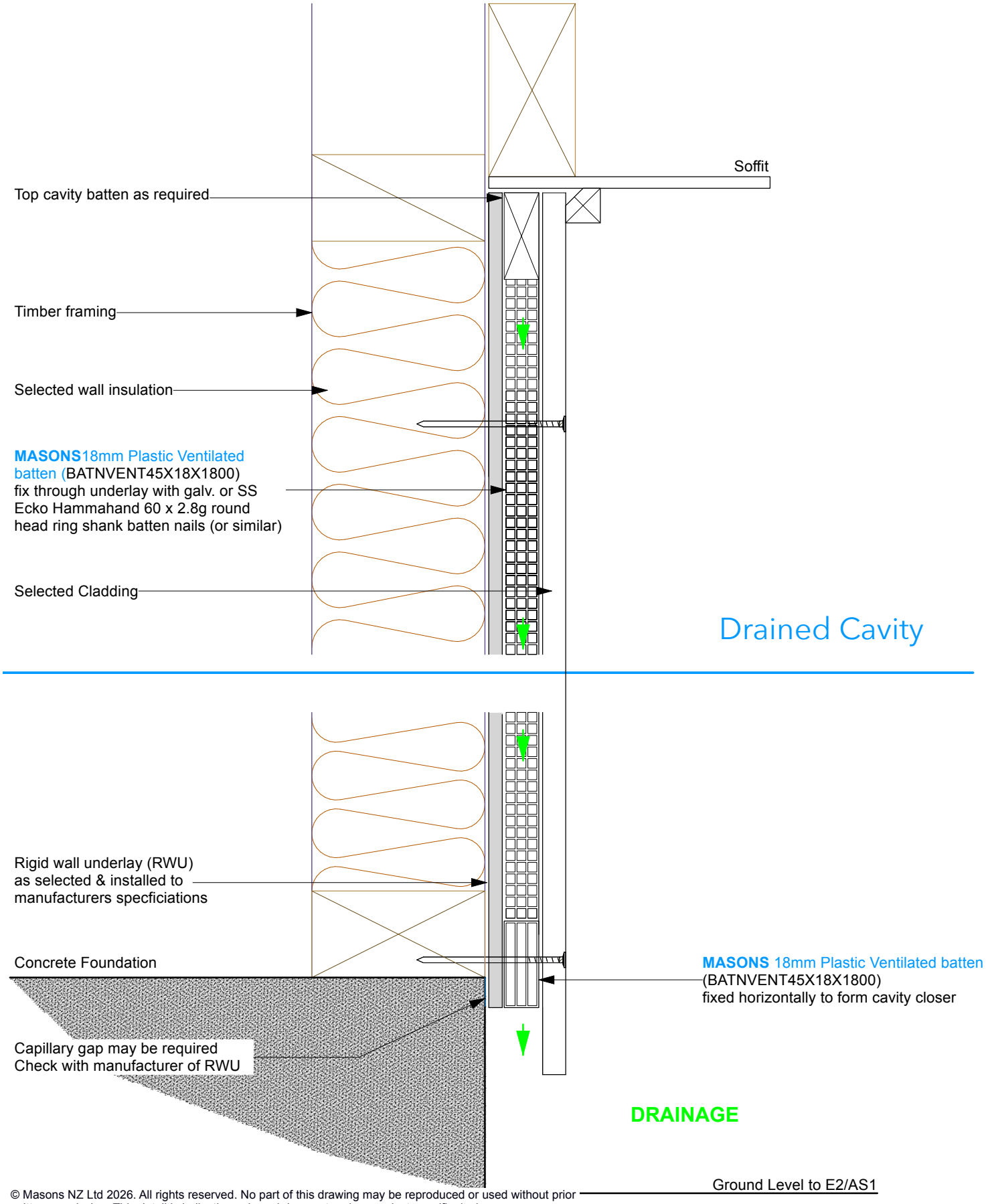
Option A - with Rigid Wall Underlay

Scale:

Date: 20/04/26

Product Code: BATNVENT45X18X1800

Drawing No. **MVCB.04**



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Ventilated & Drained Cavity

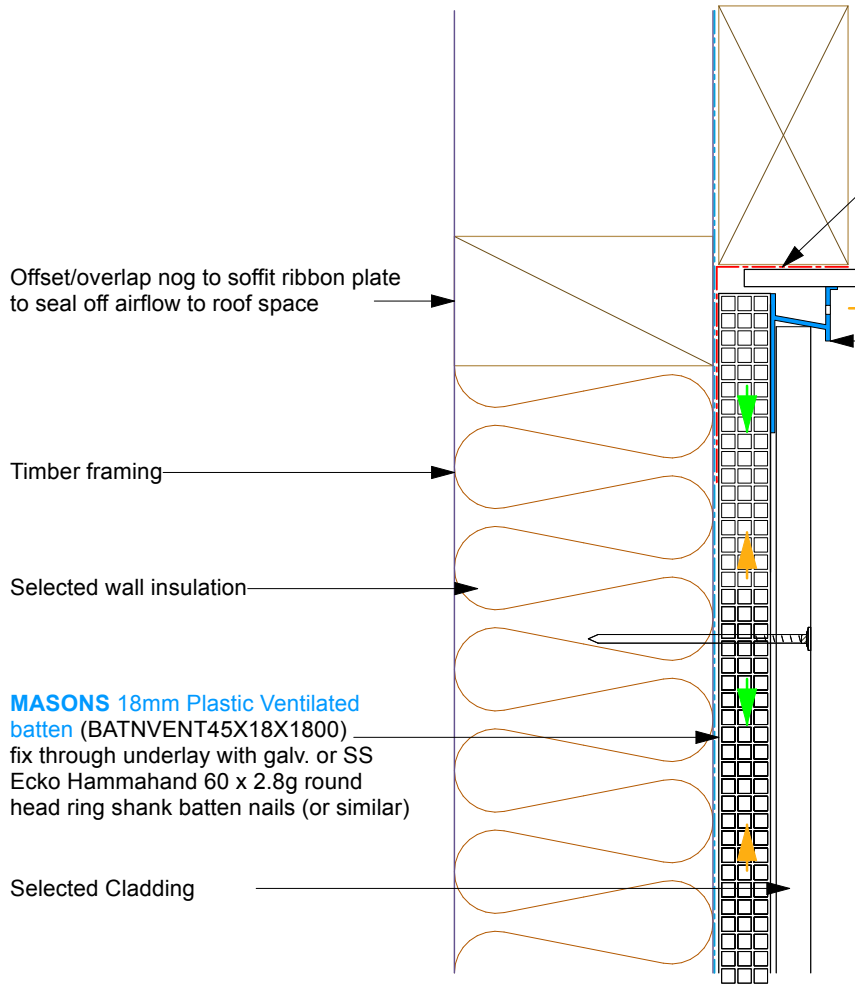
Option B

Scale:

Date: 20/04/26

Product Code: BATNVENT45X18X1800

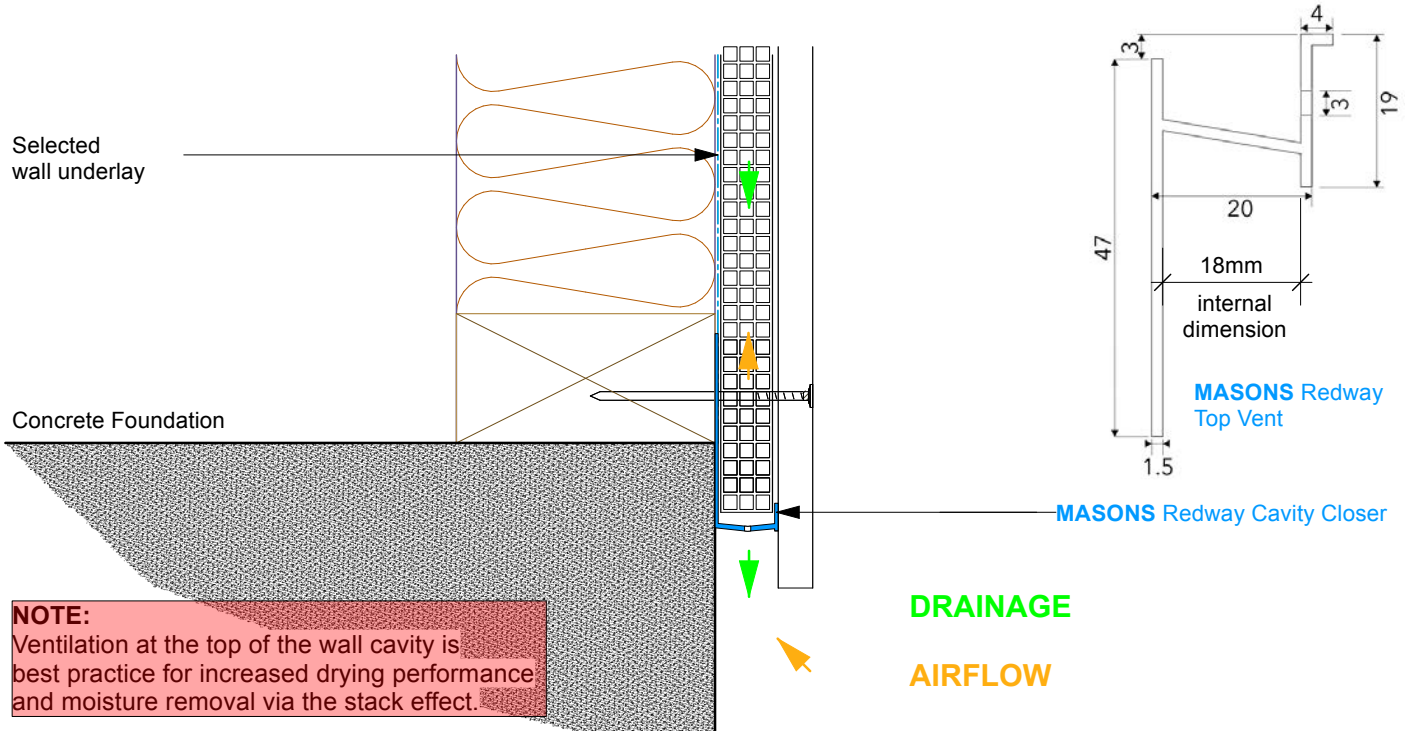
Drawing No. **MVCB.05**



When to use Top Vents

- High moisture risk walls
- with absorbant claddings
- When using RWU or airtight systems
- Multi storey or tall walls
- When walls are painted with darker colours causing solar absorption

Ventilated & Drained Cavity



NOTE:
Ventilation at the top of the wall cavity is best practice for increased drying performance and moisture removal via the stack effect.

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Ground Level to E2/AS1

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Masons Plastic Ventilated Cavity Battens

3D Expanded View

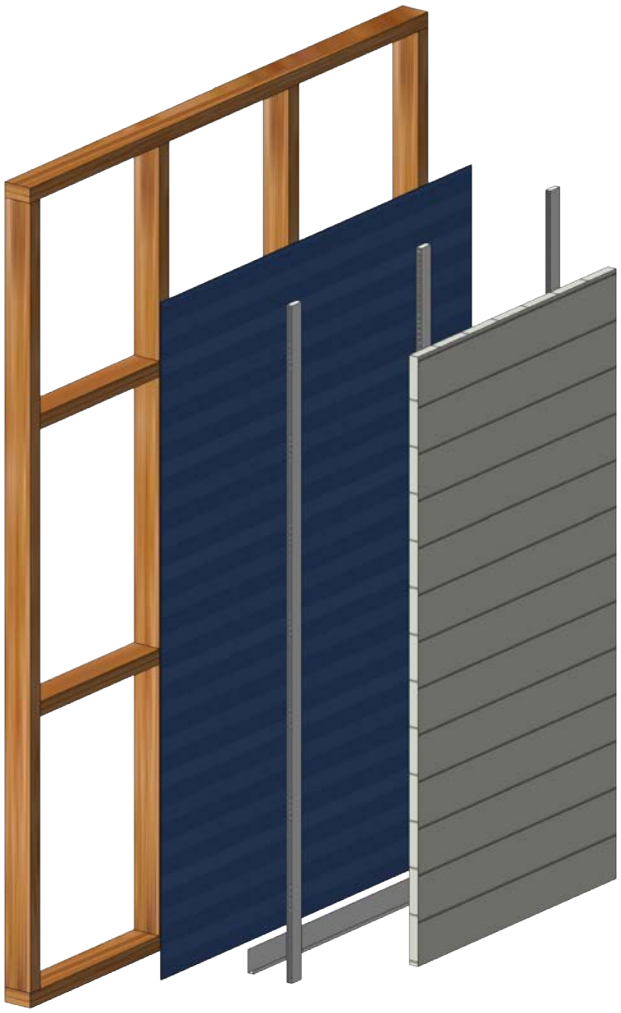
Vertical

Scale:

Date: 20/04/26

Product Code: BATNVENT45X18X1800

Drawing No. **MVCB.06**



Installation Sequence:

1. Frame & substrate preparation straight and plumb & install wall underlay over.
2. Fix Masons Cavity Closer at base typically 20mm above bottom of cladding
3. Set out batten layout over studs and nogs to match cladding fixing requirements. Plan additional battens around window/door openings/corners.
4. Install plastic battens over studs starting at one corner and working across using corrosion resistant fixings. Ensure not to crush or deform the batten
5. Install top of wall ventilation ONLY IF specified
6. Check cavity continuity for drainage path and that flashings are correctly integrated with wrap and battens
7. Install cladding as per manufacturers specifications

Always:

- Maintain width of cavity
- Avoid crushing or deforming battens
- Always follow specific cladding system requirements (they override generic guidance)
- Ensure compatibility with fire design

Avoid:

- Blocking bottom of cavity
- Missing battens at sheet joins
- Not aligning battens with studs
- Crushing battens during fixing



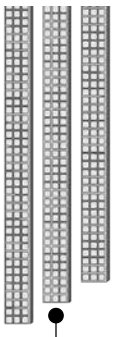
Framing as selected



Selected wall underlay



MASONS Redway Cavity Closer / Horizontal Plastic Cavity Batten



MASONS Plastic Ventilated Cavity Batten fixed in accordance with cladding & underlay manufacturers specifications



Cladding as selected

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STEP 4:

WHEN USED OVER MASONS UNI SYSTEMS

- When used as a cavity batten over UNI PLUS of UNI PRO Flexible air barrier systems, use the specific tested nail pattern for the wind zone and stud spacing available from Masons NZ Ltd. A specific tested installation method should be used. See charts and drawings shown in this guide.
- Fix the batten over UNI Plus or Pro using Ecko Round Head Hammahand 2.8 x 60mm SS or Galv batten nails driven by an Ecko Hammahand Weather Board coil nailer at 200 or 300mm intervals along the batten. Offset fixings alternately. Adjust the gun depth gauge and air pressure so that the nails are seated flush or slightly proud. The top layer of the batten must not be broken through. Calibrate the fixing gun regularly throughout the fixing of the battens.
- Use of other fixing guns is not tested and is not permitted to fix Mason's ventilated plastic battens as part of the UNI system. Hammer - or hand fitting is permitted.

UNI PLUS Flexible Air Barrier System with Masons Plastic Ventilated Battens

TESTING RESULTS AND WIND PRESSURE RECOMMENDATION

The following test results were observed and wind zones:

TABLE 2: FIXING TABLE

Stud centres (mm)	Stud Height (mm)	Nog Locations	Type of Ventilated Battens	Perimeter Fixings All Round	Fixings on Nogs	Capable of Out-of Plane Wind Pressure Referred to in NZS3604:2011
600	2400	90x45mm SG8 @ 800mm crs	Masons Ventilated Battens	ECKO 2.8 x 60mm Galvanised Round Head Nails @ 300mm crs	ECKO 2.8 x 60mm Galvanised Round Head Nails @ 300mm crs	L M H VH EH
600	2400	90x45mm SG8 @ 800mm crs	Masons Ventilated Battens	ECKO 2.8 x 60mm Galvanised Round Head Nails @ 200mm crs	ECKO 2.8 x 60mm Galvanised Round Head Nails @ 200mm crs	L M H VH EH

It is noted that above fixing spacing will also be suitable for lesser stud heights and closer stud spacings.

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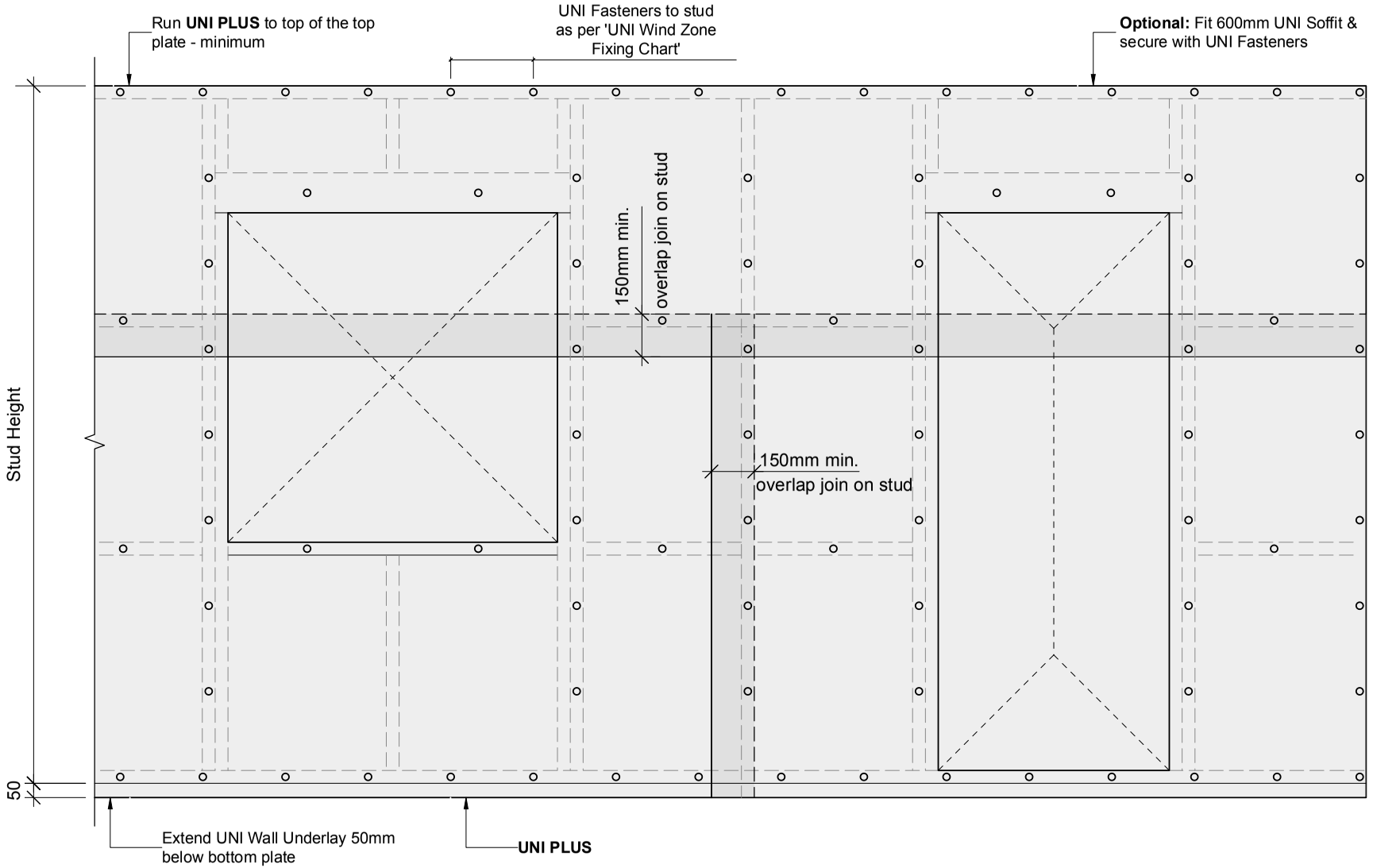
Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

Fixing of Uni Plus Underlay

Scale:

Date: 20/04/26

Product Code	UNIPLUS2.74X50	BATNVENT 45X18X1800
Drawing No.	**MVCBU.01**	



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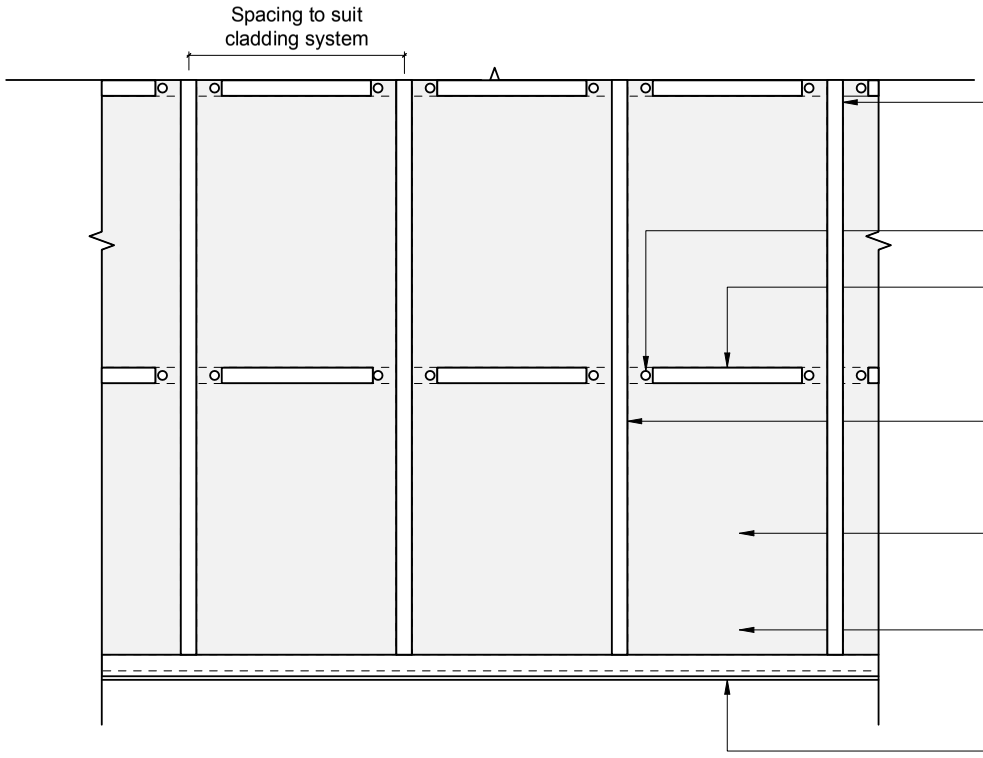
Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

Typical Batten layout - Vertical

Scale:

Date: 20/04/26

Product Code	UNIPLUS2.74X50	BATNVENT 45X18X1800
Drawing No.	**MVCBU.02**	



Vertical **MASONS Plastic Ventilated Batten** nailed at min. 200mm to max. 300mm centres using galvanised or stainlesss steel Ecko Hammahand 60 x 2.8g round head ring shank batten nails

Plan placement of **UNI** Cap Nails to not foul battens

Cavity spacers - **MASONS** Plastic Ventilated Battens nailed horizontally at min. 200mm to max. 300mm centres using galvanised or stanless steel Ecko Hammahand 60 x 2.8g round head ring shank batten nails

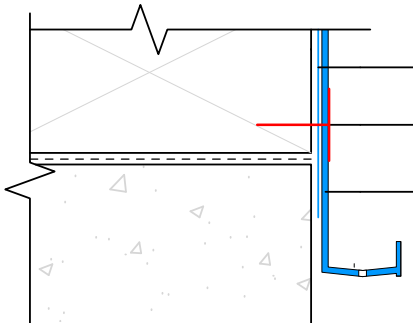
Framing at centre setout as per **UNI PLUS** fixing chart

UNI PLUS fixed to framing

Use wrap strap at 300mm centres to restrain **UNI PLUS** over 600mm stud centres. Wrap strap is not required for other stud centres or for brick veneer when fitted taut.

MASONS E2 Redway UPVC Cavity Closer or **MASONS** Plastic Ventilated Battens to be fitted as a cavity closer / vermon strip

- **UNI PLUS** is tacked to the frames using **UNI** Cap Nails
- Fix battens without delay - battens are the primary fixing



UNI PLUS Wall Underlay

UNI Cap Nails

MASONS E2 Redway UPVC Cavity Close to suit cladding. See Masons website or visit E2flashingsolutions.co.nz

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Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

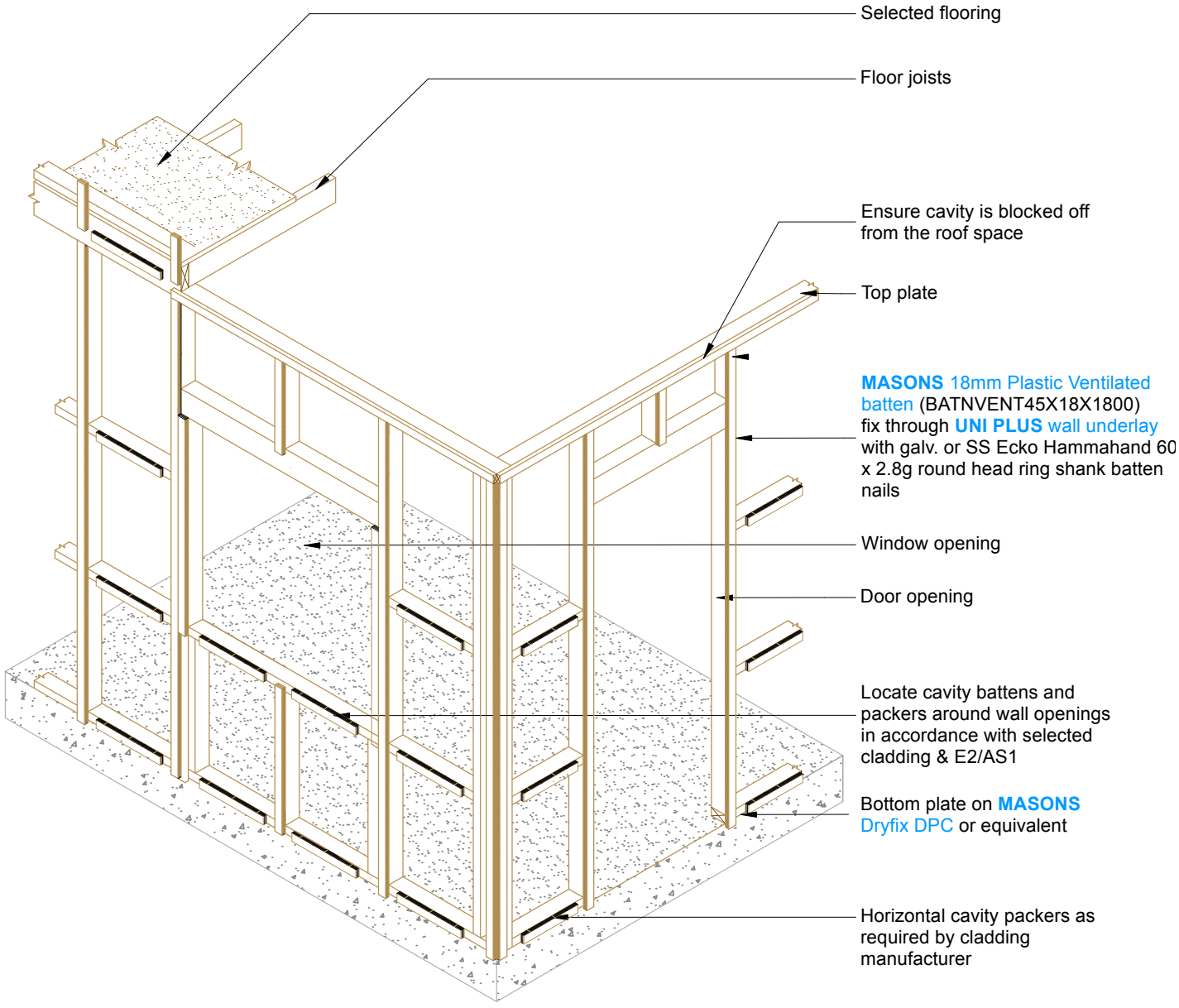
Typical Batten Layout - **Vertical**

Scale:

Date: 20/04/26

Product Code: BATNVENT 45X18X1800

Drawing No. **MVCBU.03**



NOTE:
Installation must be to E2/AS1 cl.9.1.8 & Fig. 67 and in line with Cladding & Underlay Manufacturers specifications (which superceed any generic detailing)

*UNI PLUS Wall Underlay not shown for clarity

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Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

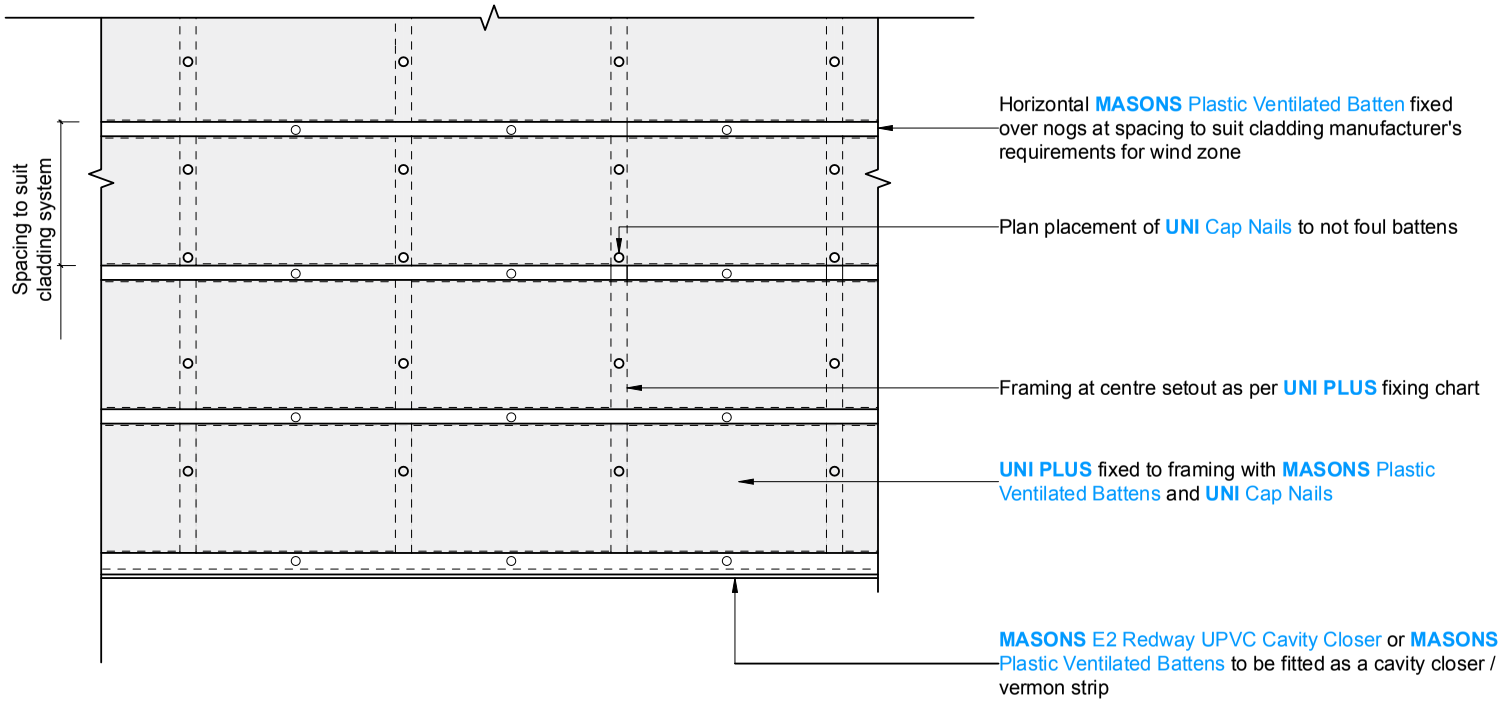
Typical Batten Layout - Horizontal

Scale:

Date: 20/04/26

Product Code UNIPLUS2.74X50 BATNVENT 45X18X1800

Drawing No. **MVCBU.04**



- Horizontal **MASONS** Plastic Ventilated Battens fixed over solid nogs have substantial holding power.
- Stud spacing must be installed in accordance with **MASONS UNI PLUS** fixing chart for the relevant wind zone
- **UNI** Cap Nails and horizontal **MASONS** Plastic Ventilated Battens may be used in conjunction. Maximum spacing between **UNI** Cap Nails and battens for the wind zone must be observed.
- Fit battens after tacking up **UNI PLUS** with **UNI** Cap Nails.

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Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

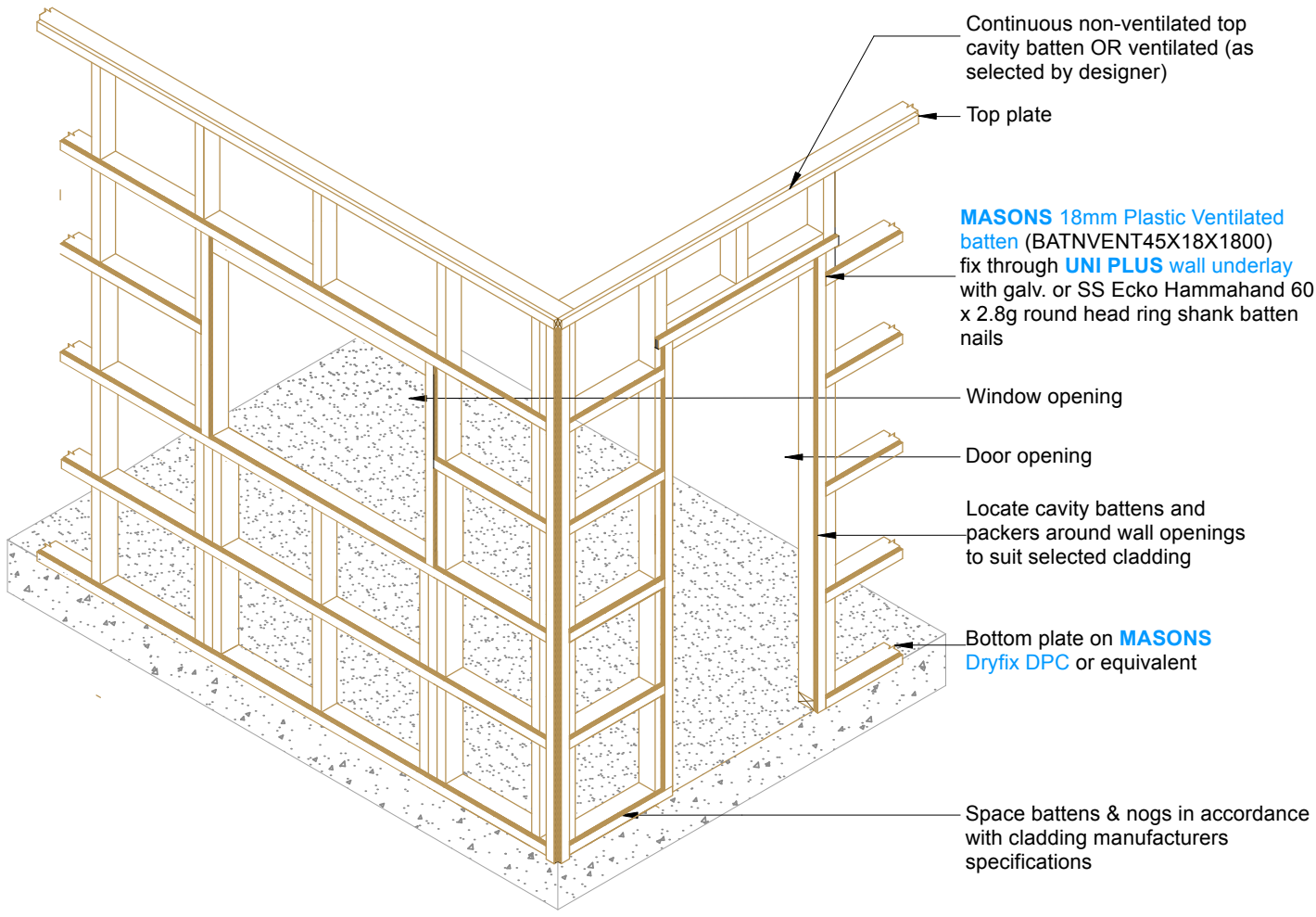
Typical Batten Layout - **Horizontal**

Scale:

Date: 20/04/26

Product Code: BATNVENT 45X18X1800

Drawing No. **MVCBU.05**



NOTE:
Installation of battens must be to E2/AS1 cl.9.1.8 & Fig. 67 and in line with Cladding & Underlay Manufacturers specifications (which superceed any generic detailing)

*Uni Plus Wall Underlay not shown for clarity

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Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

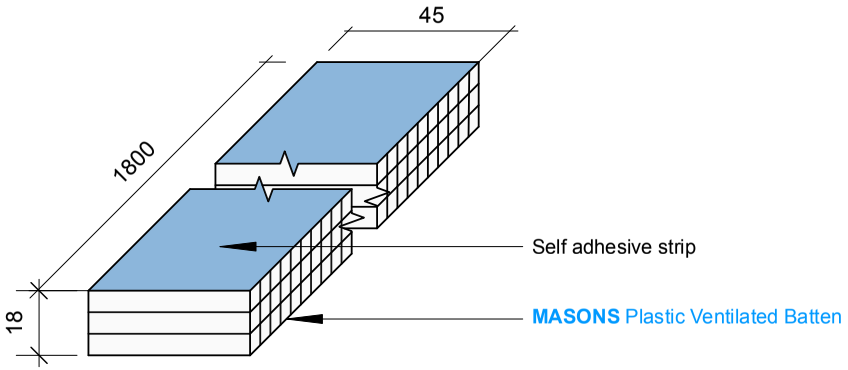
Fixing of Battens

Scale:

Date: 20/04/26

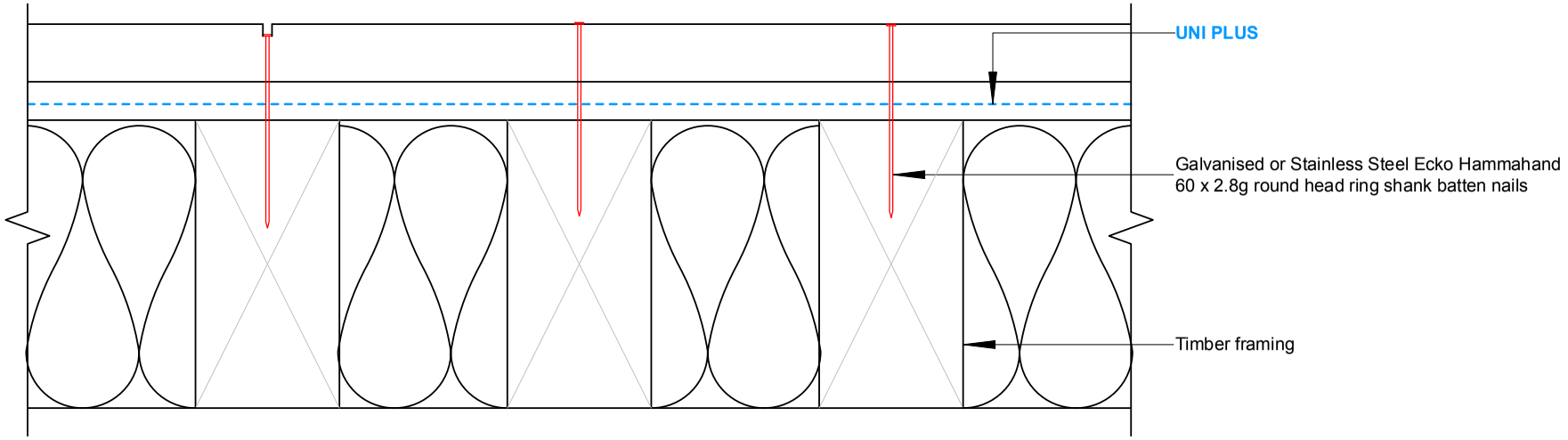
Product Code UNIPLUS2.74X50 BATNVENT 45X18X1800

Drawing No. **MVCBU.06**



NOTE:
- Battens may be fixed by hand or by using and Ecko Hammahand pneumatic coil nailer
- Adjust pressure or depth setting of the Ecko Hammahand gun to achieve correct seating of the round head batten nail.
- Calibrate Hammahand regularly throughout the job
- If a nail is over driven, calibrate gun and re-nail without rupturing the top layer of the batten.
- Min. nail spacig is 200mm to max. 300mm for all wind zones and framing centres when fixed vertically.





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MASONS
Designed Smart, Built Tough.

Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

Drained Cavity with Vertical Battens

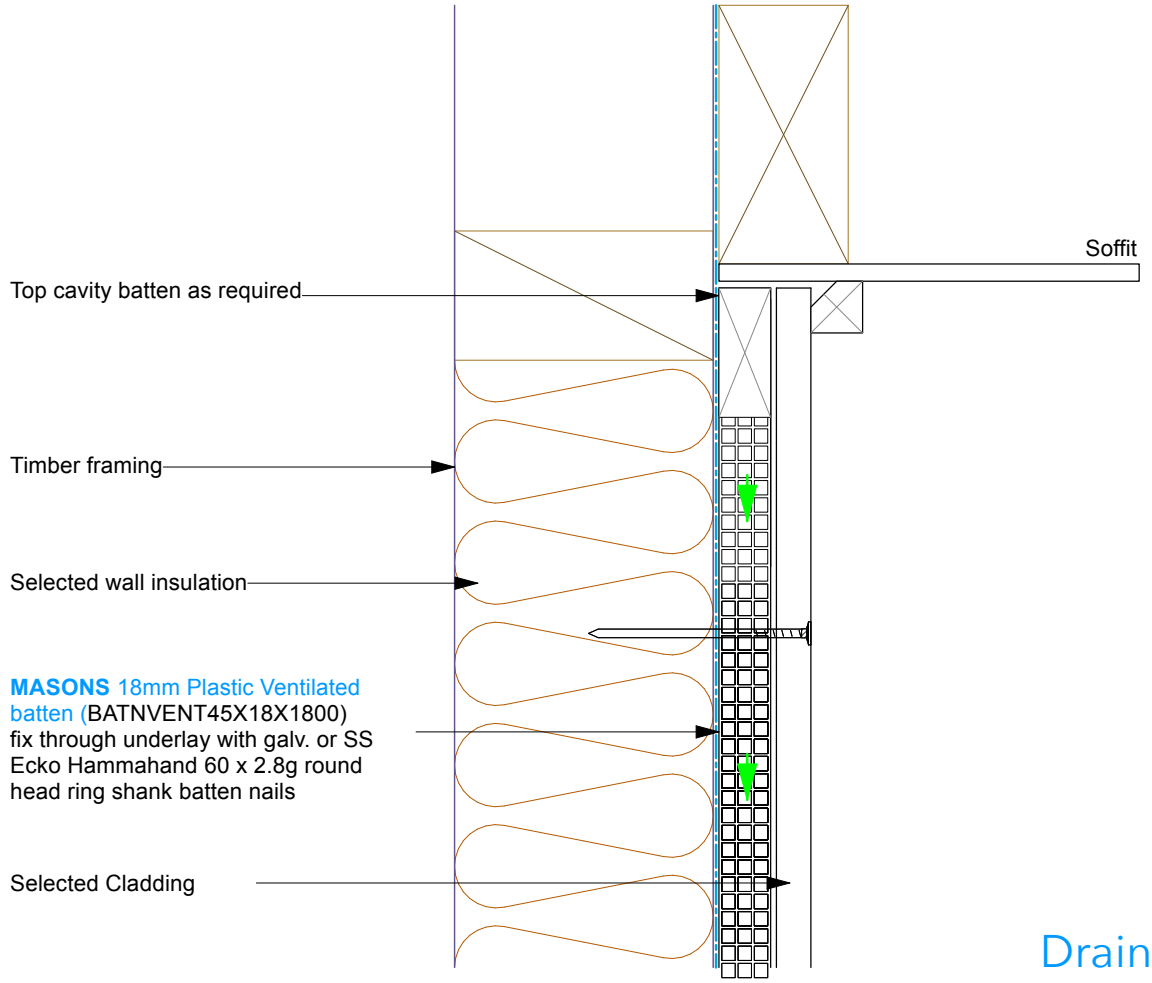
Option A

Scale:

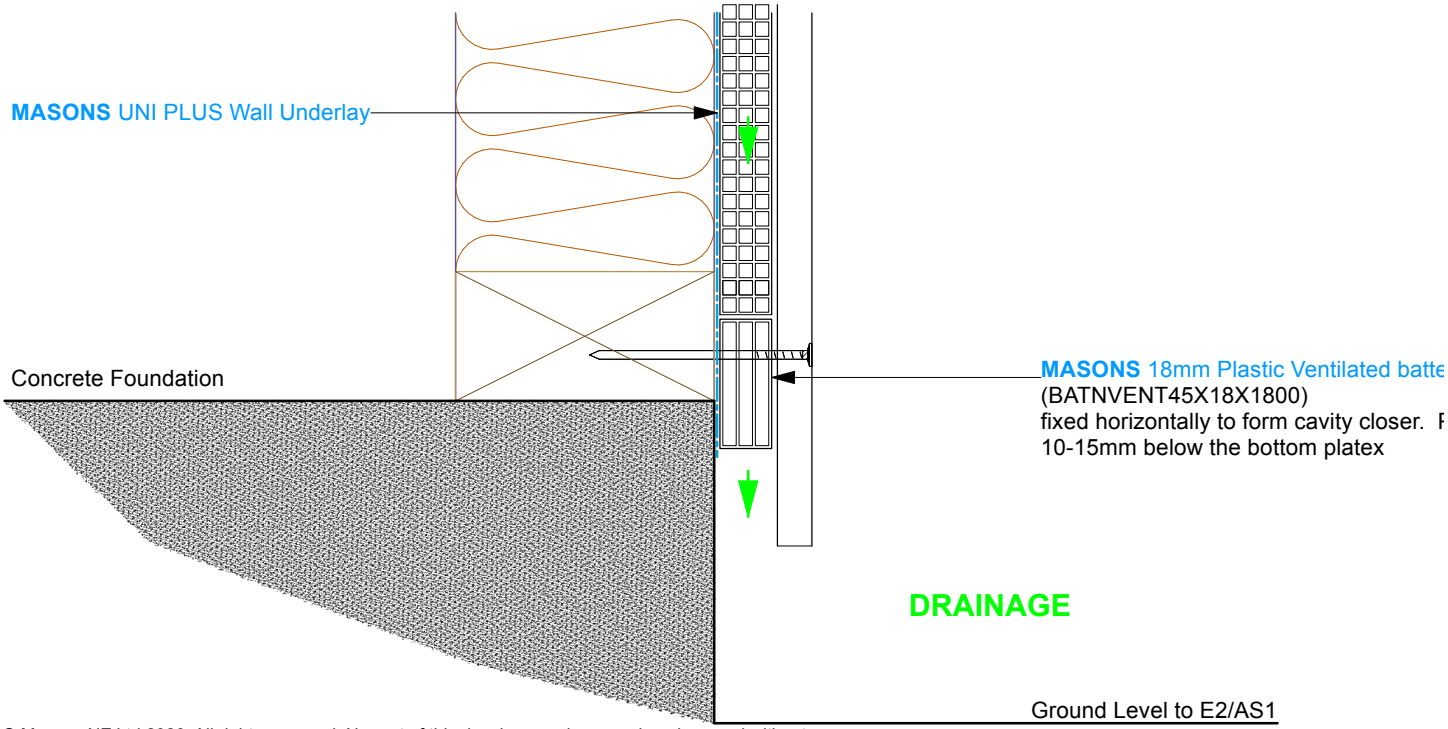
Date: 20/04/26

Product Code: UNIPLUS2.74X50 BATNVENT 45X18X1800

Drawing No. **MVCBU.07**



Drained Cavity



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Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

Ventilated & Drained Cavity w. Vertical Battens

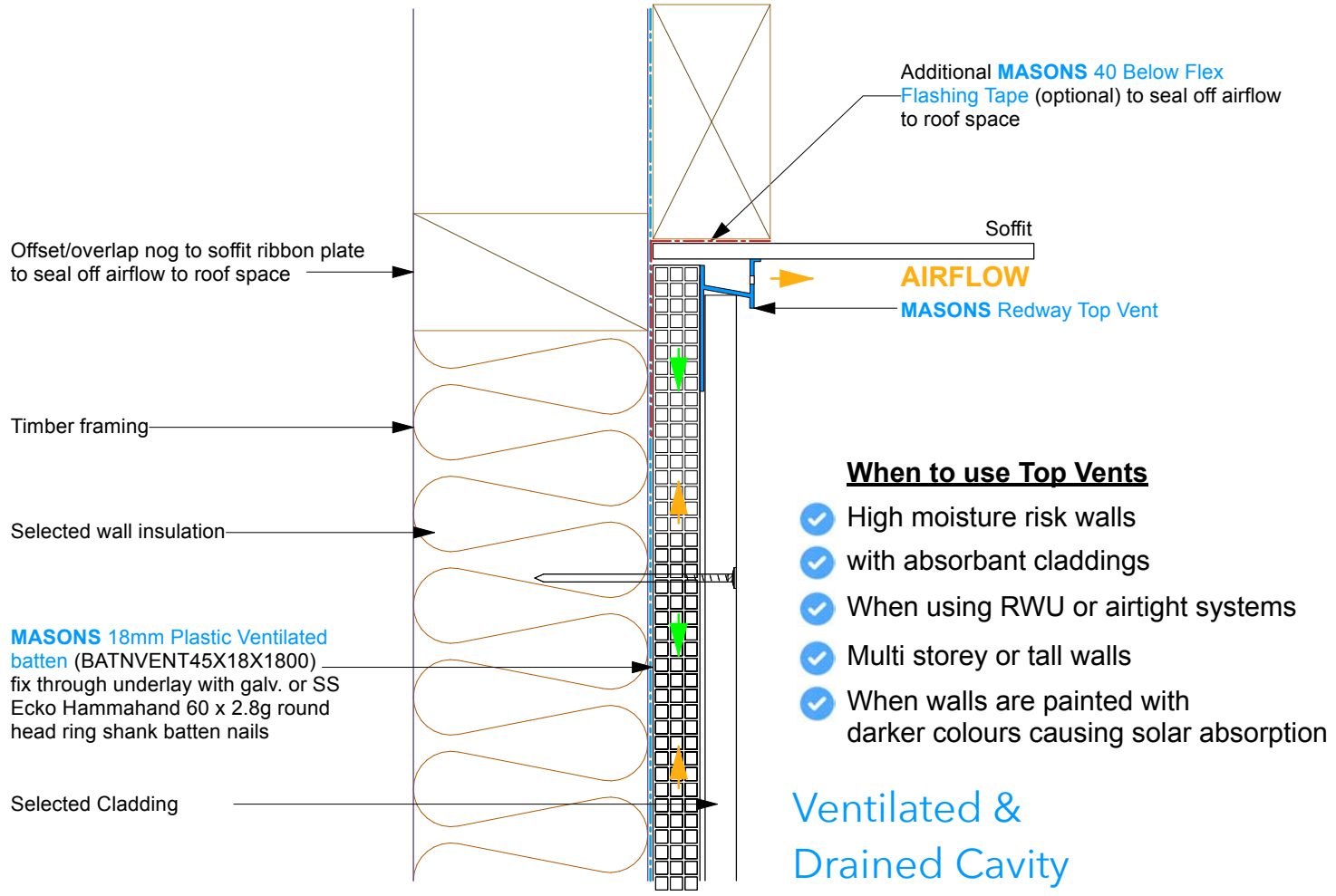
Option B

Scale:

Date: 20/04/26

Product Code: UNIPLUS2.74X50 BATNVENT 45X18X1800

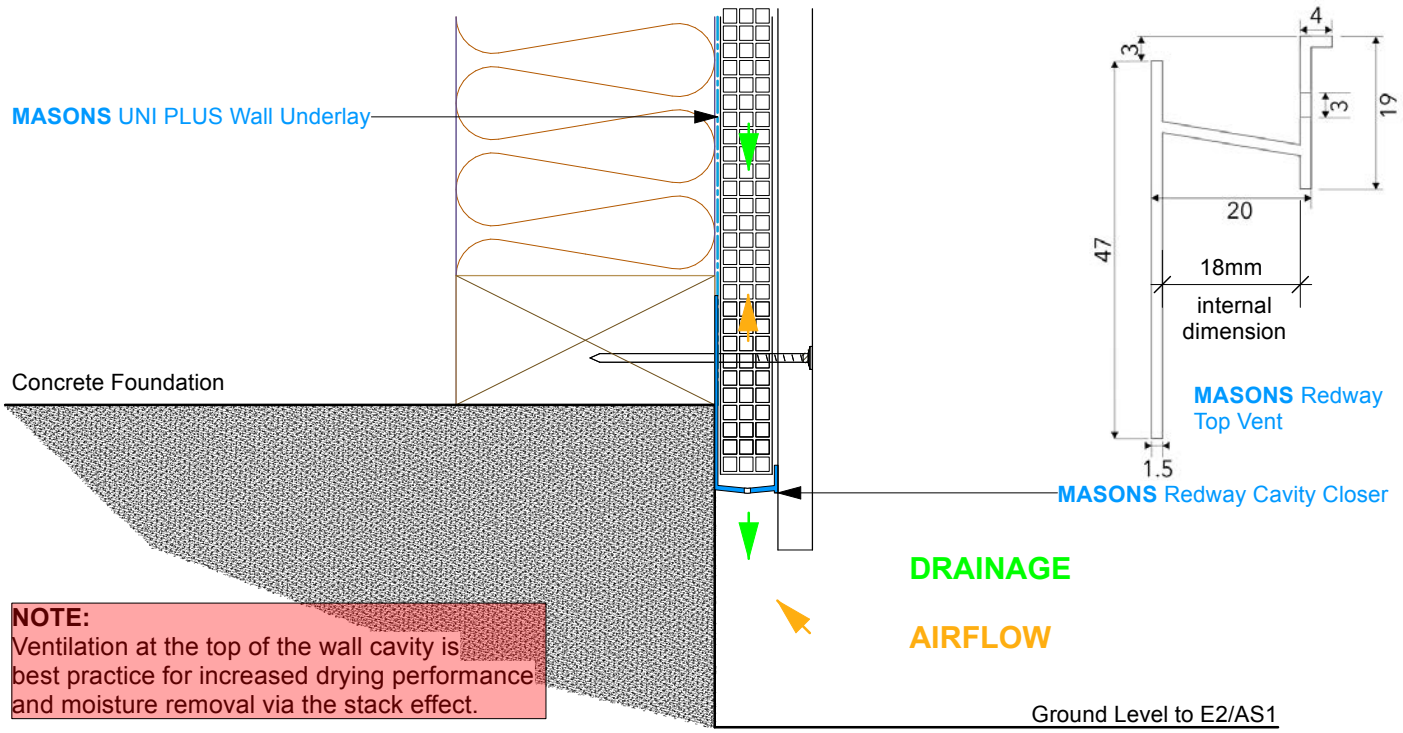
Drawing No. **MVCBU.08**



When to use Top Vents

- High moisture risk walls
- with absorbant claddings
- When using RWU or airtight systems
- Multi storey or tall walls
- When walls are painted with darker colours causing solar absorption

Ventilated & Drained Cavity



NOTE:
Ventilation at the top of the wall cavity is best practice for increased drying performance and moisture removal via the stack effect.

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MASONS
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Masons Plastic Ventilated Cavity Battens over Uni Plus Wall Underlay

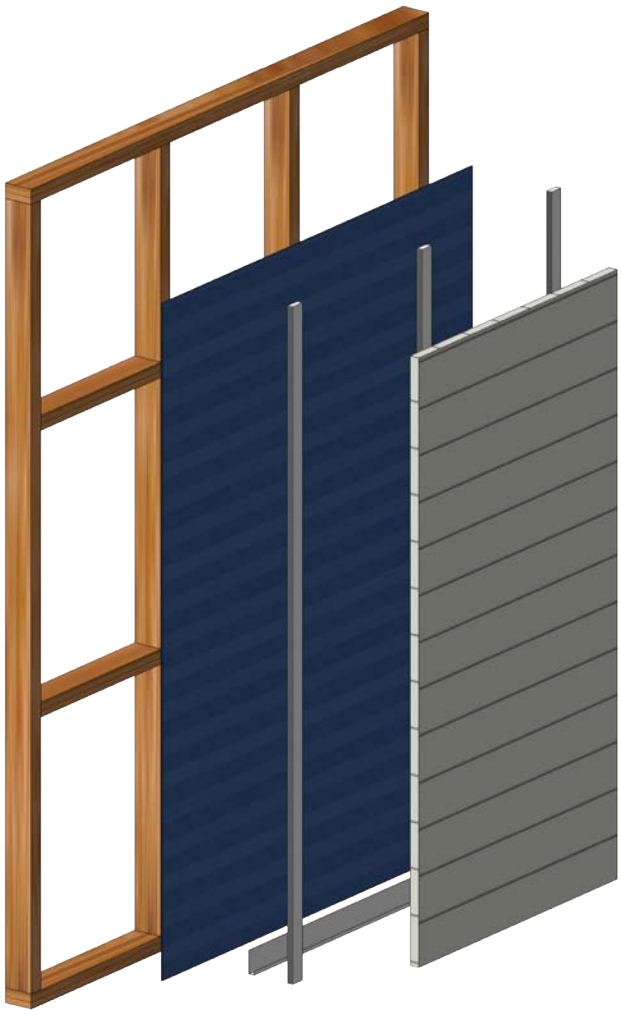
3D Expanded View - **Vertical**

Scale:

Date: 20/04/26

Product Code: UNIPLUS2.74X50 BATNVENT 45X18X1800

Drawing No. **MVCBU.09**



Installation Sequence:

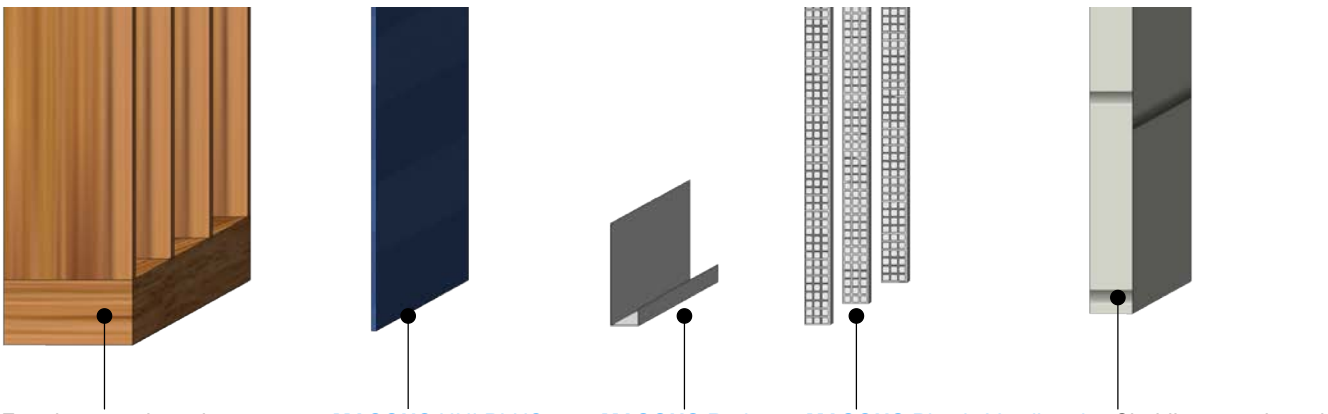
1. Frame & substrate preparation straight and plumb & install Masons Uni Plus Wall Underlay over
2. Fix Masons Cavity Closer at base typically 20mm above bottom of cladding
3. Set out batten layout over studs and nogs to match cladding fixing requirements. Plan additional battens around window/door openings/corners.
4. Install plastic battens over studs starting at one corner and working across using corrosion resistant fixings. Ensure not to crush or deform the batten
5. Install top of wall ventilation ONLY IF specified
6. Check cavity continuity for drainage path and that flashings are correctly integrated with wrap and battens
7. Install cladding as per manufacturers specifications

Always:

- Maintain width of cavity
- Avoid crushing or deforming battens
- Always follow specific cladding system requirements (they override generic guidance)
- Ensure compatibility with fire design

Avoid:

- Blocking bottom of cavity
- Missing battens at sheet joins
- Not aligning battens with studs
- Crushing battens during fixing



Framing as selected

MASONS UNI PLUS Wall Underlay

MASONS Redway Cavity Closer OR Horizontal Plastic Cavity Batten

MASONS Plastic Ventilated Cavity Batten fixed in accordance with cladding & underlay manufacturers specifications

Cladding as selected

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STEP 5: **WHEN USED OVER OTHER FLEXIBLE OR RIGID WALL UNDERLAYS**

- Fix with batten nails or wafer head screws in keeping with the underlay, or cladding manufacturers' requirements for fixing non-structural cavity battens. Avoid breaking through the top layer-skin of the batten.
- Always check the rigid underlay manufacturer's installation instructions and approved components before installing Mason's Ventilated Battens.

STEP 6: **CLADDING**

- Install and fix wall cladding to manufacturers instructions.

LIMITATIONS

- Not to be used as structural battens
- Do not break the top skin-layer of the batten
- 60 day UV exposure maximum

*ROOFS

Masons Ventilated battens form part of the Masons Passive Roof Ventilation System and include an option of an 11mm batten

For roofs, the UV exposure is 21 Days

For full design and installation details, go to **mpb.co.nz** and search for Mason's Passive Roof Ventilation System or scan QR code below.

26076

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BRANZ Appraised
Appraisal No. 650 [2020]

HERMPAC VERTILINE VERTICAL SHIPLAP WEATHERBOARD CAVITY SYSTEM

Appraisal No. 650 (2020)

This Appraisal replaces BRANZ Appraisal No. 650 (2014)

Amended 18 July 2022



BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is a cavity-based shiplap timber weatherboard external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

1.2 The system consists of vertically fixed Hermpac shiplap weatherboards, ventilated cavity battens, flashings and accessories and is finished with a premium penetrating oil, stain or an exterior paint system to Hermpac specifications.

1.3 The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall frame with a minimum 18 mm drained cavity.

Scope

2.1 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating oil or stain finished Western Red Cedar, Yellow Cedar, and DuraLarch weatherboards and paint finished Yellow Cedar, DuraLarch and AshinDura weatherboards, has been appraised as an external wall cladding system 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 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating oil or stain finished weatherboards has also been appraised for weathertightness and structural wind loading when used as an external wall cladding system for buildings within the following scope:

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

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.

2.3 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating paint finished Western Red Cedar weatherboards has been appraised as an external wall cladding system 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, Medium when dwangs or structural Vertibat cavity battens are at maximum 480 mm centres, and NZS 3604 Wind Zones up to, and including, Very High when dwangs or structural Vertibat cavity battens are at maximum 400 mm centres.

2.4 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System must only be installed vertically on vertical, flat surfaces.

2.5 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System 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 the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.)*

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System, 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. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets the requirements for loads arising from self-weight, wind, impact and creep [i.e. B1.3.3 (a), (h), (j) and (q)]. See Paragraphs 9.1-9.5.

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years and B2.3.2. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets these requirements. See Paragraphs 10.1 and 10.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets this requirement. See Paragraphs 14.1-14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets this requirement.

Technical Specification

4.1 System components and accessories supplied by Hermpac are as follows:

Hermpac Shiplap Weatherboards

- Hermpac shiplap weatherboards are manufactured from Canadian Coastal Western Red Cedar and Yellow Cedar. Selected weatherboards are also manufactured from DuraLarch and AshinDura.
- The weatherboard lap and rebate profiles are in accordance with NZS 3617 and BRANZ Bulletin 411.
- The weatherboards are supplied minimum 18 mm thick, and are available in a range of widths and face profiles. They are supplied in random lengths up to 6.1 m. Lengths outside of the general specification may be available by special contract.
- Western Red Cedar and Yellow Cedar finger-jointed weatherboards (CedarOne and CedarLine) are minimum 17.5 mm thick, and are available in a range of widths and face profiles. They are supplied in random lengths up to 6.1 m. Lengths outside of the general specification may be available by special contract.

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.

- Western Red Cedar, Yellow Cedar (including CedarOne and CedarLine) and DuraLarch weatherboards are supplied unfinished for site finishing with oil, stain or paint prior to installation, or prefinished using the flood coat application method by Machinecoat NZ Limited. AshinDura weatherboards are treated to Hazard Class H3.1 and must be paint finished only. They are supplied primed, or prefinished by Machinecoat NZ Limited. Refer to the Appraisals listing on the BRANZ website for details of the Hermpac shiplap weatherboard profiles covered by this Appraisal. *(Note: This Appraisal is only valid when weatherboards with profiles as listed are supplied by Hermpac.)*

Accessories

- **Hermpac external corner mouldings** - 40 x 40 mm, 42 x 42 mm and the Hermpac 'Smart Corner' series of profiled external corner moulds supplied in lengths 1.8 m and longer.
- **Hermpac internal corner mouldings** - 18.5 x 18.5 mm through to 39 x 39 mm and the Hermpac 'Smart Corner' series, supplied in lengths 1.8 m and longer.
- **Hermpac cover boards** - 18 mm thick boards in widths of 69 and 90 mm. The cover boards are supplied in lengths 1.8 m and longer.
- **Hermpac eaves moulding** - 40 x 27 mm, 26 x 15 mm and 30 x 18 mm bevelled profile, supplied in 1.8 m and longer.

  (Note: All timber accessories are manufactured from Canadian Coastal Western Red Cedar, Yellow Cedar or DuraLarch.)
- **Hermpac J Mould Flashing** – an optional extruded aluminium J-shaped flashing to cap the ends of the weatherboards at window and door jambs. The J Mould is available 20 and 29.5 mm wide with a 70 mm return and is supplied in 2.4 and 3 m lengths.
- **Hermpac aluminium cavity closure** – an extruded aluminium cavity closure available 20 and 40 mm wide. The cavity closure is supplied in 2.4 and 3 m lengths.
- **Vertibat cavity battens** – 45 x 20 mm (V1), 45 x 40 mm (V3), 45 x 45 mm (V5), 70 x 20 mm (V2), 70 x 40 mm (V4) or 70 x 45 mm (V6) radiata pine battens treated to Hazard Class H3.1 or H3.2. Vertibat cavity battens 45 x 18 mm (V8 and V9) are available in Western Red Cedar (refer to BRANZ Appraisal No. 1189). The top and bottom edges are bevelled with a slope. The front and back face of the batten are grooved with 20 mm wide x 5 mm deep rebates at 100 mm centres. The grooves are offset on each face.
- **Vertibat cavity batten fixings** (for 40 or 45 mm thick battens when fixed to studs only) – 12 g x 65 mm long Grade 304 stainless steel screws (for 40 mm battens) and 12 g x 75 mm long Grade 304 stainless steel screws (for 45 mm battens).
- **Hermpac oil or stain finished shiplap weatherboard fixings** (for Vertibat battens fixed to dwangs) - silicon bronze, or Grade 316 stainless steel annular grooved Hermpac crown head, rose head or flat head nails. The nail shank must be minimum 3.25 mm diameter and the length must allow minimum 30 mm penetration of the wall frame.
- **Hermpac oil or stain finished shiplap weatherboard fixings** (for 40 or 45 mm Vertibat battens fixed to studs only) - silicon bronze, or Grade 316 stainless steel annular grooved Hermpac crown head, rose head or flat head nails. The nail shank must be minimum 2.8 mm diameter and the length must allow minimum 30 mm penetration of the Vertibat batten.
- **Hermpac paint finished shiplap weatherboard fixings** - Grade 316 stainless steel annular grooved jolt head nails. The nail shank must be minimum 3.25 mm diameter and the length must allow minimum 35 mm penetration of the wall frame or Vertibat cavity batten (for 40 or 45 mm Vertibat battens fixed to studs only).
- **Hermpac weatherboard screw fixing** - Grade 316 stainless steel starcap screws to give a minimum 21 mm penetration of wall framing or structurally fixed cavity batten.
- **Hermpac clinch nails** - 27 x 2, 40 x 2 or 50 x 2 mm Grade 316 stainless steel annular grooved nails with an off-set flat head.
- **Hermpac cover board fixings** - 50 x 2.8 mm silicon bronze, or Grade 316 stainless steel annular grooved Hermpac crown head, rose head or flat head nails.

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.

4.2 Accessories used with the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System 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 wall underlay support** - polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible wall underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *[Note: Mesh and wire galvanising must comply with AS/NZS 4534.]*
- **Rigid wall underlay** - plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
- **Flexible sill 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.
- **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.
- **Vertibat cavity batten fixings** (18 mm and 20 mm thick batten) - 40 x 2.5 mm flat head hot-dip galvanised nails or 50 x 2.87 mm hot-dip galvanised gun nails to temporarily fix the battens in place prior to installation of the cladding.
- **Vertibat cavity batten fixings** (40 or 45 mm thick battens when fixed to dwangs) - 60 x 2.8 mm flat head hot-dip galvanised nails or 60 x 2.87 mm hot-dip galvanised gun nails to temporarily fix the battens in place prior to installation of the cladding.
- **Cavity closure strip** - uPVC, aluminium or stainless steel, punched with 3-5 mm diameter holes or slots complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3.
- **Flashings** - including external corner flashing, internal corner flashing, horizontal inter-storey joint flashing, balustrade and parapet saddle flashing, and balustrade and parapet cap flashings. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 and Table 21 for durability and material compatibility requirements.
- **Aluminium joinery head flashings** - as supplied by the joinery manufacturer or contractor.
- **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.

Finishing System Specification - Oil or Stain Finish

4.3 Prior to the installation of oil or stain finished weatherboards, the back, face, ends and edges of the Hermpac shiplap weatherboards not supplied prefinished must be sealed with an exterior grade oil or oil-based penetrating stain. At least two coats of an exterior grade quality oil or oil-based penetrating stain must be used over the front face of the Hermpac shiplap weatherboards to protect the weatherboards and give the desired finish colour to the exterior walls. The oil or stain must be recommended for use as a wall cladding oil or stain by the manufacturer and must be applied in accordance with the manufacturer's instructions. Proprietary oil or stain systems have not been assessed, and are therefore outside the scope of this Appraisal. *[Note: Hermpac recommends the use of oils and oil-based stains manufactured by Resene and WoodX.]*

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.

Finishing System Specification – Paint Finish

4.4 Prior to the installation of paint finished weatherboards that are supplied unprimed, the back, face, ends and edges of the Hermpac shiplap weatherboards must be primed in accordance with the Technical Literature for the relevant timber type. All exposed edges, including top edges at sills and all bottom edges of Hermpac shiplap weatherboards and accessories not supplied prefinished, must be finished with at least two coats of an exterior grade paint complying with any of Parts 7, 8, 9 or 10 of AS 3730 to protect the weatherboards and give the desired finish colour to the exterior walls. The paint must be recommended for use as a wall cladding paint for the selected timber by the manufacturer and must be applied in accordance with the manufacturer's instructions. Proprietary paint systems have not been assessed, and are therefore outside the scope of this Appraisal. *(Note: For Hermpac shiplap weatherboards, Hermpac recommends using paint with a colour that has a Light Reflectance Value (LRV) of ≥ 40% for Western Red Cedar, Yellow Cedar or AshinDura, or ≥ 45% for DuraLarch.)*

Handling and Storage

5.1 Handling and storage of all materials supplied by Hermpac or the building contractor, whether on-site or off-site, is under the control of the building contractor. Hermpac vertical shiplap weatherboards must be stacked flat and true, clear of the ground by a minimum of 150 mm and supported on dry and clean timber bearers at maximum 900 mm centres. They must be kept dry at all times either by storing within an enclosed building or when stored externally an additional secondary cover to the plastic wrapping is required. Care must be taken to avoid damage to edges, ends and the weatherboard surfaces.

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 This Appraisal must be read in conjunction with:

- VertiLine Vertical Shiplap Weatherboards Cavity System Installation Specifications, May 2022V2.
- All drawings referenced in HC-SHIP-000 and HC-SHIP-001, both issued 2022.
- All drawings referenced in HC-SHIP40-000 and HC-SHIP40-001, both dated 18/10/2017.
- All drawings referenced in VC-RWD-000 and VC-RWD-001, both dated 15/4/2020.

6.2 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

Framing

Timber Treatment

7.1 Timber wall framing behind the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System 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 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. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. In all cases studs must be at maximum 600 mm centres. Where Vertibat cavity battens are fixed to dwangs, the dwangs must be fitted flush between the studs at maximum 480 mm centres. Where interior linings compliant with NZS 3604 Section 12 are installed directly to the interior face of the wall framing and Vertibat cavity battens are structurally fixed to studs in accordance with Paragraph 17.3 of this Appraisal, dwangs are not required. Refer to NZS 3604 Section 8.5.4 for further information.

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.

7.3 Additional framing may be required at soffits, internal and external corners, and window and door openings for the support and fixing of cavity battens and the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System.

7.4 Timber wall framing behind where weatherboards are joined over a cavity batten must be nominal 50 mm thickness (i.e. 45 mm minimum finished thickness).

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

General

8.1 When the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is used for specifically designed buildings up to 2.5 kPa design differential ULS wind pressure, only the weathertightness aspects of the cladding and maximum framing centres 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 must provide a minimum ventilation opening area of 1,000 mm^2 per lineal metre of wall in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 (b). *(Note: Vertibat cavity battens can be used to provide vermin proofing at the bottom of the cavity.)*

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

8.4 At balcony, deck or roof/wall junctions, the bottom edge of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System must be kept above the top surface of any adjacent roof flashing by a minimum of 35 mm, in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.

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

8.6 Where the system 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 Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is less than 30 kg/m^2. The system is therefore considered a lightweight cladding in terms of NZS 3604.

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.

Impact Resistance

9.2 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System has good resistance to impact loads likely to be encountered in normal residential use. The likelihood of impact damage to the system when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers should be considered for vulnerable areas.

Wind Zones

9.3 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating oil or stain finished Cedar or DuraLarch weatherboards 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 design differential ULS wind pressure where buildings are specifically designed.

9.4 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating paint finished DuraLarch, AshinDura and Yellow Cedar weatherboards 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.

9.5 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating paint finished Western Red Cedar weatherboards (fixed with jolt head nails) is suitable for use in NZS 3604 Wind Zones up to, and including Medium when dwangs or structural Vertibat cavity battens are at maximum 480 mm centres, and NZS 3604 Wind Zones up to, and including, Very High when dwangs or structural Vertibat cavity battens are at maximum 400 mm centres.

Durability

Serviceable Life

10.1 Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System installations are expected to have a serviceable life of at least 20 years provided the system is maintained in accordance with this Appraisal and the Hermpac shiplap weatherboards are continuously protected by a oil, stain or paint finish. *(Note: For oil or stain finished weatherboards, this opinion only covers serviceability with regards to structural and weathertightness performance. It does not cover appearance, which may deteriorate significantly, especially when proper and regular maintenance is not carried out.)*

10.2 Microclimatic conditions, including geothermal hot spots, industrial contamination and mild corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of 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 to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.

11.2 Regular cleaning (at least annually) of the oil, stain or paint coating is required to remove grime, dirt and organic growth, and to maximise the life and appearance of the coating. Grime may be removed by brushing with a soft brush, warm water and detergent.

11.3 Recoating of the oil or stain finish will be necessary throughout the life of the cladding system. Recoating must be carried out, on average every 2-3 years or in accordance with the oil or stain manufacturer's instructions. Recoating will be required more frequently on exposed northern and western facing walls. When recoating, care must be taken to ensure bottom edges and shiplap edges are well covered and penetrated with the oil or stain.

11.4 Recoating of the paint finish will be necessary throughout the life of the cladding system. Repainting must be carried out, on average every 7-10 years or in accordance with the paint manufacturer's instructions. When repainting, care must be taken to ensure bottom edges and shiplap edges are well covered with the paint.

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.

11.5 Annual inspections must be made to ensure that all aspects of the cladding system, including flashings and 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, oil, stain or paint coatings, flashings or the weatherboards must be repaired in accordance with the relevant manufacturer's instructions.

11.6 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the system. *[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 the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System.]*

Control of External Fire Spread

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 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System has not been assessed for a peak heat release or total heat released rating and therefore cannot be used within 1 m of the relevant boundary or Risk Group SI Buildings.

12.3 Refer to NZBC Acceptable Solutions C/AS1 and C/AS2 and NZBC 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 Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and NZBC Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

14.1 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System, 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 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System 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 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 Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System, where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirements for junctions, penetrations, etc. to remain weather resistant.

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.

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 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is not a barrier to the passage of water vapour, and when installed in accordance with this Appraisal will not create a risk of moisture damage resulting from condensation.

Installation Information

Installation Skill Level Requirement

16.1 All design and building work must be carried out in accordance with the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Technical Literature and this Appraisal by competent and experienced tradespersons conversant with the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity 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 License class.

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Installation

Wall Underlay and Flexible Sill and Jamb Tape Installation

17.1 The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System. Flexible wall 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 wall underlay materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems must be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the wall underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

Vertibat Cavity Batten Installation (to Dwangs)

17.2 Vertibat cavity battens must be installed horizontally over the wall underlay to the wall framing (dwangs) at maximum 480 mm centres. (Refer to Paragraph 9.5 for the maximum dwang spacings for paint finished Western Red Cedar weatherboards fixed with jolt head nails.) The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with 40 x 2.5 mm flat head hot-dip galvanised nails or 50 x 2.87 mm hot-dip galvanised gun nails (for 20 mm thick battens), or 60 x 2.8 mm flat head hot-dip galvanised nails or 60 x 2.87 mm hot-dip galvanised gun nails (for 40 mm thick battens) to temporarily fix the battens in place prior to installation of the cladding. *(Note: Stainless steel finishing brads or nails can also be used.)*

Vertibat Cavity Batten Installation (to Studs)

17.3 40 or 45 mm thick Vertibat cavity battens must be installed horizontally over the wall underlay to the wall framing (studs) at maximum 480 mm centres. (Refer to Paragraph 9.5 for the maximum Vertibat cavity batten spacings for paint finished Western Red Cedar weatherboards fixed with jolt head nails.) The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with one 12 g x 65 mm long Grade 304 stainless steel screw at each stud crossing (maximum 600 mm centres) for 40 mm thick battens, or one 12 g x 75 mm long Grade 304 stainless steel screw at each stud crossing for 45 mm thick battens.

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.

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Installation

17.4 Hermpac shiplap weatherboards may be cut on-site by power or hand saw. Holes and cut-outs may be formed by using a hole saw.

17.5 Hermpac shiplap weatherboards must be dry prior to installation.

17.6 Before oil or stain finished Hermpac shiplap weatherboards are installed, the back, face and edges must be sealed with an exterior grade oil or oil-based penetrating stain. During installation, cut ends must be sealed with an exterior grade oil or oil-based penetrating stain.

17.7 Before paint finished Hermpac shiplap weatherboards are installed, the back, face and edges must be primed with an exterior grade primer. During the installation of paint finished Hermpac shiplap weatherboards, cut ends must be sealed with two coats of an exterior grade alkyd timber primer.

17.8 Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner, external corner moulding etc. The necessary flashings must be installed before commencing weatherboard fixing and the cavity closure must be installed continuously around the bottom of the cavity.

17.9 Hermpac shiplap weatherboards must be installed starting at the corner of the wall section being clad. The first weatherboard must be installed plumb to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50 mm. The weatherboards should be installed with the lap facing away from the prevailing winds.

17.10 Immediately prior to installing the weatherboards over the internal and external corner flashings, a continuous bead of sealant must be applied to the face of the flashing along the fixing line.

17.11 Hermpac shiplap weatherboards must be overlapped a minimum of 25 mm, with an expansion gap of 2 mm at the overlap. In NZS 3604 Wind Zones up to, and including, Very High, it is recommended that the top of the weatherboard lap is restrained using the Hermpac clinch nail at every cavity batten. Hermpac clinch nails must be used to restrain the top of the weatherboard lap in the Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa.

17.12 Fix weatherboards in full lengths where possible. Where joints are unavoidable, scarf the weatherboard at 30° over a cavity batten and fix with one fixing through the overlapping board.

Nail-Fixing Weatherboards

17.13 Hermpac shiplap weatherboards must be pre-drilled with a hole diameter slightly smaller than that of the nail. Each weatherboard is to be fixed with one nail per board at every cavity batten.

17.14 For nail-fixing of the weatherboards, silicone bronce or Grade 316 stainless steel annular grooved Hermpac crown head, rose head, flat head or jolt head nails must be used. The nail length must allow minimum 30 mm penetration (35 mm for jolt head) of the timber framing or structurally fixed cavity batten. Note that jolt head nails are for paint finish only.

17.15 Fixing must be located 30-35 mm in from the weatherboard lap and a minimum of 32 mm from the end of the board. Crown head, rose head or flat head nails must finish flush onto the surface of the weatherboard, not into or below the surface. Nails must be installed with a slight upslope to reduce capillary draw. Jolt head nails must be punched a maximum of 2 mm beneath the surface of the board.

Screw-Fixing Weatherboards

17.16 Hermpac shiplap weatherboards must be pre-drilled with a hole diameter slightly smaller than that of the screw. Each weatherboard is to be fixed with one screw per board at every cavity batten.

17.17 For screw fixing of the weatherboards, Grade 316 stainless steel Hermpac starcap screws must be used. The screw length must allow minimum 21 mm embedment of the framing timber or structurally fixed cavity batten.

17.18 Fixing must be located 30-35 mm in from the weatherboard lap and a minimum of 32 mm from the end of the board. The base of the screw head must finish flush onto the surface of the weatherboard, not into or below the surface.

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.

Aluminium Joinery Installation

17.19 Aluminium joinery and associated head flashings must be installed by the building contractor in accordance with the Technical Literature. A 7.5-10 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

Finishing

17.20 The coating manufacturer's instructions must be followed at all times for application of the oil or stain finish.

17.21 To prevent swelling of the weatherboard around punched fixings, the fixing must be filled immediately, or alternatively the weatherboard and the head of the fixing must be primed with a premium alkyd timber primer.

17.22 The paint coating manufacturer's instructions must be followed at all times for the application of the paint finish. Hermpac shiplap weatherboards must be painted as soon as practicable following fixing and must be clean and dry before commencing. If the Hermpac shiplap weatherboards are exposed to the weather for more than 2 months they must be reprimed with one coat of primer prior to the application of the finishing coats. Allow the recommended drying time between coats and follow the temperature limitations for application.

Inspection

17.23 The Technical Literature must be referred to during the inspection of Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System installations.

Health and Safety

18.1 Cutting of Hermpac shiplap weatherboards must be carried out in well ventilated areas and dust masks, eye and hearing protection must be worn.

18.2 Safe use and handling procedures for the components that make up the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System are provided in the relevant manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

19.1 The following testing has been completed by BRANZ:

- BRANZ expert opinion on NZBC E2 code compliance for the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is based on testing and evaluation of all details within the scope and as stated within this Appraisal. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System was tested to NZBC Verification Method E2/VM1. The testing assessed the performance of the Vertibat cavity battens, foundation detail, window head, jamb and sill details, meter box head, jamb and sill details, vertical joints, internal and external corners and balustrade to wall junction. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of NZBC Acceptable Solution E2/AS1 for cavity-based weatherboard claddings.
- Fastener pull through testing. BRANZ determined design wind suction pressures, and by comparing these pressures with AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber framed walls.

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.

Other Investigations

20.1 Structural and durability opinions have been provided by BRANZ technical experts.

20.2 The performance of timber weatherboard wall cladding products in New Zealand has been considered, including the structural and durability performance, and non-hazardous nature.

20.3 Site inspections have been carried out by BRANZ to assess the practicability of installation.

20.4 The Technical Literature for the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System has been examined by BRANZ and found to be satisfactory.

Quality

21.1 The manufacture of Hermpac shiplap weatherboards 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.

21.2 The quality of materials, components and accessories supplied by Hermpac is the responsibility of Hermpac.

21.3 Quality of installation on-site of components and accessories supplied by Hermpac and the building contractor 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 framing systems and joinery, wall underlays, flashing tapes, air seals, cavity battens and the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System in accordance with the instructions of Hermpac.

21.5 Building owners are responsible for the maintenance of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System in accordance with the instructions of Hermpac.

Sources of Information

- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 4534:2006 Zinc and zinc/aluminium-alloy coatings on steel wire.
- BRANZ Bulletin Number 411, April 2001, Recommended Timber Cladding Profiles.
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber structures standard.
- NZS 3604:2011 Timber-framed buildings.
- NZS 3617:1979 Specification for profiles of weatherboards, fascia boards and flooring.
- 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.

Amendments

Amendment No. 1, dated 18 July 2022

This Appraisal has been amended to remove reference to Cavibat cavity battens, add Yellow Cedar back into the Appraisal, add CedarOne and CedarLine, add the option of screw-fixing of the weatherboards and adjust the minimum thickness of the weatherboards.

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.

BRANZ

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

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

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
27 May 2020

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.

Hermpac

Product Technical Statement (PTS)

VertiLine Vertical Shiplap Weatherboard Cavity System

Product Description and Use

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

The system consists of vertically fixed Hermpac vertical shiplap weatherboards, ventilated "Vertibat" timber cavity battens, flashings and accessories and is finished with an exterior grade quality coating to Hermpac specifications.

Hermpac Vertical Shiplap weatherboards are manufactured from Canadian Coastal Western Red Cedar and Yellow Cedar. Selected profiles are available in Accoya®/Accoya® Grey, Kanda and AshinDura. NB: Paint finish only for AshinDura.

Herman Pacific Limited currently purchase timber under the following chain of custody schemes: FSC and PEFC.

New Zealand Building Code

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System, if used, designed, installed and maintained in accordance with the statements and conditions of the relevant BRANZ, Codemark and Technical Literature, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4 for loads arising from self-weight, wind, impact and creep. [i.e. B1.3.3 (a), (h), (j) and (q)].

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years and B2.3.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1.

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is an Alternative Solution in terms of New Zealand Building Code compliance.

Evidence of Compliance

Hermpac provides this PTS to demonstrate that it has met its responsibilities under s14G of the Building Act. Hermpac is able to support claims of performance, based on the technical evidence provided within BRANZ Appraisal No. 650 and Codemark Certificate GM-CM30036, or BRANZ Appraisal No. 1181 and Codemark Certificate GM-CM30138.

Scope of Use

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is suitable as an external vertically fixed wall cladding system for buildings using:

Oil/Stain finished Western Red Cedar, Yellow Cedar and Accoya®/Accoya® Grey weatherboards fixed with annular grooved crown/rose/flat head nails or Hermpac Starcap screws, or Kanda fixed with Hermpac Starcap screws;

Paint finished Accoya®, Yellow Cedar and AshinDura weatherboards fixed with annular grooved jolt/crown/rose/flat head nails or Hermpac Starcap screws;

Paint finished Western Red Cedar weatherboards fixed with annular grooved crown/rose/flat head nails or Hermpac Starcap screws:

- 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' when nogs/dwangs are at maximum 480 mm centres.

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is suitable for use as an external vertically fixed wall cladding system for weathertightness and structural wind loading for buildings using:

Oil/Stain finished Western Red Cedar, Yellow Cedar and Accoya®/Accoya® Grey weatherboards fixed with annular grooved crown/rose/flat head nails or Hermpac Starcap screws, or Kanda fixed with Hermpac Starcap screws;

Paint finished Accoya®, Yellow Cedar and AshinDura weatherboards fixed with annular grooved jolt/crown/rose/ flat head nails or Hermpac Starcap screws;

Paint finished Western Red Cedar weatherboards fixed with annular grooved crown/rose/flat head nails or Hermpac Starcap screws:

- 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 when nogs/dwangs are at maximum 480 mm centres.

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is suitable for use as an external vertically fixed wall cladding system for weathertightness and structural wind loading for buildings using **paint finished Western Red Cedar,** (including WRC CedarOne and CedarLine) weatherboards if fixed with annular grooved jolt head nails:

- 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 the NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including Medium when nogs/dwangs are at maximum 480 mm centres, and NZS 3604 Wind Zones up to, and including Very High when nogs/dwangs are at maximum 400 mm centres.

Other Conditions or Limitations

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System must only be installed vertically on vertical surfaces.

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is designed for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. This system relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind

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pressure.

Maintenance

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

Regular cleaning (at least annually) of the surface finish with water, a soft brush and a mild detergent is recommended to remove grime, dirt and organic growth, to maximise the life and appearance of the cladding.

Re-coating will be necessary throughout the life of the cladding system. Re-coating of an oil/stain finish must be carried out, on average, every 2-3 years. Re-coating of a paint finish must be carried out, on average, every 7-10 years.

All re-coating to be in accordance with the specified manufacturer's instructions. Care must be taken to ensure bottom edges are well covered and penetrated.

NB: The performance of an oil/stain finish will vary from wall to wall. The more exposed northern and western facing walls will generally require more frequent re-coating.

Technical Literature

The following Technical Literature must be followed to ensure compliance when the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is used:

www.hermpac.co.nz/architect-downloads/

Western Red Cedar, Yellow Cedar, Kanda, AshinDura

Installation Specification references

VertiLine Vertical Shiplap Weatherboard Cavity System Installation Specification

Construction Drawing Detail references

Vertical Shiplap

Support Documentation references

BRANZ Appraisal No. 650
CodeMark Certificate GM-CM30036

BRANZ Appraised
Appraisal No.650

CodeMark
CMNZ30036

Accoya®/Accoya® Grey

Installation Specification references

Accoya® VertiLine Vertical Shiplap Weatherboard Cavity System Installation Specification

Construction Drawing Detail references

Accoya® Vertical Shiplap

Support Documentation references

BRANZ Appraisal No. 1181
CodeMark Certificate GM-CM30138

BRANZ Appraised
Appraisal No.1181

CodeMark
CMNZ30138

CodeMark

Certificate no: CMNZ30036
Version: N
Original issue date: 31 March 2014
Version date: 26 July 2023
Renewal date: 12 July 2028

1. Certificate Holder Details

Herman Pacific Limited.
110 Foundry Road, Silverdale 0932
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Tel: 09 426 5475
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2. Product Certification Body

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Trading as Global-Mark
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Complaints: The complaints process for this certificate can be found here:
www.global-mark.co.nz/complaints

Global-Mark Managing Director.

Herve Michoux

global-mark

Product Certificate

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

3. Description of Building Method or Product

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System consists of vertically fixed shiplap weatherboards, ventilated cavity battens, flashings and accessories.

4. Intended use of Building Method or Product

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is an external vertically fixed wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

5. New Zealand Building Code Provisions

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System if designed, used, installed and maintained in accordance with the conditions of this Certificate will comply with or contribute to compliance with the following performance provisions of the NZ Building Code:

Clause B1 STRUCTURE:	Performance B1.3.1, B1.3.2 and B1.3.4, for the relevant physical conditions of B1.3.3 (a), (h), (j) & (q)
Clause B2 DURABILITY:	Performance B2.3.1(b) 15 years and B2.3.2(a)
Clause E2 EXTERNAL MOISTURE:	Performance E2.3.2, E2.3.5, E2.3.6 and E2.3.7
Clause F2 HAZARDOUS BUILDING MATERIALS:	Performance F2.3.1

6. Conditions and Limitations of Use

1. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is certified for buildings:
    a. not greater than 10 metre height, and
    b. situated:
        i. in all exposure zones (excluding microclimates) as defined in NZS3604:2011, Paragraph 4.2.4 NZS3604:2011, and
        ii. more than 1m from a relevant boundary, and
    c. constructed with timber framing within the scope of NZBC Acceptable Solution E2/AS1, Third Edition including amendment 10 (5/11/2020) Paragraph 1.1, and with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Third Edition including amendment 10 (5/11/2020) Table 2, situated in Wind Zones (as defined in NZS 3604:2011) as follows:

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The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

i. up to and including Extra High; for oil or stain finished Western Red Cedar, Yellow Cedar or Kanda, or with paint finished AshinDura, and

ii. up to and including Medium (provided dwangs or structural Vertibat cavity battens are at maximum 480mm centres), and if fixed with jolt head nails, up to and including Very High (provided dwangs or structural Vertibat cavity battens are at maximum 400mm centres) for paint finished Western Red Cedar, or

d. constructed with timber framing subject to specific engineering design up to a maximum design differential ultimate limit state (ULS) wind pressure of 2.5 kPa and within the scope limitations of NZBC Acceptable Solution E2/AS1, Third Edition including amendment 10 (5/11/2020) 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, Third Edition including amendment 10 (5/11/2020) Table 2, for oil or stain finished Western Red Cedar, Yellow Cedar or Kanda.

2. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System shall be designed, used, installed and maintained in accordance with:
   a. the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Installation Specifications, May 2023 V3 including:
      i. the Hermpac standard construction drawings applicable (refer sections 9 & 11 of this certificate), and
      ii. the fixing & finish requirements applicable to the oil/stain or paint system used.
3. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System shall be only installed vertically on vertical, flat surfaces.
4. Only aluminium window and door joinery meeting the requirements of NZS 4211:2008 (including Amendment1) for the relevant Wind Zone or wind pressure and installed with vertical jambs and horizontal heads and sills shall be used with The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System.
5. The designer shall provide a signed Declaration for submission with the building consent application that the use of this product in the proposed building work falls within the scope of this certificate and that all design conditions of this certificate have been met.
6. The installer shall supply a signed Product Installation Checklist Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System (January 2023 V2) for consideration for issuing a Code Compliance Certificate (CCC).

7. Health and Safety Information

Standard industry safety practices and manufacturer safety requirements as detailed in the technical literature including the applicable SDS must be observed at all times. Please refer to the product technical literature, safe handling instructions and relevant MSDS.

8. Basis for Certification

The certification decision is based on independent technical review(s) of test report(s), engineering opinion(s) and other documented evidence(s), factory audit(s) and site review(s)

Code Clause	Compliance pathway	Evidence

JAS-ANZ

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The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CodeMark

Product Certificate

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

global-mark

Certificate no: CMNZ30036
Version: N
Original issue date: 31 March 2014
Version date: 26 July 2023
Renewal date: 12 July 2028

B1 STRUCTURE	Alternate solution based on NZS3604:2011 and comparison with E2/AS1	1, 2, 3, 4, 5, 6, 7, 8 & 9
B2 DURABILITY	Alternate solution based on expert judgement	1, 6, 7, 8, 10, 13, 14 & 15
E2 EXTERNAL MOISTURE	Verification method E2/VM1 test	1, 2, 3, 4, 5, 6, 7, 8, 11 & 12
F2 HAZARDOUS BUILDING MATERIALS	Alternate solution based on expert judgement	1, 6, 7, 8, 16 & 17

9. Supporting Documentation for Certification

Rev	Author	Description	Date and/or Revision
1.	Herman Pacific	Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Installation Specifications	Version 3, May 2023
2.	Herman Pacific	VertiLine Vertical Shiplap Weatherboard 18-20mm Cavity System – Construction Drawings -	Version 2, 1 January 2022;
3.	Herman Pacific	VertiLine Vertical Shiplap Weatherboard 40-45mm Cavity System – Construction Drawings	Version 2, 1 January 2022
4.	Herman Pacific	VertiLine Vertical Shiplap Weatherboard Cavity System Random Width and Depth– Construction Drawings	Version 2, 1 January 2022
5.	Herman Pacific	Product Installation Checklist – Hermpac Accoya VertiLine Vertical Shiplap Weatherboard Cavity System_Checklist	Version 2, January 2023
6.	BRANZ	Hermpac Vertiline Vertical Shiplap Weatherboard Cavity System – BRANZ Appraisal No. 650 (2020)	27 May 2020
7.*	BRANZ	BRANZ Appraisals Means of Compliance – Basis of Appraisal - Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System – BRANZ Appraisal No. 650 (2020)	22 May 2020
8.	BRANZ	HERMPAC Cedar Horizontal Cavity Battens – BRANZ Appraisal 1189 (2021)	19 August 2021

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9.	BRANZ	Structures Test Report - HERMPAC Weatherboard Connections	5 March 2021
10.	SCION	Durability and Potential End-uses of some Timber Species Imported into New Zealand	October 2017
11.	BRANZ	Weathertightness test to E2/VM1 of Herman Pacific Vertical Shiplap Weatherboard	10 May 2013
12.	BRANZ	E2 Weathertightness Opinion for the Reissue of the Appraisal of the VertiLine Vertical Shiplap Weatherboard Cavity System	22 May 2020
13.	Herman Pacific	Yellow Cedar – Technical Data Sheet	2021
14.	Herman Pacific	Kanda – Technical Data Sheet	2021
15.	CIRAD	Tropix & Tropical Wood Species – Kanda Technical Data Sheet	26 March 2012
16.	Herman Pacific	Hermpac Weatherboard Cladding Cavity Systems – SDS Index	20-May-2020
17.	Henkel Adhesives	Safety Data Sheet – Loctite HB S039 Purbond	November 2015

* These documents were provided commercial in confidence and are not publicly available

10. Supporting Information About Description (Optional)

- The system consists of vertically fixed shiplap weatherboards, proprietary cavity battens, flashings and accessories.
- The Hermpac VertiLine Vertical Shiplap Weatherboards are manufactured from Western Red Cedar. Selected Weatherboards are also manufactured from Yellow Cedar, Kanda and AshinDura. Western Red Cedar, Yellow Cedar and Kanda weatherboards are supplied either raw, with one coat of machine applied premium penetrating exterior grade oil stain to Hermpac specifications or, with a machine applied primer coat and one machine applied undercoat of exterior grade paint to Hermpac specifications. AshinDura weatherboards are treated to H3.1 and are only available with a machine applied primer coat and one machine applied coat of exterior grade paint to Hermpac specifications.
- The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall frame with a minimal 18 mm drained cavity.
- Hermpac Standard Profiles (HP50 - HP60) and Hermpac Custom Profiles defined in accordance with NZS3617 and BRANZ Bulletin 411 are covered by this certificate.
- The system construction details defined in:

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Product Certificate

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

Certificate no: CMNZ30036
Version: N
Original issue date: 31 March 2014
Version date: 26 July 2023
Renewal date: 12 July 2028

- VertiLine Vertical Shiplap Weatherboard 18-20mm Cavity System – Construction Drawings - Version 2 dated 01 January 2022; and
- VertiLine Vertical Shiplap Weatherboard 40-45mm Cavity System – Construction Drawings - Version 2 dated 01 January 2022; and
- VertiLine Vertical Shiplap Weatherboard Cavity System Random Width and Depth– Construction Drawings - Version 2 dated 01 January 2022.

11. Supporting Information About Intended Use (Optional)

Nil

12. Supporting Information About Conditions and Limitations of Use (Optional)

Nil

All CodeMark certificates that are current much be registered with MBIE. MBIE maintains a register of valid product certificates. Please find the register here.

If the certificate is not listed on this register or it appears as (SUSPENDED), it is not a valid CodeMark certificate and does not have to be accepted by a building consent authority as establishing compliance with the New Zealand Building Code.

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. 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.
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VertiLine Vertical Shiplap Weatherboard Cavity System

Installation Specifications

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VertiLine Vertical Shiplap Weatherboard Cavity System

Installation Specifications

1.0 General Information

1.1 Introduction

The VertiLine Vertical Shiplap Cavity System is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

The cladding system consists of vertically fixed Hermpac shiplap timber weatherboards installed over ventilated battens, flashings and accessories and is finished with a premium penetrating oil/stain or paint finish to Hermpac specifications.

The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall frame with an 18/20/40 and 45mm minimum drained cavity.
Herman Pacific Ltd currently purchases timber under the following chain of custom schemes: FSC and PEFC.

1.2 BRANZ Appraisal

The VertiLine Vertical Shiplap Cavity System has been appraised by BRANZ. Refer to Appraisal No. 650 (2020).

1.3 CODEMARK Certification

The VertiLine Vertical Shiplap Cavity System has the Codemark Certificate of Conformity. Refer Certificate No. GM-CM30036.

1.4 Hermpac Vertical Shiplap Weatherboards

Hermpac vertical shiplap weatherboards are manufactured from Canadian Coastal Western Red Cedar and Yellow Cedar. Selected weatherboard profiles are manufactured from Kanda and AshinDura. NB: AshinDura available as paint finish only.

The weatherboard lap and rebate profiles are in accordance with NZS 3617 and BRANZ Bulletin 411. The weatherboards are available in a range of sizes and face profiles. They are supplied as a random length supply. Select lengths are outside of the general specification and are available by special contract.

1.5 Cavity Battens

The VertiLine Vertical Shiplap Cavity System uses Vertibat timber cavity battens to separate the weatherboards from the wall frame and form the cavity.

The Vertibat batten is installed horizontally over nogs/dwangs to provide support for the weatherboards at fixings points. The 40 and 45mm thick Vertibat battens can be structurally fixed, installed horizontally across the studs and the weatherboards are then fixed into the batten only.

Cavity battens are Vertibat 45 x 18mm (V8/V9) Western Red Cedar, 45 x 20mm (V1), 45 x 40mm (V3), 45 x 45mm (V5), 70 x 20mm (V2), 70 x 40mm (V4), 70 x 45mm (V6) thick Radiata pine treated to Hazard Class H3.1 or H3.2. The top and bottom edges are bevelled with a slope. The front and back face of the batten is grooved with nominal 20mm wide x 5mm deep rebates at 95mm centres. The grooves are offset on each face. Refer BRANZ Appraisal 1189 (2021) Hermpac Cedar Horizontal Cavity Battens.

1.6 Accessories

Accessories supplied by Hermpac for use with the VertiLine Vertical Shiplap Cavity System include:

- Hermpac external corner mouldings – HP40 (40 x 40mm) and HP42 (42 x 42mm) and the Hermpac 'Smart Corner' series, profiled external corner moulds.
- Hermpac internal corner mould – HP41 (18.5 x 18.5mm), through to HP110 (39 x 39mm) profiles and the Hermpac 'Smart Corner' series.
- Hermpac cover battens – HP201 (69 x 18mm) and HP202 (90 x 18mm).
- Hermpac cover batten fixings – 50 x 2.8mm silicon bronze or Grade 316 Stainless Steel annular grooved Hermpac Crown, Rose or Flat Head nails for oil/stain finish or Grade 316 Stainless Steel annular grooved Jolt Head nails for paint finish.
- Hermpac eaves moulding – HP32 (40 x 27mm), HP33 (26 x 15mm) and HP7 (30 x 18mm) bevelled profile.
- Screw fixings for 40-45mm thick Vertibat cavity batten fixed to studs only – 12gauge x 65-75mm long Grade 304 Stainless Steel screws. Minimum 25mm penetration to frame required.
- Hermpac scribers - HP11 - HP18, with bevelled or radiused edges (cut to suit as required).
- Hermpac scriber fixings - length to suit scriber size (minimum 50 x 2.8mm) Stainless Steel annular grooved Hermpac Crown, Rose or Flat Head nails for oil/stain finish or Jolt Head nails for paint finish.
- **Nail fixing - Oil/Stain finished weatherboard fixing** – Silicon Bronze or Grade 316 Stainless Steel annular grooved Hermpac Crown, Rose or Flat head nails. NB: Nail shank diameter and length as per Hermpac construction drawings. Must allow minimum 30mm embedment into framing timber (nog/dwang) or structurally fixed cavity batten.
- **Screw fixing - Oil/Stain finished weatherboard fixing**- Grade 316 Stainless Steel or Bronzed Stainless Hermpac Starcap Screw. NB: Must allow minimum 21mm embedment into framing timber (nog/dwang) or structurally fixed cavity batten. NB: Kanda Vertical Shiplap weatherboards **must be** screw fixed.
- **Paint finished weatherboard fixings** – Grade 316 annular grooved Hermpac Jolt head nails. Nail shank diameter and length as per Hermpac construction drawings. Must allow minimum 35mm embedment into framing timber (nog/dwang) or structurally fixed cavity batten. NB: If Crown, Rose, Flat head nails or Starcap Screws are used, refer to fixing clauses above.
- Hermpac clinch nails – Grade 316 Stainless Steel annular grooved nails with an off-set flat head.
- Hermpac aluminium flashings – widths to suit specified corners – 2.4m or 3.0m lengths – no substitutions.
- Hermpac J Mould Flashing – for window jambs – 20mm or 29.5mm, 2.4m or 3.0m lengths.
- Hermpac aluminium Cavity Closure – 20/40/45mm, 2.4m or 3.0m lengths.

1.7 Handling and Storage

Hermpac vertical shiplap weatherboards must be stacked flat and true, clear of the ground by a minimum of 150mm and supported on dry and clean timber bearers at maximum 900mm centres.
The weatherboards must be kept dry at all times either by storing within an enclosed building or when stored externally an additional secondary cover to the plastic wrapping is required. Care must be taken to avoid damage to edges, ends and the weatherboard surfaces. Water must not be allowed to enter the stack.

2.0 Design Information

2.1 Design Responsibility

The Specifier for the project must ensure that the details in this literature are suitable 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.

2.2 Scope

This specification covers the use of the VertiLine Vertical Shiplap Cavity System as an external vertically fixed wall cladding system for buildings within the following scope:
All oil/stain finished Hermpac weatherboards fixed with crown/rose/flat head nails or Starcap screws. Paint finished Yellow Cedar, and AshinDura weatherboards fixed with annular grooved jjolt/crown/rose or flat head nails.

Paint finished Western Red Cedar weatherboards fixed with annular grooved crown/rose/flat head nails:

- 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'.

Any oil/stain or paint finished weatherboards if fixed with annular grooved flat/crown/rose head nails, or Starcap screws only, for weathertightness and structural wind loading 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.

Paint finished Western Red Cedar weatherboards (including CedarOne/CedarLine) fixed with annular grooved jolt head nails:

- 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 Medium when nogs/dwangs or structural Vertibat cavity battens are at maximum 480 mm centres, and NZS 3604 Wind Zones up to, and including Very High when nogs/dwangs or structurally fixed Vertibat cavity battens are at maximum 400mm centres.

For applications which are outside the scope of this literature and details which are not in this literature the specifier must ensure that the design meets the relevant performance requirements of the NZBC. Hermpac recommends that professional design advice is sought in these circumstances.

2.3 Building Regulations

The VertiLine Vertical Shiplap Cavity System if designed, used and installed in accordance with the statements and conditions of this literature and the supporting BRANZ Appraisal, will meet the following provisions of the New Zealand Building Code:

- Clause B1 Structure
- Clause B2 Durability
- Clause E2 External Moisture
- Clause F2 Hazardous Building Materials

2.4 Ground Clearances

The finished floor level must have a minimum clearance to paved or unprotected ground as required by NZS 3604:2011. Hermpac weatherboards must overhang the floor structure by a minimum of 50mm as required by NZBC Acceptable Solution E2/AS1, Table 18.

The bottom edge of the VertiLine Vertical Shiplap Cavity System must finish a minimum of 100mm above paved surfaces or 175mm above unprotected ground.

At deck or low pitch roof/wall junctions, the bottom edge of the Hermpac weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35mm.

2.5 Structure & Framing

Timber wall framing behind the VertiLine Vertical Shiplap Cavity System must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber framing 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. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Use of timber framing must be in accordance with framing manufacturer's specifications.

In all cases studs must be at maximum 600mm centres. Where Vertibat cavity battens are fixed to nogs/dwangs, the nogs/dwangs must be fitted flush between the studs at maximum 480mm centres. Where 40-45mm thick Vertibat cavity battens are structurally fixed at studs only, nogs/dwangs are not required. Refer Paragraph 7.2 of BRANZ Appraisal No. 650 (2020) for more information.

Note: For paint finished Western Red Cedar weatherboards (including CedarOne/CedarLine) fixed with annular grooved Grade 316 Stainless Steel Jolt head nails, nogs/dwangs or structurally fixed Vertibat cavity battens must be at a maximum 480mm centres for NZS 3604 Wind Zones up to, and including Medium and at a maximum 400mm centres for NZS 3604 Wind Zones High and Very High.

2.6 Framing 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 3604:2011.

2.7 Cavity Closure Strip

The VertiLine Vertical Shiplap Cavity System must incorporate a cavity closure strip to close off the bottom of the cavity and provide resistance against the penetration of vermin. The cavity closure strip must be in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3. The cavity closure strip must be manufactured from uPVC, aluminium or Stainless Steel, and be punched with 3-5mm holes or slots which provide a minimum ventilation opening area of 1000mm² per lineal metre of wall.

2.8 Wall Underlay

The VertiLine Vertical Shiplap Cavity System must be installed over wall underlay complying with NZBC Acceptable Solution E2/AS1, Table 23, or wall underlays covered by a valid BRANZ Appraisal.

All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including 'Very High', and rigid underlays for buildings in the 'Extra High' wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure.

Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the weatherboard fixing lengths must be increased by a minimum of the thickness of the underlay.

2.9 Inter-storey Junctions

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

2.10 Hermpac Vertical Shiplap Weatherboards

The weatherboards shall be pre-coated with the selected coating (prior to site delivery and installation) by Hermpac associate Machinecoat (NZ) Ltd, by the flood coat inundation method or in-line spray coat system (subject to coating type selected).

Pre-finished vertical shiplap weatherboards shall be over-coated and maintained in accordance with the coating manufacturer's specification. All cut ends and/or uncoated surfaces to be double coated during installation to protect against the penetration of moisture, post installation.

The weatherboards shall be fixed to nogs/dwangs (or structurally fixed to 40-45mm Vertibat cavity battens) at 400-480mm maximum centres using Hermpac shiplap weatherboard fixings (refer to Section 1.5 of this specification).

NOTE: Pinning of laps or board faces will not comply with Hermpac Installation details.

External corners shall be weatherproofed by the use of Hermpac aluminium corner flashings and corner facings, e.g. Hermpac proprietary profiles HP40, HP42 the Hermpac 'Smart Corner' series or cover battens HP201 and HP202.

Internal corners shall be weatherproofed by the use of Hermpac aluminium corner flashings along with internal mouldings, e.g. Hermpac profiles HP41 and HP110 or the Hermpac 'Smart Corner' series.

3.0 Installation Information

3.1 System Installation

The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the VertiLine Vertical Shiplap Cavity System.

Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints.

Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

The selected cavity closure strip must be installed so a minimum 15mm drip edge to the bottom of the weatherboards is maintained at all times.

There are several options available for the installation of cavity battens as outlined below.

Vertibat Cavity Battens to Nogs/Dwangs

Vertibat cavity battens must be installed horizontally over the building underlay to the wall framing (nogs/dwangs) at 400-480mm maximum centres. The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with 40 x 2.5mm flat head hot-dipped galvanised nails or 50 x 2.8mm hot- dipped galvanised gun nails (for 18 or 20mm thick battens), or 60 x 2.8mm flat head hot-dipped galvanised nails or 60 x 2.8mm hot-dipped galvanised gun nails (for 40 or 45mm thick battens) to temporarily fix the battens in place prior to installation of the cladding.

40 or 45mm thick structurally fixed Vertibat Cavity Battens to Studs

40 or 45mm thick Vertibat cavity battens must be installed horizontally over the building underlay to the wall framing (studs) at 400-480mm maximum centres. The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with one 12gauge x 65mm long (for V3 or V4) or 12gauge x 75mm long (for V5 or V6) Grade 304 Stainless Steel screw at each stud crossing (maximum 600mm centres). A 25mm minimum penetration of the framing is required.

Where Hermpac cavity battens are installed 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.

3.1.1 Aluminium Joinery Installation

Aluminium joinery and associated head flashings must be installed in accordance with the window manufacturer's instructions. A 7.5-10mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6 after the joinery has been secured in place.

3.1.2 Hermpac Vertical Shiplap Weatherboard Installation

Hermpac vertical shiplap weatherboards must not be wet prior to installation. Prior to installation, the back face and edges of the weatherboards to be sealed with an exterior grade oil-based penetrating oil/ stain or paint. During installation, cut ends and edges and all fresh cuts or exposed timber must be double sealed with an exterior grade oil-based penetrating oil/stain or paint.

Hermpac shiplap weatherboards must be installed starting at the corner of the wall section being clad. The first weatherboard must be installed plumb to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50mm. The weatherboards should be installed with the lap facing away from the prevailing winds.

Immediately prior to installing the weatherboards over the internal and external aluminium corner flashings, a continuous bead of sealant must be applied to the face of the flashing along the fixing line.

Hermpac shiplap weatherboards must be overlapped 25mm with an expansion gap of 2mm at the overlap. The bottom lap needs to be restrained with the clinch nail at every cavity batten, ensuring a minimum 2 mm gap between weatherboards at the back of the board.

Clinch nails are a proprietary component of this cladding system. Use on all installations. Mandatory for installations in 'Extra High' wind zones and above.

NOTE: Pinning of laps or board faces will not comply with Hermpac Installation details.

Hermpac shiplap weatherboards must be pre-drilled on a slight up-slope, with a hole slightly smaller than that of the fixing. Fix each weatherboard with one nail/screw per board at every cavity batten.

The fixing must be located 30-35mm in from the weatherboard lap, be located no closer than 32mm (where practical) from the end of the board. Fix weatherboards in full lengths where possible. Where joints are required, scarf the weatherboard at 30° over a cavity batten and fix as per detail 'HC-SHIP-413' or 'HC- SHIP40-413'.

Nail fixing - oil/stain finished weatherboards
Weatherboard fixings must be either Silicon Bronze or Grade 316 Stainless Steel annular grooved Hermpac Crown, Rose or Flat head nails. The nail shank diameter and length as per Hermpac construction drawings. Must allow minimum 30mm embedment into framing timber or structurally fixed cavity batten. Finish flush onto the surface of the weatherboard, not into or below the surface.

Nail fixing - paint finished weatherboards
Weatherboard fixings must be Grade 316 Stainless Steel annular grooved Hermpac Jolt head nails. The nail shank diameter and length as per Hermpac construction drawings. NB: Must allow minimum 35mm embedment into the framing timber or structurally fixed cavity batten. Punch nails 2mm below the weatherboard surface, prime nail holes and fill prior to sanding and finishing.
NB: If Crown, Rose or Flat head nails are used with paint finished weatherboards, refer to fixing clause above.

Hermpac recommend the use of paint quality profiled weatherboards. Please ensure (PQ) profiles are ordered. Paint quality profiles are machined with a dressed face and then sanded.

NOTE: "Through pinning" of laps and/or rebates or board faces will not comply with Hermpac Installation details.

Screw Fixing oil, stain or paint finished weatherboards
Weatherboard fixings must be Grade 316 Stainless Steel or Bronzed Stainless annular grooved Hermpac Starcap screw. The screw diameter and length as per Hermpac construction drawings. Must allow minimum 21mm embedment into framing timber or structurally fixed cavity batten. Finish flush onto the surface of the weatherboard, not into or below the surface. NB: Kanda Vertical Shiplap weatherboards **must be** screw fixed.

3.1.3 Boxed Corners, Cover Battens and Mouldings

External and internal corners must be finished in accordance with the installation detailing.

Most Hermpac 'Smart Corners' mouldings can be fixed by applying a continuous bead of sealant to the inside surfaces of the moulding or the faces of the flashing to which the moulding is to be bonded. Excess coating should be wiped off areas of the moulding intended to contact the adhesive.

Wherever possible, the moulding should be bonded to the flashing prior to installation. If this is not possible, the moulding shall be temporarily held in place while the sealant cures.

A continuous bead of sealant should also be applied at the join between the moulding and the end-grain cross section of any butted weatherboard and direct to flashing along the line of weatherboard nail fixing (if the weatherboard fixing will pierce the flashing).
Sealant options for Wood-X Oil or Resene Waterborne Woodsman Stains include Sikaflex 11FC or Sikaflex-123 MS Bond (with Sika Primer 3N), Sikaflex AT Façade, Gorilla MS Sealant or Bostik (Seal N Flex FC). Always follow manufacturer instructions. (NB: for other coatings please check with the manufacturer to determine the most suitable sealant).
Further or sole mechanical support of the Moulding- Flashing interface can be achieved in some cases with a pre-drilled and suitably placed Hermpac nail. The requirement for a continuous bead of sealant as detailed above still applies.

3.1.4 Finishing

Wood oil or oil stain finish
Prior to install, a minimum single envelope coat of the selected coating system. Post install and subject to coating type, either two or three coats of an exterior grade quality oil-based penetrating wood oil or oil stain must be used over the front faces and edges of the weatherboards to protect the weatherboards and give the desired finish colour.

The oil/stain must be recommended for use as a wall cladding oil/stain by the manufacturer and must be applied manually (on site) or factory applied by Machinecoat NZ Ltd. Hermpac recommends the use of oil based stains manufactured by Wood-X and Resene.

Follow the oil/stain manufacturer's instructions at all times for application of the oil/stain finish.

Paint finish
Prior to install, a minimum single envelope coat of the selected coating system. Post install and subject to coating type, either two or three coats of an exterior grade quality paint must be used over the front faces and edges of the weatherboards to protect the weatherboards and give the desired finish colour.

The paint must be recommended for use as a wall cladding paint by the manufacturer and must be applied manually (on site) or factory applied by Machinecoat NZ Ltd.

To ensure a top quality paint finish, the selected weatherboard profile/s will be paint quality (PQ) and the process below followed:

1. Any sharp edges should be removed to provide a radius to aid in uniform paint film coverage.
2. Double coat all cut ends and bare timber surfaces with a premium alkyd oil or acrylic based primer.
3. Punch nail holes and prime promptly after punching.
4. Fill holes with a suitable filler and allow to dry.
5. When filler is fully dry and cured, sand areasmooth.
6. Apply one coat of an alkyd oil or acrylic based primer to sanded area and allow to fully dry before sanding lightly.
7. Ensure surface is clean and free from any chalking, dirt, dust, mould or other contaminants prior to painting top coats.
8. Apply two coats of premium high quality 100% exterior grade acrylic to surface allowing adequate time for drying between coats.

Timber is a natural product. For best results use a colour with a LRV of 40-45% or above. Please consult with us for a specific recommendation minimum for your chosen timber.

Follow the paint manufacturer's instructions at all times for application of the paint finish.

Refer Section 4.0 for maintenance requirements.

4.0 Maintenance

Building owners are responsible for the maintenance of the VertiLine Vertical Shiplap Cavity System. Annual inspections must be made to ensure that all aspects of the cladding system, including flashings remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately. Sealant, coatings, flashings or the weatherboards must be repaired in accordance with the relevant manufacturer's instructions.

Regular cleaning (at least annually) of the surface finish with water and a mild detergent is recommended to remove grime, dirt and organic growth, to maximise the life and appearance of the cladding.

Recoating of the oil/stain finish will be necessary throughout the life of the cladding system. Re-staining must be carried out, on average, every 2-3 years in accordance with the oil/stain manufacturer's instructions. Re-staining will be required more frequently on exposed northern and western facing walls. When re-staining, care must be taken to ensure bottom edges and shiplap edges are well covered and penetrated with the stain.

Recoating of the paint finish will be necessary throughout the life of the cladding system. Re-coating must be carried out, on average, every 7-10 years in accordance with the paint manufacturer's instructions. When re-coating, care must be taken to ensure bottom edges are well covered and penetrated with the paint

5.0 Health & Safety

Cutting of Hermpac shiplap weatherboards must be carried out in well ventilated areas and dust masks, eye and hearing protection must be worn.

All relevant sections of AS/NZS2311:2017 "Guide to the painting of Buildings" should be adhered to. Technical Data Sheets and Safety Data Sheets for the specified coating should be obtained from the coating supplier and consulted prior to commencing work. MBIE guidelines and regulations must be followed at all times

Hermpac

BRANZ Appraised 650

CodeMark 30036

Product Installation Checklist
Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

Project Name

Project Address

Initial Check done by **Date**

Revision Check done by **Date**

To be read in conjunction with NZS3604:2011 and Hermpac Documentation: Construction drawings, VertiLine Vertical Shiplap Weatherboard Cavity System Installation Specification, BRANZ Appraisal 650 and CodeMark Certificate GM-CM30036. Aluminium Joinery to NZBC:4211 and material compatibility as per NZBC E2/AS1 Tables 20 and 21.

PLEASE TICK ✓	OK	REQUIRED	RECHECK	DATE
Framing checks				
Ensure framing is straight and true. Framing tolerances must comply with the requirements of NZS3604:2011.				
Studs as per design specification and NZBC (or at max. 600mm centres).				
Nogs/Dwangs as per design specification and NZBC (or at 400mm min. to 480mm max. centres).				
Wind loading & wall underlay – as per NZBC E2/AS1				
Wind Loading up to, and including 'Very High' - flexible or rigid underlay – installed in accordance with manufacturer's instructions and in accordance with E2/AS1.				
Wind Loading 'Extra High' - a rigid wall underlay overlaid with a flexible wall underlay, or using proprietary RAB system in accordance with E2/AS1.				
SED or Specific Design wind pressures up to and including a design differential of 2.5kPa ULS - proprietary RAB system installed in accordance with manufacturer's instructions.				
Cavity battens				
Non-structurally fixed - Vertibat cavity batten V8/V9 (Western Red Cedar FJ, untreated) or Vertibat cavity batten V1/V2 (Radiata Pine FJ, min. H3.1 treated) fixed at 400mm min. to 480mm max. centres.				
Non-structural fixing - Tack in place (to temporary fix) with 40x2.5mm flat head nails, 50x2.8mm or 60x2.8mm flat head nails or Stainless Steel finishing brads.				
Structurally fixed - Vertibat cavity batten V3/V4/V5/V6 cavity batten (min. H3.2 treated) Radiata Pine – at 400mm min. to 480mm max. centres.				
Structural fixing - screw fix using Hermpac 12 gauge x 65mm or 75mm Grade 304 Stainless Steel screws - one screw at each stud crossing (maximum 600mm centres) – screw must achieve 25mm min. penetration into framing.				
Install cavity battens vertically at all internal and external corners and jambs. Fit to support selected Hermpac aluminum/stainless steel flashings. Use Vertibat or square dressed merchant grade H3.1 treated pine cavity battens (if non-structurally fixed) and Hermpac 40x45/45x40mm square dressed H3.2 treated pine cavity batten (if structurally fixed).				
Flashings				
Hermpac Aluminium/Stainless Steel flashings to all internal and external corners and jambs. Ensure the correct size flashing, is used. Refer construction drawings.				
Cavity closure				
The selected cavity closure strip must be installed so a minimum 15mm drip edge to the bottom edge of the weatherboards is maintained at all times.				

PEFC PEFC/01-31-237

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p. 04 586 9674

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27 Nga Mahi Road, Sockburn
p. 03 341 2163

Product Installation Checklist
VertiLine Vertical Shiplap Weatherboard Cavity System

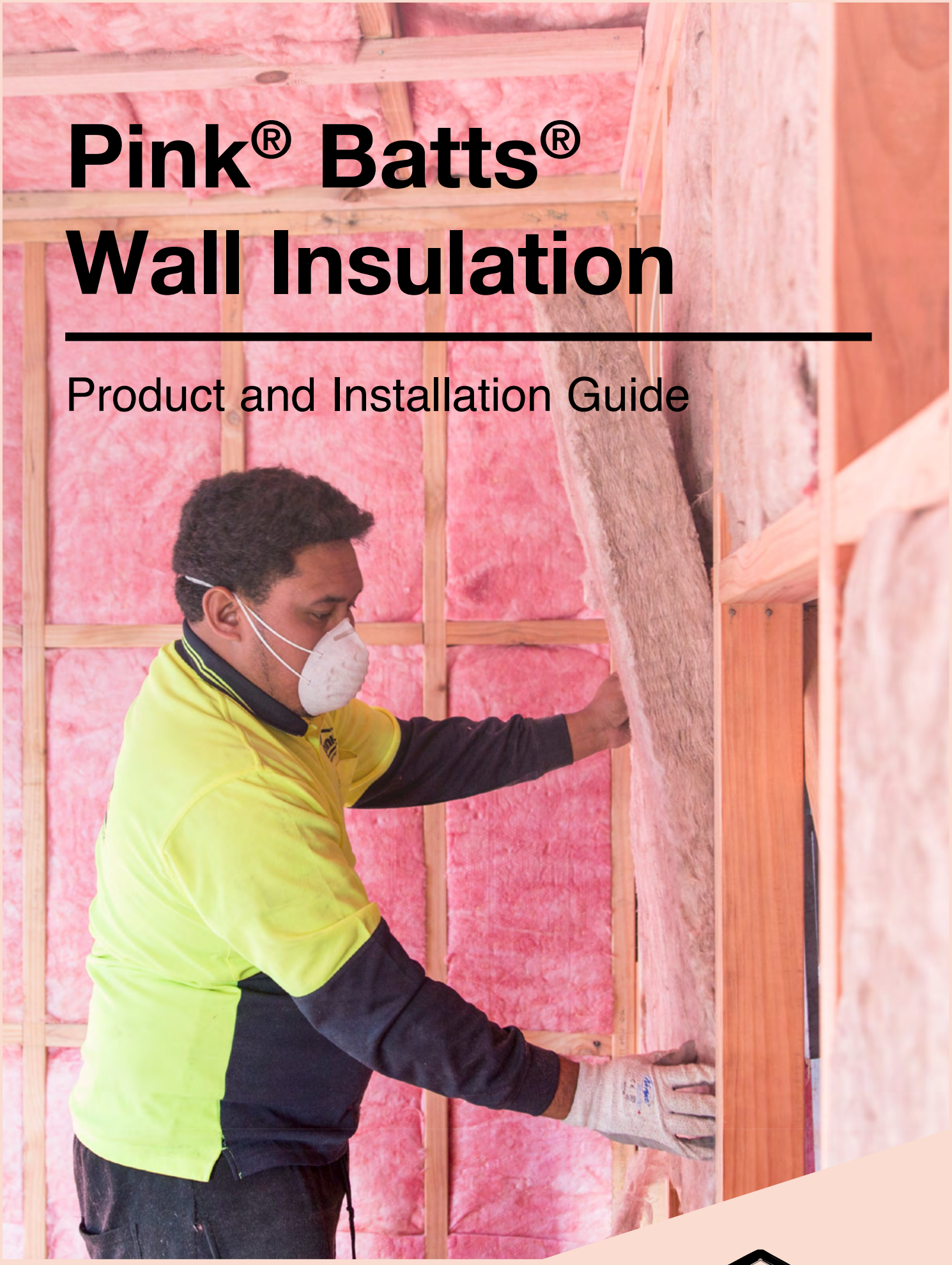
PLEASE TICK ✔	OK	REQUIRED	RECHECK	DATE
FIXING WEATHERBOARDS				
Fix Hermpac clinch nail hard up against the hidden lap of the weatherboard at every cavity batten – ref: HC-SHIP-410/S/411, HC-SHIP40-410/A/S/SS/411/A or VC-RWD-410/S/411. **Do not fix clinch nails through weatherboard lap. Do not pin weatherboard laps or faces.**				
Ensure set out of weatherboards allows for 2mm expansion gap at the back between lapped boards.				
Face fixings to be pilot drilled on a slight up-slope with a hole slightly smaller than the diameter of the specified fixing. Line fixings horizontally across boards.				
Single face fix weatherboards 30-35mm in from the top weatherboard lap, at 400mm min. to 480mm max. centres vertically. Fix no closer than 32mm (where practical) from the end of the board.				
WOOD OIL/OIL STAIN FINISH Back of the nail or screw head to finish flush onto the surface of the weatherboard – ref: HC-SHIP-410/410S or HC-SHIP40-410/A/S/SS or VC-RWD-410/S. Use Hermpac Grade 316 Stainless Steel or Silicon Bronze Crown, Rose or Flat head nails, or Hermpac Grade 316 Stainless Steel or Bronzed Stainless Starcap Screws.				
PAINT FINISH Nails must be punched below the surface of the weatherboard - ref: HC-SHIP-411, HC-SHIP40-411/411A or VC-RWD-411. Use Hermpac Grade 316 Stainless Steel Jolt head nails. Refer Hermpac Product Technical Statement for scope limitations for painted Western Red Cedar (including CedarOne and CedarLine) when fixed with jolt head nails. Refer wood oil/oil stain finish above if using Crown, Rose or Flat Head nails, or Hermpac Starcap screws.				
Ensure all fixings achieve minimum penetration requirements – refer Hermpac Installation Specification or Construction Drawings for details.				
Sealing weatherboards				
Prior to installation, site coating to all six sides of the weatherboards (if not factory coated via Machinecoat NZ Ltd) as per coating manufacturer's specification.				
During installation, double seal all cut edges, ends or fresh cut timber with selected coating.				
Once installed, apply second and subsequent coatings to achieve desired finish. Following coating manufacturer's specification at all times.				
Corner mouldings, scribers, cappings				
Internal corners as per construction drawings HC-SHIP-300-311, HC-SHIP40-300-311 or VC-RWD-301-311				
External corners as per construction drawings HC-SHIP400-408A & HC-SHIP40-400-408A, VC-RWD-401-408.				
Jambs as per Hermpac construction drawings.				
Refer 3.1.3 of Installation Specification prior to commencing. Apply a continuous bead of specified flexible adhesive to inside surfaces of the moulding or the faces of the flashing to which the moulding is to be bonded. A continous bead of sealant to be applied at the join between the moulding and the end grain cross section of any butted weatherboard and direct to flashing along the fixing line, where fixing will pierce the flashing.				
Additional or sole mechanical support can be achieved with a pre-drilled and suitably placed Hermpac fixing. Refer 3.1.3 of Installation Specification.				
Check all timber mouldings (eaves and corners), scribers and cappings are suitably fixed.				
Clearances				
The weatherboards must overhang the floor structure by a minimum of 50mm as required by NZBC E2/AS1, Table 18.				
Ensure minimum ground clearances are observed: Bottom edge of weatherboards to finish 35mm clear of finished deck surface, 100mm above paved surfaces or 175mm above unprotected ground (other surfaces ref: E2/AS1 9.1.3.3).				
At deck or low pitch roof/wall junctions, the bottom edge of weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35mm.				
Scarf Joins				
Scarf the weatherboard at 30º over a cavity batten. Ref: HC-SHIP-413 / HC-SHIP40-413 / VC-SHIP-413.				
Inter-storey junctions				
Inter-storey drained joints must be constructed as per HC-SHIP-412 / HC-SHIP40-412 / VC-SHIP-412. NZBC E2/AS1, paragraph 9.1.9.4 requires that inter-storey junctions be installed to limit continuous cavities to maximum height of 7m.				
Aluminium joinery				
All joinery and associated detailing and flashings must be installed in accordance with manufacturer's instructions, in accordance with NZBC E2/AS1, paragraph 9.1.6 and as per construction drawings HC-SHIP-200-212A / HC-SHIP40-200-212A.				
Health & Safety				
Cutting of Hermpac weatherboards must be carried out in well ventilated areas. Dust masks, eye and hearing protection must be worn.				
All relevant sections of AS/NZS2311:2017 "Guide to the painting of Buildings" should be adhered to. All Technical Data Sheets and Safety Data Sheets for the specified coating to be obtained from the coating supplier and consulted prior to commencing work.				
Maintenance				
Maintenance schedule provided to homeowner on completion of project.				

Hermpac

This is a guide only, designed to assist contractors during installation. Contractors must always follow the instructions provided within the Hermpac Installation Specification and construction details. For further information please contact us **technical@hermpac.co.nz**

Pink® Batts® Wall Insulation

Product and Installation Guide



pink® batts®

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Pink® Batts® Wall Insulation

Product and Installation Guide

Product Specifications

PRODUCT GLASS WOOL RANGE	Product Code	Size (mm)	Nominal Stabilised Thickness (mm)	Nominal Total Area Per Bale (m^2)	Approx. Coverage Per Bale* (m^2)	Pieces Per Bale	Eco Choice Aotearoa (Environmental Choice)	Environmental Product Declaration	BRANZ Appraisal Number
WALL – ACOUSTIC INSULATION									
Pink® Batts® Silencer® 100mm	7317001	1140 x 560	100	12.8	14.9	20	-	✓	x
Pink® Batts® Silencer® 75mm	7317003	1140 x 560	75	16.6	19.5	26	-	✓	x
WALL – THERMAL INSULATION									
INTERIOR SECONDARY INSULATION LAYER - 530mm WIDTH									
R1.0 Pink® Batts® Ultra® Interior Wall	7160271	1220 x 530	35	16.8	18.9	26	✓	✓	238
R1.3 Pink® Batts® Ultra® Interior Wall	7160272	1220 x 530	45	12.9	14.5	20	✓	✓	238
MASONRY WALL - 580mm WIDTH									
R1.0 Pink® Batts® Masonry Wall	7160110	1220 x 580	40	21.2	-	30	✓	✓	238
R1.2 Pink® Batts® Masonry Wall	7160134	1220 x 580	50	17.0	-	24	✓	✓	238
70mm WALL RANGE - 560mm WIDTH									
R2.2 Pink® Batts® 70mm Wall	7160248	1140 x 560	70	6.4	7.5	10	✓	✓	238
STEEL WALL - 610mm WIDTH									
R2.2 Pink® Batts® Steel Wall	7160214	1220 x 610	90	15.6	15.6	21	✓	✓	238
R2.6 Pink® Batts® Ultra® Steel Wall	7160215	1220 x 610	90	9.7	9.7	13	✓	✓	238
R2.8 Pink® Batts® Ultra® Steel Wall	7160267	1220 x 610	90	6.7	6.7	9	✓	✓	238
90mm WALL RANGE - STANDARD 560mm WIDTH									
R1.8 Pink® Batts® Wall	7127118	1140 x 560	90	16.6	19.6	26	✓	✓	238
R2.2 Pink® Batts® Wall	7127122	1140 x 560	90	13.4	15.8	21	✓	✓	238
R2.4 Pink® Batts® Wall	7127124	1140 x 560	90	10.2	12.1	16	✓	✓	238
R2.6 Pink® Batts® Ultra® Wall	7127126	1140 x 560	90	9.6	11.3	15	✓	✓	238
R2.6 Pink® Batts® Ultra® Wall (OC)	718226	1140 x 560	90	9.6	11.3	15			238
R2.8 Pink® Batts® Ultra® Wall	7127128	1140 x 560	90	6.4	7.5	10	✓	✓	238
R2.8 Pink® Batts® Ultra® Wall (OC)	718228	1140 x 560	90	6.4	7.5	10			238

* Square metre coverage per bale are estimates and actual coverage may differ

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Product Specifications

PRODUCT GLASS WOOL RANGE	Product Code	Size (mm)	Nominal Stabilised Thickness (mm)	Nominal Total Area Per Bale (m^2)	Approx. Coverage Per Bale* (m^2)	Pieces Per Bale	Eco Choice Aotearoa (Environmental Choice)	Environmental Product Declaration	BRANZ Appraisal Number
90mm WALL RANGE - NARROW WALL 360mm WIDTH									
R2.2 Pink® Batts® Narrow Wall	7160243	1140 x 360	90	9.0	11.2	22	✓	✓	238
R2.6 Pink® Batts® Ultra® Narrow Wall	7160244	1140 x 360	90	7.4	9.2	18	✓	✓	238
R2.8 Pink® Batts® Ultra® Narrow Wall	7160247	1140 x 360	90	4.5	5.6	11	✓	✓	238
140mm WALL RANGE - STANDARD 560mm WIDTH									
R3.2 Pink® Batts® Ultra® 140mm Wall	7127132	1140 x 560	140	9.6	11.3	15	✓	✓	238
R3.6 Pink® Batts® Ultra® 140mm Wall	7127136	1140 x 560	140	7.0	8.3	11	✓	✓	238
R4.0 Pink® Batts® Ultra® 140mm Wall	7127140	1140 x 560	140	5.1	6	8	✓	✓	238
R4.3 Pink® Batts® Ultra® 140mm Wall	7127143	1140 x 560	140	3.2	3.8	5	✓	✓	238
140mm WALL RANGE - NARROW WALL 360mm WIDTH									
R3.2 Pink® Batts® Ultra® 140mm Narrow Wall	7160245	1140 x 360	140	7.0	8.6	17	✓	✓	238
R3.6 Pink® Batts® Ultra® 140mm Narrow Wall	7160273	1140 x 360	140	5.7	7.1	14	✓	✓	238
R4.0 Pink® Batts® Ultra® 140mm Narrow Wall	7160246	1140 x 360	140	4.1	5	10	✓	✓	238
R4.3 Pink® Batts® Ultra® 140mm Narrow Wall	7160262	1140 x 360	140	2.9	3.6	7	✓	✓	238

* Square metre coverage per bale are estimates and actual coverage may differ.

Pink® Batts® Wall Insulation
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Application

Pink® Batts® wall insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate timber and steel framed walls
- Fit easily into standard wall constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- High R-values – R-values up to R4.3 to assist in keeping homes above 18°C as per the World Health Organization's recommendation for a healthy and comfortable home
- Easy to install – lightweight, flexible and simple design makes the installation fast and easy
- Internationally certified for Indoor Air Quality – gives assurance that products meet strict chemical emissions limits
- Non-combustible – will not easily burn in the event of a fire
- Made from recycled glass making sustainable use of waste



Pink® Batts® Wall Insulation
Product and Installation Guide

Environment

Pink® Batts® insulation is a sustainable and energy efficient product.

- Manufactured using recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months[1]

Green Star NZ Credits

Green Star is a comprehensive environmental rating system for buildings; materials with certain attributes can receive points that contribute to the overall score of a rated home.

New Zealand Green Building Council (NZGBC) does not test or certify products; they rely on the work done by third party certification bodies and eco labels like Eco Choice Aotearoa. Further information is available at **nzgbc.org.nz**.

Eco Choice Aotearoa

All NZ-made Pink® Batts® Wall insulation products have Eco Choice Aotearoa Accreditation (refer to the Product Specifications)

Independently assessed for:

- **Waste Minimisation:** Recycled content, and recycling of process waste
- **Energy Management:** Effective energy management policies and procedures
- **Manufacturing Process:** Not manufactured using blowing agents with a Global Warming Potential (GWP) or Ozone Depleting Potential (ODP)
- **Product Characteristics:** Durability and performance

Eco Choice Aotearoa
Licence No 2504017

While only BRANZ appraised products are eligible for Eco Choice Aotearoa, all Pink® Batts® thermal insulation products are manufactured in the same environmentally considerate way.

1 (Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005)

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Health and Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies the glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'. This is the same classification as caffeine, tea, hair colouring, chlorinated drinking water and saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body

Indoor Air Quality

- Pink® Batts® insulation is certified under the GREENGUARD Certification Program. Being certified for indoor air quality gives an assurance that products meet strict chemical emissions limits (including minimal levels of VOCs and formaldehyde), to help create healthier indoor environments

General Health

- Pink® Batts® insulation will assist in meeting the World Health Organisation recommendation for houses to be maintained at a minimum temperature of 18ºC to provide a healthy and comfortable home
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation[2]

2 Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460

Technical Data

Properties	Result		Test/Method/Standard	Test Results
Combustibility	Non-Combustible	✓	AS/NZS 1530.1:1994	Group Number 1S
Early Fire Hazards		✓	AS/NZS 1530.3:1993 - Ignitability (Range 0-20) - Spread of Flame Index (Range 0-10) - Heat Evolved Index (Range 0-10) - Smoke Developed Index (Range 0-10)	 = 0 = 0 = 0 = 0-1
R-value	Various*	✓	AS/NZS 4859.1:2018	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2018-Glass wool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2018-Glass wool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2018-Glass wool exempt	

* Stated thicknesses are values at which stated R-values are achieved and are likely to be minimum values. See table on Page 1.

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New Zealand Building Code (NZBC) and Limitations

Pink® Batts® wall insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

NZBC Clause H1: Energy Efficiency

Contributes to meeting this requirement

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® wall insulation MUST be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2016: Energy Efficiency-Installing bulk thermal Insulation in Residential Buildings

Pink® Batts® wall insulation should NOT be crushed, folded or compressed.

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in walls will transmit sound readily.
Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

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Installation Instructions

Correct installation with no compression, gaps or folds is critical to ensure Pink® Batts® wall insulation performance is not compromised.

Safety

Each installation is unique so prior to installation check for all hazards that may cause injury:

- Carry out any required repair work before starting installation
- Ensure there's adequate lighting to identify any hazards
- Treat all electrical cables as live, being careful not to cut or expose cables and wires
- Beware of other sharp objects (protruding nails, splinters etc.), pests (bees and wasps), loose boards and pipe work

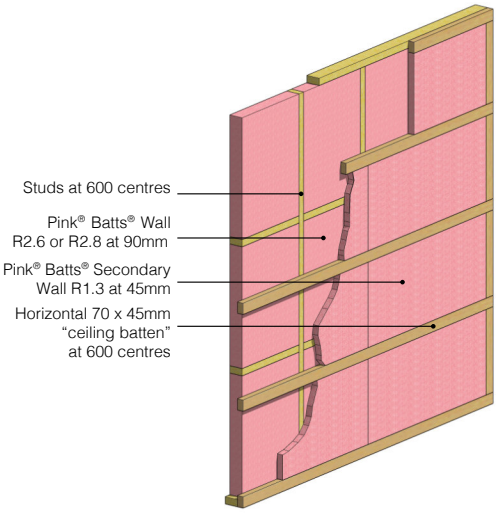
Note: Seek professional advice if you are unsure how best to isolate the hazard or have a professional installer carry out the work on your behalf.

We recommend PinkFit® professional installers. PinkFit® are a nationwide network of professional installers who guarantee that their completed installation will meet the requirements of NZS 4246:2016

For your local PinkFit® installer call **0800 746 534** or visit **pinkbatts.co.nz/installing-pink-batts/**

Secondary Insulation Layer Wall Solution

With industry recognition of the issue of thermal bridging in walls, we have developed a cost-effective solution to significantly reduce heat loss while balancing cost. Our Interior Secondary Insulation Solution (ISIL) is installed to the interior of a 90mm frame between interior battens delivering around 20% more thermal performance as the same thickness of 140mm wall, while also being less expensive, and lighter and safer to transport and stand up on site. The ISIL solution utilizes standard 90mm Pink® Batts® in frame and a purpose manufactured 530mm wide x 45mm thickness R1.3 secondary internal layer, to fit between 70mm wide interior battens at 600 centres, to reduce the thermal bridges from more than 25% down to only around 5%. Better still, testing by GIB® demonstrates that their bracing systems will still perform when installed over the interior battens provided the end studs of each bracing element are also battened vertically; contact us for more details.





Pink® Batts® Wall Insulation
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Installation:

Any slight irritation to exposed skin caused by the fibres in glass wool, or through their inhalation, is harmless and temporary.

However for your comfort while installing, it's recommended you wear:

- Loose fitting work clothes which cover the arms and legs
- Covered shoes
- Dust mask
- Safety glasses

For safety while installing, it's recommended you use:

- Cut resistant gloves (if knife is used)

For an efficient installation, the following tools are recommended:

- Stable working platform
- Knife
- Tape measure

To ensure Pink® Batts® wall insulation performance isn't compromised, use only wall products for installing in wall applications.

- Ensure the product and all cavities are dry
- If cutting is required, cut oversize by 5 mm to ensure a good friction fit
- Ensure there are no gaps, folds or compression of the product to achieve optimal performance
- Fill gaps around windows and doors with off-cuts
- Follow the manufacturer's instructions for minimum clearances from hot inbuilt appliances. If they are unknown, refer to NZS 4246:2016
- Do not cover vents. Insulate around vents to allow unhindered ventilation
- Fit Pink® Batts® insulation tight and close around electrical cables and pipes. It's important to minimise compression, gaps and folds in the insulation. For electrical cables and small diameter pipes, partially cut insulation and place around the cables and pipes
- In new construction, it is recommended that Pink® Batts® insulation is installed once the cladding system is completely installed.

Tip: To verify Building Code Compliance, staple a product label and installer information at an easy to find location away from any hot items such as downlights or water cylinders. An alternative is to supply the information to the building owner or authorised person.

Refer to NZS 4246:2016 for further information related to the correct installation of insulation and clearances.

Retrofitting insulation in external walls without wall underlay/or underlay in poor condition

a) Direct Fixed Cladding

- A recent BRANZ study found that the most reliable mitigation measure for retrofitting insulation to an existing cavity is to include a drainage plane mesh, combined with a synthetic underlay, between the mesh and retrofitted insulation. The most effective way to protect the bottom plate was a strip of kraft paper tucked into the gap between the framing and the back of the cladding. Therefore, prior to installing the insulation, our recommendation is to fit an underlay with a water-repellent drainage plane mesh into the back of the cavity cut to the size of the opening and use the whole framing cavity. For further information please refer to Build 199 – 49 (Dec/Jan 2024).

Since some existing framing is only 95mm depth (or occasionally 90mm depth), the specific insulation product needs to be chosen to match the framing depth and the installation process. For example, with a 90mm frame depth a suitable product would need to have a thickness of 83mm or less to allow the lining to be correctly installed. Therefore, for a 90mm frame Pink® Batts® R2.2 70mm product should be used.

b) Drained Cavity

- The insulation can be the same thickness as the frame.
- The use of horizontal strapping is recommended or fit an underlay with a water-repellent drainage plane mesh (Dupont Tyvek Metal) into the back of the cavity cut to the size of the opening and use the whole framing cavity.

Unlined Walls in Roof Cavities

- Pink® Batts® Wall should be secured in place by using horizontal strapping (max spacing of 300mm).

Pink® Batts® Masonry Wall Insulation

- It is a requirement that an absorbent building paper or a waterproof membrane is placed between the insulation and the concrete. This is not intended to replace the DPC which must still be fixed between strapping and masonry.
- There is high likelihood of interstitial condensation occurring where a 90mm thickness (R2.2 and above) glasswool insulation is installed against a masonry or concrete wall. This is due to the lack of a ventilated external cavity to remove moisture. Therefore, in this situation, the recommended solution is Comfortech® Kooltherm Insulated Plasterboard.

CAUTION: Electrical cables and equipment may overheat and fail when partially or completely covered with bulk thermal insulation.

Storage and Maintenance

Pink® Batts® insulation should be protected from damage and weather. Store undercover in clean, dry conditions.
The installed product should remain dry at all times. If the product becomes wet or damp, the source of dampness (e.g. leak in building) should be repaired and any wet or damp insulation should be removed and replaced with new insulation of an equivalent R-value.

Disposal of bags

Recyclable LLDPE bags are used for packaging of Pink® Batts® insulation.
For further details download the relevant product data sheet from pinkbatts.co.nz

PREFERRED PINK® BATTS® INSTALLERS

BRANZ Appraised
Appraisal No. 238

Eco Choice Aotearoa
Licence No 2504017

AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION

GREENGUARD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

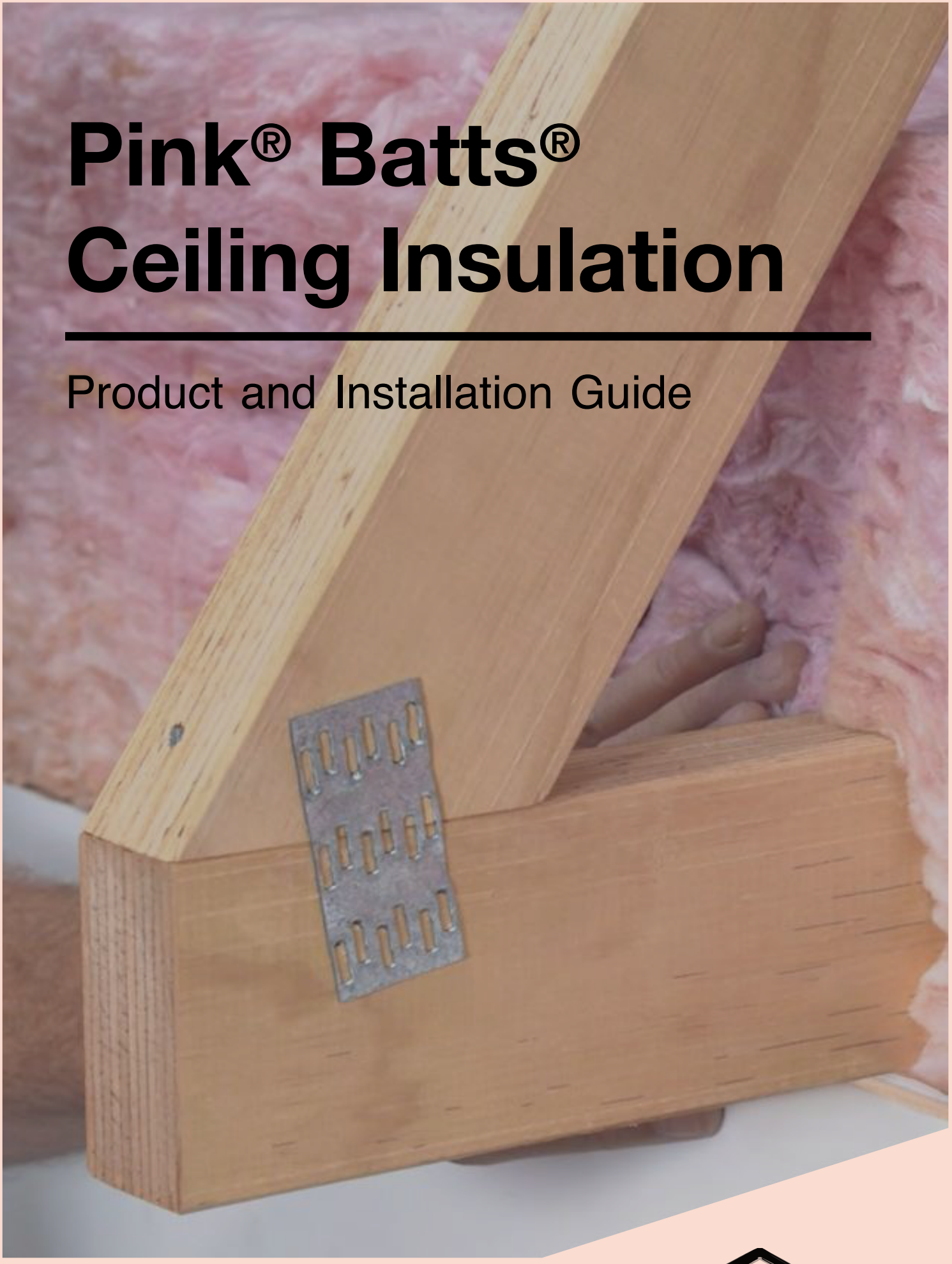
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Quality ISO 9001

pinkbatts.co.nz **0800 746 522**

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9-15 Holloway Place, Penrose, Auckland
January 2026

pink® batts®
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Pink® Batts® Ceiling Insulation

Product and Installation Guide

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Pink® Batts® Ceiling Insulation

Product and Installation Guide

Product Specifications

PRODUCT GLASS WOOL RANGE	Product Code	Size (mm)	Nominal Stabilised Thickness (mm)	Nominal Total Area Per Bale (m^2)	Approx. Coverage Per Bale* (m^2)	Pieces Per Bale	Eco Choice Aotearoa (Environmental Choice)	Environmental Product Declaration	BRANZ Appraisa l Number
ROOF – THERMAL INSULATION									
432mm WIDTH RANGE									
R1.8 Pink® Batts® Ceiling	7110118	1220 x 432	95	13.7	14.4	26	✓	✓	238
R2.2 Pink® Batts® Ceiling	7110122	1220 x 432	115	12.6	13.3	24	✓	✓	238
R2.6 Pink® Batts® Ceiling	7110126	1220 x 432	140	10.5	11.1	20	✓	✓	238
R3.2 Pink® Batts® Ceiling	7110132	1220 x 432	170	8.4	8.8	16	✓	✓	238
R3.6 Pink® Batts® Ceiling	7110136	1220 x 432	180	7.4	7.7	14	✓	✓	238
R4.0 Pink® Batts® Ceiling	7110140	1220 x 432	195	6.3	6.6	12	✓	✓	238
460mm WIDTH RANGE COVERING THE TRUSS CHORD									
R4.5 Pink® Superbatts® Ceiling	7113145	1220 x 460	210	5.6	5.5	10	✓	✓	238
R5.0 Pink® Superbatts® Ceiling	7113150	1220 x 460	225	4.5	4.4	8	✓	✓	238
R6.0 Pink® Superbatts® Ceiling	7113160	1220 x 460	245	3.9	3.8	7	✓	✓	238
R7.0 Pink® Superbatts® Ceiling	7114170	1220 x 460	275	3.9	3.8	7	✓	✓	238
ROOF – DOUBLE LAYER SOLUTION - FIRST LAYER THERMAL INSULATION									
R2.6 Pink® Batts® 110mm Ceiling	7160266	1220 x 432	110	9.5	10	18	✓	✓	238
R3.0 Pink® Batts® 160mm Ceiling	7160265	1220 x 432	160	8.4	8.9	16	✓	✓	238
ROOF – PERIMETER THERMAL INSULATION									
R2.7 Pink® Batts® Perimeter	7160274	1220 x 560	100	8.9	9.5	13	✓	✓	238
ROOF – SKILLION THERMAL INSULATION									
SKILLION 432mm WIDTH RANGE									
R3.2 Pink® Batts® Skillion Roof	7110232	1220 x 432	115	3.7	3.9	7	✓	✓	767
R3.6 Pink® Batts® Skillion Roof	7110236	1220 x 432	165	6.3	6.6	12	✓	✓	767
R4.5 Pink® Batts® Skillion Roof	7110245	1220 x 432	165	3.2	3.3	6	✓	✓	767
R5.0 Pink® Batts® Skillion Roof	7110250	1220 x 432	180	3.2	3.3	6	✓	✓	767
R6.0 Pink® Batts® Skillion Roof	7110260	1220 x 432	230	3.2	3.3	6	✓	✓	767
R7.4 Pink® Batts® Skillion Roof	7110274	1220 x 432	275	2.6	2.8	5	✓	✓	767

* Square metre coverage per bale are estimates and actual coverage may differ.

Pink® Batts® Ceiling Insulation
Product and Installation Guide

Product Specifications

PRODUCT GLASS WOOL RANGE	Product Code	Size (mm)	Nominal Stabilised Thickness (mm)	Nominal Total Area Per Bale (m^2)	Approx. Coverage Per Bale* (m^2)	Pieces Per Bale	Eco Choice Aotearoa (Environmental Choice)	Environmental Product Declaration	BRANZ Appraisa l Number
ROOF – SKILLION THERMAL INSULATION									
SKILLION 560mm WIDTH RANGE									
R5.0 Pink® Superbatts® Skillion Roof	7113250	1220 x 560	180	4.1	4.4	6	✓	✓	767
R6.0 Pink® Superbatts® Skillion Roof	7113260	1220 x 560	230	4.1	4.4	6	✓	✓	767
R7.4 Pink® Superbatts® Skillion Roof	7113274	1220 x 560	275	3.4	3.7	5	✓	✓	767
SKILLION 580mm WIDTH RANGE - SECONDARY INSULATION LAYER SOLUTION									
R1.0 Pink® Superbatts® Skillion Roof	7113210	1220 x 580	40	17.0	17.6	24	✓	✓	767

* Square metre coverage per bale are estimates and actual coverage may differ.

To find out more about our vision for better performing New Zealand homes, visit our H1 Hub at **www.pinkbatts.co.nz**

Our Pink® Superbatts® are at least 25mm wider than our standard Pink® Batts® ceiling range to ensure the truss chord is fully covered

Pink® Batts® Ceiling Insulation
Product and Installation Guide

Application

Pink® Batts® ceiling insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate ceilings in new homes, be retrofitted into existing homes without insulation, or over existing insulation for better performance
- Fit easily into standard ceiling constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- High R-values – R-values up to R7.0 to assist in keeping homes above 18°C as per the World Health Organisation's recommendation for a healthy and comfortable home
- Easy to install – lightweight, flexible and simple design makes the installation fast and easy
- Internationally certified for Indoor Air Quality – gives assurance that products meet strict chemical emissions limits
- Non-combustible – will not easily burn in the event of a fire
- Made from over 80% recycled glass – making sustainable use of waste
- Designed for New Zealand building conditions



Pink® Batts® Ceiling Insulation
Product and Installation Guide

Environment

Pink® Batts® insulation is a sustainable and energy efficient product.

- Manufactured using over 80% recycled glass, making sustainable use of waste
- Manufactured in New Zealand, reducing shipping distances
- Recyclable packaging

Green Star NZ Credits

Green Star is a comprehensive environmental rating system for buildings; materials with certain attributes can receive points that contribute to the overall score of a rated home.

New Zealand Green Building Council (NZGBC) does not test or certify products; they rely on the work done by third party certification bodies and eco labels like Eco Choice Aotearoa. Further information is available at **nzgbc.org.nz**.

Eco Choice Aotearoa

Pink® Batts® ceiling insulation products have Eco Choice Aotearoa Accreditation (refer to Product Specifications on page 1 for accredited products)

Independently assessed for:

- **Waste Minimisation:** Recycled content, and recycling of process waste
- **Energy Management:** Effective energy management policies and procedures
- **Manufacturing Process:** Not manufactured using blowing agents with a Global Warming Potential (GWP) or Ozone Depleting Potential (ODP)
- **Product Characteristics:** Durability and performance

Eco Choice Aotearoa
Licence No 2504017

While only BRANZ appraised products are eligible for Eco Choice Aotearoa, all Pink® Batts® thermal insulation products are manufactured in the same environmentally considerate way.

Pink® Batts® Ceiling Insulation
Product and Installation Guide

Health and Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies the glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'. This is the same classification as caffeine, tea, hair colouring, chlorinated drinking water and saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body

Indoor Air Quality

- Pink® Batts® insulation is certified under the GREENGUARD Certification Program. Being certified for indoor air quality gives an assurance that products meet strict chemical emissions limits (including minimal levels of VOCs and formaldehyde), to help create healthier indoor environments

General Health

- Pink® Batts® insulation will assist in meeting the World Health Organisation recommendation for houses to be maintained at a minimum temperature of 18ºC to provide a healthy and comfortable home

Technical Data

Properties	Result		Test/Method/Standard	Test Results
Combustibility	Non-Combustible	✓	AS/NZS 1530.1:1994	Group Number 1S
Early Fire Hazards		✓	AS/NZS 1530.3:1993 - Ignitability (Range 0-20) - Spread of Flame Index (Range 0-10) - Heat Evolved Index (Range 0-10) - Smoke Developed Index (Range 0-10)	 = 0 = 0 = 0 = 0-1
R-value	Various*	✓	AS/NZS 4859.1:2018	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2018-Glass wool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2018-Glass wool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2018-Glass wool exempt	

* Stated thicknesses are values at which stated R-values are achieved and are likely to be minimum values. See table on page 1.

Pink® Batts® Ceiling Insulation
Product and Installation Guide

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in ceilings and walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

New Zealand Building Code (NZBC) and Limitations

Pink® Batts® ceiling insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

NZBC Clause H1: Energy Efficiency

Contributes to meeting this requirement

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® ceiling insulation MUST be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2016: Energy Efficiency-Installing Bulk Thermal Insulation in Residential Buildings

Pink® Batts® ceiling insulation should NOT be crushed, folded or compressed#.

The exception to this being where edge compression is being utilised to maintain a ventilation pathway at the roof perimeter. Please refer to instructions on Pink® Superbatts® edge compression.

Pink® Batts® Ceiling Insulation
Product and Installation Guide

Installation Instructions

Correct installation with no compression#, gaps or folds is critical to ensure Pink® Batts® ceiling insulation performance is not compromised.

Safety

Each installation is unique so prior to installation check for all hazards that may cause injury:

- Carry out any required repair work before starting installation
- Ensure there's adequate lighting to identify any hazards
- Treat all electrical cables as live, being careful not to cut or expose cables and wires
- Beware of sharp objects (protruding nails, splinters etc.), pests (bees and wasps), loose boards and pipe work
- Avoid installing during the warmest part of the day. The roof cavity temperature can increase to uncomfortable levels
- Do not stand on ceiling lining or ceiling battens

Note: Seek professional advice if you are unsure how best to isolate the hazard or have a professional installer carry out the work on your behalf.

We recommend PinkFit® professional installers. PinkFit® are a nationwide network of professional installers who guarantee that their completed installation will meet the requirements of NZS 4246:2016.

For your local PinkFit® installer call **0800 746 534**



The exception to this being where edge compression is being utilised to maintain a ventilation pathway at the roof perimeter. Please refer to instructions on Pink® Superbatts® edge compression.

Pink® Batts® Ceiling Insulation
Product and Installation Guide

Installation

Any slight irritation to exposed skin caused by the fibres in glass wool, or through their inhalation, is harmless and temporary.

However for your comfort while installing, it's recommended you wear:

- Loose fitting work clothes which cover the arms and legs
- Covered shoes
- Dust mask
- Safety glasses

For safety while installing, it's recommended you use:

- Cut resistant gloves (if knife is used)
- Kneepads (for retrofitting)

For an efficient installation, the following tools are recommended:

- Stable working platform (for new build)
- Kneeling board or planks (for retrofitting)
- Knife
- Tape measure
- Install rod for tight spaces
- Head torch (for retrofitting)

For retrofitting, take into consideration:

- Using planks laid across joists to walk and work on
- Levelling and refitting any existing insulation if required with correct clearances
- Removing any damp insulation
- Starting installation at the point furthest away from the ceiling access hole

To ensure Pink® Batts® ceiling insulation performance isn't compromised, confirm the correct product and R-value is used in ceiling applications.

- Ensure the product is installed dry
- Friction fit product between framing, ensuring there are NO gaps, folds or compression[#] of the product to achieve optimal performance
- If cutting is required, cut oversize by 5-10mm to ensure a good friction fit
- Ensure that Pink® Batts® ceiling segments are firmly butted against each other
- For retrofitting, install over timber where insulation already exists or where appropriate. Any open-air pockets beside joist/truss cord ends at the roof perimeter to be blocked off with insulation off-cuts
- Fit Pink® Batts® insulation beneath electrical wiring and plumbing work. Minimise tucks
- Install to the outer edge of the top plate covering at least 50% of it while ensuring minimal overflow to the eaves
- Maintain a 25mm gap clearance between the Pink® Batts® insulation and any roofing material. If required to maintain 25mm clearance, utilise an insulation guard and edge compression or use a thinner product around the perimeter such as the new Pink® Batts® Perimeter product
- Insulate access hole cover and secure in place with strapping or glue. Remove excess material

Tip: To verify Building Code Compliance, staple a product label at an easy to find location away from any hot items such as down lights or water cylinders e.g. on truss/rafter above ceiling access hole and hot water cupboard.

Note: Pink® Batts® and Pink® Superbatts® ceiling insulation should not be installed in a roof space where foil has been installed as a roof underlay. Refer to NZS 4246:2016 for full details.

[#] The exception to this being where edge compression is being utilised to maintain a ventilation pathway at the roof perimeter. Please refer to instructions on Pink® Superbatts® edge compression.

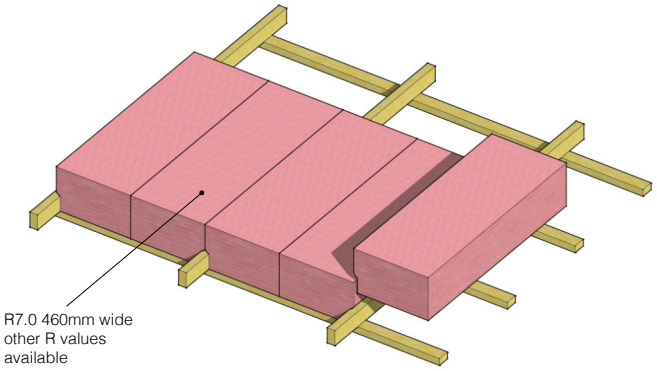
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Product and Installation Guide

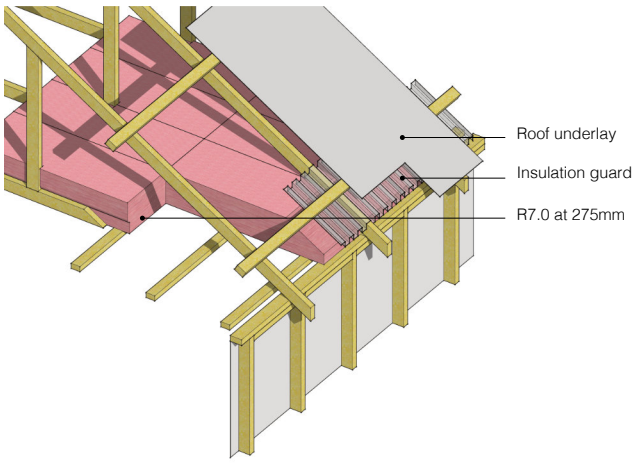
Single Layer Ceiling Solution

Comfortech® have developed a range of single layer Pink® Superbatts® solutions, at a width of 460mm. Segments can now also be ballooned to fit around and over the truss chord to seal the thermal bridge.

- Along with our R7.0 Pink® Superbatts®, as the calculation and modelling methods may determine a lower R-value is required, Comfortech® has a range of other R-values including Pink® Superbatts® R4.5, R5.0, R6.0 at 460mm wide
- Using an insulation barrier at the perimeter ensures contact between the insulation and roof underlay is avoided and a ventilation pathway is maintained. Using an insulation barrier provides a minimum 25mm air space to the roof underlay, using an insulation guard Pink® Superbatts® can be installed on a roof pitch of 18 degrees or above without requiring a raised heel

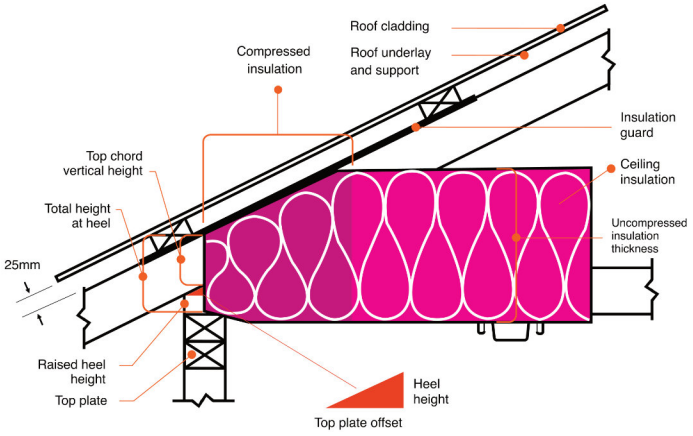
Note: *As an alternative to an insulation guard and edge compression, Comfortech® have developed a Pink® Batts® Perimeter solution that can be used under the H1 6th Edition.* *See more on page 10.*





Clearance at the Roof Perimeter

NZ 4246 requires that a 25mm clearance is maintained between the underside of the roof underlay and the top of the insulation



Double Layer Ceiling Solution

An alternative to our single layer solution, is our double layer solution where a secondary layer is installed between the timber or steel ceiling battens.

The Comfortech® double layer solution uses a:

- First layer of high-density Pink® Batts® insulation that is the combined height of the truss chord and the gap to the top of the ceiling batten. This layer is either 110mm for a 90mm truss chord, or 160mm for a 140mm truss chord
- Second layer of (460mm wide) Pink® Superbatts® insulation, installed at right angles to the first layer
- When the two layers are installed, the thermal bridge is completely closed, and the insulation performs as modelled

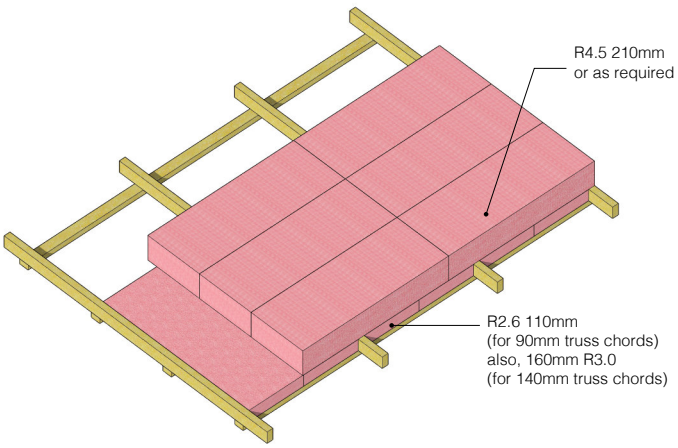
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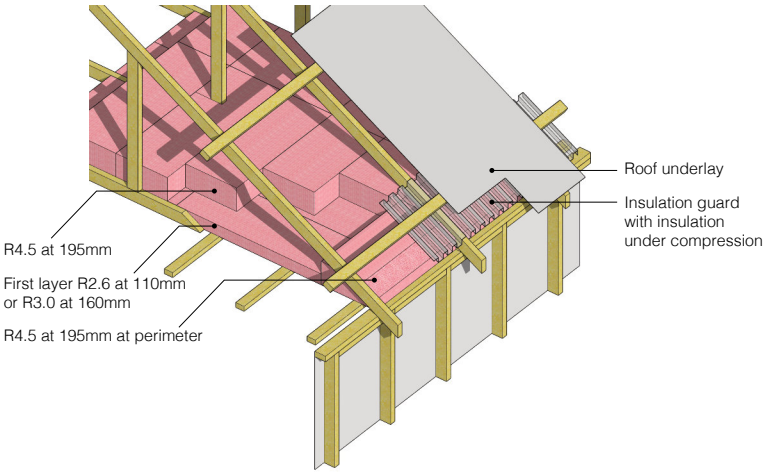
Double Layer Ceiling Installation

- With our two-layer solution, best practice is to install the top layer first, from below, across the truss chords
- The bottom layer is then pushed up under the top, to sit between the truss chords
- At the roof perimeter, the Pink® Superbatts® are designed to be compressed under the insulation guard, with installation to the middle of the top plate required
- Using an insulation guard at the perimeter ensures contact between the insulation and roof underlay is avoided and a ventilation pathway is maintained
- For the two-layer solution, at the perimeter, the bottom layer is stopped short so the last 460mm is the higher R value top layer only; typically R4.5 Pink® Superbatts®
- Pink® Superbatts® can be installed on a roof pitch of 18 degrees or above under perimeter compression over the last 460mm and still achieve the required perimeter R value, eliminating the need for a raised heel. When using Pink® Superbatts® R4.5, the roof pitch can go as low as 15 degrees whilst still achieving the required R value when under compression

Note: *As an alternative to an insulation guard and edge compression, Comfortech® have developed a Pink® Batts® Perimeter segment solution. See Pink® Batts® Perimeter below.*

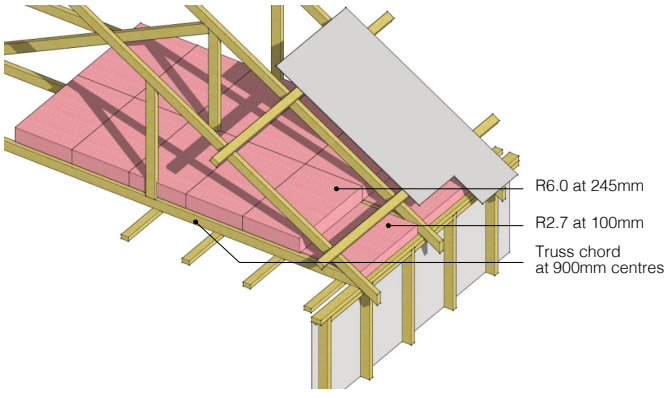
Double Layer Solution





Pink® Batts® Perimeter

With the reduction of the R value requirement for ceilings to a construction R value of R2.6 under the H1 6th Edition, we have released an R2.7 Pink® Batts® Perimeter product at 100mm thickness. Supplied at 560mm wide, our Pink® Batts® Perimeter is designed to cover over at least half of the top plate and extend up to 500mm into the ceiling space at the perimeter. Combined with the 460mm wide Superbatts® ceiling insulation solutions this ensures you can meet the requirements of the H1 6th Edition, while avoiding the need for a raise heel or an insulation guard.



Clearances for Electrical Equipment

Follow the clearances specified by the manufacturer, if they are not known then:

Recessed Luminaire

- CA rated recessed luminaires - None required, can close abut however, do not install insulation on top of the recessed luminaire
- IC rated recessed luminaires - None required, insulation can be installed over the top of the recessed luminaire
- Unmarked - Minimum 100mm

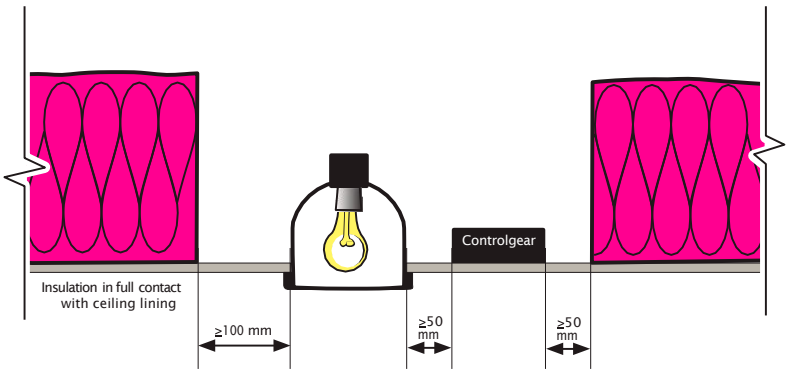
Surface Mounted Luminaire - Minimum clearance 200mm; however it does not apply if the insulation is permanently shielded.

Controlgear

- If possible place it on top of the insulation and leave a minimum clearance of 50mm between controlgear and luminaire
- If not possible to place it on top of the insulation and leave 50mm from the insulation to the controlgear

Controlgear **shall not sink** into the insulation

- Built in appliances - Minimum 50mm
- Enclosures containing electrical equipment - Minimum 50mm
- Fan/heat/light unit - Minimum 100mm
- Ventilation systems - Minimum 50mm
- Unducted mechanical fan units - Minimum 200mm
- Unducted passive vents that remain functional - Minimum 200mm
- Metal chimney and flues - Minimum 75mm
- Brick chimney - Minimum 50mm
- Roof underlay - Minimum 25mm



Unmarked luminaire and controlgear not placed on top of Pink® Batts® ceiling products.

Note: Pink® Batts® ceiling insulation can be installed from below when the ceiling is to be lined or replaced

Joist cover with insulation can be achieved either with two separate layers of insulation or cutting a single thick layer of insulation such that it spills over the top when tightly fitted.

***Caution:** Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail.

For information on how to install Pink® Superbatts® ceiling insulation, please refer to the Pink® Superbatts® Installation Guide.

Pink® Batts® Ceiling Insulation
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Storage and Maintenance

Pink® Batts® and Pink® Superbatts® insulation should be protected from damage and weather. Store undercover in clean, dry conditions. The installed product should remain dry at all times. If the product becomes wet or damp, the source of dampness (e.g. leak in building) should be repaired and any wet or damp insulation should be removed and replaced with new insulation of an equivalent R-value.

Disposal of bags

Recyclable LLDPE bags are used for packaging of Pink® Batts® and Pink® Superbatts® insulation.

For further details download the relevant product data sheet from pinkbatts.co.nz

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9-15 Holloway Place, Penrose, Auckland
March 2026

pink® batts®
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BRANZ Appraised

Appraisal No. 238 [2023]

PINK® BATTS® INSULATION



Appraisal No. 238 (2023)

This Appraisal replaces BRANZ Appraisal No. 238 (2018)

Amended 23 February 2026

BRANZ Appraisals

Technical Assessments of products for building and construction.

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BUILDING PERFORMANCE SOLUTIONS

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WFTAO
WORLD FEDERATION OF TECHNICAL ASSESSMENT ORGANISATIONS

Product

1.1 Pink® Batts® Insulation is a range of resin-bonded, fibrous glasswool thermal insulating material for use in walls, ceilings and roofs of buildings. Pink® Batts® Insulation is pre-cut to suit a range of framing spacings.

Scope

2.1 Pink® Batts® Insulation has been appraised as a thermal insulation material for framed or part-framed walls, ceilings and roofs of domestic and commercial buildings.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Pink® Batts® Insulation, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years and B2.3.1 (b) 15 years. Pink® Batts® Insulation meets these requirements. See Paragraph 8.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. Pink® Batts® Insulation contributes to meeting this requirement. See Paragraphs 13.1 and 13.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Pink® Batts® Insulation meets this requirement.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 (a) and H1.3.2 E. Pink® Batts® Insulation contributes to meeting these requirements. See Paragraphs 14.1 and 14.2.

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.

Technical Specification

4.1 Pink® Batts® Insulation is a resin-bonded, fibrous, glasswool insulation, manufactured from recycled and/or virgin glass and cured urea extended phenolic resin.

4.2 Pink® Batts® Insulation is manufactured in a range of sizes to suit framing centres and cavity depths. Building Insulation Blanket (BIB) is supplied in rolls for commercial applications. Pink® Batts® Insulation is available as set out in Table 1.

Table 1: Pink® Batts® Insulation Product Table

R-value	Length (mm)	Width (mm)	Nominal Thickness (mm)	Density (kg/m³)
Roof - Ceiling Thermal Insulation				
1.8	1,220	432	95	8.3
2.2	1,220	432	115	8.2
2.6	1,220	432	140	7.0
2.6	1,220	432	110	10.5
3.0	1,220	432	160	8.2
3.2	1,220	432	170	6.9
3.6	1,220	432	180	7.2
4.0	1,220	432	195	8.1
4.5	1,220	460	210	8.5
5.0	1,220	460	225	8.9
6.0	1,220	460	245	11.1
7.0	1,220	460	275	11.8
Roof - Building Insulation Blanket (BIB)				
1.2	14,000 or 24,000	1,200	50	12.0
1.8	11,000 or 20,000	1,200	75	12.0
2.4	9,000 or 16,000	1,200	95	12.0
2.6	8,000 or 14,000	1,200	105	12.0
3.2	6,000 or 12,000	1,200	125	12.0
3.6	5,000 or 10,000	1,200	140	12.5
Roof - Perimeter Thermal Insulation				
2.7	1,220	560	100	15.8
Wall - Masonry Insulation				
1.0	1,220	580	40	14.0
1.2	1,220	580	50	12.8
Wall - Interior Secondary Insulation Layer[2]				
1.0[2]	1,220	530	35	22.0
1.3[2]	1,220	530	45	22.0
70 mm Wall Range - Thermal Insulation				
2.2	1,140	560	70	30.0
90 mm Wall Range - Thermal Insulation				
1.8	1,140	560	90	9.1
2.2	1,140	560	90	11.0
2.4	1,140	560	90	13.9
2.6	1,140	560	90	18.0

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.

2.6[1]	1,140	560	90	18.0
2.8	1,140	560	90	25.2
2.8[1]	1,140	560	90	25.5
90 mm Narrow Wall Range - Thermal Insulation				
2.2	1,140	360	90	11.0
2.6	1,140	360	90	18.0
2.8	1,140	360	90	25.2
90 mm Steel Wall Range - Thermal Insulation				
2.2	1,220	610	90	11.0
2.6	1,220	610	90	18.0
2.8	1,220	610	90	25.2
140 mm Wall Range - Thermal Insulation				
3.2	1,140	560	140	9.6
3.6	1,140	560	140	12.4
4.0	1,140	560	140	17.6
4.3	1,140	560	140	28.0
140 mm Narrow Wall Range - Thermal Insulation				
3.2	1,140	360	140	9.6
3.6	1,140	360	140	12.4
4.0	1,140	360	140	17.6
4.3	1,140	360	140	28.0

[1] Pink® Batts® Wall range R2.6 and R2.8 are manufactured by Owens Corning Canada.

[2] Pink® Batts® R1.0 and R1.3 wall products have been assessed as thermal insulation material. The assessment of performance of these when used as a secondary insulation layer for walls specifically impacts on the bracing design of the wall as well as interstitial condensation, these have not been assessed by BRANZ and are outside the scope of this Appraisal.

Note: Customised widths additional to those listed above can be provided by Comfortech Building Performance Solutions. These must be to the same R-value, thickness and density requirements as the products above.

All Pink® Batts® Insulation products covered by this Appraisal and manufactured in New Zealand have the Eco Choice Aotearoa Licence.

4.3 Pink® Batts® Insulation is pink in colour and is baled in polythene bags with labelling in compliance with AS/NZS 4859.1.

4.4 Accessories used with Pink® Batts® Insulation, which are supplied by the insulation installer, are wire netting, plastic strapping and fixings.

Handling and Storage

5.1 Pink® Batts® Insulation must be stored under cover and in dry conditions. Heavy objects must not be stacked on the bales. The bales must be stored in an orientation that avoids excessive compression of the product.

5.2 In general, insulation products are sensitive to the length of time they are stored under compression packaging. Product that does not recover to its nominal thickness may not achieve the stated thermal resistance (R-value).

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.

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Pink® Batts® Thermal Solutions: Product Guide, January 2026.
- Pink® Batts® Ceiling Insulation Installation Product and Installation Guide, January 2026.
- Pink® Batts® Wall Insulation Product and Installation Guide, January 2026.
- Pink® Superbatts® Thermal Solutions: Installation Guide, January 2025.
- Pink® Batts® Building Insulation Blanket (BIB) – Product and Installation Guide, January 2025.

6.2 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 Pink® Batts® Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Pink® Batts® Insulation can be used to meet the requirements of the NZBC Verification Methods H1/VM1, H1/VM2, NZBC Acceptable Solutions H1/AS1 or H1/AS2. Greater construction R-values can be achieved where specific design is used. For construction R-values, refer to the BRANZ House Insulation Guide. Product R-values and dimensions are given in Table 1.

7.2 The R-value of Pink® Batts® Insulation has been determined by testing to AS/NZS 4859.1.

7.3 Pink® Batts® Insulation is designed to be friction-fitted between wall, ceiling or roof framing. It can also be laid directly on a ceiling lining, over ceiling battens or over joists/truss chords. In other horizontal situations, the insulation must be adequately supported by galvanised wire netting or some other suitable durable material.

7.4 When insulation is installed in a double layer over new or existing insulation, the possibility of compression of the bottom layer must be avoided, or reduction of R-values for the bottom layer of the formed system must be taken into account.

7.5 For new and existing buildings, the R4.5, R5.0, R6.0 and R7.0 Pink® Superbatts® ceiling products are designed to be notched around timber framing and to form a uniform layer above the timber framing, between and on the top of the truss chords.

7.6 At the roof perimeter, Pink® Batts® Insulation is designed to be compressed rather than cut. To achieve the required construction R-value of R3.3 at the ceiling perimeter, a minimum product R-value of R3.5 and a minimum 115 mm height is required at the midpoint of the top plate to the underside of the insulation guard, to accommodate the compressed insulation. The Pink® Superbatts® range all exceed this product R-value requirement under compression with a 115 mm heel. If the roof slope is less than 20° and the height is less than 115 mm, a raised heel will be required.

7.7 Where the insulation is installed in exterior walls, the nominal thickness of the insulation material must be selected to provide a snug close fit which touches all sides of the insulation cavity between the wall underlay and the interior wall lining.

7.8 Where the insulation is retrofitted in external walls without a wall underlay, and with direct-fixed claddings, the insulation must be at least 20 mm thinner than the framing to allow a gap of at least 20 mm between the insulation and the wall cladding. Horizontal straps must be stapled into the sides of the wall studs at 300 mm centres maximum as support before the insulation is installed. Refer also to NZS 4246.

7.9 When the insulation is installed in a wall with a drained cavity, it is recommended that specific wall products with a controlled nominal thickness be used. Where the stud spacings are greater than 450 mm, an intermediate means of restraining the insulation from bulging into the cavity must be installed in accordance with NZBC Acceptable Solution E2/AS1.

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.

7.10 Building Insulation Blanket (BIB) products are designed specifically for commercial roof and commercial wall applications. In residential applications, installation must be completed in accordance with NZS 4246.

7.11 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.

7.12 The clearance requirements for heating appliances and downlights must be met, and reference made to the manufacturer's instructions and NZS 4246.

Durability

Serviceable Life

8.1 Where the building is maintained so that the provisions of NZBC Clauses E2 and E3 are met, and where the insulation is not crushed or exposed to conditions that will diminish its thermal performance (e.g. moisture), Pink® Batts® Insulation can be expected to have a serviceable life of at least 50 years.

Maintenance

9.1 Insulation that has become damp must be removed and the cause of dampness repaired. Cavities must be clean and dry before fitting new insulation of an equivalent thermal rating. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.

Prevention of Fire Occurring

10.1 Pink® Batts® Insulation is classified a non-combustible material and need not be separated from heat sources such as fireplaces, heating appliances and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated or protected from heat sources. NZBC Acceptable Solutions C/AS1 and C/AS2 provide methods for separation and protection of combustible materials from heat sources.

Downlights

10.2 Insulation should maintain 100 mm clearance from all undefined recessed luminaires, treating them as a heat source. For insulation to abut or cover recessed luminaires, these must be clearly marked as being suitable for having insulation abutting and covering them, and have been installed in accordance with NZBC Acceptable Solution G9/AS1.

Fire Affecting Areas Beyond the Fire Source

Control of Internal Fire and Smoke Spread

11.1 Pink® Batts® Insulation products have been tested to AS 1530.1 and are classified as non-combustible. Pink® Batts® Insulation can be assigned a Group Number of 1-S. Refer to NZBC Acceptable Solutions C/AS1 and C/AS2 to determine where Pink® Batts® Insulation may be used according to its Group Number.

11.2 Pink® Batts® Insulation may or may not need to be enclosed by an internal lining depending on the Risk Group. The NZBC Building Product Specifications provides specified performances (Group Number) for some generic substrate and coating combinations, including concrete, sheet metal, fibre cement, gypsum plasterboard and wood substrates.

External Moisture

12.1 The total building envelope must be weathertight and comply with the requirements of NZBC Clause E2 to ensure that the insulation remains dry in use.

12.2 The moisture content of the construction materials at the time of installing and enclosing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1 or a lower moisture content if required by the lining manufacturer.

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.

Internal Moisture

13.1 Buildings must provide an adequate combination of thermal resistance, ventilation and space temperature to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate. This does not apply to Communal Non-residential, Commercial, Industrial, Outbuildings or Ancillary buildings.

13.2 NZBC Acceptable Solution E3/AS1 provides an Acceptable Solution for compliance with internal moisture requirements and details on minimum ventilation and wall and ceiling insulation levels to meet these requirements.

Energy Efficiency

14.1 Pink® Batts® Insulation will contribute to meeting the requirements of NZBC Clause H1, Performance H1.3.1 (a) and H1.3.2 E, by compliance with NZBC Verification Methods H1/VM1, H1/VM2, NZBC Acceptable Solutions H1/AS1 or H1/AS2. Refer to Paragraphs 7.1-7.9.

14.2 Pink® Batts® Insulation R-values have been determined by testing to AS/NZS 4859.1 and are given in Table 1.

Installation Information

Installation Skill Level Requirement

15.1 All design and building work must be carried out in accordance with the Pink® Batts® Insulation Technical Literature and this Appraisal. All building work must be undertaken by competent and experienced tradespeople conversant with Pink® Batts® Insulation.

General

16.1 Installation of Pink® Batts® Insulation must be in accordance with the Technical Literature and this Appraisal. NZS 4246 should be used as a guide for installing insulation in residential buildings.

16.2 The product must be installed only when the building is enclosed and when the construction materials have achieved the required maximum moisture content or less.

16.3 Pink® Batts® Insulation must be released from the packaging and allowed to re-loft prior to installation. The time to loft will depend upon the length of time the product has been packaged and stored.

16.4 Pink® Batts® Insulation is supplied in segment and blanket form (see Table 1) to suit framing layouts. The product is able to be cut to suit wall cavities and when fitted between roof or ceiling framing. The insulation must be neatly friction-fitted between framing members so that the potential for gaps and convective heat loss is reduced. In wall cavities, the insulation must be neatly friction-fitted between framing members to prevent sagging. In ceiling or roofs, the insulation may be fitted between framing members or fitted over framing members and butted tightly. The insulation must extend to the external wall top plate. The insulation must not be folded or compressed. A close even fit provides the most efficient thermal performance. Whenever possible, the insulation should be fitted beneath wiring or plumbing.

16.5 The clearance requirements for heating appliances and downlights must be followed. Refer also to NZS 4246.

Inspections

16.6 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of Pink® Batts® Insulation installations.

Health and Safety

17.1 Refer to the Technical Literature and NZS 4246 for guidance on health and safety requirements such as personal protective clothing and installation hazard assessment.

Basis of Appraisal

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.

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

Tests

18.1 Thermal resistance testing of Pink® Batts Insulation in accordance with AS/NZS 4859.1 has been completed. The results have been reviewed by BRANZ technical experts.

18.2 Tests have been carried out in accordance with AS 1530.1. Pink® Batts® Insulation is not deemed combustible according to the test criteria. The results have been reviewed by BRANZ technical experts.

Other Investigations

19.1 An assessment of the durability of Pink® Batts® Insulation has been made by BRANZ technical experts.

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

Quality

20.1 The manufacture of Pink® Batts® Insulation has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes, and quality and composition of the raw materials used were obtained and found to be satisfactory.

20.2 The range of Pink® Batts® Insulation products have been assessed for their environmental impact by The New Zealand Ecolabelling Trust and comply with the requirements of the Eco Choice Aotearoa Specification, Licence No. 2504017 - Building Insulants. The products that have the Eco Choice Aotearoa Licence are noted in Table 1.

20.3 Comfortech Building Performance Solutions are responsible for the quality of the product supplied.

20.4 Quality of installation of the product on-site is the responsibility of the installer.

20.5 Quality of maintenance of the building to ensure the insulation material remains dry is the responsibility of the building owner.

Sources of Information

- AS 1530.1:1994 Combustibility test for materials.
- AS/NZS 4859.1:2018 Thermal insulation materials for buildings.
- BRANZ House Insulation Guide [Sixth Edition].
- NZS 4246:2016 Energy efficiency - Installing bulk thermal insulation in residential buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 12 August 2024

This Appraisal has been amended to update Table 1.

Amendment No. 2, dated 04 November 2024

This Appraisal has been amended to update product specifications in Table 1 for products R5.0 ceiling, R6.0 ceiling, R7.0 ceiling and R2.4 wall.

Amendment No. 3, dated 21 January 2026

This Appraisal has been amended to update the Product Range in Table 1, update the Technical Literature referenced and to reflect the changes made to the NZBC compliance documentation.

Amendment No. 4, dated 23 February 2026

This Appraisal has been amended to update the Product Range in Table 1 and to update the Technical Literature referenced.

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.

BRANZ

In the opinion of BRANZ, Pink® Batts® Insulation 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 Tasman Insulation New Zealand Ltd (t/a Comfortech Building Performance Solutions), 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. Tasman Insulation New Zealand Ltd (t/a Comfortech Building Performance Solutions):
   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 quality of work;
   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 Tasman Insulation New Zealand Ltd (t/a Comfortech Building Performance Solutions).
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 Tasman Insulation New Zealand Ltd (t/a Comfortech Building Performance Solutions) or any third party.

For BRANZ



Claire Falck
Chief Executive

Date of Issue:
30 October 2023

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.

BRANZ Appraised

Appraisal No. 967 [2019]

FIRTH TWO STOREY MASONRY VENEER SOLUTIONS



Appraisal No. 967 (2019)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Firth Two Storey Masonry Veneer Solutions is a concrete brick veneer cladding system specifically for use on two storey buildings.

Scope

2.1 Firth Two Storey Masonry Veneer Solutions has been appraised for use as a veneer cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 in terms of floor area, with a maximum of two stories; and,
- with a maximum height of brick veneer of 7.5 m above the supporting foundation, except that at gable ends and some piers this height may be up to 10.0 m, and a maximum height of 4.0 m above a roof line; and,
- with a depth of cavity of between 40 mm and 75 mm; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- with timber framing constructed on slab-on-ground in accordance with NZS 3604 and/or concrete masonry foundation constructed in accordance with NZS 4229; and,
- situated in NZS 3604 Wind Zones up to and including Very High.

2.2 Firth Two Storey Masonry Veneer Solutions is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *[The Appraisal of Firth Two Storey Masonry Veneer Solutions relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone].*

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.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Firth Two Storey Masonry Veneer Solutions 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. Firth Two Storey Masonry Veneer Solutions meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep and shrinkage [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraph 8.1 - 8.11.

Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years. The structural support elements and hidden flashings meet this requirement. Performance B2.3.1 (b), 15 years. Firth Two Storey Masonry Veneer Solutions meets these requirements. See Paragraph 9.1 - 9.4.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Firth Two Storey Masonry Veneer Solutions meets this requirement. See Paragraph 13.1 - 13.4.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Firth Two Storey Masonry Veneer Solutions meet this requirement and will not present a health hazard to people.

Technical Specification

Concrete Bricks

4.1 System components and accessories supplied by Firth Industries for the Firth Two Storey Masonry Veneer Solutions are:

- **Manorstone** are 90 mm thick and are supplied 390 mm long and 190 mm high. The Manorstone Veneer bricks are available as either straight edge or rumbled finished.
- **Devonstone** are 70 mm thick and are supplied 290 mm long and 160 mm high. The Devonstone Veneer bricks are available as either straight edge or rumbled finished.
- **10 Series** are 90 mm thick and are supplied 390 mm long and 190 mm high or 390 mm long and 90 mm high. The 10 Series Veneer bricks are available with a straight edge finish.
- **Focus** are 75 mm thick and are supplied 230 mm long and 90 mm high. The Focus Veneer bricks are available with a straight edge finish.
- **Strata** are 70 mm thick and are supplied 290 mm long and 75 mm high. The Strata Veneer bricks are available with a straight edge finish.

4.2 The Firth Concrete Bricks are manufactured in compliance with NZS 4210.

Accessories

4.3 Accessories and materials used with the Firth Two Storey Masonry Veneer Solutions that are supplied by the bricklayer or builder are:

- **Mortar** - Dricon bagged products with a mortar strength of 12.5 MPa at 28 days in accordance with NZS 4210.
- **Metal brick ties and screw fixings** - complying with AS/NZS 2699.1.
- **Steel lintels** - steel lintels complying with AS/NZS 2699.3 and NZBC Acceptable Solution E2/AS1 Paragraph 9.2.9.
- **Steel shelf angles** - 100 x 75 x 6 mm and 125 x 75 x 6 mm steel shelf angles complying with AS/NZS 2699.3 and NZBC Acceptable Solution E2/AS1 Paragraph 9.2.9.
- **Flashing** - butyl rubber or bituminous flashings complying with either NZBC Acceptable Solution E2/AS1 Paragraph 4.3.9 or Paragraph 4.3.10. (Coated or galvanised steel flashings are not suitable for this application.)
- **Sill, head and jamb flashings** - complying with NZBC Acceptable Solution E2/AS1 Paragraph 9.2.4.
- **Coach screws** - 75 x 12 mm or 75 x 16 mm hot dipped galvanised complying with NZS 3604 for fixing to timber studs.
- **Bricklock** - a galvanised double wire used as reinforcing in mortar joints.

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.

- **Wall underlay** - wall underlay 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 sill and jamb flashing tapes** - 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.
- **Joinery head flashings** - folded from aluminium or galvanised steel to suit window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for material selection and durability requirements.
- **Window and door trim cavity air seals** - 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 for use around window, door and other wall penetration openings.

Packaging, Handling and Storage

5.1 Bricks are packaged in plastic and delivered on pallets. They must be handled with care to avoid physical damage, particularly to corners and edges, and must be stored so that they are protected from the weather.

5.2 Components such as brick ties, lintels and shelf angles must be handled so as to avoid damage. They must also be stored in dry locations protected from the weather.

5.3 Pre-bagged and pre-mixed mortar must be stored in dry locations protected from the weather.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ Website for details of the current Technical Literature for Firth Two Storey Masonry Veneer Solutions. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 Firth Two Storey Masonry Veneer Solutions allows brick veneer cladding to be erected to a height greater than that specified by NZS 3604 and NZBC Acceptable Solution E2/AS1, Section 9.2.

7.2 This system also allows the use of veneer supported above roof lines on horizontal steel shelf angles.

7.3 The system and Technical Literature apply for use only with brick type and thicknesses as given in Paragraph 4.1. The bricks come in a range of colour tones and finishes and are not intended to be further finished.

7.4 The system is designed for use with a veneer cavity of between 40 mm and 75 mm.

Structure

Foundations

8.1 Foundation systems supporting the veneer must consist of concrete slab-on-ground systems complying with either NZS 3604 or NZS 4229, or to specific engineering design.

8.2 Where the building under consideration is to be built on expansive soils (as defined by AS 2870), control joints may be necessary, and the advice of a design professional should be obtained.

Framing

8.3 The system can be used as a masonry veneer cladding for timber framed buildings complying with NZS 3604, or for buildings to specific design in accordance with AS/NZS 1170 and NZS 3603. Beams outside the scope of NZS 3604 must be to a specific design.

8.4 All framing timber, including studs, floor joists and lintels must be kiln dried to a maximum of 18% moisture content.

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.

8.5 Walls to which the veneer is attached must be constructed from 90 x 45 mm minimum, SG8 minimum, timber framing. Studs must be at maximum 400 mm centres, where they are supporting shelf angles.

8.6 The maximum span of any external opening where the veneer is supported over the opening must be in accordance with the lintel tables in the Technical Literature.

Timber Treatment

8.7 Timber wall framing behind the Firth Two Storey Masonry Veneer Solutions must be treated as required by NZBC Acceptable Solution B2/AS1.

Veneer Height

8.8 The maximum permitted height of veneer for the Firth Two Storey Masonry Veneer Solutions is 7.5 m above its foundation support, except that at gable ends and some piers this height may be up to 10.0 m. Where veneer is above roofs, the maximum permitted height is 4.0 m above the veneer roof-line support, or 7.5 above an adjacent building foundation, whichever is the lesser.

Wall Bracing Requirements

8.9 Bracing demand requirements of walls may be calculated by using Tables 5.10 and 14.3 as applicable for the floor load in NZS 3604.

Mass

8.10 For structural design purposes, the 90 mm thick Manorstone Veneer is 148 - 165 kg/m^2; the 70 mm thick Devonstone Veneer is 125 - 133 kg/m^2; the 90 mm thick 10 Series Veneer is 148 - 165 kg/m^2, the Focus Veneer is 158-193 kg/m^2; and the Strata Veneer is 125-133 kg/m^2. Firth Two Story Masonry Veneer Solutions is considered a heavy wall cladding in terms of NZS 3604.

Steel Lintel Angles

8.11 Lintel angle sizes and details for above windows and doors are given in the Technical Literature.

Durability

Serviceable Life

9.1 Firth Two Storey Masonry Veneer Solutions is expected to have a serviceable life of at least 50 years provided the system is maintained in accordance with this Appraisal and the Technical Literature.

9.2 Brick veneer ties, must meet the durability requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.2.7.1.

9.3 Flashings must comply with NZBC Acceptable Solution E2/AS1, Paragraph 9.2.4.

9.4 Lintels and shelf angles must meet the durability requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.2.9.

Maintenance

10.1 Regular maintenance is essential to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.

10.2 Firth Two Storey Masonry Veneer Solutions should be inspected at least annually. Weep holes must be kept clear of dust, dirt, spider webs and the like to ensure that moisture can continue to drain from the cavity.

10.3 Where bricks or mortars are cracked, the cause must be determined (this may require a structural engineer's assessment) and repairs must be carried out to restore the cladding.

Prevention of Fire Occurring

11.1 Firth Two Storey Masonry Veneers are considered non-combustible and need not be separated from heat sources such as fire places, heating appliances, flues and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from fire places, heating appliances, flues and chimneys in accordance with the requirements of Part 7 of NZBC Acceptable Solutions C/AS1, and C/AS2 and NZBC Verification Method C/VM1.

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.

Control of External Fire Spread

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 The Firth Two Storey Masonry Veneers are composed entirely of concrete brick and are therefore defined as non-combustible, as per NZBC Acceptable Solution C/AS2 Definitions. When the Firth Two Storey Masonry Veneers are uncoated or have a directly applied surface finish of no more than 1 mm in thickness, they can be used within 1 m of the relevant boundary. This meets the requirements of Paragraph 5.4 of NZBC Acceptable Solution C/AS1 and Paragraph 5.8.2 a) of NZBC Acceptable Solution C/AS2.

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.

External Moisture

13.1 Firth Two Storey Masonry Veneer Solutions, when installed in accordance with this Appraisal and the Technical Literature on buildings with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2, prevents the penetration of moisture that could cause undue dampness or damage to building elements.

13.2 Weathertightness details are specifically designed on a project by project basis. At a minimum all flashing overlap dimension and clearances must be at least that given in NZBC Acceptable Solution E2/AS1.

13.3 Weathertightness details for masonry veneer are given in NZBC Acceptable Solution E2/AS1, Paragraph 9.2 and SNZ HB 4236. The ingress of moisture must be excluded by detailing joinery and wall interfaces and in the Technical Literature. Details for sloping shelf angle are not included and are outside the scope of this Appraisal. 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.

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

13.5 Firth Two Storey Masonry Veneer Solutions allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet compliance with NZBC Clause E2.3.6.

Installation Information

Installation Skill Level Requirement

14.1 Installation must always be carried out in accordance with Firth Two Storey Masonry Veneer Solutions Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

System Installation

General

15.1 The guidelines and requirements for masonry veneer wall cladding given in SNZ HB 4236 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.

Wall Underlay and Tape Installation

15.2 The wall underlay and flashing tape system must be installed by the building contractor in accordance with the underlay and flashing tape manufacturer's instructions prior to the installation of the concrete bricks. Particular attention must be paid to the installation of the wall underlay and sill and jamb junction and head and jamb junction tapes around the window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

Aluminium Joinery Installation

15.3 Adequate weather protection must be provided around door and window frames. Aluminium joinery must be installed so that a cover to the brick veneer of approximately 10 – 20 mm is provided when measured from the back of the brick to the front of the joinery flange.

15.4 Aluminium joinery must have a 7.5 mm nominal gap 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.

15.5 Head flashings must be provided at all openings of the brick veneer cladding. Jambs must be flashed with the likes of a DPC flashing material attached to the opening stud over the building underlay and folded around into the back of the joinery flange. The jamb flashing material must overlay in front of the sill flashings upstands. Sill flashings must be provided in the veneer cavity under all openings. See Paragraphs 13.2 and 13.3.

Concrete Brick Installation

15.6 Bricks should always be kept covered so that they are laid dry.

15.7 Bricks must not be stack bonded and must be at least quarter bonded.

15.8 Mortar joints thickness must be 10 mm ±3 mm in accordance with NZS 4210. Joints may be raked to a maximum depth of 6 mm and shall be tooled to provide a hard smooth surface to reduce water absorption.

15.9 Mortar must be prepared in accordance with the instructions of Dricon to meet the 12.5 MPa requirement.

15.10 Drainage and ventilation holes must be provided in the bottom and top courses of brick work including over shelf angles.

Brick Tie Installation

15.11 Brick ties must be screw fixed to the framing at the spacings given in the Technical Literature, and must angle down from the framing toward to the brick veneer at 5° slope.

15.12 Brick ties must be embedded and attached as given in the Technical Literature and NZS 4210.

15.13 During and after brick veneer installation it is recommended that, if possible, internal linings be attached to timber frames by screwing rather than nailing in order to avoid vibration to the cladding that could produce hairline cracks in the mortar.

Brick Veneer Above Roof Lines Support Installation

15.14 The brick veneer above roof line support should not be installed until the veneer below has reached it full height so that the veneer is correctly aligned.

15.15 Where a steel shelf angle is to be fixed above a roof, it is recommended that temporary timber blocks be cut to the slope of the rafter below and the correct height, then tack nailed to provide temporary support until the steel angle is permanently fixed. The angle is then fixed to the studs at 400 mm maximum centres with 75 x 12 mm or 75 x 16 mm hot dipped galvanised coach screws. The shelf angles and coach screw sizes are given in the Technical Literature. These depend on the brick selected and the height of the veneer.

15.16 Steel angles should be ordered from the fabricator and clearly marked so that their location is uniquely identified. Holes should be drilled 25 mm down from the top of the vertical flange, sharp edges filed and the bare metal surfaces of galvanised steel angles painted with two coats of zinc rich primer. For quality, drilling and painting is best carried out in a fabricator's workshop.

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.

15.17 When fixing steel angles to the framing pilot holes must first be drilled in the studs to take the coach screws.

15.18 Horizontal laps in the waterproofing flashing must be sealed and waterproof.

15.19 A flashing must be provided behind the shelf angle which flashes over the roof.

Inspections

15.20 The documents as referenced in Paragraph 13.3 must be referred to during the inspection of the Firth Two Storey Masonry Veneer Solutions installations by building consent authorities and territorial authorities. Flashing installation is a critical point of inspection.

Health and Safety

16.1 Cutting of concrete bricks with power tools should be carried out in well ventilated areas, and a dusk mask and eye protection should be worn.

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:

- BRANZ expert opinion on NZBC Clause E2 code compliance of the Firth Two Storey Masonry Veneer Solutions was based on evaluation of details within the scope and stated within this Appraisal. Testing of the Firth Two Storey Masonry Veneer Solutions to NZBC E2/VM1 was also carried out.
- BRANZ has carried out bond wrench testing in accordance with NZS 4210.

Other Investigations

18.1 Assessment has been made of the structural aspects and durability of the system and opinions given by BRANZ technical experts.

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

18.3 Site inspections were carried out by BRANZ to assess methods used for construction of the Firth Two Storey Masonry Veneer Solutions and to inspect completed systems.

Quality

19.1 The manufacture of concrete bricks by Firth Industries has been examined by BRANZ, and details of the quality and composition of the materials used were obtained and found to be satisfactory.

19.2 The quality of materials, components, and accessories supplied by Firth Industries are the responsibility of Firth Industries. The quality control system of Firth Industries has been assessed and registered as meeting the requirements of ISO 9001.

19.3 Quality on site for construction of the Firth Two Storey Masonry Veneer Solutions is the responsibility of the installers.

19.4 Building owners are responsible for the maintenance of the Firth Two Storey Masonry Veneer Solutions in accordance with Firth instructions.

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.

Sources of Information

- AS 2870: 2011 Residential slabs and footings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2699.1: 2000 Built-in components for masonry construction - Wall ties.
- AS/NZS 2699.3: 2002 Built-in components for masonry construction - Lintels and shelf angles [durability requirements].
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4210: 2001 Masonry construction: Materials and workmanship.
- NZS 4211: 2008 Specification for performance of windows.
- NZS 4229: 2013 Concrete masonry buildings not requiring specific engineering design.
- SNZ HB 4236: 2002 Masonry veneer wall cladding.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

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.

BRANZ

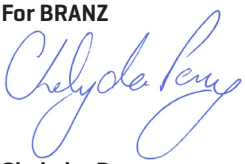
In the opinion of BRANZ, Firth Two Storey Masonry Veneer Solutions is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Firth Industries, 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. Firth Industries:
   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 Firth Industries.
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 Firth Industries or any third party.

For BRANZ



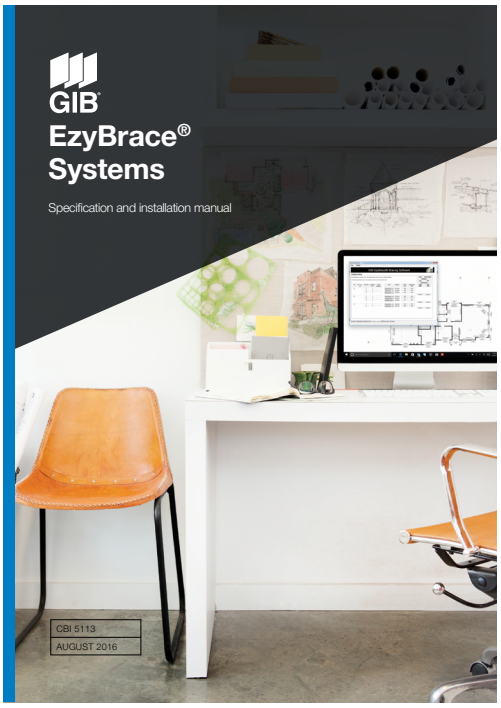
Chelydra Percy
Chief Executive

Date of Issue:
6 September 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.

BRANZ Appraised
Appraisal No. 928 [2021]

GIB EZYBRACE® SYSTEMS



Appraisal No. 928 (2021)

This Appraisal replaces BRANZ Appraisal No. 928 [2016]

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

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

Scope

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

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, GIB EzyBrace® Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GIB EzyBrace® Systems meet the requirements for loads arising from self-weight, earthquake, wind and impact [i.e. B1.3.3 (a), (f), (h) and (j)]. See Paragraphs 8.1-8.10.

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

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

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.

Technical Specification

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

GIB® plasterboards

- **GIB® Standard** - GIB® Standard plasterboard is a paper-bound, fibreglass reinforced gypsum-plaster core sheet lining material. GIB® Standard plasterboard is available in 10 mm and 13 mm thicknesses and a sheet width of 1,200 mm and 1,350 mm (GIB® Wideline). The sheets have a taper on the two long sheet edges. The 10 mm thick sheets are also available with a square edge. Sheets are available in various lengths from 2,400 mm to 6,000 mm. The nominal sheet weight is 6.5 kg/m² for 10 mm thick sheets and 8.5 kg/m² for 13 mm thick sheets. GIB® Standard plasterboard face paper is a light buff colour.
- **GIB Braceline®** - GIB Braceline® is a high-density fibreglass reinforced, paper-bound gypsum-plaster core sheet lining material. GIB Braceline® is available in 10 mm and 13 mm thicknesses. The sheets have a taper on the two long sheet edges. GIB Braceline® has a sheet width of 1,200 mm and 1,350 mm, and is available in lengths of 2,400 mm, 2,700 mm, 3,000 mm, 3,600 mm and 4,800 mm. The nominal sheet weight is 9 kg/m² for 10 mm thick sheets and 12.5 kg/m² for 13 mm thick sheets. GIB Braceline® face paper is light blue in colour.
- **Alternative GIB® plasterboards** - in certain situations, as specified in the Technical Literature, substitution is permitted with GIB Aqualine®, GIB Fyreline®, GIB Toughline® and GIB Ultraline®.

Components and Accessories

- **GIB® Accessories and GIB® Jointing Compounds** - as specified in the GIB® Site Guide Technical Literature.
- Fasteners
  - **GIB Grabber® High Thread Screws for fixing directly to timber** – 32 mm x 6 g.
  - **GIB Nail** – 30 x 2.8 mm.
  - **GIB Grabber® screws for fixing to light gauge steel battens** – 32 mm x 6 g.
- Adhesive and Sealants
  - **GIBFix® One** – an off-white acrylic adhesive supplied in 375 ml cartridges and 600 ml sausages.
  - **GIBFix® All-Bond** – a green solvent-based adhesive supplied in 375 ml cartridges and 600 ml sausages.
- GIBFix® Framing Components
  - **GIBFix® Angle** – 45 x 45 x 0.55 mm galvanised steel angle with a knurled surface. Supplied in lengths of 2.4 m and 2.7 m.
  - **GIB Grabber® Dual Thread Screws for fixing to timber through GIBFix® Angle** – 32 mm x 7 g needle-point screw with coarse thread lower section and fine thread upper section.
- Fasteners, Anchors and Connections
  - **GIB® HandiBrac®** – a one-piece, 2 mm thick, galvanised steel angle bracket approximately 95 mm high, 65 mm long and 54 mm wide. The bracket is supplied with five Type 17 screws, 14 g x 35 mm.
  - **BOWMAC® screw bolt** – M10 x 140 mm screw anchor, with a blue painted hex head.
  - **Coach screws** – 12 mm x 150 mm and 50 x 50 x 3 mm washer, hot-dip galvanised for fixing to timber floors.
  - **Cast-in bolts** – M12 x 150 mm minimum and 50 x 50 x 3 mm washers for fixing to concrete floors.
  - **Shot-fired fasteners** – minimum 75 mm x 3.8 mm with 16 mm discs for fixing GS1-N, GS2-N and GS2-NOM internal line bracing elements to concrete slabs.
  - **Galvanised or stainless steel strap** – 25 x 0.9 mm top and bottom plate connections.
  - **Strap fixings** – 30 x 2.5 mm hot-dip galvanised or stainless steel flat head nails. *(Note: For corrosion protection requirements, refer to NZS 3604, Section 4.)*

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.

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

Handling and Storage

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

5.2 All accessories must be kept dry.

Technical Literature

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

Design Information

General

7.1 NZS 3604 provides methods to distribute the bracing elements in walls to resist forces. The use of ceiling diaphragms is defined in the Technical Literature.

7.2 GIB EzyBrace® Systems are for use in dry, internal situations only.

7.3 GIB EzyBrace® Systems must not be exposed to temperatures of 52°C or greater for prolonged periods. Refer to appliance and fitting manufacturers for installation details.

GIB EzyBrace® Bracing Software

7.4 The GIB EzyBrace® Bracing Software contains design procedures and an electronic calculation method for bracing demand calculated in accordance with NZS 3604, Section 5. Floor loadings can be selected in accordance with either NZS 3604, Bracing Demand Tables 5.5–5.10 for 2 kPa floor loads or less, or Tables 14.1–14.3 for 3 kPa floor loads.

7.5 The bracing demand calculations contained in the GIB EzyBrace® Bracing Software are based on first principles engineering and calculate wind and earthquake demand, based on the building parameters entered. Resulting bracing demand calculations are project specific and can differ from values derived using NZS 3604 wind and earthquake demand tables. The GIB EzyBrace® Bracing Software has been assessed as part of this Appraisal.

7.6 The bracing ratings for GIB EzyBrace® Systems are embedded in the GIB EzyBrace® Bracing Software.

GIBFix® Framing System

7.7 The GIBFix® Framing System utilises GIBFix® Angles fixed at internal corners and at wall/ceiling junctions to reduce the potential for fastener 'popping' and joint cracking due to timber framing movement. The GIBFix® Framing System also offers an alternative arrangement of studs at corners and at intersecting walls to improve insulation and to reduce thermal bridging compared to traditional wall framing layouts. Refer to the Technical Literature for full details.

7.8 Where walls intersect, noggings are required at maximum 900 mm centres to enable fixing of the end stud of the intersecting wall to the main wall framing.

7.9 The GIBFix® Framing System permits the use of a single panel hold-down [e.g. GIB® HandiBrac®] at wall corners and T-intersections for both the across and along bracing directions.

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.

Framing

7.10 GIB EzyBrace® Systems can be installed using conventional timber framing layouts or by using the layouts provided in the GIBFix® Framing System. The bracing ratings embedded in the GIB EzyBrace® Bracing Software are equally applicable to both framing options.

7.11 Timber framing grade, spacing and construction must comply with NZS 3604. Timber treatment must comply with NZBC Acceptable Solution B2/AS1.

7.12 Winstone Wallboards Ltd recommends the use of kiln-dried stress-graded framing timber. The minimum actual framing dimensions are 90 mm x 45 mm for external walls and 75 mm x 45 mm for internal walls.

7.13 Joints in the top plates of bracing panels must be tied together with 3 kN and 6 kN top plate connectors using 25 mm x 0.9 mm hot-dip galvanised mild steel strap, three nails each side of joint for 3 kN and six nails each side of joint for 6 kN.

Bracing System GS2-NOM

7.14 Most GIB EzyBrace® Systems require additional fasteners at the corners to achieve the published bracing ratings. The GS2-NOM system only requires fixings at 300 mm centres around the sheet perimeter.

7.15 Where internal doors penetrate a GS2-NOM bracing element and recessed door jambs are used, the sheets may be adhesive fixed around the door opening with GIBFix® All-Bond, instead of screw fixing. This is designed to reduce fastener 'popping' around internal doors when using grooved door frames. Screw fixing should be used where door frames are to be finished with architraves and the architrave will cover the screws. The adhesive fix option around door openings must not be used with any other GIB EzyBrace® Systems.

Alternative GIB® plasterboards

7.16 GIB Ezybrace® Systems have been designed and tested using only the products specified. Occasionally additional properties may be required to be provided by a different GIB® plasterboard product. Table 1 provides acceptable alternative options.

Table 1: Permitted Alternatives in GIB EzyBrace® Systems

Specified	Permitted alternative GIB® plasterboard products								
GIB® plasterboard	GIB® Standard	GIB Ultraline®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyreline®			
						10 mm	13 mm	16 mm	19 mm
GIB® Standard	N/A	✓	✓	✓	✓	✓ *Note 1*	✓ *Notes 1 and 3*		
GIB Braceline®	X	X	N/A	✓ *Note 2*	✓	X	✓ *Notes 1, 2 and 3*		

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

BOWMAC Screw Bolts

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

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.

Structure

Bracing

8.1 The bracing unit (BU) ratings are embedded in the GIB EzyBrace® Bracing Software and vary with the wall length.

8.2 The Technical Literature provides comprehensive construction and panel hold-down details. These include bottom plate fixings using anchor screws and cast-in bolts (concrete), coach screws (timber), GIB® HandiBrac® or nailed stud-to-plate straps.

8.3 Bracing units derived from the BRANZ P21 test method are based on a wall height of 2.4 m. The GIB EzyBrace® Bracing Software calculates bracing ratings for higher wall heights by multiplying the appropriate bracing rating by 2.4 m and dividing by the actual wall height in metres. For walls less than 2.4 m in height, the GIB EzyBrace® Bracing Software calculates bracing ratings as if they were 2.4 m high.

8.4 NZS 3604 limits wall bracing elements to a maximum of 120 BU/m for timber-framed floors and 150 BU/m for concrete floors.

Ceiling Diaphragms

8.5 GIB® ceiling diaphragms are used to space bracing lines further apart than 6 m. The basic shape of a ceiling diaphragm must be square or rectangular and the length must not exceed twice the width.

8.6 For ceiling diaphragms not steeper than 15° and not exceeding 7.5 m in length, any GIB® plasterboard may be used provided the perimeter fixing are at 150 mm centres.

8.7 For ceiling diaphragms not steeper than 45° and not exceeding 7.5 m in length, and for diaphragms not steeper than 25° and not exceeding 12 m in length, any GIB® plasterboard may be used provided the perimeter fixings are at 100 mm centres.

Openings in Bracing Elements

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

Shower Areas

8.9 GIB EzyBrace® Systems must not be located in shower cubicles or behind baths and the like. GIB EzyBrace® Systems may be used in water-splash areas provided they are protected as required by NZBC Clause E3 Internal Moisture. Refer to BRANZ Appraisal No. 427 GIB® Wet Area Systems.

Impact Resistance

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

Durability

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

Maintenance

9.2 The building must be maintained weatherproof and GIB® plasterboards must be protected from external and internal moisture in accordance with NZBC Clauses E2 and E3.

9.3 Holes resulting from damage to the lining, up to 100 x 100 mm square, will have no significant effect on the performance of the bracing panel. Such holes may be repaired by patching, stopping and finishing as appropriate. Independent expert advice must be sought to assess the effect and repair of larger areas of damage.

9.4 Bracing elements require no ongoing maintenance, apart from decoration and the repair of any damage.

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.

Prevention of Fire Occurring

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

Fire Affecting Areas Beyond the Fire Source

11.1 For internal surface finish properties and fire resistance ratings, refer to BRANZ Appraisal No. 289 GIB® Fire Rated Systems.

Internal Moisture

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

Installation Information

Installation Skill Level Requirement

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

General

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

Framing

14.2 To achieve an acceptable decorative finish, the GIB® Site Guide specifies that walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallboards Ltd recommends a moisture content of 12% or less where buildings are to be air conditioned, centrally heated or have heat pumps installed.

14.3 Where the GIBFix® Framing System is used, GIBFix® Angles are tacked to the framing with flat head clouts prior to installation of the GIB® plasterboard.

Cutting

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

Hold-downs

14.5 GIB EzyBrace® Systems which require hold-downs must either have a GIB® HandiBrac® fitted to each end of the bracing element or alternatively a metal stud-to-plate strap and hold-down anchor may be used. Refer to the Technical Literature for full installation details. Where a metal stud-to-plate strap is used, the hold-down anchor must be placed no more than 80 mm from the end of the bracing element.

14.6 Where the GIBFix® Framing System is used, a single hold-down located at a wall intersection may be used to provide the hold-down in both the across and along bracing directions.

Plasterboard Sheet Fixing

14.7 Corner fixings must be 50 mm away from the sheet corner. Fixings must be no closer than 12 mm from the paper-bound sheet edge, and no closer than 18 mm from a cut edge, and driven at right angles to the sheet until the head is seated in a slight dimple just below the surface of the paper liner. Fixings must not be over-driven.

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.

14.8 Wall bracing plasterboards (except for those used with the GS2-NOM system) are fixed at 150 mm centres around the perimeter framing of the bracing element *(Note: There is a variation for GIB Aqualine® and GIB Fyreline®, see Table 1)*. At the corners of the wall bracing elements, a special fastening pattern is required with fasteners spaced at 50 mm, 100 mm, 150 mm, 225 mm and 300 mm from the corner and thereafter at 150 mm centres. Fixing to other framing is either mechanical or by using GIBFix® adhesives.

14.9 When installing GS2-NOM bracing elements, the GIB® plasterboard is fixed to framing around the bracing element perimeter and at sheet joints with fasteners at maximum 300 mm centres. Where recessed door jambs are used on internal door frames, the GIB® plasterboard may be fixed to the framing around the door opening with GIBFix® All-Bond, see Paragraph 7.15.

14.10 Where GIB Aqualine® or GIB Fyreline® substitutes for GIB Braceline®, bracing elements must be longer than 900 mm and the bracing element perimeter fasteners must be spaced at 100 mm centres and the corner pattern described in Paragraph 14.8 used.

14.11 Full sheets must be used wherever possible.

Fire Resistance Rated Bracing Elements

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

Plywood Fixing

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

Ceiling Diaphragms

14.14 All GIB EzyBrace® System ceiling diaphragms require fixings around the perimeter at 100 mm or 150 mm centres, depending on the ceiling pitch and length. See Paragraphs 8.4-8.6 and refer to the Technical Literature.

14.15 The perimeter of the ceiling diaphragm is fixed to GIBFix® Angles, GIB® Rondo® perimeter channels, or alternatively, to an additional ex 150 x 40 mm timber plate fixed to the top plate.

Jointing and Finishing

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

Health and Safety

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

Basis of Appraisal

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

Tests

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

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.

Other Investigations

17.1 The GIB EzyBrace® Bracing Software has been assessed by BRANZ and found to be satisfactory.

17.2 The GIB EzyBrace® Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.

17.3 Site inspections were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.

17.4 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

17.5 The properties of Winstone Wallboards Ltd GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, and hard and soft body impact tests.

Quality

18.1 Winstone Wallboards Ltd's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.

18.2 The quality management systems of Winstone Wallboards Ltd have been assessed and registered by TELARC as meeting the requirements of ISO 9001, Registration No. 581.

18.3 Winstone Wallboards Ltd is responsible for the quality of the product supplied.

18.4 The quality of the application and finish on-site is the responsibility of the installation and stopping contractors.

18.5 Designers are responsible for the design of buildings.

18.6 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Ltd.

Sources of Information

- AS/NZS 2269.0:2012 Plywood - Structural - Specifications.
- AS/NZS 2588:2018 Gypsum plasterboard.
- BRANZ Technical Paper P21:2010 A wall bracing test and evaluation procedure.
- NZS 3604:2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

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.

BRANZ

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

The Appraisal is issued only to Winstone Wallboards Ltd, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

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

For BRANZ

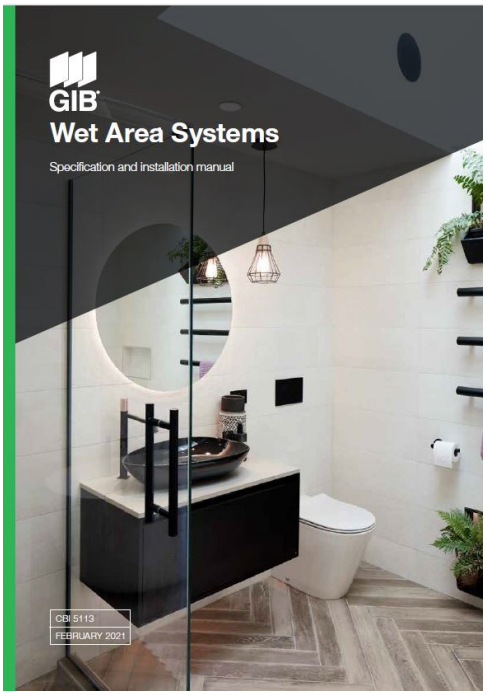
Chelydra Percy
Chief Executive

Date of Issue:
01 December 2021

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.

BRANZ Appraised
Appraisal No. 427 [2021]

GIB® WET AREA SYSTEMS



Appraisal No. 427 (2021)

This Appraisal replaces BRANZ Appraisal No. 427 (2007)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

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

Scope

2.1 GIB® Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:

- on timber-framed walls and ceilings within the scope limitations on NZS 3604; or,
- on steel-framed walls and ceilings within the scope limitations of NASH Standard Part 2, or,
- on timber and light gauge steel-framed walls and ceilings subject to specific design.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, GIB® Wet Area Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:**

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

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

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

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

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.

Technical Specification

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

GIB® Plasterboards

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

Table 1: GIB® Wet Area Plasterboard Available Sheet Sizes

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

TE = Tapered Edge SE = Square Edge

Fastenings

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

Adhesive and Sealants

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

GIB® Accessories

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

GIB® Jointing Compounds

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

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.

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

Waterproofing

- A waterproofing system complying with AS/NZS 4858.

Finishes

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

Handling and Storage

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

5.2 All accessories must be kept dry.

Technical Literature

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

Design Information

General

7.1 GIB® Wet Area Systems provide a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, toilets, laundries and kitchens. The typical finishes are ceramic tiles and flexible sheet vinyl to walls, and paint and wallpaper to walls and ceilings. [*Note: GIB Weatherline® is a suitable substrate for ceramic tiles and sheet vinyl. For paint or wallpaper finishes use GIB Aqualine® or GIB Toughline® Aqua.]*

7.2 GIB® Wet Area Systems must not be used in the following situations:

- For bracing applications in shower areas or adjacent baths [See Paragraphs 7.4 and 8.2].
- In areas of high humidity [above 90% RH] or continually wet areas such as group showers, steam rooms, or swimming pools.
- Installed over a vapour barrier.
- Applied directly to masonry, concrete or solid plaster.
- Applied over other sheet lining materials.
- Used externally of the building envelope.
- Exposed to temperatures of 52°C or greater for prolonged periods. [Refer to appliance and fitting manufacturers for installation details.]

7.3 GIB Aqualine® may be substituted for some other GIB® plasterboard products in specific GIB® Bracing Systems, GIB® Fire Rated Systems and GIB® Noise Control Systems. Refer to the relevant systems technical literature for details.

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.

Wet Areas

7.4 Wet areas are spaces where sanitary fixtures and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:

- Water Splash – These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
- Shower Areas – These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.

7.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. In addition, shower areas must be waterproofed. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finishes, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

Intertenancy Walls – Wet Areas

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

Tiling

7.7 GIB® Wet Area Systems are suitable as a substrate for tiling up to the following weights:

- 10 mm GIB Aqualine® and GIB Weatherline® - up to 26 kg/m^2.
- 13 mm GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® - up to 40 kg/m^2.

[Note: Most ceramic and porcelain wall tiles weigh less than 20 kg/m^2. For further information on tiling consult the BRANZ Good Practice Guide – Tiling.]

Framing

7.8 Supporting framing must comprise one of the following, subject to the minimum sizes, dwang centres and all other frame requirements of GIB® Wet Area Systems Technical Literature:

- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170. Refer to Paragraph 15.2 regarding recommended moisture content of timber framing.
- Steel framing must be designed and constructed in accordance with NASH Standard Part 2, or to a specific design in accordance with AS/NZS 1170.

Structure

Bracing

8.1 GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline®can be used in GIB EzyBrace® Systems. Refer to BRANZ Appraisals Nos. 928 [2016] and 1048 [2019].

8.2 GIB Wet Area Systems must not be used for bracing in shower areas or behind baths.

Impact Resistance

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

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.

Durability

Serviceable Life

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

Maintenance

9.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.

9.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the GIB® plasterboard substrate must be checked for defects and repaired or replaced, as required.

9.4 For flexible sheet vinyl, particular attention must be paid to joints, especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.

9.5 Impact damage to GIB® plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from Winstone Wallboards Ltd.

Prevention of Fire Occurring

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

Fire Affecting Areas Beyond the Fire Source

Control of Internal Fire and Smoke Spread

11.1 The gypsum plasterboard used in GIB® Wet Area Systems without an applied paint or wallpaper finish has been tested in accordance with ISO 5660 and achieved a Material Group Number of 1-S.

11.2 The gypsum plasterboard used in GIB® Wet Area Systems with an untested applied finish of a waterborne or solvent borne paint coating ≤ 0.4mm thick achieves a Material Group Number of G2-S in accordance with Table A1 of NZBC Verification Method C/VM2.

11.3 A lower Material Group Number may be achieved when used with a tested finishing system. The Material Group Number for the complete lining system must be obtained from the supplier of the finish product or system.

Fire Resistance Ratings (FRRs)

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

Internal Moisture

12.1 When installed in accordance with this Appraisal, GIB® Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.

12.2 The construction methods in the Technical Literature meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.

12.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.

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.

Airborne and Impact Sound

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

Installation Information

Installation Skill Level Requirement

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

General

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

Framing

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

Cutting

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

Fixing Sheets

Non-Tiled Areas

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

Tiled Areas

16.2 Control joints must be provided at maximum 4 m centres.

16.3 Internal corners in shower areas must be reinforced with a minimum 32 x 32 x 0.55 mm galvanised metal angle (i.e. GIBFix® Angle or GIB® Rondo® NZ18) prior to lining the walls.

16.4 GIB® Wet Area plasterboards may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 150 mm centres to the perimeter of wall and to all intermediate studs. Adhesive must not be used in place of screws.

Ceilings

16.5 Supports of timber or steel battens or ceiling joists must be 450 mm centres for 10 mm GIB Aqualine®, or 600 mm centres for 13 mm GIB Aqualine® or GIB Toughline® Aqua.

16.6 GIB Aqualine® and GIB Toughline® Aqua sheets must be fixed with GIB® Grabber® screws at 600 mm centres around the perimeter of the ceiling and at 200 mm centre along supports. Alternatively, sheets are screw fixed at 600 mm centres along the supports and GIBFix® adhesive placed at 200 mm centres between the screws.

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.

Penetrations and Sealants

17.1 All cut-outs for pipe penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the pipe.

17.2 A bead of sealant must be placed to the full thickness of the plasterboard sheet around all pipe penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.

17.3 In tiled areas, a bead of sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

Jointing and Finishing

18.1 Jointing must be carried out in accordance with GIB® Site Guide Technical Literature.

18.2 Tiled shower areas must incorporate a waterproofing membrane over GIB® Wet Area Systems. Waterproofing membranes are outside the scope of this Appraisal and must otherwise be specified and approved.

Health and Safety

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

Basis of Appraisal

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

Tests

20.1 Winstone Wallboards Ltd GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, edge hardness, water resistance, hard and soft body impact tests and humidified deflection.

20.2 Cone calorimeter tests to ISO 5660 have been carried out by BRANZ.

Other Investigations

21.1 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

21.2 Site inspections were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.

21.3 The GIB® Wet Area Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.

Quality

22.1 Winstone Wallboards Ltd's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.

22.2 The quality management systems of Winstone Wallboards Ltd have been assessed and registered by TELARC as meeting the requirements of ISO 9001: 2015, Registration No. 581.

22.3 Winstone Wallboards Ltd is responsible for the quality of the product supplied.

22.4 The quality of the application and finish on site is the responsibility of the installation, stopping and finishing contractors.

22.5 Designers are responsible for the design of buildings.

22.6 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Ltd.

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.

Sources of Information

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

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.

BRANZ

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

The Appraisal is issued only to Winstone Wallboards Ltd, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

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

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
15 February 2021

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.

CodeMark

Certificate no: CMNZ70116
Version: 2
Original issue date: 25 November 2021
Version date: 22 July 2024

Product Certificate

Masons UNI® and UNI® PLUS Flexible Air Barriers

1. Certificate Holder Details

MASONS
Designed Smart, Built Tough.

Masons NZ 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
11/500 Collins Street
Melbourne VIC 3000 Australia
product.certification@bureauveritas.com
Ph: 1800 855 190
www.bureauveritas.com.au

Complaints: The complaints process for this certificate can be found here:
www.bureauveritas.com.au/your-feedback

Sam Guindi – Bureau Veritas Product Certification Manager

3. Description of Building Method or Product

Name of the product or method in Aotearoa New Zealand, including any brand names used. Description of what it is and the components that make up any system and its physical attributes including the materials and make-up of the product, where applicable. 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. Continuation of description can be found in item 10 – Supporting Information about Description. [Delete if not applicable]. The building method's or building product's catalogue or model identification number or numbers or other unique identifiers that might be used to identify the building product or building method

Masons UNI® and UNI® PLUS Flexible Air Barriers are tri-laminate synthetic sheets 2.74 metres wide consisting of two outer non-woven layers and a middle synthetic membrane which is dark grey.

- UNI® Flexible Air Barrier has a blue front face marked "UNI® Flexible Air Barrier" and a black rear face.
- UNI® PLUS Flexible Air Barrier has a blue front face marked "UNI® PLUS Flexible Air Barrier" and a white rear face.
- UNI® Flexible Air Barrier is also available as 600 mm wide sheet with a self-adhesive strip, marketed as UNI® Soffit.

4. Intended use of Building Method or Product

Intended use of the building method or product as described in the product manual and other instructional materials. A statement of the function or purpose of the building method or product. Continuation of intended use can be found in item 11 – Supporting Information about Intended use. [Delete if not applicable]

Masons UNI® and UNI® PLUS Flexible Air Barriers are wall underlays and flexible air barriers and are suitable for use as temporary weather protection to allow interior works to continue inside the building without the exterior wall cladding fully in place.

UNI® PLUS Flexible Air Barrier is fire retardant and suitable for use where exposed to view in an occupied space.

5. New Zealand 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).

How the building method or product complies or contributes can be found in item 8. Basis for Certification. Any qualifications on the extent of that compliance can be found in item 6. Conditions and limitations of use.

B2 Durability: B2.3.1(a), B2.3.2
C3 Fire affecting areas beyond the fire source: C3.4(c) (UNI® PLUS)
E2 External moisture: E2.3.2 (contributes to), E2.3.5 (contributes to), E2.3.6 (contributes to), E2.3.7
F2 Hazardous building materials: F2.3.1
H1 Energy efficiency: H1.3.1(b) (contributes to)

JAS-ANZ
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CodeMark

Product Certificate

Masons UNI® and UNI® PLUS Flexible Air Barriers

BUREAU VERITAS

Certificate no: CMNZ70116
Version: 2
Original issue date: 25 November 2021
Version date: 22 July 2024

6. Conditions and Limitations of Use

The building method or product's use is to be in accordance with the installation instructions and requirements against which the building method or product was assessed.

Conditions or limitations of conformity for the performance requirements the building method or product is compliant with, including any requirements for people with the qualifications and skills to install or use the building method or product, any known or demonstrated situations where the building method or product should not be used. A statement as to whether there are any matters that should be taken into account in the use or application of the building product or building method and, if so, what those matters are.

1. Masons UNI® and UNI® PLUS Flexible Air Barriers are 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 Manual V1.0, October 2021 - CM, or the Masons UNI® PLUS Flexible Air Barrier Design and Installation Manual V2.0, March 2022 - CM respectively, and
    c. with absorbent or non-absorbent wall claddings directly fixed to the frame; or 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 NZBC Acceptable Solution E2/AS4 for steel framed buildings, and
    d. Masons UNI® Flexible Air Barrier must not be used where the underlay is exposed to view in an occupied space
    e. Masons UNI® PLUS Flexible Air Barrier may be used when exposed to view in an occupied space.
2. Masons UNI® and UNI® PLUS Flexible Air Barriers shall be:
    a. installed in accordance with the Masons UNI® Flexible Air Barrier Design and Installation Manual V1.0, October 2021 - CM, or the Masons UNI® PLUS Flexible Air Barrier Design and Installation Manual V2.0, March 2022 - CM respectively, 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® and UNI® PLUS Flexible Air Barrier being part of the thermal envelope of the building, and
    b. horizontal and vertical laps being securely taped.

7. Health and Safety Information

Health, safety, and well-being declarations associated with installation, maintenance, and use of the building method or product, and their specific editions and dates necessary to ensure the performance requirements of clauses F1 to F9 of the Building Code can be met.

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.

JAS-ANZ

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Product Certificate

Masons UNI® and UNI® PLUS Flexible Air Barriers

Certificate no: CMNZ70116
Version: 2
Original issue date: 25 November 2021
Version date: 22 July 2024

8. Basis for Certification

How the performance requirements in the Building Code were met for each of the provisions. Where used as part of a system, the specific contribution to compliance.

B2 Durability - By testing and comparison with Acceptable Solution E2/AS1 and referenced standard NZS2295
C3 Fire affecting areas beyond the fire source - By testing and comparison with Acceptable Solutions C/AS1 and C/AS2
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 NZS2295

9. Supporting Documentation for Certification

Reference to any acceptable solutions, verification methods, New Zealand Standards, or other compliance pathways referenced against each individual performance requirement the building method or product is compliant with, and their specific version and date. Reference to documents describing tests and evaluations and any other documents relied on for certification or used to prove compliance, including their full title, specific version and date.

1. C1 - C6 Protection from Fire Acceptable Solution C/AS1 Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH) Second Edition, 2 November 2023.
2. C/AS2 Acceptable Solution for Buildings other than Risk Group SH for New Zealand Building Code Clauses C1-C6 Protection from Fire First edition (Amendment 2), 5 November 2020.
3. 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.
4. Acceptable Solution E2 External Moisture E2/AS4 First edition, 28 November 2019.
5. NZS 2295 2295:2006 Pliable, permeable building underlays.
6. AS1530.2:1993 Methods for fire tests on building materials, components and structures.
7. Masons Plastabrick Material Safety Datasheet V2, January 2022.
8. Scion Report No 2704886 [J31991 / QT8222VHPU] Evaluation of Roof VHP Ultra to NZS2295, July 2020.
9. ProConsult Report Reference 13038 HP Ultra wall underlay system compliance with NZBC B1 Structure (including fixing recommendations), 22 March 2021.
10. L H Bolton Report 201265 Assessment of Masons Roofing Underlays for Buildings, 21 October 2020.
11. NZWTA Test Report No.1374734.0 "SP180 Test for Flammability to AS1530 .2-1993", July 2021.
12. Scion Report No 45558911 [J32028 / QT9596] Assessment of SP180 TO NZS 2295, January 2022.
13. Masons UNI® Flexible Air Barrier Design and Installation Manual V1.0, October 2021 – CM.
14. Masons UNI® PLUS Flexible Air Barrier Design and Installation Manual V2.0, March 2022 – CM.

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CodeMark

Product Certificate

Masons UNI® and UNI® PLUS Flexible Air Barriers

Certificate no: CMNZ70116
Version: 2
Original issue date: 25 November 2021
Version date: 22 July 2024

10. Supporting Information About Description (Optional)

Any supporting information for section 3.

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

11. Supporting Information About Intended Use (Optional)

Any supporting information for section 4.

N/A

12. Supporting Information About Conditions and Limitations of Use (Optional)

Any supporting information for section 6.

N/A

All CodeMark certificates that are current must be registered with MBIE. MBIE maintains a register of valid product certificates. Please find the register here.

If the certificate is not listed on this register or it appears as (SUSPENDED), it is not a valid CodeMark certificate and does not have to be accepted by a building consent authority as establishing compliance with the New Zealand Building Code.

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CodeMark

Certificate no: CMNZ70117
Version: 1
Original issue date: 25 November 2021
Version date: 22 July 2024

Product Certificate

Masons UNI® PRO Flexible Air Barrier

1. Certificate Holder Details

Masons NZ 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
11/500 Collins Street
Melbourne VIC 3000 Australia
product.certification@bureauveritas.com
Ph: 1800 855 190
www.bureauveritas.com.au

Complaints: The complaints process for this certificate can be found here: www.bureauveritas.com.au/your-feedback



Sam Guindi – Bureau Veritas Product Certification Manager

3. Description of Building Method or Product

Name of the product or method in Aotearoa New Zealand, including any brand names used. Description of what it is and the components that make up any system and its physical attributes including the materials and make-up of the product, where applicable. 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. Continuation of description can be found in item 10 – Supporting Information about Description. [Delete if not applicable]. The building method's or building product's catalogue or model identification number or numbers or other unique identifiers that might be used to identify the building product or building method

Masons UNI® PRO Flexible Air Barrier is a tri-laminate synthetic sheet consisting of two outer non-woven layers; a blue front face and a white rear face and a middle synthetic membrane which is dark grey. Both sides of the sheet have a fine embossing pattern. The sheet is 2.74 meters wide and marked "UNI® PRO Flexible Air Barrier".

4. Intended use of Building Method or Product

Intended use of the building method or product as described in the product manual and other instructional materials. A statement of the function or purpose of the building method or product. Continuation of intended use can be found in item 11 – Supporting Information about Intended use. [Delete if not applicable]

Masons UNI® PRO Flexible Air Barrier is a wall underlay and flexible air barrier that 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 150 days.

5. New Zealand 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).

How the building method or product complies or contributes can be found in item 8. Basis for Certification. Any qualifications on the extent of that compliance can be found in item 6. Conditions and limitations of use.

B2 Durability: B2.3.1(a), B2.3.2
E2 External moisture: E2.3.2 (contributes to), E2.3.5 (contributes to), E2.3.6 (contributes to), E2.3.7
F2 Hazardous building materials: F2.3.1
H1 Energy efficiency: H1.3.1(b) (contributes to)

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Product Certificate

Masons UNI® PRO Flexible Air Barrier

Certificate no: CMNZ70117
Version: 1
Original issue date: 25 November 2021
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6. Conditions and Limitations of Use

The building method or product's use is to be in accordance with the installation instructions and requirements against which the building method or product was assessed.

Conditions or limitations of conformity for the performance requirements the building method or product is compliant with, including any requirements for people with the qualifications and skills to install or use the building method or product, any known or demonstrated situations where the building method or product should not be used. A statement as to whether there are any matters that should be taken into account in the use or application of the building product or building method and, if so, what those matters are.

1. Masons UNI® PRO 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® PRO Flexible Air Barrier Design and Installation Guide V1.0, November 2021, 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® PRO Flexible Air Barrier shall be:
   a) installed in accordance with the MASONS UNI® PRO Flexible Air Barrier Design and Installation Guide V1.0, November 2021, 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 150 days.
3. Contribution to compliance with Building Code clause H1.3.1(b) is conditional on:
   a) the element incorporating UNI® PRO Flexible Air Barrier being part of the thermal envelope of the building, and
   b) horizontal and vertical laps being securely taped.

7. Health and Safety Information

Health, safety, and well-being declarations associated with installation, maintenance, and use of the building method or product, and their specific editions and dates necessary to ensure the performance requirements of clauses F1 to F9 of the Building Code can be met.

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.

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CodeMark

Product Certificate

Masons UNI® PRO Flexible Air Barrier

Certificate no: CMNZ70117
Version: 1
Original issue date: 25 November 2021
Version date: 22 July 2024

8. Basis for Certification

How the performance requirements in the Building Code were met for each of the provisions. Where used as part of a system, the specific contribution to compliance.

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

9. Supporting Documentation for Certification

Reference to any acceptable solutions, verification methods, New Zealand Standards, or other compliance pathways referenced against each individual performance requirement the building method or product is compliant with, and their specific version and date. Reference to documents describing tests and evaluations and any other documents relied on for certification or used to prove compliance, including their full title, specific version and date.

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. Scion Report No. 43743986 [J48921 / QT9004] Roof VHP Maxi Testing to NZS2295, September 2021.
4. Masons Plastabrick Material Safety Datasheet V1.0, September 2021.
5. ProConsult Report Reference 13038 HP Ultra wall underlay system compliance with NZBC B1 Structure (including fixing recommendations), 22 March 2021.
6. L H Bolton Report 201265 Assessment of Masons Roofing Underlays for Buildings, 21 October 2020.
7. Masons UNI® PRO Flexible Air Barrier Design and Installation Guide V1.0, November 2021.

10. Supporting Information About Description (Optional)

Any supporting information for section 3.

The following accessories are used with Masons UNI® PRO 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.

11. Supporting Information About Intended Use (Optional)

Any supporting information for section 4.

N/A

JAS-ANZ

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12. Supporting Information About Conditions and Limitations of Use (Optional)

Any supporting information for section 6.

N/A

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