Approved Building Consent Documents

Please Note: A copy of the stamped approved documents must be available on site for all inspections.

APPROVED BC190130 03/04/2019 Napier City Council Pg 1 of 207

Specification Option Report

Homeworx Design and Build
http://www.homeworx.co.nz
invoice@homeworx.co.nz
06 838 8343

Project Name: Stones Cottage

Project Address: 278 Meeanee Road Napier, Napier, Hawke's Bay, New Zealand, 4112

APPROVED BC190130 03/04/2019 Napier City Council Pg 2 of 207

Preliminary and General

Design	Design Costs
Building Consent Allowance $3,500.00	Building Consent Fees
Temporary Power	Owner Supplied
Insurance	Builders Risk Insurance
Colour Consultation	Colour Consultation
Guarantee	Ten Year Guarantee

Framing

Frames	Frames 2.400 typical stud height
Trusses	Trusses H1.2 Scissor Trusses to create cove ceiling.
Building Wrap	Masons Barricade ITM Branded 2740 x 36.49 100 M2
Purlins	75 x 50 mm Radiata H1.2 Kiln Dried Gauged SG8
Post	88 x 88 mm Radiata Finger Jointed Laminated Post H5 3.6 length
Veranda Beam	200 x 90 mm LVL 9.5 H3
Top Plate	150 x 40 mm Radiata H1.2 Kiln Dried Gauged SG8

Interior pre-line

Ceiling Batten	75 x 40 mm Radiata H1 Kiln Dried Gauged F/J Ceiling Batten
Wall Insulation	R2.6 Ultra Wall Pink Batts
Ceiling Insulation	R3.6 Pink Ceiling Batts

Interior Ceiling Linings

Ceiling Gib	10 mm Standard Gib Board 4800 x 1200
Ceiling Gib Wardrobes	10 mm Standard Gib Board 2400 x 1200
Ceiling Gib Bathrooms	10 mm Aqualine 2400 x 1200

Interior Wall Linings

Wall Lining	10 mm Standard Gib Board 4800 x 1200
Wall Lining Wardrobes	10 mm Standard Gib Board 2400 x 1200
Wall Lining Bathrooms	10 mm Aqualine 2400 x 1200
Low VOC Glue for Wall Gib	Bostik Wallboard Gold Adhesive 375 ml

Interior Finishings

Gibstopping Ceiling	Level 4 Gibstopping
Gibstopping Walls	Level 4 Gibstopping
Wall to Ceiling Joint	Square Stopping

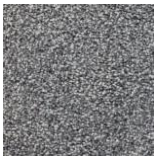
APPROVED BC190130 03/04/2019 Napier City Council Pg 3 of 207

Window Architraves	60 x 12 mm Architrave Bevelled Single No 20 MDF	
Interior Door Architraves	60 x 12 mm Architrave Bevelled Single No 20 MDF	
Skirting	85 x 12 mm Architrave Bevelled Single No 32 MDF	
Wet Area Skirting	90 x 10 mm Radiata Finger Jointed Single Bevelled Skirting No 32	
Interior Painting	Dulux Wash and Wear (up to four colour choices)	

Interior Doors & Joinery

Single Hung Doors	Single Hung Flush Panel 2.000 MDF 3mm skins	
Double Hung Doors	Double Hung Flush Panel 2.000 MDF 3mm skins	
Single Cavity Sliders	Single Cavity Slider Flush Panel 2.000 high 3.0mm skins	
Double Sliders	Door Flush MDF preprimed single hung	
Passage Door Hardware	Windsor Futura Brushed Nickel Passage Set-Apex	
Dummy Door Hardware	Windsor Futura Brushed Nickel Dummy Lever Set - Helix Apex	
Privacy Door Hardware	Cavity-suite Privacy Kit Round	

APPROVED BC190130 03/04/2019 Napier City Council Pg 4 of 207

Cavity Slider Hardware	Mardecco Round Flush Pull Stainless Steel	
Cavity Slider Hardware	Schlage R26 Round SSS Finger Pull 26mm	
Sliding Door Hardware	Mardecco Rectangular Flush Pull	
Doorstops	Mardecco 5036 concealed fix	
Exterior Doorstop	Wall Mounted Latchback	
Electrical		
12 Interior Downlights	Kore LED 13w 850 lumen dimmable sk warm white 110mm trim diameter	
2 Exterior Lights	Install surface mounted light bre	
4 Single Power Point (Applicances)	Single Power Point	
8 Double Power Point	Double Power Point	
Cavius Smoke Detector	Cavius Smoke Detector	
Finishing		
Carpet	Valencia/Casa Bella 7kg (56oz) Solution Dyed Nylon Cut Pile	

APPROVED BC190130 03/04/2019 Napier City Council Pg 5 of 207

Window Clean	Window Clean (Inside and Out)	
Home Clean	Construction Clean	
Hard Flooring	Quickstep Laminate Flooring Colour: 'Soft oak Light' chosen	

Exterior

Path and Patio Concrete (25m2)	Readymix Concrete 20.0 MPA 20 mm M3

Kitchen

Kitchen Tapware	Curb sink mixer	
Kitchen Joinery allowance $5,000.00	Kitchen Benchtop and Cabinetry	
Allowance $3,000	Appliance Allowance	
Splashback Allowance ($300)	Allowance Splashback Tiles: ''Decor Glass Orion 316 x 316' Confirmed 31/01/2019	

Heating & Cooling

Air Conditioning	Daikin Cora FTXM 71 Inverter Wall Mounter Air Conditioner	

Bathroom & Laundry

Bathroom Shower	Clearlite Millennium Moulded Wall 900 x 900	

APPROVED BC190130 03/04/2019 Napier City Council Pg 6 of 207

Bathroom Shower Mixer	Curb shower mixer	
Bathroom Shower Rose	Curb slide shower	
Bathroom Towel Rail	Caroma Cosmo Double Towel Rail 630mm	
Bathroom Vanity	Clearlite Cashmere Classic 900 Floor Standing	
Bathroom Vanity Tapware	Curb basin mixer	
Toilet	Heirloom Centro Wall Faced Toilet	
Toilet Roll Holder	Caroma Cosmo Toilet Roll Holder	

Exterior Wall Cladding

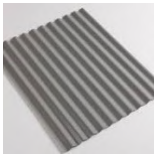
Exterior Paint	Dulux Weathershield X10	
External Corner	Hardies PVC Universal External Corner 2 Piece 3000 mm x 7.5 mm	
Cladding	16.0 mm Hardies Linea Classic Preprimed Grey Weatherboard 150 x 4200	

Exterior Joinery

APPROVED BC190130 03/04/2019 Napier City Council Pg 7 of 207

Windows	Aluminium joinery, double glazed, architraves to jambs	
Joinery Hardware	Urbo Hardware - Black Double tongue hardware. Confirmed to Annika 23/01/2019	
Joinery Glass	Grey Tint Double Glaze	
Obscure Glass	Satinlite Double Glaze	

Roof & Fascia

Roof	Colorsteel Corrugate Roof and Fascia Colour: Sandstone Grey. Confirmed with Annika 23/01/2019	
Fascia	Axent Fascia - James Hardie Fascia changed from Colorsteel to Axent Fascia - price to check (just left the same amount for the moment)	
Gutter	135 Continuous Colorsteel Gutter	
Downpipes	PVC Downpipes	

APPROVED BC190130 03/04/2019 Napier City Council Pg 8 of 207

New Home

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

Stones Home

278 Meeanee Road

Meeanee

Napier

Issued for Consent

APPROVED BC190130 03/04/2019 Napier City Council Pg 9 of 207

PROJECT OVERVIEW

Scope

Single level timber framed home on concrete floor. Colorsteel corrugate roof with Linea Weatherboards cladding.

Address

Site Address	278 Meeanee Road
Suburb	Meeanee
City	Napier

Site Conditions

Wind Zone	H - High Wind Speed
Earthquake Zone	Zone 3
Exposure Zone	Zone C - Medium
Snow Loading Zone	Zone N1

APPROVED BC190130 03/04/2019 Napier City Council Pg 10 of 207

TABLE OF CONTENTS

Preliminaries & General....4
Project Quality....4
Works Management....5
Project Overview....7
Carpentry....14
Timber Framing....14
GIB® Plasterboard Sheets....18
Linea Weatherboard....20
Plasterwork....24
Plasterboard Finish....24
Roofing....26
Profiled Metal Roofing....26
Aluminium Joinery....33
Aluminium Windows & Doors....33
Insulation....36
Pink® Batts® Insulation....36
Thermal Insulation....41
Painting & Decorating....43
General....43
Floor Coverings....46
Carpet & Resilient Floor Coverings....46
Overlay Flooring....48
Plumbing....52
Workmanship....52
Materials....54
Systems....54
Elements....55
Drainlaying....57
Workmanship....57
Electrical....59
Workmanship....59
Systems....61
Materials & Control....61

APPROVED BC190130 03/04/2019 Napier City Council Pg 11 of 207

1 PRELIMINARIES & GENERAL

1.1 Project Quality

1.1.1 Protection

Precautions

Take all appropriate precautions to protect all third party property, services, etc. and indemnify the Principal against any claims arising from the construction operations. Any damage to third party property caused by construction activities or failure to protect shall be rectified as soon as possible by the person causing the damage, or by appropriately qualified trades-persons employed by the person responsible for the damage if necessary.

Adverse Weather

Suspend operations during weather which would affect the quality of work in progress. Secure the works as soon as possible against adverse weather, dust and vandals. Avoid structural damage that is caused by overloading.

Protect Finished Work

Adequately protect all finished work and maintain until the date of Practical Completion. Each trade shall protect the work of all other trades, and each trade is responsible for making good any damage they cause to finished works. Arrange special protection as required for windows and doors, finished timber work, plumbing fittings and hardware, and cabinets and other joinery.

1.1.2 Responsibility

Contractor Responsibility

The Contractor will be held responsible for the full period of his legal responsibility in connection with this Contract for ensuring that all work execution, materials, and fittings, are completely in accordance with Contract requirements.

Guarantees

Contractor is responsible to the Principal for the appropriateness and fitness, in relation to a reasonable expectation or requirement, of all of the materials and workmanship incorporated into the works by himself or his subcontractors; for this reason few specific guarantees are required in these contract documents.

The terms and conditions of any warranty or guarantee required or provided shall not in any way negate the minimum remedies available under common law as if no warranty or guarantee had been furnished.

Good Trade Practice

Workmanship in all trades is required to be equal to or better than recognised good trade practice.

APPROVED BC190130 03/04/2019 Napier City Council Pg 12 of 207

Notification

Should any tradesperson consider that the surface finish or general conditions of previous work are unsatisfactory to ensure a proper finish for their own work thereon, that tradesperson shall give immediate notice to the Contractor or Architect/Designer as appropriate and shall not proceed until necessary improvements have been made. Failing such notice the trade concerned will not be relieved of the responsibility for a poor finish due to such unsatisfactory condition.

Substrates

Specialist Finishes Subcontractors are responsible for ensuring that substrates are completely appropriate for them to achieve first class results, and to this end shall, in sufficient time, instruct the Contractor with regard any fixings, primings, sealings or whatever for the substrate that vary in any way from the substrate manufacturer's standard recommendations. The contractor shall advise the Architect/Designer with regard these variances, and not proceed until the Architect/Designer has agreed to them.

Watertightness Detailing

The Contractor and all Subcontractors affected shall be jointly and severally responsible for completion of the whole of the works in a completely watertight condition and shall therefore examine all details to be satisfied that this condition can be achieved. If any detail is considered unsatisfactory the Architect/Designer shall be notified immediately and he will then either interpret the detail to the Contractor's satisfaction, or accept responsibility for watertightness at points in question, always assuming reasonable workmanship.

Systems Installation

For all electronic/ electrical/ mechanical operating systems all work and all necessary materials and items incidental to the primary item specified, that are incorporated into the works, shall be such as to leave a neat, efficient, easily maintained and robust installation, completely in accordance with all recommendations of the primary items manufacturers. Where appropriate source all parts of a system from a single supplier or manufacturer.

Compatibility

Ensure that all parts of a construction or finish are compatible and that their individual use is approved by the manufacturers and/or suppliers of other parts of the system.

1.2 Works Management

1.2.1 Setting Out

Basic Site Setout

The Contractor is responsible for accurate setting out of the works. It is recommended that the Contractor engage a Registered Surveyor to establish the basic site setout and the floor levels.

Setout Info for Subcontractors

The Contractor shall provide all necessary setting out information and component dimensions for subcontractors and shall check and be responsible for the accuracy of their work.

APPROVED BC190130 03/04/2019 Napier City Council Pg 13 of 207

1.2.2 Co-ordination of the works

Co-ordinate the works of all trades to ensure efficient progress of the works. Ensure that all holes, sleeves, penetrations, supports etc. that are required for services are correctly incorporated as work proceeds. Identify and sufficiently forward notify the appropriate persons of all deadlines for the supply of components, fittings, information, etc.

1.2.3 Authorities and Charges

Building Code

Comply with all relevant provisions of the NZ Building Code, and with all relevant territorial or statutory authority regulations, by-laws, obligations etc. Give all required notices.

Consents

The Principal has obtained a Land Use Consent. The Principal has applied for and paid for the Project Information Memoranda, the Building Consent and other approvals required for the works to start. The PIM and Building Consent will be forwarded to the contractor as quickly as possible after they are issued by the Territorial Authority.

Note: It is an offence under the Building Act to carry out work not in accordance with a building consent.

Building Consent Conditions

Should the building consent be subject to any conditions which modify the contract documents in any way, the Architect/Designer reserves the right to negotiate any or all of these modifying conditions with the Building Consent Authority. If after these negotiations additional work is required, it will be handled as a variation to the contract.

Code Compliance Certificate

The Principal will apply for the Code Compliance Certificate and any other licenses or approvals for the building to be used. However Practical Completion will NOT be certified until the CCC inspection has occurred and any additional works required by the local Building Consent Authority has been completed. To this end it is recommended that the Contractor obtains all required certificates, guarantees, as-built drawings, etc. required for the CCC application as work proceeds, to facilitate application for the CCC as soon as the works are completed. For his part, the Principal hereby undertakes to apply for the CCC within one day of all required material being in hand. Likewise, the Contractor should have the capacity available to attend upon as soon as possible to any items identified by the Building Consent Authority as being required prior to the issue of the CCC.

1.2.4 Standards

New Zealand Standards (NZS), Australian Standards (AS), joint Standards (AS/NZS), British Standards (BS), Acts of Parliament, Regulations made thereunder, Codes of Practice, and any specific Manufacturer's Instructions or Manufacturer's Recommendations that are referred to in the Contract Documents shall all be deemed to be the latest published edition thereof at the time of drawings issue and shall be followed by the Contractor and all Subcontractors to the full extent applicable consistent with the intent of this Contract. Documents cited within other cited publications are deemed to form part of this specification.

APPROVED BC190130 03/04/2019 Napier City Council Pg 14 of 207

Where Standards have a number of Divisions, e.g. AS/NZS 3500.1, AS/NZS 3500.2, etc., each of the Divisions relevant to this project is deemed to form part of this specification.

Retain current copies of significant cited documents and manufacturer's technical literature on the site.

1.2.5 Cleaning and Completion

Site Cleaning

Clear construction debris and rubbish from the works at regular intervals, and additionally if so instructed by the Architect/Designer. Clean each space thoroughly before commencing any finishing works.

Practical Completion

In preparation for the Practical Completion inspection carry out the following:

-Clean the works thoroughly, removing all debris, surplus materials, splashes, marks, temporary markings, etc. All cleaning methods and materials shall be as recommended by the manufacturer of the item being cleaned.
-Remove protective wrappings and coverings unless otherwise directed.
-Touch up minor painting faults, carefully matching colour, and brushing out edges. Repaint any badly marked surfaces back to suitable break lines.
-Adjust, ease and/or lubricate as required all doors, drawers, controls and other moving parts to ensure their efficient operation.
-Any other works required to leave all spaces ready for immediate occupation and all electronic / electrical / mechanical systems fully operational.
-Clean out all spoutings, gutters, downpipes, and gullies and flush out all drains.
-Clean all sanitary appliances and check all aspects of the water services.
-Thoroughly re-inspect all aspects of the works (and have any defects fully rectified) to be certain that the works are completely ready for the Practical Completion inspection - if an unreasonable number of items are noted by the Architect/Designer during the inspection it will be terminated and then rescheduled for at least a week forward to allow for proper completion to be achieved.

Certification

Note that a Code Compliance Certificate must be obtained before Practical Completion will be certified. Obtain all required certificates, guarantees, as-built drawings etc. as work proceeds to enable the CCC application to be submitted as soon as construction is completed.

1.3 Project Overview

1.3.1 Protection

Take all appropriate precautions to protect all third party property, services, etc., and indemnify the Principal against any claims arising from the construction operations. Any damage to third party property caused by construction activities or failure to protect shall be rectified as soon as possible by the person causing the damage, or by appropriately qualified trades-persons employed by the person responsible for the damage if necessary.

APPROVED BC190130 03/04/2019 Napier City Council Pg 15 of 207

Suspend operations during weather which would affect the quality of work in progress. Secure the works as soon as possible against adverse weather, dust and vandals. Avoid structural damage that is caused by overloading.
Adequately protect all finished work and maintain until the date of Practical Completion. Each trade shall protect the work of all other trades, and each trade is responsible for making good any damage they cause to finished works. Arrange special protection as required for windows and doors, finished timber work, plumbing fittings and hardware, cabinets and other joinery, and similar items.

1.3.2 Responsibility

The Contractor will be held responsible for the full period of his legal responsibility in connection with this Contract for ensuring that all work execution, materials, and fittings, are completely in accordance with Contract requirements.
The Contractor is responsible to the Principal for the appropriateness and fitness, in relation to a reasonable expectation or requirement, of all of the materials and workmanship incorporated into the works by himself or his subcontractors; for this reason few specific guarantees are required in these contract documents. The terms and conditions of any warranty or guarantee required or provided shall not in any way negate the minimum remedies available under common law as if no warranty or guarantee had been furnished.
No apparent expression of the Architect's/Designer's reasonable satisfaction shall be deemed to be acceptance of defective materials or workmanship within the terms of the Contract or to be an authority for any Variation except where such Variation is authorised as provided for in the Contract. Instructions that are given verbally are deemed to be instructions for proper execution of the works and do not involve extra charges.

Workmanship in all trades is required to be equal to or better than recognised good trade practice. The Contractor shall provide all necessary setting out information and component dimensions for subcontractors and shall check and be responsible for the accuracy of their work.

Should any tradesperson consider that the surface finish or general conditions of previous work are unsatisfactory to ensure a proper finish for their own work thereon, that tradesperson shall give immediate notice to the Contractor or Architect/Designer as appropriate and shall not proceed until all necessary improvements have been made. Failing such notice the trade concerned will not be relieved of responsibility for a poor finish due to such unsatisfactory condition.
Specialist Finishes Subcontractors are responsible for ensuring that substrates are completely appropriate for them to achieve first class results, and to this end shall, in sufficient time, instruct the Contractor with regard any fixings, primings, sealings or whatever for the substrate that vary in any way from the substrate manufacturer's standard recommendations. The Contractor shall advise the Architect/Designer with regard these variances, and not proceed until the Architect/Designer has agreed to them.

The Contractor and all Subcontractors affected shall be jointly and severally responsible for completion of the whole of the works in a completely watertight condition and shall therefore examine all details to be satisfied that this condition can be achieved. If any detail is considered unsatisfactory the Architect/Designer shall be notified immediately and he/she will then either interpret the detail to the Contractor's satisfaction, or accept responsibility for watertightness at the points in question, always assuming reasonable workmanship.

APPROVED BC190130 03/04/2019 Napier City Council Pg 16 of 207

Ensure that all materials or items incorporated into any particular construction or finish are compatible and that their individual use is approved by the manufacturers and/or suppliers of the other parts of the system.
For all electronic/electrical/mechanical operating systems all work and all necessary materials and items incidental to the primary item specified, that are incorporated into the works, shall be such as to leave a neat, efficient, easily maintained and robust installation, completely in accordance with all of the recommendations of the primary items' manufacturers. Where appropriate, source all parts of a system from a single supplier or manufacturer.

The Contractor shall make provision for all temporary works and services required for the satisfactory completion of the contract works. The Contractor shall pay all associated costs and fees; carry out all necessary maintenance, alterations and servicing requirements; and remove temporary works and services on completion of the contract works. Temporary works and services shall comply with the requirements New Zealand Building Code.

APPROVED BC190130 03/04/2019 Napier City Council Pg 17 of 207

1.3.3 Specification

This Specification covers contract administration, standards, materials quality, workmanship and the scope of works only: the exact nature of the works and all specialist items, descriptions, etc., are contained on the drawings, which also take full precedence.
All clauses in all specification sections apply to their full extent and meaning to the entire Contract.
Trade sections and paragraphs have been introduced into this specification for reference only and it shall not be construed that each trade section is a complete segregation of the materials and labour of that trade. The onus is on all trades to be conversant with any and all clauses which in any way affect their work.
(Be aware that the ‘scope’ noted in the ‘Project Overview’, and scope and general extent clauses within this specification, are included to provide a general indication only and must NOT be interpreted as schedules of quantities - the exact nature and extent of all aspects of the works are shown on the drawings).

1.3.4 Standards

New Zealand Standards (NZS), Australian Standards (AS), Joint Standards (AS/NZS), British Standards (BS), Acts of Parliament, Regulations made thereunder, Codes of Practice, and any specific Manufacturer's Instructions or Manufacturer's Recommendations that are referred to in these Contract Documents shall all be deemed to be the latest published edition thereof at the time of drawings issue, and shall be followed by the Contractor and all Subcontractors to the full extent applicable consistent with the intent of this Contract. Documents cited within other cited publications are deemed to form part of this specification.
Where Standards have a number of Divisions, e.g. AS/NZS 3500.1, AS/NZS 3500.2, etc., each of the Divisions relevant to this project is deemed to form part of this specification.
Retain current copies of significant cited documents and manufacturer's technical literature on the site.

1.3.5 Authorities and Charges

Comply with all relevant provisions of the NZ Building Code, and with all relevant territorial or statutory authority regulations, by-laws, obligations, etc. Give all required notices.

The Principal has obtained a Land Use Consent. The Principal has applied for and paid for the Project Information Memoranda, the Building Consent and other approvals required for the works to start. The PIM and Building Consent will be forwarded to the Contractor as quickly as possible after they are issued by the Territorial Authority. Note: It is an offence under the Building Act to carry out work not in accordance with a Building Consent.
Should the Building Consent be subject to any conditions which modify the requirements of the Contract Documents in any way, the Architect/Designer reserves the right to negotiate any or all of these modifying conditions with the Building Consent Authority. If after these negotiations additional work is required, it will be handled as a Variation to the Contract.

1.3.6 Code Compliance Certificate

The Principal will apply for the Code Compliance Certificate (CCC) and any other licenses or approvals for the building to be used. However, Practical Completion will NOT be certified until the CCC inspection has occurred and any additional works required by the local Building Consent Authority have been completed. To this end it is recommended that the Contractor obtains all required certificates, guarantees, Producer Statements, as-built drawings, etc., required for the CCC application as work proceeds, to facilitate application for the CCC as soon as the works are completed. For his part, the Principal hereby undertakes to apply for the CCC within one day of all required material being in hand. Likewise, the Contractor should have capacity available to attend as quickly as possible to any items identified by the Building Consent Authority as being required prior to the issue of the CCC.

1.3.7 Coordination of the Works

Coordinate the works of all trades to ensure efficient progress of the works. Ensure that all holes, sleeves, penetrations, supports, etc., that are required for services are correctly incorporated as work proceeds. Identify and sufficiently forward-notify the appropriate persons of all deadlines for the supply of fittings, components, information, etc.

1.3.8 Documents Interpretation

Except where they are clearly to the contrary, all dimensions are deemed to be to the bare surface of concrete, masonry, timber framing or other basic construction material. All figured dimensions take precedence over scaled sizes. Where any detail is included in more than one drawing the larger scale detail takes precedence. Where any ambiguity exists refer to the Architect/Designer for interpretation.
The word ‘provide' and the word ‘fix' used separately in the Documents shall be taken to mean ‘provide and fix' unless otherwise stated.
When the term ‘allow' occurs in the Documents, except with reference to Monetary Allowances, the cost of the item shall be at the risk of the Contractor.
The terms ‘approved', ‘directed', and ‘selected' when used in the Documents refers to the approval, direction or selection of or by the Architect/Designer. Please give adequate notice of when these decisions are required. ‘Architect/Designer' shall mean the Architect or Designer, their representative or any Consulting Engineer engaged by the Architect/Designer.

APPROVED BC190130 03/04/2019 Napier City Council Pg 18 of 207

1.3.9 Work Shown and Mentioned

The Contract Documents show the extent and nature of the works but there is no warranty expressed or implied that they show each and every minor detail or item required to be included by the Contractor. Should any material, structural member, fixing, or item or work appear to be inadequately described, yet obviously necessary for the neat, strong and satisfactory completion of the work, it shall be incorporated into the Contract Works.

1.3.10 Site 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. Comply with the relevant provisions of the New Zealand Building Code, in particular Clause F5.

So far as is reasonably practicable and according to a PCBU's (person conducting a business or undertaking) primary duty of care, take all necessary steps required to make the site and the contract works safe, and to provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the site safety rules and are not unnecessarily exposed to hazards.

Each PCBU, so far as is reasonably practicable, must ensure the health and safety of workers, and that other people are not put at risk by its work. If more than one PCBU has a duty in relation to the same matter, each PCBU with the duty must, so far as is reasonably practicable, consult, co-operate with, and co-ordinate activities with all other PCBUs who have a duty in relation to the same matter. PCBUs can enter reasonable agreements with other PCBUs to meet their duties, but cannot contract out of their duties.

Notify WorkSafe as soon as possible when a notifiable event occurs. Take all reasonable steps to preserve the site of the notifiable event in accordance with WorkSafe requirements. Ensure that the site of the event is not disturbed until authorised otherwise by WorkSafe. Keep records of all notifiable events.

Scaffolding shall comply with all Statutory and Local Authority Regulations, with the WorkSafe 'Best Practice Guidelines for Scaffolding', AS/NZS 1576 (Scaffolding equipment), AS/NZS 4576 (Guidelines for Scaffolding), and AS/NZS 4994 (Roof edge scaffolding), and shall be maintained for the duration and removed on completion.

The use of ballistic fixings must absolutely comply with all relevant safety recommendations at all times. No rubbish fires are allowed on site. Portable/personal disc/tape players, radios and iPods must not be used anywhere on the site. No smoking on site, except in the designated location in accordance with the Smoke Free Environments Act 1990, the location of which will be determined by the Contractor, with the approval of the Principal.

A PCBU's primary duty of care includes, but is not limited to, so far as is reasonably practicable:
- providing and maintaining a work environment that is without risks to health and safety;
- providing and maintaining safe plant and structures;
- providing and maintaining safe systems of work;

APPROVED BC190130 03/04/2019 Napier City Council Pg 19 of 207

- ensuring the safe use, handling and storage of plant, structures and substances;
- providing adequate facilities for the welfare at work of workers in carrying out work for the business or undertaking, including ensuring access to those facilities;
- providing any information, training, instruction, or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking;
- monitoring the health of workers and the conditions at the workplace for the purpose of preventing injury or illness of workers arising from the conduct of the business or undertaking.

Before commencing work on the site, PCBU's and staff must become familar with the Hazardco site specific safety plan and complete relevant induction cards, or shall prepare and submit to the contract administrator an alternative health and safety plan for approval before commencing work. The health and safety plan includes, but not be limited to:
- the health and safety of all people on the site and on other properties, and the general public;
- identification of existing and potential construction hazards and risks;
- safety procedures to eliminate, isolate or minimise construction hazards;
- the equipment to be used to minimise the hazards;
- the maintenance of a register of hazards for the site;
- the name and qualifications of the site safety person;
- emergency procedures;
- first aid facilities and safety equipment;
- the methodology for notifying, recording and investigating accidents and injuries.

Carry out all construction operations in accordance with the health and safety plan.

1.3.11 Cleaning and Completion

Clear construction debris and rubbish from the works at regular intervals, and additionally if so instructed by the Architect/Designer. Clean each space thoroughly before commencing any finishing works.

In preparation for the Practical Completion inspection carry out the following:
- Clean the works thoroughly, removing all debris, surplus materials, splashes, marks, temporary markings, etc. (All cleaning methods and materials shall be as recommended by the manufacturer of the item being cleaned).
- Remove protective wrappings and coverings unless otherwise directed.
- Touch up minor painting faults, carefully matching colour, and brushing out edges. Repaint any badly marked surfaces back to suitable break-lines.
- Adjust, ease and/or lubricate as required all doors, drawers, controls and other moving parts to ensure their efficient operation.
- Any other works required to leave all spaces ready for immediate occupation and all electronic/electrical/mechanical systems fully operational.
- Clean out all spoutings, gutters, downpipes, and gullies and flush out all drains.
- Clean all sanitary appliances and check all aspects of the water services.
- Thoroughly re-inspect all aspects of the works (and have any defects fully rectified) to be certain that the works are completely ready for the Practical Completion inspection - if an unreasonable number of items are noted by the Architect/Designer during the inspection it will be terminated and

APPROVED BC190130 03/04/2019 Napier City Council Pg 20 of 207

then rescheduled for at least a week forward to allow proper completion to be achieved.
(Note that a Code Compliance Certificate must be obtained before Practical Completion will be certified. Obtain all required certificates, guarantees, as-built drawings, etc., as work proceeds to enable the CCC application to be submitted as soon as construction is completed).

APPROVED BC190130 03/04/2019 Napier City Council Pg 21 of 207

2 CARPENTRY

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:

2589:2017(AS/NZS)	Gypsum linings - Application and finishing
3604:2011(NZS)	Timber-framed buildings
3631:1988(NZS)	New Zealand timber grading rules
NZBC E2	External moisture

2.3 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.

2.4 Timber Framing

2.4.1 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.

2.4.2 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 and as shown on the drawings.

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings prior to installing timber framing.
Co-ordinate with other trades to install timber framing as required.

APPROVED BC190130 03/04/2019 Napier City Council Pg 22 of 207

2.4.3 Timber Framing

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.

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.

Framing 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.

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.

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.

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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 23 of 207

2.4.4 Steel Fixings

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.

Durability of Fixings & Fastenings

Unless otherwise noted or specified, the minimum durability of timber framing fixings and fastenings, excluding nails and screws, shall comply with the durability requirements of NZS 3604 Table 4.1.
Galvanised steel fixing components, excluding nails and screws, 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.
Stainless steel nails shall be minimum Grade 304 unless otherwise specified or noted.

Bolts and Coachscrews

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

2.4.5 Wall Framing

Plates

Top and bottom plates shall be to the dimensions and layout shown on the drawings. Unless specified or shown otherwise, top and 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 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 and bottom plates in accordance with NZS 3604 8.7.5.

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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 24 of 207

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

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.

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.

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.

Ribbon Boards

Ribbon boards shall be as dimensioned and located on the drawings, and installed on edge and checked 25mm into studs at the required height, true to line and level, and fixed in place in accordance with NZS 3604 Table 8.19.

2.4.6 Posts

Timber Posts

Timber posts shall be to the sizes and locations shown on the drawings, and installed true to line and plumb each way, and secured to concrete footing with D12 bars as per drawings.

2.4.7 Roof Framing

Rafters

All rafters (including hip, valley and jack rafters) shall be to the dimensions, spacings, pitch, and layout shown on the drawings.
Rafters shall be aligned and paired at the required spacings to ridge boards, ridge beams, hip rafters and valley rafters, and as shown on the drawings, and installed parallel, true to line, pitch and plane, and fixed in accordance with NZS 3604 Table 10.1.
Any required jointing of rafters shall be made over supports shown on the drawings only.
Unless shown otherwise, rafter seating to top plates, beams, and lintels shall have a minimum bearing of 32mm without reducing the rafter depth to less than 65mm, or 80%, at the birds mouth.
Extend rafter ends to form eaves as detailed on the drawings and in accordance with NZS 3604 10.2.1.14.
Fly rafters and outriggers installed to form gable verges as detailed on the drawings and in accordance with NZS 10.2.1.15.3

APPROVED BC190130 03/04/2019 Napier City Council Pg 25 of 207

Verandah Beams

Verandah beams shall be to the dimensions and locations shown on the drawing and installed true to line and level. Unless shown otherwise, all verandah beam jointing and connections to timber posts shall be in accordance with NZS 3604 Table 9.2.

Ceiling Runners

Unless specified or shown otherwise, ceiling runners shall be to the dimensions and spacings given in NZS 3604 Table 10.4. Ceiling joists shall be supported by ceiling runners with proprietary steel hangers or 50mm x 50mm timber hangers in accordance with NZS 3604 10.2.1.7.6.

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.

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.

Roof Bracing

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

2.4.8 Ceiling Framing

Ceiling framing shall be to the dimensions, layout, spacings, and details shown on the drawings, and shall be installed true to line, level and plane, and securely fixed in accordance with NZS 3604 Table 13.3.

2.5 GIB® Plasterboard Sheets

2.5.1 Scope

Supply and install the selected GIB® Plasterboard sheets, complete with all accessories, as sheet lining material to the walls, ceilings and other elements identified on the drawings. All aspects of this work shall be in complete accordance with Winstone Wallboards Ltd technical literature and installation guidelines (call Winstone Helpline on 0800 100 442 or check www.gib.co.nz for the latest editions) and other relevant product manufacturers' recommendations.

APPROVED BC190130 03/04/2019 Napier City Council Pg 26 of 207

Substitution of any specified GIB® system, GIB® System component or GIB® plasterboard is not permitted.

2.5.2 Performance

To the areas noted on the drawings as 'General Plasterboard Wall or Ceiling Lining', comply with all relevant aspects of the GIB® Site Guide (2014) publication, complete with all recommended components and accessories, and other relevant manufacturers recommendations.

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 (2007) publication, BRANZ Appraisal No.427 (2007), and other relevant product manufacturers' recommendations. Refer to separate specification GIB Aqualine® Wet Area Systems.

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 (2016), and other relevant product manufacturers' recommendations. Refer to separate specification GIB EzyBrace® Systems.

2.5.3 GIB Plasterboard

GIB® Standard plasterboard, 10mm thick.

Refer specifications summary for location

GIB Aqualine® plasterboard, 10mm thick.

Refer specifications summary for location

2.5.4 Fixings

Fix sheets with adhesive and GIB® Grabber® drywall screws in accordance with Winstone Wallboards Ltd requirements.

2.5.5 Level of Plasterboard Finish

To the areas noted as a specific Level of Finish (3-5) on the drawings, additionally comply with all relevant aspects of Winstone Wallboards Ltd literature 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.

2.5.6 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 to ensure that appropriate clearances are allowed from adjacent internal linings, fixtures, products, and associated services, etc, that the sheets correctly allow for

APPROVED BC190130 03/04/2019 Napier City Council Pg 27 of 207

door and window installation, and that services penetrations are correctly handled to maintain sheet integrity.

2.5.7 Workmanship

All installation work shall be carried out by experienced tradesmen familiar with the techniques and materials specified and in accordance with the current requirements of Winstone Wallboards Ltd.

2.5.8 Delivery & Handling

Store GIB® plasterboard sheets undercover inside a watertight building and keep sheets dry at all times. Stack sheets flat on a dry level surface in accordance with Winstone Wallboards Ltd recommendations. Avoid damage to sheet edges, ends, and surfaces. Carry all sheets on edge.
Do not use damaged or faulty sheets.

2.5.9 Preparation

Check that the timber framing elements are in accordance with NZS 3604, or in accordance with NZS 3603 and AS/NZS 1170 for specific design, and otherwise in accordance with the specified Level of Finish and Winstone Wallboards Ltd requirements. Framing shall be plumb and in true alignment, complete and suitable for the sheets, and maximum moisture content 18% or as recommended by Winstone Wallboards Ltd. Ensure that the framing is true to line and plane and with no projections due to structural and bracing bracketry etc. Ensure that all framing brackets, plates, braces and hold-downs etc. are correctly installed.

Check that the building has been completely finished to all penetrations including doors, windows, services, etc so that the sheets can be installed without being affected by any weather conditions. Check junctions to all other building elements and ensure that all necessary works have been completed eg. flooring, setout of services, etc. that will enable the sheets and accessories to be installed. Clear building debris and rubbish from framing voids and keep clean until GIB sheet linings are installed.

2.5.10 Installation

Install the sheets, complete with all accessories, to the framing in accordance with the relevant Winstone Wallboards Ltd recommendations and literature, and as noted and detailed on the drawings.

2.5.11 Completion

Ensure that the sheets have been cut, fitted and joined, and fixed correctly. Check for damage and replace as necessary.
Clean up thoroughly on completion and remove all waste and rubbish from site.
Provide a copy of the Winstone Wallboards Ltd maintenance requirements to the owner.

2.6 Linea Weatherboard

2.6.1 Scope

Supply and install Linea 150mm Weatherboards as a fibre-cement weatherboard cladding material to the walls identified on the drawings, complete with all accessories. The Linea Weatherboards are to

APPROVED BC190130 03/04/2019 Napier City Council Pg 28 of 207

be finished with a paint system. All aspects of this work shall be in complete accordance with the James Hardie Linea Weatherboard Technical Specification (check www.jameshardie.co.nz, or call 0800 808 868 for the latest edition), Linea BRANZ Appraisals, and other relevant product manufacturers' recommendations.

James Hardie Linea Weatherboard Direct Fixed and Cavity Cladding is CodeMark assured with the NZ Building Code: CodeMark Certificate of Conformity No:GM-CM30018 (Rev G), issued by Global-Mark Pty Ltd.

2.6.2 Co-operation

Co-operation

Co-ordinate with other trades to ensure that appropriate clearances are allowed from roofing products and associated flashings etc, that the panels correctly allow for door and window installation, and that services penetrations are correctly handled to maintain full weathertightness and panel integrity.

Ensure that other trades are aware of the James Hardie Safe Working Practices.

2.6.3 Preparation

Check that the timber framing elements are in accordance with NZS 3604, or in accordance with NZS 3603 and AS/NZS 1170 for specific design, and in accordance with James Hardie requirements. Framing shall be plumb and in true alignment, complete and suitable for the weatherboards, and maximum moisture content as per NZS 3602. Ensure that the framing is true in line with no projections due to structural and bracing bracketry etc. Ensure that the bottom plate hold-downs are correctly installed.

Check that the building underlay or rigid air barrier has been installed in full accordance with the manufacturer’s requirements and the drawings, and completely finished to all penetrations including doors, windows, services, etc. Check junctions to all other building elements and ensure that all necessary works have been completed eg. flashings etc that will enable the weatherboards and all accessories to be installed.

Check that the ground levels are sloping away from the building so that there will be no ponding water against the building, and that the ground will be remain clear of the weatherboards by at least 100mm at all times in accordance with E2/AS1.

2.6.4 Sealants

Flexible silicone sealant to be SIKA AT Facade. Use to seal the weatherboards and accessories in accordance with the sealant manufacturer’s recommendations and to James Hardie requirements. Ensure sealant compatibility with selected finish.

APPROVED BC190130 03/04/2019 Napier City Council Pg 29 of 207

2.6.5 Workmanship

Workmanship

All installation work shall be carried out by an LBP, or supervised by an LBP, in accordance with Linea Weatherboards Technical Specification and other relevant product manufacturers' recommendations.

2.6.6 Delivery & Handling

Carry all boards on edge. Stack boards flat on a level platform off the ground ie. use the supplied delivery pallet on level ground (if no pallet then evenly spaced bearers on level ground at 600mm crs maximum). Keep boards and accessories dry at all times. Avoid damage to board edges, ends, and surfaces. Keep uPVC flashings etc out of direct sunlight, and store all accessories on flat and avoid damage. All installers to be familiar with and comply with the James Hardie Safe Working Practices in the Installation Manual, to use appropriate safety gear, and in particular to be aware to avoid breathing silica dust. Do not use any damaged or blemished weatherboards or accessories.

2.6.7 Installation

Install the Linea Weatherboards through the building underlay or rigid air barrier to the framing in accordance with the Technical Specification and BRANZ Appraisal No.446 (2010), complete with all accessories eg. corner mouldings, cant strip, sealant, soakers, etc. Weatherboard end joints are to be formed off framing with a tongue & groove joint and sealant.

Ensure that all cut edges of weatherboards are primed prior to installation with Dulux 1 Step Prep, Resene Quick Dry, or similar. Ensure that the bottom edge of the weatherboard overhangs below the bottom plate by 50mm, and is clear of the ground surface by at least 100mm; the finished ground clearance shall be in accordance with E2/AS1. Install flexible flashing tape to all junctions and penetrations (including cables etc), with the addition of a pipe bandage for pipes to maintain weathertightness and air pressure resistance, and seal around.

2.6.8 Fixings

Fix weatherboards and accessories with galvanised nails using the concealed nailing method in accordance with James Hardie requirements.

Fix soakers with nails in accordance with James Hardie requirements.

Optional face nail as required in accordance with James Hardie requirements.

Fix corners and vertical edges of openings with galvanised nails using the face nailing method in accordance with James Hardie requirements.

2.6.9 Completion

Completion

Ensure that the Linea Weatherboards have been fixed correctly, that all vertical joints and accessories have been completed correctly, and that all penetrations have been taped correctly. Check that no damage has occurred to any installed weatherboard element or associated component, replace as necessary. Check that no dirt has been mounded up within 175mm of the weatherboards, and

APPROVED BC190130 03/04/2019 Napier City Council Pg 30 of 207

maintain the clearance. Ensure that the weatherboards are painted within 90 days of the sheet installation, complete with all accessories and flashings. Hand over a copy of the latest edition of the Linea Weatherboard Product Warranty to the client. Hand over a copy of the latest Linea Weatherboard Maintenance Schedule to the client.

APPROVED BC190130 03/04/2019 Napier City Council Pg 31 of 207

3 PLASTERWORK

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:

2589:2017(AS/NZS) Gypsum linings - Application and finishing

3.3 Plasterboard Finish

3.3.1 Scope

Plasterboard linings shall be finished to the specified finish level.

3.3.2 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.

3.3.3 Jointing Tape

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

3.3.4 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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 32 of 207

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.

3.3.5 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.

3.3.6 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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 33 of 207

4 ROOFING

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:

NZBC B2	Durability
NZBC E2/AS1	External Moisture
NZMRM Code of Practice	NZ Metal Roof and Wall Cladding Code of Practice - Version 2.2

4.3 Profiled Metal Roofing

4.3.1 Scope

Extent of Work

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

4.3.2 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.

Warranty - Roofing Material

Roofing Material Product Warranty. Warrant this work against failure of materials under normal use and environmental conditions:

- 15 Years for Perforation: according to the roofing material manufacturer/supplier warranty conditions.
- 15 Years for Coatings: according to the roofing material manufacturer's warranty conditions.
- Provide the Product Warranty on the roofing manufacturer's Standard Warranty Form.
- Commence the warranty from the date of practical completion of the contract works.

Warranty - Installation

Installation Warranty. Warrant this work under normal environmental conditions and use against waterproofing failure:

APPROVED BC190130 03/04/2019 Napier City Council Pg 34 of 207

- 15 Years for Workmanship.
- Provide the Installation Warranty on the roofing installer's Standard Warranty Form.
- Commence the warranty from the date of practical completion of the contract works.

Include a copy of the roofing manufacturer's maintenance requirements with the Installation Warranty.

Wind Performance - High Wind Zone

Profiled Metal Roofing Wind Performance - Non-Specific Design Wind Zone Classification:

- NZS 3604 Wind Zone: H = High.
- Wind Speed: <44m/s.
- Ultimate Limit State: 1.16kPa.

Refer to the roofing manufacturer's technical literature for wind load design parameters.

4.3.3 Roofing Profile

Corrugated Profile - C2

Corrugated Profiled Metal Roofing. Standard corrugated profile; 18mm nominal crest height; 76mm nominal crest pitch. Manufactured from the material type, thickness and finish specified.

Minimum roof pitch: 8° (1:7).

Corrugated metal roofing shall be fixed with self-drilling screws through the profile crest in accordance with the requirements of the NZMRM Code of practice.

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 requirements of the roofing manufacturer's technical literature and the NZMRM Code of Practice, to the locations and details shown on the drawings.

Installed Location:

4.3.4 Roofing Material

Corrugate Colorsteel

0.4mm BMT prepainted corrugated roofing.

4.3.5 Components & Accessories

Roof Underlay

Roof Underlay. Refer to separate specification section.

APPROVED BC190130 03/04/2019 Napier City Council Pg 35 of 207

Screw Fasteners - Corrugated/Trapezoidal Profiles

Screw Fasteners - Corrugated and Trapezoidal Profiles. Screw fasteners shall be self-drilling screws complying with AS 3566 Class 4 or Class 5, as appropriate, and be no less than the durability of the roofing material being fixed.

Fastener type and placement (frequency) shall be appropriate for the environmental conditions, and the specified roofing profile and material, and the supporting structure material; all in accordance with the NZMRM Code of Practice.

Screw fasteners for pre-painted roofing must be pre-painted prior to installation for an accurate colour match.

Sealant

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

4.3.6 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 to ensure that all roof members required for ridges, hips, valleys, barges, penetrations, junctions with vertical faces, etc. are correctly installed.

Coordinate with the roof drainage system, and generally with other trades as required, to install the specified profiled metal roofing.

Ensure that each section of roof is waterproofed as soon as possible after preparatory work is complete; allow to carry out the works in several operations if necessary to comply with this condition.

4.3.7 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.

All installation work shall be carried out by experienced and competent tradespersons, familiar with the specified products and installation techniques, in accordance with the requirements of the NZMRM Code of Practice, and to fully comply with all warranty requirements. All work shall be such as to leave a neat, efficient, robust and weathertight installation.

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 36 of 207

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

4.3.8 Delivery & Handling

Upon delivery to site, inspect roofing materials and reject those items that are found to be damaged, defective or contaminated. Contact the manufacturer/supplier for replacement of rejected items at time of delivery to site.

Store profiled metal roofing, flashings and accessories undercover, clear of level ground, on bearers at evenly spaced centres as recommended by the roofing manufacturer. Keep stored materials and accessories dry 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, including surface marking. Do not used damaged or defective materials or products, 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 - in particular the Best practice guidelines for working on roofs and the OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry.

For all work undertaken on the roof, installers shall always wear soft, clean footwear with a light-coloured sole. Do not walk on translucent/natural lighting sheet.

4.3.9 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 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 3603 at the time of installation.

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 37 of 207

Supporting steel structures shall comply with NZS 3404.

Roof Structure Check

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

- Check that the purlins are set-out to the required set-out and spacings, are straight and true to line and plane, and are securely fixed.
- Check that 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 drawings.
- Check that trimming for roof penetrations, and roof/wall junction blocking, and all necessary work by other trades is complete.
- Check that solid backing required for fully supported roofing is complete and securely fixed in accordance with the approved drawings.

4.3.10 Installation

Roof Underlay

Install roof underlay in accordance with the underlay manufacturer's requirements with minimum 150mm side and end laps, and lapped such that any water will be shed to the outside of the underlay.

Non self-supporting underlay must be supported by hexagonal galvanised wire mesh, safety mesh or alternative support, as specified and/or shown on the drawings, in accordance with the 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 - Sections 4.3.11 Separation, 11.4.2 Substrate, and 11.5.1 Ventilation.

Roofing - Corrugated/Trapezoidal Profile

Install profiled metal roofing in accordance with the NZMRM Code of Practice and as shown on the drawings, and to fully comply with all warranty requirements. As shown on the drawings, confirm any specific roofing detailing requirements prior to installation.

Accurately set-out roofing sheets exactly square to the building axis and with sheets lapped away from the prevailing wind; maintain this accurate set-out throughout installation. Check for and eliminate any creep and/or spread of sheets during installation.

Cut metal roofing and flashings by shear only – do not use abrasive cutting tools on or near the roof. Do not use black lead pencils for marking pre-finished roofing and flashings.

APPROVED BC190130 03/04/2019 Napier City Council Pg 38 of 207

Prevent contact with, or run-off from, incompatible materials in accordance with the recommendations in the NZMRM Code of Practice. Observe the roofing material manufacturer's recommendations where flues discharge above roofs, and for the installation of solar heating panels. Protect roofing surfaces from damage at all times; replace the whole sheet where a significant depth of the material or coating has been damaged (including flashings).

Screw-fixed sheets shall be fixed with fasteners appropriate for the roofing profile and material, substrate/structure and the environment in accordance with the Roofing Industries Profile Technical Summary and the NZMRM Code of Practice recommendations (minimum Class 4).

Screw fastening placement and spacings shall be strictly in accordance with the roofing manufacturer's requirements and the NZMRM Code of Practice, to fully comply with the Wind Zone requirements, purlins spacings, etc.

Use fixing systems that will accommodate thermal expansion for long lengths and/or dark colours.

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

Ridges, hips, barges and flashings generally, shall be in accordance with the NZMRM Code of Practice and the roofing manufacturer's requirements.

Flashings

Install flashings to roof edges, ridges, roof/wall junctions, parapets and roof penetrations as detailed on the drawings and in accordance with the NZMRM Code of Practice and the roofing manufacturer's requirements.

All flashings shall be neatly formed and finished, securely fastened to the structure, weatherproof and have falls set to avoid water ponding.

For highly visible flashings, plan each flashing joint and/or junction with specific regard to aesthetic requirements.

Penetrations

Penetrations greater than 150mm in any direction must have support framing installed around the perimeter of the penetration. Penetration flashings shall not rely solely on silicone sealant to achieve weathertightness of the flashing.

Flash pipes penetrating the roofing with a proprietary pipe collar flashing.

Cleaning

Completely clean off all drill and other swarf and pop-rivet shanks as the work proceeds (at least daily), and keep them and other rubbish out of the spoutings.

APPROVED BC190130 03/04/2019 Napier City Council Pg 39 of 207

Remove associated trade debris from the roof and from the site progressively, and on completion leave the roof and rainwater system completely clean.

4.3.11 Completion

Check that the profiled metal roofing and associated components and flashings have been installed and finished correctly.

Check for defective work and materials - replace and/or repair as necessary.

Sweep down the completed roof and clean out spouting, gutters and rainwater pipes.

Leave all of this work complete and weathertight in accordance with the roofing manufacturer's requirements and the NZMRM Code of Practice, and to fully comply with all warranty requirements.

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

Issue to the Owner a copy of the roofing manufacturer's maintenance requirements on completion.

Issue to the Owner the roofing material manufacturer/supplier 'Product Warranty', and a copy of the installer's 'Installation Warranty'

APPROVED BC190130 03/04/2019 Napier City Council Pg 40 of 207

5 ALUMINIUM JOINERY

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:

4223.3:2016(NZS)	Glazing in buildings - Part 3: Human impact safety requirements
4223.4:2008(NZS)	Glazing in buildings - Part 4: Wind, dead, snow, and live actions

5.3 Aluminium Windows & Doors

5.3.1 Alternatives

The materials and elements specified indicate the required standards for these works. Alternatives which are equal to or superior to these materials and elements may be tendered for approval.

Thermal performance (NZBC H1/AS1) must be as required to meet the Designer's Thermal Evaluation.

5.3.2 Installation Type

Timber Frame Installation - Direct Fix

All windows (and aluminium frame external doors) installation work shall be exactly in accordance with NZBC E2/AS1, the Windows Association's Windows Installation System (WANZ:WIS), and details on the drawings or supplied by the windows manufacturer.

Check framing alignment, and that window openings are square and the correct size for fitting tolerances.

Prepare framing openings by neatly cutting the building wrap at 45º into the corners, turning wrap through the frame depth and fixing to the inside face, flashing the bottom corners with moulded plastic and over-flashing the full sill and 200mm up the jambs with the specified flexible flashing tape, stapled to hold the stretched external corners. At head corners install flashing tape 200mm each way from the corners.

Install the sill flashing, extending from an upstand lip behind the line of the aluminium frame out to lap a minimum of 35mm down over the top of the cladding, sloping at 15º unless the glazing weight requires the frame be blocked up for support. (If the flashing is level for blocking-up the sill, upstand its ends to create 'dams' as shown in E2/AS1).

APPROVED BC190130 03/04/2019 Napier City Council Pg 41 of 207

Set shims or pack as necessary and install the frames exactly true and square. Use appropriate separators between aluminium and other materials, and fix securely with due regard for any anticipated movements and for linings, trim etc.

Install the head flashing, extending 35mm up behind the cladding (and in turn over-flashed with an additional piece of wrap cover extended up under the wrap or flashing or eaves above), sloping at 15º down to the exterior, and turning down to cover the top of the aluminium frame by at least 10mm, before finishing with a 5mm 45º 'kick out'. Seal between head flashing and cladding at the ends as detailed. Install jamb flashings/sealant or scribers as detailed.
After frames installation install closed cell backing rods as required and expanding foam air-seal the gap between framing and liners.

APPROVED BC190130 03/04/2019 Napier City Council Pg 42 of 207

5.3.3 Interior Finish

Architraved.

5.3.4 Reveal

Timber reveals for paint finish with all sides primed.

5.3.5 Glass Platform

Double Glazed.

5.3.6 Workmanship

These windows will be manufacturerd in workshops containing all mechanical equipment appropriate for the work, and by experienced and competent tradesmen who are familiar with the techniques and materials specified.

The manufacturer will co-ordinate with other trades to establish the exact sizes for all frames before fabrication. Frames and sashes will be fabricated true, square, rigid, and ‘out of wind’, with all joints strongly mechanically fixed, and with mitres tight and fully sealed. Potential thermal, wind and seismic movements will be accommodated within the construction. All cavities will drain to the exterior, and all drilling swarf etc. will be removed during fabrication.

Stays, hinges, running gear and glazing will be installed as scheduled (the Designer will be notified if any scheduled hardware of fixing position appears to be inappropriate for this project).

Hardware will be fixed true to line and position, and adjusted and oiled as required for correct operation.

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

Flashings as detailed will be supplied. Flashing materials will be compatible with the windows.

5.3.7 Delivery and Installation

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

Arrange for delivery of windows to the site only when a suitable storage situation is available for them, handle the windows in accordance with the manufacturers requirements, avoid any frame distortion, avoid rubbing damage, avoid contact with concrete, plaster, mud etc. and keep them dry. Retain protective coverings for as long as possible, and remove them at completion.

Experienced and competent tradesmen who are familiar with the techniques and materials specified shall carry out all installation work. Fix in accordance with the manufacturer's instructions. Take utmost care to avoid damage to anodized or powder coated surfaces - correction of any such disfigurement requires written authority - replace any badly damaged items.

Use fixings compatible with the materials involved, as recommended by the windows manufacturer and to comply with the DWP requirements, basically aluminium or Type 316 stainless steel where exposed externally; galvanized to AS/NZS 4680, 610g/m2, may be used where not exposed.

Thoroughly check all preparatory work to openings prior to installation, including underlay, corner seal tapes, adjacent cladding, pre-installed flashings, waterproofing systems etc. as appropriate. Use inert barriers or coatings to prevent contact between dissimilar metals or between aluminium and concrete.

Install flashings as detailed and supplied by the windows manufacturer, installed tightly and neatly with absolute minimum tolerances, with head weathering jamb, jamb weathering sill, and sill open (draining) to exterior. Except where the window is recessed all head flashings shall extend 30mm minimum beyond the frame.

Air-seal all frame perimeters to adjacent structure to a depth of 15 - 20mm with expanding foam or appropriate sealant including a PEF rod at head, sill and jambs to retard the spread of sealant.

Weather-seal frame jambs etc. to adjacent surfaces (or to each other) as detailed or as required by the windows manufacturer, to achieve a fully watertight installation. In preparation for sealant the joints shall be clean, dry, and primed if necessary. Insert closed cell polyethylene backer rods or a polyethylene tape slip layer if required. Mask adjacent surfaces if appropriate, install the sealant fully in accordance with the sealant manufacturer's recommendations, and finish to even smooth surfaces.

Remove trade debris progressively, appropriately clean any affected adjacent surfaces, thoroughly clean the windows, check that all hardware is in full working order, and provide safety indication of the glass for the balance of adjacent works.

APPROVED BC190130 03/04/2019 Napier City Council Pg 43 of 207

6 INSULATION

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:

3604:2011(NZS)	Timber-framed buildings
4218:2004(NZS)	Energy efficiency - Small building envelope
4218:2009(NZS)	Thermal insulation - Housing and small buildings
NZBC H1/AS1	Energy efficiency

6.3 Pink® Batts® Insulation

6.3.1 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. All aspects of this work shall be in complete accordance with Tasman Insulation technical information and installation requirements (check pinkbatts.co.nz, call 0800 746 522, or email customer@pinkbatts.co.nz for the latest editions), other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for Pink® Batts® Insulation.

Pink® Batts® insulation is certified under the GREENGUARD Certification Program (UL 2818). 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.

6.3.2 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.

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 44 of 207

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.

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 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 Pink® Batts® branded products to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Installer.

Inspections

Carry out all necessary pre-installation and pre-line inspections of Pink® Batts® Insulation for each area of work in accordance with the requirements of industry best practice recommendations and manufacturer guidelines.

Complete a Pre-Installation Checklist prior to installation, and a Pre-Line Checklist before handing over for subsequent work.

Note: Pink® Batts® checklist applies only to Pinkfit.

6.3.3 Wall Thermal Insulation

Pink® Batts® Ultra® R2.6 Wall

Pink® Batts® Ultra® R2.6 Wall - product code 7127126. A non-combustible, resin bonded fibrous glasswool insulation manufactured from recycled and virgin glass and cured urea extended phenolic resin. R-value R-2.6. 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 (2012).

Pink® Batts® Ultra® R2.6 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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 45 of 207

6.3.4 Ceiling Thermal Insulation

Pink® Batts® Classic R3.6 Ceiling

Pink® Batts® Classic R3.6 Ceiling - product code 7110136. A non-combustible, resin bonded fibrous glasswool insulation manufactured from recycled and virgin glass and cured urea extended phenolic resin. R-value R-3.6. 180mm thick x 432mm wide x 1220mm long segments.

BRANZ Appraised for use as a thermal insulating material for ceilings of domestic and commercial buildings according to the conditions and limitations of BRANZ Appraisal No.238 (2012).

Pink® Batts® Classic R3.6 Ceiling is licenced with Environmental Choice New Zealand: Thermal Building Insulant Licence No.2504017.

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

Installed Location:

6.3.5 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.

6.3.6 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.

The building envelope must be fully enclosed and weatherproof, with construction materials framing at or below the required moisture content, before insulation installation commences.

All installation work shall be carried out by registered PinkFit® 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.

Carry out all necessary pre-installation and pre-line inspections of Pink® Batts® Insulation for each area of work in accordance with the requirements of industry best practice recommendations and the manufacturer's guidelines. Inspect all Pink® Batts® insulation work before it is closed off with linings or made inaccessible.

Insulation shoud be installed without leaving gaps or compresing the material. Always maintain full insulation thickness to ensure that the stated thermal and acoustic values are achieved. Do not install insulation into closed cavities with a cavity depth less than the insulation's stated thickness.

APPROVED BC190130 03/04/2019 Napier City Council Pg 46 of 207

6.3.7 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.

Do not use damaged or defective materials.

Should a problem be encountered with any Pink® Batts® Insulation product, immediately contact Pink® Batts® on 0800 746 522. Do not continue to use the product that is not performing to specification or expectation. Keep the product in question and where possible, the bale package documentation with batch number and/or date of manufacture.

Handle Pink® Batts® Insulation products in accordance with the manufacturer's requirements and in a manner that prevents damage to and contamination of the product. Ensure installed Pink® Batts® Insulation remains dry at all times.

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

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.

6.3.8 Installation

General

Install Pink® Batts® Insulation in accordance with NZS 4246 and the manufacturer's requirements.

Each installation is unique, so prior to installation:
- check for all hazards that may cause injury; and
- carry out any required repair work before starting installation; and
- ensure there's adequate lighting to identify any hazards; and
- treat all electrical cables as live, being careful not to cut or expose cables and wires; and
- beware of other sharp objects (protruding nails, splinters etc.), pests (bees and wasps), loose boards and pipe work.

Pink® Batts® Wall

Pink® Batts® wall insulation segments shall be oversized by no more than 10mm than the wall framing spacings. If cutting is required, cut oversize by 5mm to ensure a good friction fit.

Friction fit the insulation segments between wall framing members ensuring there is no undue compression, gaps, creases, tucks or folds, and the insulation is finished flush with the framing edges.

Firmly butt all insulation segment joins together, ensuring there are no gaps, and maintain full thickness of the insulation to ensure maximum thermal performance.

APPROVED BC190130 03/04/2019 Napier City Council Pg 47 of 207

Fit Pink® Batts® insulation tight and close around electrical cables and pipes. As necessary, partially cut and fit insulation around cables and pipes. Take extreme care when working around exposed electrical cables - treat all cables as live.

Pink® Batts® Ceiling - Truss/Framed Roof

Pink® Batts® insulation segments shall be oversized by no more than 10mm wider than the ceiling framing spacings.

Lay the insulation segments over the ceiling, friction fitted between the ceiling joists/truss chords, ensuring there is no undue compression, gaps, creases, tucks or folds in the insulation.

Firmly butt all insulation segment joins together, ensuring there are no gaps, and maintain full thickness of the insulation to ensure maximum thermal performance.

Cover the entire ceiling, including the outer edge of the top plate of external walls - the insulation must cover at least 50% of external top plates.

Maintain a minimum 25mm clearance between the top of the ceiling insulation and any roofing material, including underlay. If required, trim the insulation or use a thinner product around the perimeter.

Ensure that the appropriate clearances are maintained for electrical equipment, heating and ventilation equipment, heated flues and pipes, etc. Where possible, place insulation beneath electrical wiring and plumbing. Take extreme care when working around exposed electrical cables - treat all cables as live.

6.3.9 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.

Check that 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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 48 of 207

6.4 Thermal Insulation

6.4.1 Scope

Supply and install the selected products as thermal insulation to the specified R-values, complete with all accessories, to the floors, walls, ceilings, roofs, and other thermally insulated building elements, as noted and shown on the drawings. All aspects of this work shall be in accordance with the product manufacturer's technical literature and installation requirements, other relevant product manufacturers' recommendations, and as shown on the drawings.

6.4.2 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 all thermal insulation as required.

6.4.3 Workmanship

All installation work shall be carried out by experienced and competent tradesmen, familiar with the specified products and installation techniques, in accordance with the manufacturer's installation requirements, and as noted and detailed on the drawings.
Store and handle products in accordance with the manufacturer's recommendations, keep dry and protect from damage. Do not compress fibre insulation bales. Do not use damaged or defective insulation products and accessories.
The building must be completely enclosed and water tight before installation commences with the exception of roof insulation when installed with roofing. Ensure the moisture content of timber framing is no greater than 18% prior to installing insulation to timber framed elements. Always maintain the full insulation thickness to ensure the required thermal values are achieved. Do not install insulation pads or blankets into closed cavities that are less than the stated insulation nominal thickness.

6.4.4 Product

H Grade Expanded Polystyrene Sheet
High Grade expanded polystyrene (EPS) thermal insulating sheets, 24kg/m3.

Manufacturer, brand name & type: Expol Thermaslab H Grade
Thickness & R-Value: 40mm, R1.05
Location: Slab insulation

6.4.5 Installation

Under Slab Insulation - Polystyrene Sheet
Install the selected polystyrene sheets, complete with accessories, over the damp proof membrane to the layout shown on the drawings, sheets neatly butt jointed in accordance with the manufacturer's recommendations. Carefully cut penetrations holes with a sharp knife around cast-in pipes etc. and seal off with polythene tape or as noted otherwise. Do not install under footings or slab thickenings.
Install slab reinforcing steel immediately on flat mesh chairs to hold insulation sheets in place.
Below ground slab edge insulation installed as detailed.

APPROVED BC190130 03/04/2019 Napier City Council Pg 49 of 207

6.4.6 Completion

Completion

Check that all insulation has been installed correctly and is correctly supported and that all edges, joins and ends are fully closed without gaps. Check for damage and faults and repair or replace as necessary. Collect and remove from site all rubbish and waste material.

Issue to the Owner a copy of any product maintenance requirements and a copy of the Thermal Insulation Product and Installation Warranties for the completed works.

APPROVED BC190130 03/04/2019 Napier City Council Pg 50 of 207

7 PAINTING & DECORATING

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.

7.3 General

7.3.1 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).

7.3.2 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.

7.3.3 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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 51 of 207

7.3.4 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.

7.3.5 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.

7.3.6 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.

7.3.7 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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 52 of 207

7.3.8 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).

7.3.9 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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 53 of 207

8 FLOOR COVERINGS

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.

8.3 Carpet & Resilient Floor Coverings

8.3.1 Scope

Supply and install the specified Floor Coverings and flooring products to the areas and surfaces, layouts and details shown on the drawings, complete with all accessories. All aspects of this work shall be in accordance with the specified floor covering manufacturers' technical literature and installation requirements, relevant Standards and Code requirements, other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for the specified Floor Coverings and flooring products.

8.3.2 Floor Coverings

Carpet

Carpet flooring; to the specified product, pile style and content, and colour and pattern. Installed in accordance with the manufacturer's requirements and AS/NZS 2455.1 to the locations and layout shown on the drawings.

8.3.3 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.
Co-ordinate with other trades as required to install the specified floor coverings and accessories.

8.3.4 Workmanship

All installation work shall be carried out by experienced and competent floor layers, familiar with the products specified and installation techniques, under the direct supervision of a Registered National Flooring Association (NFA) Member, in accordance with the manufacturer's installation requirements, NZS/AS 1884, AS/NZS 2455.1, AS/NZS 2455.2 and AS/NZS 4586 as relevant, and as noted and detailed on the drawings.
Use only approved adhesives that are compatible with the specified floor covering product and the substrate as recommended by the floor covering manufacturer.
The building must be fully enclosed and weathertight with all doors and necessary fittings and trim installed prior to laying floor coverings.

APPROVED BC190130 03/04/2019 Napier City Council Pg 54 of 207

8.3.5 Delivery & Handling

Store and handle all floor covering products and accessories in accordance with the manufacturer's recommendations. Store products and accessories under cover and out of direct sunlight on a flat and level surface; keep dry and protect from damage and contamination at all times.
Do not use damaged or defective flooring products or accessories, or products that are beyond their designated shelf life. Do not damage or mark or distort flooring products and accessories during handling.
Allow floor coverings and accessories to properly condition for a minimum of 24 hours, or as recommended by the manufacturer, prior to laying in accordance with the manufacturer's requirements. Unless recommended otherwise by the manufacturer, do not lay floor coverings below 15^{o}C room temperature.

8.3.6 Substrate Preparation

General
Ensure the substrate surface is free of oil, grease and other contaminants, then sweep or vacuum as required to ensure it is absolutely clean. Ensure that any expansion or crack control joints are appropriately trimmed - do not install floor coverings over them.
The commencement of work on each section of floor shall be deemed to indicate a full acceptance by the relevant Flooring Subcontractor that all preparatory works by other trades are appropriate to achieve the required finished results.

8.3.7 Installation

Carpet Floor Coverings - Conventional Stretch-in
Install by conventional stretch-in method carpet floor coverings, and accessories, including all jointing, in accordance with the manufacturers' recommendations, procedures and techniques, AS/NZS 2455.1, and as shown on the drawings.

Allow the carpet underlay and carpet floor coverings to properly condition in accordance with the manufacturers' recommendations prior to laying. Turn underfloor heating systems off 48 hours prior to installation and leave off during installation and for a minimum of 48 hours after completion.
Thoroughly clean each area before commencing work. Seal or prime as necessary any porous surface receiving floor covering adhesive, and apply adhesive exactly to the manufacturer's recommendations.

Confirm the location of all carpet joints and seams prior to laying. Install carpet rolls in consecutive sequence and in the same direction. Do not install carpet underlay and carpet floor coverings over expansion joints - use only the specified expansion joint cover strip and neatly finish the underlay and carpet flooring in accordance with the cover strip manufacturer's requirements.

Install edge grippers and lay the carpet underlay at right angles to the direction of the carpet floor covering with joints no less than 300mm from any seam in the carpet. Staple or adhesive fix underlay to substrates in accordance with the manufacturer's recommendations.

APPROVED BC190130 03/04/2019 Napier City Council Pg 55 of 207

Carpet flooring installed flat and taut and evenly tensioned both ways by power stretching sequence. All seams and cross joins to be close-fitting and fused together with hot melt tape. Cut and properly prepare cross joins to ensure accurate pattern alignment.
Accurately install stair tread nosings and lay pre-cut carpet pieces to each stair tread and riser and finish neatly into or under the nosing edge as necessary.
Install any required carpet skirting, capping and edge trim, transition strips and naplock bars, as noted and detailed on the drawings; all finished straight and level and true to line.

Keep the working area cordoned off and protected during installation and protect completed installation work from damage and contamination until hand over of the works as programmed/scheduled.

8.3.8 Completion

Ensure that the specified floor coverings have been installed correctly, and that all seams, joints and accessories have been and completed correctly. Check for damage and defects and repair or replace as necessary.
Thoroughly clean the installed floor coverings in accordance with the manufacturers' recommended techniques and procedures.
Carry out any product specific finishing/polishing applications as recommended only by the floor covering manufacturer.
Leave the works area clean and remove all rubbish and waste material from the site.

Protect the completed works from damage, trafficable dirt and grime, and stains as necessary while other works are in progress.

Issue to the Owner a copy of the Manufacturers' maintenance requirements and a copy of the Manufacturers' Materials Warranties and the Applicators' Installation Warranties for all of the installed floor coverings.

8.4 Overlay Flooring

8.4.1 Scope

Supply and install the specified Overlay Floorings to the locations, layouts and details shown on the drawings, complete with all accessories. All aspects of this work shall be in accordance with the manufacturers' technical literature and installation requirements, relevant Standards and Code requirements, other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for the specified Overlay Floorings.

8.4.2 Overlay Flooring

Manufactured Laminate Overlay Flooring - Fixed
Laminate Strip Overlay Flooring: prefinished, manufactured laminate interlocking plank flooring, to the specified product, and species and finish, and size. Installed as a fixed overlay floor covering in

APPROVED BC190130 03/04/2019 Napier City Council Pg 56 of 207

accordance with the manufacturer's requirements, and as specified, to the locations, layout and details shown on the drawings.

8.4.3 Substrate Type

Concrete Floor - Manufactured Laminate Overlay Flooring (fixed)

The specified fixed Manufactured Laminate Overlay Flooring is to be installed over a concrete floor.

8.4.4 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.

Co-ordinate with trades the locations of pipes, cables, outlets, and other fittings installed by others, and to install the specified Overlay Flooring as required.

8.4.5 Workmanship

All installation work shall be carried out by experienced and competent installers, familiar with the products specified and installation techniques, in accordance with the manufacturer's installation requirements, AS/NZS 4586, and as noted and detailed on the drawings.

Use only approved adhesives that are compatible with the specified overlay flooring product and the substrate as recommended by the overlay flooring manufacturer.

The building must be fully enclosed and weathertight with all doors and necessary fittings and trim installed prior to laying overlay floorings.

8.4.6 Delivery & Handling

Store and handle overlay flooring products and accessories in accordance with the manufacturer's recommendations. Store products and accessories under cover and out of direct sunlight on a flat and level surface; keep dry and protect from damage and contamination at all times.

Do not use damaged or defective overlay floorings or accessories, or products that are beyond their designated shelf life. Do not damage or mark or distort overlay flooring and accessories during handling.

Allow overlay floorings and accessories to properly condition prior to laying in accordance with the manufacturer's requirements. Refer to the manufacturer's installation recommendations for minimum and maximum floor and ambient temperatures.

8.4.7 Substrate Preparation

General

Ensure the substrate surface is free of oil, grease and other contaminants, then sweep or vacuum as required to ensure it is absolutely clean. Ensure that any expansion or crack control joints are appropriately trimmed - do not install overlay flooring over them.

The commencement of work on each section of floor shall be deemed to indicate a full acceptance by the relevant Flooring Subcontractor that all preparatory works by other trades are appropriate to achieve the required finished results.

APPROVED BC190130 03/04/2019 Napier City Council Pg 57 of 207

New Concrete Floors

New concrete substrates must be allowed to properly dry out and be compliant with NZS 3114 'U3 Surface Finish' and with the overlay flooring manufacturer's requirements and must have aged for a minimum of 28 days prior to laying the overlay floor coverings.
Check for moisture content by hygrometer reading to BRANZ BU330 - do not commence laying overlay flooring until the substrate is surface-dry and the moisture readings are less than 70% relative humidity over the entire surface.
Substrate surfaces must not deviate more than 3mm over 3000mm in any direction and have no abrupt variation greater than 1mm over 250mm.
Grind off any high spots on the concrete slab, and using the specified proprietary levelling compound repair flush with feathered edges any low spots or damaged areas then grind smooth.
Lightly grind or shot blast any surface that is glazed to the extent that may compromise the adhesion of the vapour barrier and/or acoustic underlay. Leave the surface clean and free of dust and contaminants etc.

Location:

8.4.8 Installation

Manufactured Laminate Overlay Flooring - Fixed

Install the specified manufactured laminate overlay flooring and accessories in accordance with the manufacturer's recommendations, procedures and techniques, and as shown on the drawings.

Allow manufactured laminate overlay flooring to properly condition in accordance with the manufacturer's recommendations prior to laying.

Confirm the overlay flooring layout pattern and direction prior to laying. Do not install overlay floor coverings over expansion joints - use only the specified expansion joint and neatly finish overlay flooring in accordance with the manufacturer's requirements.

Manufactured laminate overlay flooring accurately laid, fitted and jointed, and fully bonded to the substrate without cupping or surface deviation. Leave expansion gap at all fixed objects, walls and flooring transitions and junctions. Remove excess adhesive as the work proceeds.
Accurately install stair tread nosings and adhesive fix pre-cut manufactured laminate overlay pieces to each stair tread and riser and neatly finish to the nosing edge as detailed.
Install any required manufactured laminate skirting, capping and edge trim, transition strips and bars, as noted and detailed on the drawings; all finished straight and level and true to line.

Keep the working area cordoned off and protected during installation and protect completed installation work from damage and contamination until hand over of the works as programmed/scheduled.

8.4.9 Completion

Ensure that the specified Overlay Floorings have been installed correctly, and that all joins and accessories have been and completed correctly. Check for damage and defects and repair or replace as necessary.

APPROVED BC190130 03/04/2019 Napier City Council Pg 58 of 207

Thoroughly clean the installed overlay flooring in accordance with the manufacturers' recommended techniques and procedures.
Carry out any product specific finishing/polishing applications as recommended only by the floor covering manufacturer.
Leave the works area clean and remove all rubbish and waste material from the site.

Protect the completed works from damage, trafficable dirt and grime, and stains as necessary while other works are in progress.

Issue to the Owner a copy of the Manufacturer's maintenance requirements and a copy of the Manufacturer's Material Warranty and the Applicator's Installation Warranty for the installed overlay flooring.

APPROVED BC190130 03/04/2019 Napier City Council Pg 59 of 207

9 PLUMBING

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:

1546.1:2008(AS/NZS)	On-site domestic wastewater treatment units - Septic tanks
4607:1989(NZS)	Installation of thermal storage electric water heaters: valve-vented systems
4692.1:2005(AS/NZS)	Electric water heaters - Energy consumption, performance and general requirements
AS/NZS 3500.5:2012	Plumbing and drainage - Part 5: Housing installations
NZBC G12	Water Supplies
NZBC G13	Foul Water

9.3 General

Carry out all works necessary to leave the water, waste, vent and soil systems serving the sanitary fittings and the plumbing hardware shown on the drawings or specified below in correct working order complete with all ancillary systems (safetrays, floor drains, overflows, relief valves, etc.) required, and with all normal incidentals customarily installed by this trade.

Comply with the Building Code, Territorial Authority By-laws and statutory authority Regulations as appropriate. Obtain all necessary permits and consents, serve all necessary notices, arrange for all tests and pay all fees and customary charges in connection with the required works.

9.4 Workmanship

9.4.1 Co-operation

Co-operate with all other trades. Attend upon Concretor, Drainlayer and Carpenter to set out the exact positions of pipe runs before adjacent work is put in hand, and to ensure that all pipes, sleeves, fixings, flashings etc. are correctly incorporated into the structure as construction proceeds.

9.4.2 Workmanship

All plumbing work shall be carried out by, or under the direct control of, properly qualified tradesmen, and shall be to recognised high standards.

APPROVED BC190130 03/04/2019 Napier City Council Pg 60 of 207

The cutting away and checking of timbers shall be limited to such dimensions as will not prejudice the purpose for which the timber is used; observe NZS 3604 restrictions on the holing and checking of joists and beams. Chasing and checking of other materials only to approval. Install seismic restraints to storage tanks and HWCs.

Weatherseal wherever pipes, screws, bolts or other fastenings penetrate an external surface, and particularly roofing; seal with gaskets, flashings (and overflashings if necessary) or mastic as appropriate - any damage that results from failure of such seals will be made good at the Plumber's expense.

Adequately protect all surfaces. Any damage to fittings or surfaces made good by the appropriate trade at the Plumber's expense.

APPROVED BC190130 03/04/2019 Napier City Council Pg 61 of 207

9.4.3 Pipework

Joints between pipes of different materials shall always be to the approval of the TA Plumbing Inspector.

Pipework set-out neatly with a minimum number of bends, and more or less parallel to and at right angles to structural elements - avoid diagonal piping.

All internal pipework shall be concealed except where otherwise is either shown or approved. Exposed pipework shall be accurately and neatly run. Arrange all pipework (and particularly traps) in a manner which will allow maximum future accessibility for repairs or maintenance. Arrange for access panels to any primary maintenance positions, and install conveniently located isolating valves for each group of fittings. Wingbacks securely and squarely fixed. Crox unions usually acceptable only at the final connection to fittings. Install white plastic flanges where pipes penetrate linings in visible locations.

Where pipes are covered with nail fixed linings and trim ensure that their positions are marked on the linings to minimise the risk of subsequent nailings penetrating the pipe. Any such damage shall be rectified immediately, with all consequential damage made good.

Set pipework out in straight runs to even gradients. Fix all pipes to the structure sufficiently to fully support and to prevent sagging or vibration. Clips and saddles shall be the same material as the pipe. Exterior pipes on stand-off brackets. Fixings to the exterior or damp locations shall all be hot dip galvanized unless otherwise noted. Sleeves for pipes or drains penetrating concrete or masonry shall be uPVC, 20mm minimum larger internal diameter than the external diameter of the pipe, finished flush with concrete or masonry, and packed and mastic sealed.

Close open ends of the systems during construction to prevent the entry of foreign matter.

9.4.4 Temperature Movement

All work shall respect in full all probable thermal movements - layouts, fixings and jointings shall be arranged to allow thermal movement without risk of prejudice to watertight conditions, or risk of damage from straining of the pipes which will generate failures.
In particular, observe best local trade practice to avoid problems arising from freezing conditions.

9.4.5 Excavation

Allow to carry out all excavation that is required to suit the services installed by this trade. Check for other services before excavation. Trenches true to line and level, base of trenches clear of loose material, and shore trenches as required to suit the ground conditions. Backfilling shall be carried out by this trade, and be to the requirements specified in Siteworks.

9.4.6 Testing

All plumbing services shall be completed in stages which will allow for proper testing under normal working pressures prior to the application of insulation, concealment or other enclosure. Testing of piped water services shall be by hydrostatic testing in accordance with AS/NZS 3500.1 and shall not show any leakage when subjected to a hydrostatic pressure of 1500kPa for a period of not less than 30 minutes. All leaks remedied and retested. On completion the whole of the plumbing services to be subjected to full operational tests in the presence of the plumbing inspector, with any defects revealed in these tests properly remedied.

9.4.7 Warranties

Warranty cards and manufacturer's guarantees for all items supplied and installed by this trade shall be correctly filled in and handed over prior to Practical Completion.

9.5 Materials

9.5.1 Materials

Materials shall be delivered with packaging and labeling intact. Incidentals (jointing compounds, PTFE tape, seals, washers, silfos, solvent cements, etc.) shall be completely appropriate for the application involved. The use of imperfect items or items damaged in any way is always subject to approval.

9.5.2 Alternatives

The materials and elements specified indicate the required standards for these works. Alternatives which are equal to or superior to these materials and elements may be tendered for approval.

9.5.3 Materials Separation

Separate dissimilar metals in any circumstances which could produce contact or electrolytic action by a water film, with thick plastic tape, bituminous felt or other inert material. Pipes in contact with or built into concrete or masonry shall be fully spiral wrapped in Denso tape or equal.

9.6 Systems

9.6.1 Wastes & Vents

All traps sized to AS 3500.2. Wastes and vents all uPVC. Wastes shall be to AS 3500.2 falls as a minimum. Vents shall be generally as indicated, but avoid where permissible in compliance with AS 3500.2, or shall be combined above the flood level of the fittings.

Fit bird proof domes to all vents.

APPROVED BC190130 03/04/2019 Napier City Council Pg 62 of 207

9.6.2 Cold Water System

Supply From New Connection to Reticulated Supply

All cold water supply pipework shall be polybutylene, arranged and fixed so that all joints are in a fully 'relaxed' condition, without any stress or tension.

Make complete arrangements for the installation of a new connection to the reticulated supply in the street and the main feed and toby in the position shown. Lay on a 20mm main from the toby along the route shown on the Site Plan to the connection position noted on the Floor Plan (pipe depth, protection, backfilling, signal strip etc. to comply with all Supply Authority requirements). At the connection position take a branch feed off for the hosecocks (and reticulate to the positions shown and install angle hosecocks) and toilet cisterns and then take the main feed through an accessibly positioned cleanable in-line sediment and dirt filter.

Primary distribution from the water filter shall be in 20mm piping, reducing to 12mm for the final feed to individual items. Install conveniently located isolating valves to turn off each group of fittings, and install a small isolating valve alongside each toilet cistern not integrally fitted with one. (Note that these isolating valves and the hosecocks are not covered by the Plumbing Hardware Prime Cost Sum).

9.6.3 Hot Water System

Electric Storage, High Pressure Hot Water Cylinder

Supply the electric storage high pressure hot water cylinder noted on the drawings and install it where shown. Where appropriate install the cylinder on a safetray, with its drain discharging in a visible location.

Install temperature and pressure relief valves, cold water expansion valves, flow control valves, line strainers, pressure limit valves, and non-return/isolating valves as required to leave the hot water system in full design operational order. Install a tempering valve for each cylinder to control the hot water temperature at any sanitary fixture used for personal hygiene at not more than 55°C.

Check that the water pressure is suitable for the cylinders operation, and install PRV's if excessive.

Pressure relief discharges shall be copper and to the exterior in approved positions.

Flush all pipework before making the final connections. Lag the main distribution pipes full length with wall pipe insulation.

Showers shall have priority feeds, without 'tees', and the pipework layout shall ensure that the showers temperature and pressure remain as even as possible.

Irrespective of whether a mixing device is installed, the storage water heater control thermostat shall be set at a temperature of not less than 60°C to prevent the growth of Legionella bacteria.

9.7 Elements

9.7.1 Sanitary Fittings

Fix all of the sanitary fittings as scheduled on the drawings and specifications addendum. All fittings checked on delivery for 'perfect' condition. Supply and fix all normal accessories that are not usually supplied with the fitting. The Plumber is responsible for fittings from delivery until Practical Completion of the contract.

APPROVED BC190130 03/04/2019 Napier City Council Pg 63 of 207

9.7.2 Appliances

All appliances are exactly identified on the drawings notes. Main Contractor will establish, in consultation with the Plumber and Electrician, which of them will be supplied by each of these trades.

APPROVED BC190130 03/04/2019 Napier City Council Pg 64 of 207

10 DRAINLAYING

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:

1546.1:2008(AS/NZS)	On-site domestic wastewater treatment units - Septic tanks
BS 5572	Code of practice for sanitary pipework
NZBC G13	Foul Water

10.3 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.

10.4 Workmanship

10.4.1 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.

10.4.2 Co-operation

Cooperate with all trades and attend upon the Concretor and Plumber to set out exact pipe runs before any adjacent work is put in hand and ensure that all sleeves etc. are correctly incorporated as work proceeds.

10.4.3 Materials

All pipes and other materials shall comply with the appropriate Standards, and shall be protected from damage of any kind until installation is complete. All incidentals appropriate for the applications involved. Concrete shall be 17.5MPa and as specified under Concretor, Mortar shall be as specified in Blocklayer.

APPROVED BC190130 03/04/2019 Napier City Council Pg 65 of 207

10.4.4 Workmanship

All drainlaying shall be carried out by, or under direct control of, properly qualified tradesmen, and shall be to recognised high standards. Ensure cast-in items are installed when required so that no delay is caused by this trade. Adequately protect all adjacent surfaces - clean down to remove dirt etc., and any damage shall be made good by the appropriate trade at the Drainlayer's expense.

On completion of drainlaying clean up full area affected by this trade to the condition it was in before drainlaying commenced.

Site is to be returned as close as possible to its present condition on completion of the contract.

10.4.5 Excavation

As required for sewer and stormwater. Check for other service lines before excavation - the Drainlayer is responsible for making good any damage. Trenches true to line and with even gradients between gullies, soil stack terminations or downpipes, etc.

Keep the bottom of trenches clear of loose material. All pipes shall be laid in appropriate bedding material, compacted as required. Shore trenches if required to suit ground conditions. Backfilling shall be by this trade, to the standards required in Siteworks.

APPROVED BC190130 03/04/2019 Napier City Council Pg 66 of 207

11 ELECTRICAL

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:

3000:2007(AS/NZS)	Electrical installations (known as the Australia/New Zealand Wiring Rules)
3085.1:2004(AS/NZS)	Telecommunications installations - Basic requirements
NZECP 54	Recessed luminaires

11.3 Workmanship

11.3.1 General

Supply and install all materials, including all necessary minor and incidental items, for proper completion of all of the electrical services specified or shown on the drawings. The contract will not be deemed to be complete until the Electrician has provided an Electrical Certificate of Compliance in accordance with NZECP 11 (made available to the Contractor in time for the Code Compliance Certificate application).

Obtain all necessary permits and consents, serve all notices and pay all fees in and customary charges connection with the works.

The position of switches, light and power outlets and other fittings, although shown specifically in some instances, are in general only shown diagrammatically. The exact location of each of these items will be as directed on site by the Owner in conjunction with the Architect/Designer; the Electrician shall give reasonable notice of when this information is required. Items positioned in contravention of this shall be repositioned if directed, including rewiring if necessary, all at the Electrician's expense.

Unless drawn or specified otherwise the mounting height to the centreline of the following items above the floor shall be:

-1000mm for lighting switches;
-2000mm for wall mounted lights;
-2100mm for the bayonet of pendant lights;
-300mm for power points, except at benches.

APPROVED BC190130 03/04/2019 Napier City Council Pg 67 of 207

(Notify the Architect/Designer if either the actual fitting or mounting position seem to make the mounting height noted above inappropriate).

Warranty cards and manufacturers guarantees for items supplied and installed by this trade shall be filled in correctly and handed over at Practical Completion. Arrange all circuits to obtain an optimum balance of the system, and check and reconnect where necessary to achieve this on completion. Leave the works clean and tidy and in full operational order.

11.3.2 Co-operation

Co-operate with all other trades and attend upon the Concretor and Carpenter to set out all required penetrations and to ensure that all wiring and fittings are correctly incorporated as work proceeds. The Carpenter will provide and fix all necessary dwangs and timber supports in locations determined by the Electrician.

11.3.3 Workmanship

All electrical work shall be carried out by, or under the direct control of, registered tradesmen, and shall be to recognized high standards. All work shall be such as to leave a neat, efficient and robust installation. Neatly label switchboards to identify each circuit.

The cutting away and checking of timbers shall be limited to such dimensions as will not prejudice the purpose for which the timber is used; observe NZS 3604: 2011 restrictions on the holing and checking of joists and beams. Chasing and checking of other materials shall be only to approval.

Adequately protect all surfaces. Any damage to fittings or surfaces made good by the appropriate trade at the Electrician's expense.

11.3.4 Wiring

Joints within cable runs will not normally be accepted. TPS cable shall be adequately supported, and clipped at regular intervals. At terminations all strands of conductors shall be fully secured in a terminal block or clamped under a screw head washer; do not cut away any strands. Wiring which terminates in enclosed fittings and/or where subject to heat liable to cause deterioration, shall be high temperature type, with the tails made off with heat resisting sleeves, to protect the permanent wiring.

Conceal all wiring except as noted on drawings or below. All wiring cast into concrete shall be run in conduit pipes. All cables shall be stranded (single core is unacceptable).

Generally, do not run TPS horizontally within timber walls except in the area up to 300mm above floor. Wire in the ceiling framing and drop vertically to outlets and switches.

Do not run TPS horizontally within partitions except in the area up to 300mm above floor. Wire in the ceiling void and drop vertically to outlets and switches. Principal wiring in the ceiling void shall be supported on adequate catenaries.

Wire exterior lighting in screened cable.

APPROVED BC190130 03/04/2019 Napier City Council Pg 68 of 207

11.4 Systems

11.5 Materials & Control

11.6

APPROVED BC190130 03/04/2019 Napier City Council Pg 69 of 207

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Technical Product Guide

APPROVED BC190130 03/04/2019 Napier City Council Pg 70 of 207

SOLID INSULATION AND LIGHTWEIGHT CONSTRUCTION SOLUTIONS

EXPOL
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SOLID INSULATION AND LIGHTWEIGHT CONSTRUCTION SOLUTIONS

EXPOL supplies a range of products that provide solutions for insulation and lightweight construction, so you can focus on the things you do best.

EXPOL has a wide range of solutions made possible by the dynamic nature of Expanded Polystyrene (EPS) and Extruded Polystyrene (XPS) foams. All EXPOL products are tested by a variety of institutions, including BRANZ, to ensure quality and reliability.

The manufacturing of EXPOL products uses no CFC's or HCFC's. These products are so efficient they can save up to 200 times their own resource in thermal energy savings. EXPOL also runs one of the country's biggest EPS recycling plants, ensuring the sustainability of EPS building products.

EXPOL operates six manufacturing facilities in New Zealand to ensure our customers get fast and reliable service at the lowest possible price. EXPOL also has manufacturing partners throughout Australia.

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Tauranga
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Blenheim
Christchurch
Cromwell

AUSTRALIA
Sydney
Melbourne
Adelaide
Tasmania

APPROVED BC190130 03/04/2019 Napier City Council Pg 71 of 207

WHY SPECIFY EXPOL?

www.expol.co.nz

Insulation

EXPOL produces and supplies some of the country's most efficient insulation materials. Products include EPS which has a long established reputation for its exceptionally high insulation qualities. EXPOL Platinum Board (a variation of EPS) can achieve an insulation efficiency of 0.032 W/mK while EXPOL-X (XPS) boasts as much as 0.028 W/mK. All EXPOL products have been tested for thermal performance by a variety of institutions, including BRANZ, to ensure all products are manufactured to specification.

Recycling & Sustainability Credentials

EXPOL have invested in and operate dedicated recycling plants in their manufacturing facilities. At every stage of its life cycle, from production to recovery or recycling, EPS offers exceptional eco-credentials and is therefore ideally suited to the new generation of eco-friendly building projects. All manufacturing processes comply with current environmental regulations. It is chemically and environmentally non-aggressive and it can be – and is – easily recycled into long-life products through an expanding nationwide network of collection points.

Rigid

EXPOL provides insulation solutions that cannot be achieved by other insulation products. Expanded Polystyrene (EPS) and Extruded Polystyrene (XPS) are both rigid foams that hold their shape, which means their insulation performance does not diminish over time. EXPOL UnderFloor Insulation is one of the only insulation products on the market that is suitable for use in exposed timber floor situations without the need for lining. This is backed by a BRANZ appraisal and shows the advantages of rigid foam products.

Lightweight

EPS offers an exceptionally lightweight solution to many applications in construction. This is not surprising when you consider that, as a result of advanced manufacturing technologies, EPS is effectively 98% air captured within a 2% cellular matrix. The advantages in on-site handling and transportation bring significant economic benefits whilst considerably reducing health and safety risks associated with the lifting of heavier materials. It is therefore an excellent substitute for infill materials and ballast where it also brings load and fill times down in time-critical build projects.

High Strength & Structural Stability

In spite of its lightweight, the unique matrix structure of EPS brings the benefits of exceptional compressive strength and block rigidity. This means it is ideal for use in many construction and civil engineering applications, particularly as a structural base infill, for example in road, railway and bridge infrastructures. Strength tests performed on EPS which was first placed in the ground almost 30 years ago show that it is just as strong today – the tested strength routinely exceeding the original minimum design strength of 100kPa. EPS bridge foundations, which have been subject to many years of sustained loading, show 'creep' deformation of less than 1.3% - only half as much as had been theoretically predicted. Most importantly, EPS stability does not deteriorate with age.

Resistance to Water Ingress

After almost 30 years in the ground, samples of EPS retrieved from locations as little as 200mm above the groundwater level all have less than 1% water content by volume, whilst blocks which are periodically entirely submerged show less than 4% water content – performance notably superior to other foamed plastic materials.

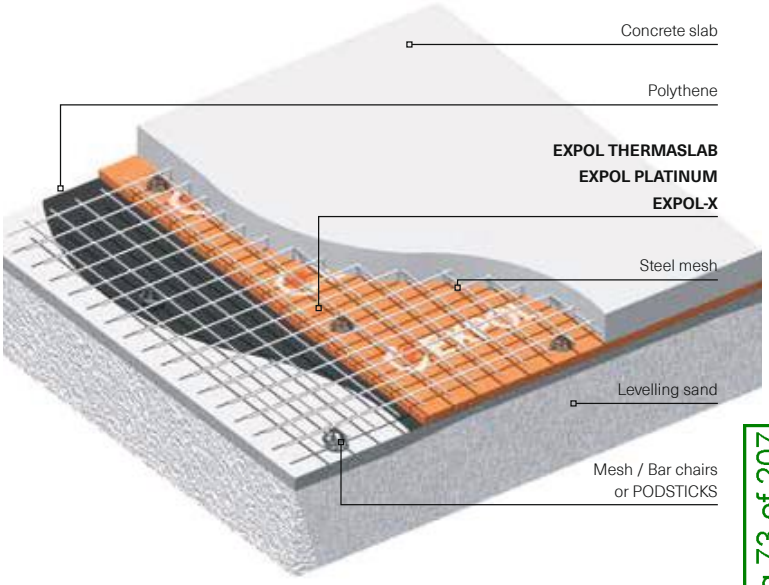
APPROVED BC190130 03/04/2019 Napier City Council Pg 72 of 207

BRANZ Appraised
Appraisal No.256

RECYCLABLE | FIRE RETARDANT | HIGH STRENGTH | MOISTURE RESISTANT | NEW ZEALAND OWNED / MANUFACTURED

CONCRETE FLOOR INSULATION

EXPOL supplies both **EPS** and **XPS** for under concrete slab insulation. Depending on the application, one product will be more suitable than the other.



APPROVED BC190130 03/04/2019 Napier City Council Pg 73 of 207

Table 3.1

PRODUCT OPTIONS & SIZES

	Length (mm)	Width (mm)
EXPOL ThermaSlab (S, H, VH)	2400	1200
	2450	1200
	2700	1200
	3600	1200
	4800	1200
	Special sizes on request	
EXPOL Platinum Board	2400	1200
	2450	1200
	2700	1200
	3600	1200
	4800	1200
	Special sizes on request	
EXPOL-X	2500	600

THE PRODUCTS

EXPOL ThermaSlab S and H are the most cost effective products for insulating under a concrete slab. These densities will suit most residential floors and will achieve R values above building regulations.

EXPOL ThermaSlab VH would normally be required in commercial applications where very high loads are probable. Also see EXPOL-X for these situations.

EXPOL Platinum Board is graphite infused EPS supplied in sheets suitable for insulating under a concrete slab. EXPOL Platinum Board is a premium product which achieves superior R values relative to thickness, commonly used when thickness is an issue or high R values are required.

EXPOL-X is extruded polystyrene (XPS) available in full sheets only (see Table 3.1). EXPOL-X is highly water resistant and has an extremely high compressive strength. See Table 3.2 for specifications.

SYSTEM COMPONENTS

MESH / BAR CHAIRS 25/40

EXPOL supplies bar chairs for steel mesh support

EXPOL PODSTICK

Used as an alternative to Mesh / Bar Chairs. Provides more support for steel mesh over polystyrene

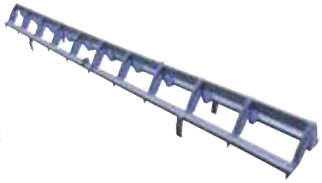


Table 3.2

PRODUCT PROPERTIES

Property	Unit		EXPOL ThermaSlab S	EXPOL ThermaSlab H	EXPOL ThermaSlab VH	EXPOL Platinum Board	EXPOL-X	Test Reference
Material			EPS	EPS	EPS	EPS (with graphite)	XPS	
Density	kg/m3		16	24	28	18	30	
Thickness / R Value		m2K/W						ASTM C518-04
		20mm	R 0.53	R 0.56	R 0.57	R 0.63	-	
		25mm	R 0.66	R 0.69	R 0.71	R 0.78	-	
		30mm	R 0.79	R 0.83	R 0.86	R 0.94	R 1.10	
		40mm	R 1.05	R 1.11	R 1.14	R 1.25	R 1.45	
		50mm	R 1.32	R 1.39	R 1.43	R 1.56	R 1.80	
		60mm	R 1.58	R 1.67	R 1.71	R 1.88	-	
		70mm	R 1.84	R 1.94	R 2.00	R 2.19	-	
		80mm	R 2.11	R 2.22	R 2.29	R 2.50	-	
		90mm	R 2.37	R 2.50	R 2.57	R 2.81	-	
		100mm	R 2.63	R 2.78	R 2.86	R 3.13	-	
		110mm	R 2.89	R 3.06	R 3.14	R 3.44	-	
		120mm	R 3.16	R 3.33	R 3.43	R 3.75	-	
Compressive Resistance		KPA at 1%	34	64	86	-	-	
Compressive Resistance		KPA at 2%	59	108	138	-	-	
Compressive Resistance		KPA at 5%	74	133	166	-	-	
Compressive Resistance		KPA at 10%	84	146	182	105	250	AS 2498.3
Youngs Modulus		(MPA)	3.8	6.2	8	-	-	
Cross breaking strength		KPA	165	260	320	200	-	AS 2498.4
Determination of flame propagation surface ignition								
Medium flame duration (max)		sec	2	2	2	2	-	AS2122.1-1993
Eighth value		sec	3	3	3	3	-	
Fire behaviour - Spread of Flame Index		(0-10)	0	0	0	0	0	AS/NZS
- Smoke Developed Index		(0-10)	5	5	5	5	3	1530.3:1999
Dimensional stability of length, width & thickness (max) at 70 deg C for 7 days		%	1	1	1	1	-	AS2498.6
Recycled content		%	0	0	0	0	0	
Rate of water vapour transmission (max) measured parallel to rise at 23°C		mg/m2s	520	460	400	520	-	AS 2498.5
Long term water absorption by immersion		% v/v	-	-	-	-	0.028	ASTM C272

APPROVED BC190130 03/04/2019 Napier City Council Pg 74 of 207

FURTHER INFORMATION

For further, detailed information on all of these products, refer to product information on page 26 which provides links to product data sheets and technical brochures.

MANUFACTURING STANDARD

All products and grades of EPS supplied by EXPOL for concrete floors comply with manufacturing standard AS 1366 Part 3 1992.

For miproducts
Details www.miproducts.co.nz

For masterspec
Details www.masterspec.co.nz

Expanded Polystyrene Densities and Colour Coding - see page 27

Quotes / Technical
E: tech@expol.co.nz

Website
www.expol.co.nz

Contact EXPOL
T: 0800 86 33 73
E: sales@expol.co.nz

Ramset™

BOTTOM PLATE FIXING SOLUTIONS 2013

| Meets NZS 3604:2011 Requirements| 90 x 45 Bottom Plate |

Bottom Plate Durability

Fixing Requirements				Installation		
Bottom Plate Location	Bottom Plate Fixing Requirement	Concrete Strength (min.)	Floor Edge Type	Max Spacing	Fastener	Min Edge Distance (FROM OUTERFACE)
External Wall	NZS3604:2011	17.5 MPa	Concrete	900 mm	12120BPAG*1 OR T12140GH*1	55 mm
			Masonry Block	600 mm		
	Proprietary Bracing Systems (15 kN)	17.5 MPa	Concrete	900 mm	AS12150GH + RPBA	
			Masonry Block	600 mm		
Internal Wall	NZS3604:2011	17.5 MPa	N/A	900 mm	12120BPAG*1 OR T12140GH*1	N/A
				600 mm	8x75 Drive Pin & Washer	N/A
	Proprietary Bracing Systems (15 kN)	17.5 MPa	N/A	900 mm	12120BPAG*1 + RPBA OR T12140GH*1 + RPBA	N/A

HD875 DRIVE PIN

AS12150GH ANCHOR

12120BPAG ANCHOR

Ramset Bracing Anchor (RPBA)

Advantages

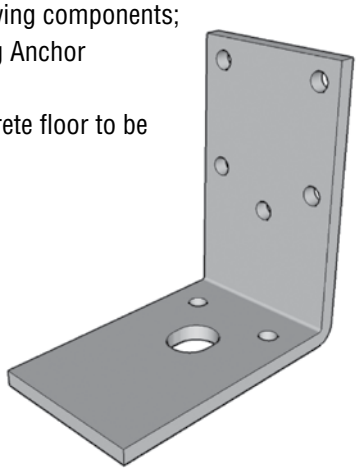
- Ease and speed of installation
- No checking of timber frame to ensure flush fitting of board
- The RPBA is a one piece anchor for either side of stud
- Slotted hole on bottom of bracket provides some flexibility in bolt & bracket position
- Installed prior to fixing of gypsum wallboard
- Easy inspection

The Ramset Bracing Anchor is sold as a set of 2.

Each set includes the following components;

- 2 Each Ramset Bracing Anchor
- 14 Each Tek screws

Fixings into timber or concrete floor to be purchased separately



APPROVED BC190130 03/04/2019 Napier City Council Pg 75 of 207

Barricade™

Building Wrap

BRANZ Appraised
Appraisal No.795 [2012]

1. HT Green Concrete Underlay
2. Hydro™ Seal Bituminous treatment
3. Dry-Fix DPC
4. **Building Wrap**
5. Wrapstrap™
6. Window Tape
7. Air Tight P.E.F Backing Rod

SPECIFICATION

PRODUCT DESCRIPTION

Barricade Building Wrap is a hydrophobic non-woven fabric that has a unique clear breathable overlay, which allows moisture and condensation to run off the face and then evaporate in the cavity area.

PHYSICAL PROPERTIES

Barricade Building Wrap is a 90 gsm hydrophobic non-woven breathable composite building wrap.
The following tests have been carried out in accordance with NZBC Acceptable Solution E2/AS1 Table 23:

- Tensile Strength, edge tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1
- Resistance to water penetration in accordance with AS/NZS 4201.1.4
- Surface Water absorbency in accordance with AS/NZS 4201.6
- Air resistance to BS 6538.3
- Shrinkage in accordance with AS/NZS 4201.3
- pH of extract in accordance with AS/NZS 1301.421s

COMPATIBILITY

***Barricade Wall Wrap* has been appraised for use as a flexible wall underlay on timber framed buildings within the following scope:**

- The scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- With absorbent wall claddings directly fixed to the frame; and,
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity; and,
- With masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
- Situated in NZS 3604 Wind Zones up to and including **'Very High'**

***Barricade Wall Wrap* has been appraised for use as a flexible wall underlay on steel framed buildings within the following scope:**

- The scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; with regards to building height and floor plan area; and,
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity; and,
- With masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
- Situated in NZS 3604 Wind Zones up to and including **'Very High'**

***Barricade Wall Wrap* has been appraised for use as a flexible wall underlay over rigid wall underlays on timber and steel framed buildings within the following scope:**

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 76 of 207

Barricade™

BRANZ Appraised
Appraisal No.795 [2012]

Building Wrap

INSTALLATION

1. *Masons Building Wrap* must be fixed (with the printed side out) to all framing members at maximum 300 mm centres with large-head clouts 20 mm long, 6-8 mm staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.
2. *Masons Building Wrap* must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.
3. The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame. Masons ***Flashing Tape*** needs to be installed around the openings prior to fitting the doors and windows.
4. *Masons Building Wrap* must be restrained from bulging into the drained cavity in accordance with NZBC Acceptable Solution E2/ AS1, Paragraph 9.1.8.5. Installing Masons ***WrapStrap*** - horizontal at 300mm centres - prevents the wrap and insulation from bulging.
5. *Masons Building Wrap* can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.7(e).
6. When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.
7. Any damaged areas of *Masons Building Wrap*, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears with Masons ***Flashing Tape***.

Provided Masons Wrap is not exposed to the weather or ultra-violet light for a total of more than 42 days, and provided the exterior cladding is maintained in accordance with the manufacturers instructions and the cladding remains weather resistant, the wrap is expected to have a serviceable life equal to that of the cladding.

DURABILITY

BRANZ Appraised
Appraisal No.795 [2012]

Barricade Building Wrap has been BRANZ appraised to ensure it meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for building wraps used where the cladding DURABILITY requirement or expected serviceable life is not less than 50 years.

STORAGE

Masons Wrap whether on or off site should

- Be stored on end under a cover, in a clean and dry area
- Do not crush the rolls
- The rolls must be protected from damage

Masons Building Wraps	Roll Sizes	Masons Code
Masons Barricade Building Wrap - 50m²	H 2.74 m x L 18.24 m	MPBBW50 2.74m
Masons Barricade Building Wrap - 100m²	H 2.74 m x L 36.49 m	MPBBW100 2.74m
Masons Barricade Building Wrap - 100m²	H 1.37 m x L 73 m	MPBBW100 1.37m
Masons Barricade Building Wrap - 50m²	H 1.37 m x L 36.50 m	MPBBW50 1.37m
Masons Barricade Building Wrap - 25m²	H 1.37 m x L 18.25 m	MPBBW25 1.37m

APPROVED BC190130 03/04/2019 Napier City Council Pg 77 of 207

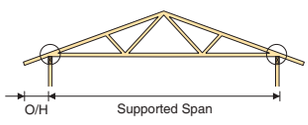
LUMBERLOK®

STUD TO TOP PLATE FIXING SCHEDULE
ALTERNATIVE TO TABLE 8.18 NZS 3604:2011

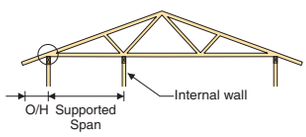
NOTE:

- ★ All fixings are designed to resist vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ Gable end wall top plate/stud connections where the adjacent rafter/truss is located within 1200mm of gable end wall with a maximum verge overhang of 750mm, requires fixing type A as shown below.
- ★ All fixings assume top plate thickness of 45mm maximum.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011.

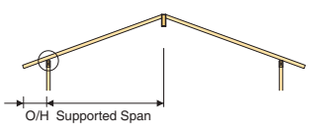
LOADED DIMENSION DEFINITION



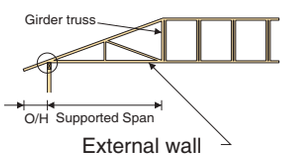
External wall
Standard truss



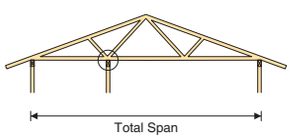
External wall
Internally supported truss



External wall
Rafter roof



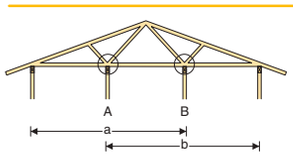
External wall
Jack truss



Internal wall
Internally supported truss
(overhang dimension does not apply)

EXTERNAL WALL
LOADED DIMENSION =
$\frac{\text{SUPPORTED SPAN}}{2}$ + O/H

INTERNAL WALL
LOADED DIMENSION =
$\frac{\text{TOTAL SPAN}}{2}$



Multiple internal walls
(overhang dimension does not apply)

MULTIPLE INTERNAL WALL
LOADED DIMENSION FOR
WALL A = $\frac{a}{2}$
WALL B = $\frac{b}{2}$

FIXING SELECTION CHART

(Suitable for walls supporting roof members at 600, 900 or 1200mm crs.)

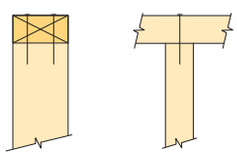
Wind Zones L, M, H, VH, EH, as per NZS 3604:2011

Loaded Dimension (m) Stud Centres			Light Roof Wind Zone					Heavy Roof Wind Zone				
300mm	400mm	600mm	L	M	H	VH	EH	L	M	H	VH	EH
3.0	2.3	1.5	A	A	B	B	B	A	A	B	B	B
4.0	3.0	2.0	A	A	B	B	B	A	A	B	B	B
5.0	3.8	2.5	A	B	B	B	B	A	A	B	B	B
6.0	4.5	3.0	A	B	B	B	B	A	A	B	B	B
7.0	5.3	3.5	A	B	B	B	B	A	A	B	B	B
8.0	6.0	4.0	A	B	B	B	B	A	A	B	B	B
9.0	6.8	4.5	B	B	B	B	B	A	A	B	B	B
10.0	7.5	5.0	B	B	B	B	B	A	A	B	B	B
11.0	8.3	5.5	B	B	B	B	B	A	A	B	B	B
12.0	9.0	6.0	B	B	B	B	B	A	A	B	B	B

FIXING OPTIONS

FIXING TYPE A
0.7 kN

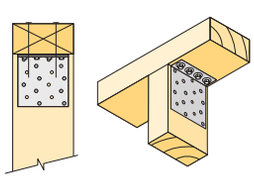
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



FIXING TYPE B
4.7 kN

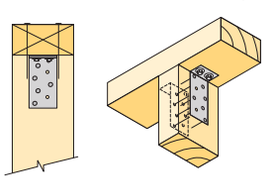
CHOOSE ANY OF THE 3 OPTIONS BELOW

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



Plus
LUMBERLOK
6kN Stud Anchor
(CPC80)

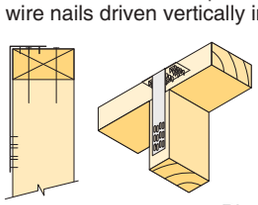
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
2 x LUMBERLOK
CPC40

Recommended for internal wall options to avoid lining issues

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



Plus
LUMBERLOK
Stud Strap
(one face only)

Note:
To calculate the number of B type fixings required, divide the wall length by the stud centres, add 1 to this figure and locate this number of fixings as evenly as possible along the wall length. This figure includes the start and end studs in each wall length.

APPROVED BC190130 03/04/2019 Napier City Council Pg 78 of 207

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MiTek®
GANG-NAIL® LUMBERLOK® BOWMAC®

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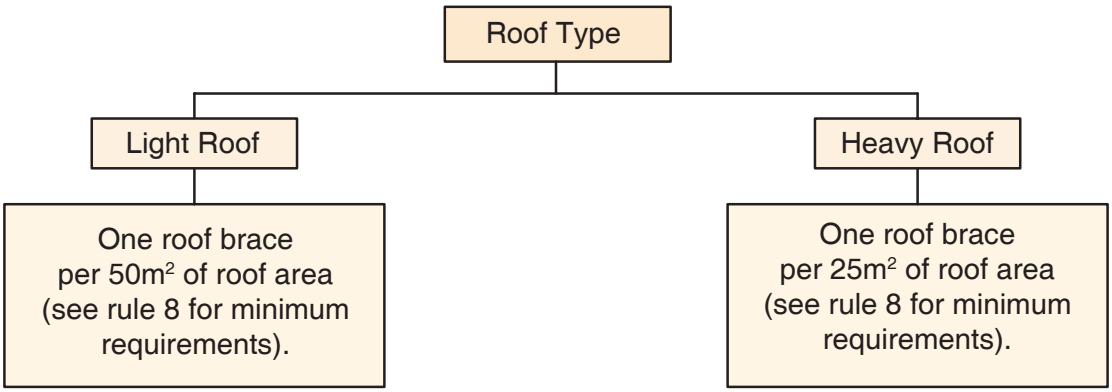
LUMBERLOK®

ROOF BRACING SPECIFICATION

AS PER NZS 3604:2011

- ★ Covers roof bracing requirements to resist horizontal loads as set out in Section 10 NZS 3604:2011.
- ★ A definitive guide to the description and installation of Roof Plane Braces and Roof Space Braces.

Roof Bracing Requirements



Roof Bracing - Rules & Definitions

1. The bracing described in this brochure covers both framed roofs and fully trussed roofs.
2. Roof planes less than 6m² (e.g. dormers & porches) do not require bracing.
3. Roof braces can consist of either
   i) Roof Plane Brace or
   ii) Roof Space Brace or combination of the two.
4. Roof braces are not required on roofs where sarking is installed as per Clause 10.4.4 NZS 3604:2011 or where a ceiling diaphragm is installed and is attached to the rafters.
5. Roof area is the actual plan area of the roof and includes overhangs.
6. A hip or valley rafter running continuously from ridge to top plate can be classed as one roof plane brace.
7. A pair of crossed LUMBERLOK Strip Brace (preferred for ease of installation) can be classed as one roof plane brace and shall be installed as detailed in this brochure.
8. There must be at least one roof plane brace in each roof plane. Each ridge line shall have a minimum of two roof braces.
9. Every design effort should be made to distribute the roof braces as evenly as possible over the entire roof area and run alternately in opposite directions.

APPROVED BC190130 03/04/2019 Napier City Council Pg 79 of 207

SCAN FOR INSTALLATION VIDEO

https://vimeo.com/117353345

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Roof Bracing Options

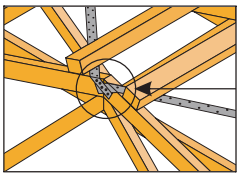
i) ROOF PLANE BRACE

Each roof plane brace can be:

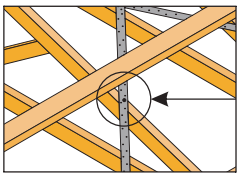
- A hip or valley rafter running continuously from ridge to the top plate in accordance with Clauses 10.2.1.3.2 or 10.2.1.3.3 NZS 3604:2011.

OR

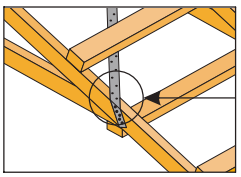
- A pair of tensioned and crossed LUMBERLOK Strip Brace running continuously from ridge to top plate installed as detailed below.



5 x 30mm x 3.15 dia. nails each end

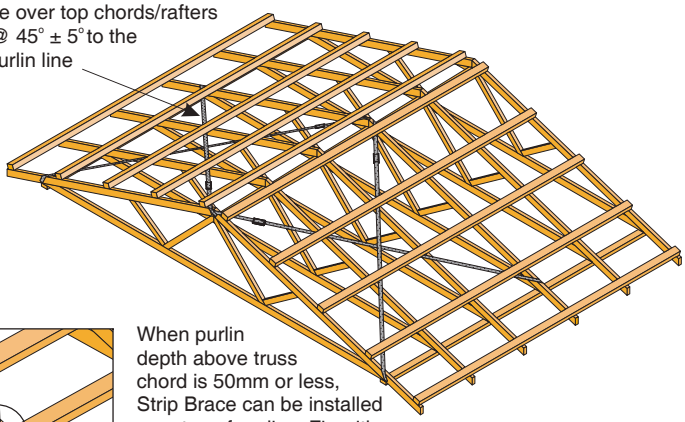


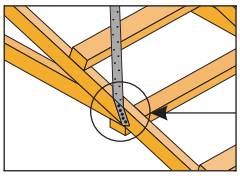
1 x 30mm x 3.15 dia. nail at crossing (after tensioning)



5 x 30mm x 3.15 dia. nails each end

A pair of tensioned and crossed LUMBERLOK Strip Brace over top chords/rafters installed @ 45° ± 5° to the rafter or purlin line

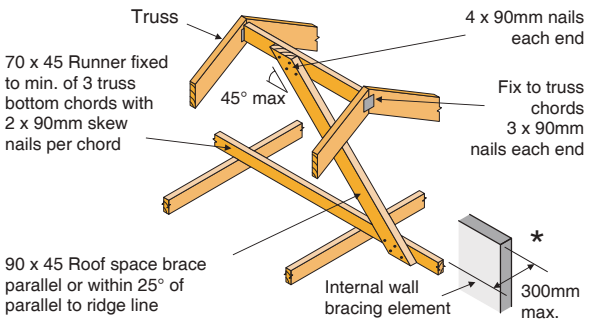




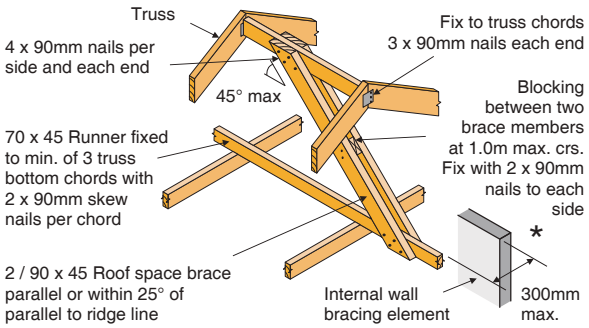
When purlin depth above truss chord is 50mm or less, Strip Brace can be installed over top of purlins. Fix with 1 x 30mm x 3.15 dia. nail at the purlin closest to the rafter/truss crossing

ii) ROOF SPACE BRACE

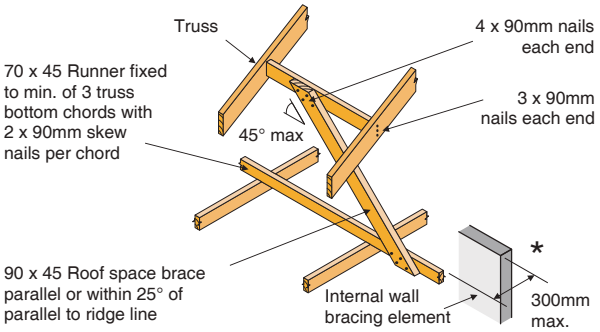
(A) Less than 2m long



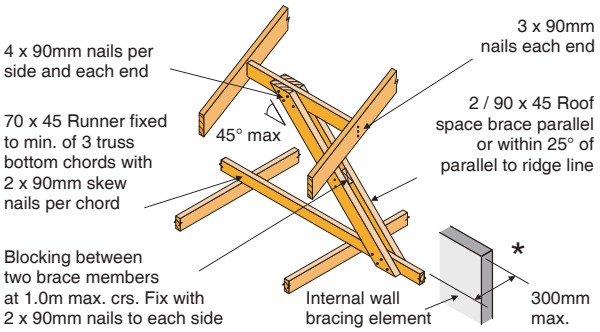
(B) More than 2m long (Max. 4.8m)



(C) Not directly under the ridge - less than 2m long



(D) Not directly under the ridge - more than 2m long



*Not required when a ceiling diaphragm complying with Clause 13.5 NZS 3604:2011 is used.

APPROVED BC190130 03/04/2019 Napier City Council Pg 80 of 207

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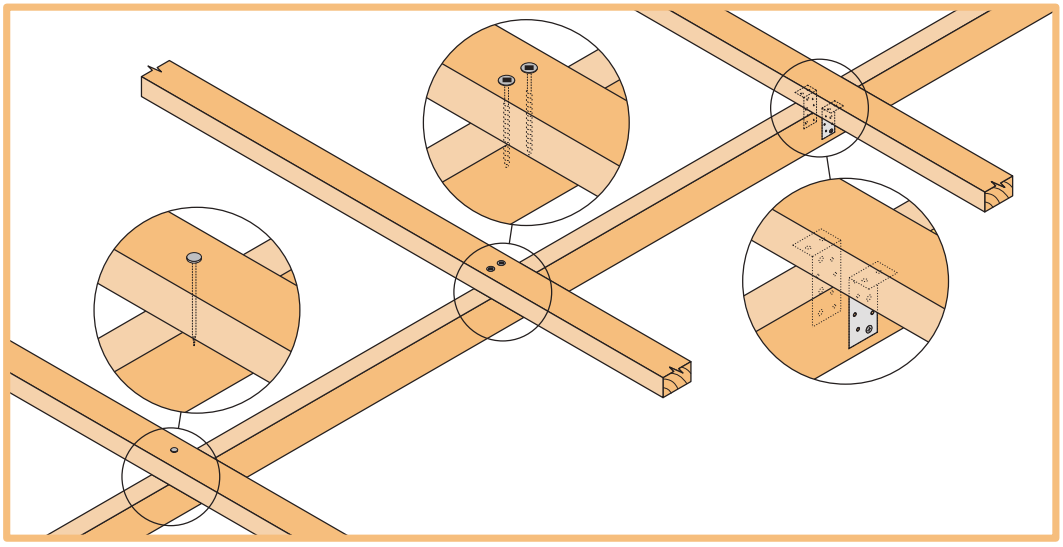
LUMBERLOK®

PURLIN & BATTEN FIXING CHART

ALTERNATIVE SOLUTION TO NZS 3604:2011 TABLES 10.10 & 10.12

NOTE:

- ★ All purlin and batten sizes are as per NZS 3604:2011.
- ★ All fixings assume that the purlin and battens are installed on their flat over the top of the rafter or truss.
- ★ The minimum fixing requirements apply to all purlin locations within the roof area.
- ★ The LUMBERLOK BLUE SCREW where specified requires a minimum of 30mm penetration into rafter or truss i.e. it is suitable for rough sawn timber up to 50mm thick at 18% moisture content.



APPROVED BC190130 03/04/2019 Napier City Council Pg 81 of 207

SELECTION CHART FIXING OPTIONS

(minimum fixing requirements)

ROOF WEIGHT	MAX. PURLIN SPAN (mm)	MAX. PURLIN CRS. (mm)	WIND ZONE				
			L	M	H	VH	EH
HEAVY ROOF Tile Battens	900	370	A	A	A	A	A
LIGHT ROOF Tile Battens	900	370	A	A	B	C	C
	1200	370	A	B	C	C	C
LIGHT ROOF Purlins	900	900	C	C	C	C	D
	1200	900	C	C	C	D	D
	1200	1200	C	C	D	E	E

Wind Zone:
As per NZS 3604:2011

L = Low Wind
M = Medium Wind
H = High Wind
VH = Very High Wind
EH = Extra High Wind

SCAN FOR INSTALLATION VIDEO

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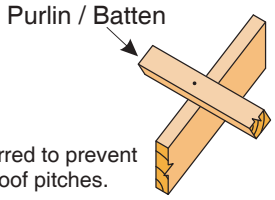
LUMBERLOK®

STANDARD FIXING OPTIONS

FIXING TYPE A 0.55kN

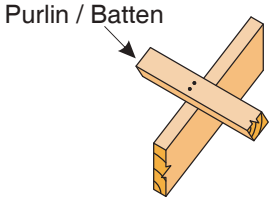
1 NAIL

Note: Two nails maybe preferred to prevent batten rolling over with high roof pitches.



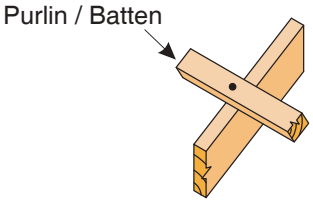
FIXING TYPE B 0.8kN

2 NAILS



FIXING TYPE C 2.4kN

1 BLUE SCREW



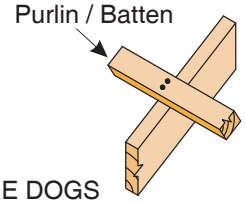
FIXING TYPE D 3.45kN

2 BLUE SCREWS

OR

2 SKEW NAILS plus 2 WIRE DOGS

(for purlin on edge)

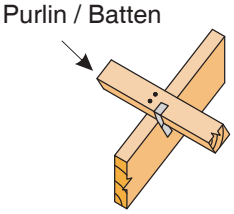


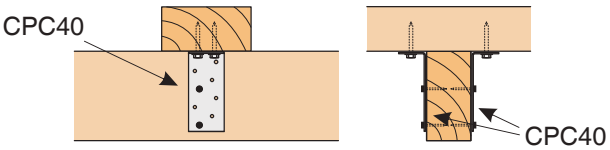
FIXING TYPE E 5.5kN

2 NAILS plus 1 CT200

OR

1 PAIR of CPC40





FIXING DEFINITIONS

NAIL = Either 90mm x 3.15 dia. power-driven nail or 100mm x 3.75 dia. hand-driven nail

BLUE SCREW = 80mm x 10 gauge LUMBERLOK BLUE SCREW

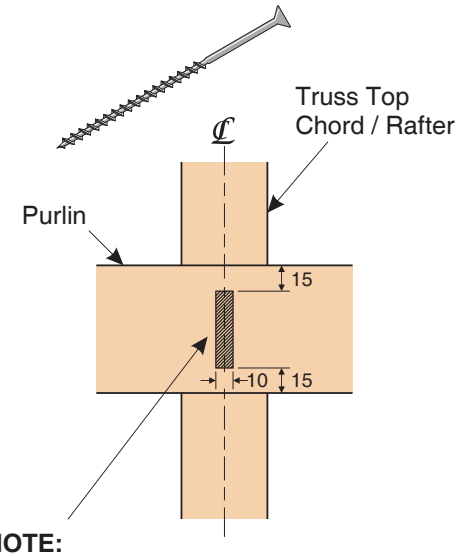
WIRE DOG = LUMBERLOK WIRE DOG either LH or RH

CT200 = LUMBERLOK Ceiling Tie CT200 bend over purlin, 4 x LUMBERLOK Product Nails 30mm x 3.15 dia. each end

CPC40 = LUMBERLOK CPC40 with 2 x Type 17 - 14g x 35mm Hex Head Screws per flange

FIXING TOLERANCES

LUMBERLOK BLUE SCREW



NOTE:

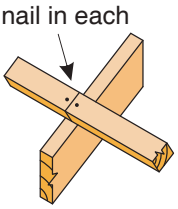
Locate fixings within the shaded area. Care to be taken to avoid over tightening of screws.

PURLIN / BATTEN SPLICE FIXING OPTIONS

FIXING TYPE A & B OVER PURLIN SPLICE

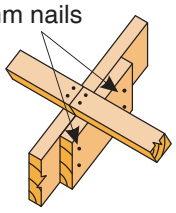
NOTE:

Skew nail when fixing to 35mm rafter or truss



FIXING TYPE C, D or E OVER PURLIN SPLICE

90 x 35mm block fixed to chord or rafter with 4 x 75mm nails



- TYPE C
  1 SCREW
  to each purlin
- TYPE D & E
  1 NAIL plus 1 SCREW to each purlin

APPROVED BC190130 03/04/2019 Napier City Council Pg 82 of 207

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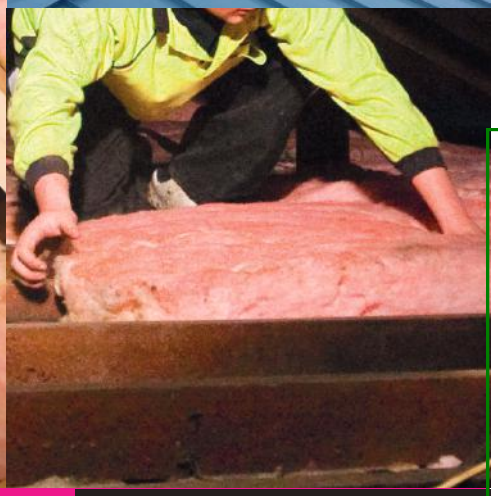


INSTALLATION INSTRUCTIONS

Roof | PINK® BATTS® CEILING INSULATION

APPROVED BC190130 03/04/2019 Napier City Council Pg 83 of 207

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 other 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 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.

Call **0800 746 534** for your local PinkFit® installer

Roof | PINK® BATTS® CEILING INSULATION

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
- Leveling 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, trim insulation or use a thinner product around the perimeter
- Insulate access hole cover and secure in place with strapping or glue
- Remove excess material

Unlined Walls in Roof Cavities

- **Pink® Batts® Wall** or **Pink® Batts® HandyPack insulation** should be secured in place by using horizontal strapping (max spacing of 300mm)

Tip: To verify Building Code Compliance, staple a product label at an easy to find location away from any hot items such as downlights or water cylinders e.g. on truss/rafter above ceiling access hole and hot water cupboard.

Note: **Pink® Batts® ceiling insulation shall not be installed in a roof space where foil has been installed as a roof underlay.**

Refer to NZS 4246:2016 for full details.

APPROVED BC190130 03/04/2019 Napier City Council Pg 84 of 207

Clearances

Follow the clearances specified by the manufacturer; if they are not known then:

Recessed Luminaire

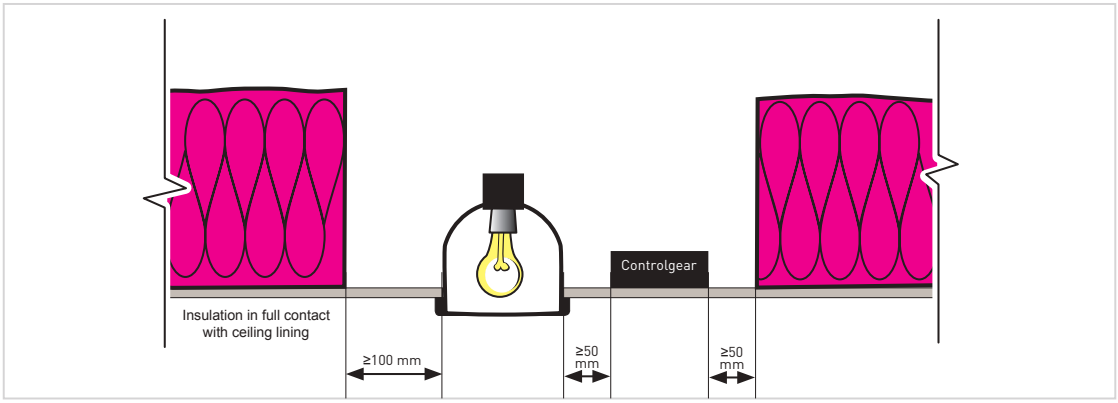
- CA rated recessed luminaires - Nil, however do not install insulation on top of the recessed luminaire
- IC rated recessed luminaires - Nil, insulation can be installed over the top of the recessed luminaire
- Unmarked - Minimum 100mm

Surface Mounted Luminaire - Minimum clearance 200mm; however it does not apply if the insulation is permanently shielded.

Controlgear

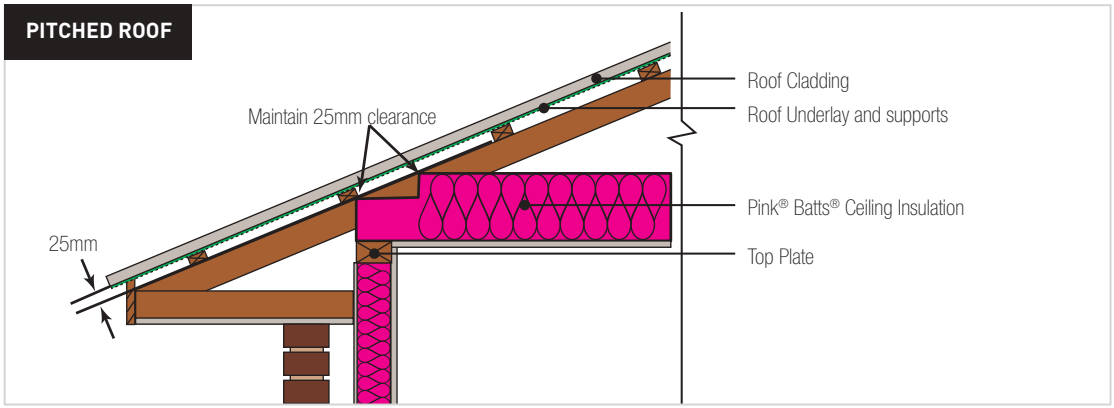
- If possible place it on top of the insulation and leave a minimum clearance of 50mm between controlgear and luminaire
- If not possible to place it on top of the insulation and leave 50mm from the insulation to the controlgear

Controlgear **shall not** sink into the insulation.



Unmarked luminaire and controlgear not placed on top of Pink® Batts® ceiling products.

- 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



Note: Pink® Batts® ceiling insulation can be installed from below when the ceiling is to be lined or replaced

*Caution: Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. This applies to wiring installed prior to 1989.

APPROVED BC190130 03/04/2019 Napier City Council Pg 85 of 207

Roof | PINK® BATTS® CEILING INSULATION

Product Specifications

ROOF - Thermal Insulation		PRODUCT CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER BALE (m^2)	APPROX. COVERAGE PER BALE* (m^2)	ENVIRONMENTAL CHOICE
R1.8	Pink® Batts® Classic R1.8 Ceiling	7110118	1220 x 432	95	13.7	14.4	✓
R2.2	Pink® Batts® Classic R2.2 Ceiling	7110122	1220 x 432	115	12.6	13.3	✓
R2.6	Pink® Batts® Classic R2.6 Ceiling	7110126	1220 x 432	140	10.5	11.1	✓
R3.2	Pink® Batts® Classic R3.2 Ceiling‡	7110132	1220 x 432	170	8.4	8.8	✓‡
R3.2	Pink® Batts® Skillion Roof R3.2	7110232	1220 x 432	115 max	3.7	3.9	✓
R3.6	Pink® Batts® Classic R3.6 Ceiling‡	7110136	1220 x 432	180	7.4	7.7	✓‡
R3.6	Pink® Batts® Skillion Roof R3.6	7110236	1220 x 432	165 max	6.3	6.6	✓
R4.0	Pink® Batts® Ultra® R4.0 Ceiling	7110140	1220 x 432	195	6.3	6.6	✓
R5.0	Pink® Batts® Ultra® R5.0 Ceiling	7110150	1220 x 432	220	4.2	4.4	✓
R6.0	Pink® Batts® Ultra® R6.0 Ceiling	7110160	1220 x 432	235	3.7	3.9	✓
R6.3	Pink® Batts® Ultra® R6.3 Ceiling	7110163	1220 x 432	250	3.2	3.3	✓
R7.0	Pink® Batts® Ultra® R7.0 Ceiling	7110170	1220 x 432	260	2.6	2.8	✓
ROOF - Thermal Retrofit Insulation							
R2.9	Pink® Batts® R2.9 Retrofit Ceiling	7110129	1220 x 432	150	9.5	10.0	✓
R3.3	Pink® Batts® R3.3 Retrofit Ceiling	7110133	1220 x 432	175	8.4	8.8	✓
ROOF and WALL - Thermal Insulation							
R2.4	Pink® Batts® HandyPack R2.4^	7200158	7000 x 580	90	4.06	-	

* Coverage relates to standard structures (ie with framing allowance) therefore actual coverage may vary.
‡ This product is manufactured in both New Zealand and Australia. Environmental Choice New Zealand applies to New Zealand made product only.
# For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz/lifetime-warranty.
^ Product does not have the Pink® Batts® Lifetime Warranty or BRANZ Appraised Accreditation.

APPROVED BC190130 03/04/2019 Napier City Council Pg 86 of 207

Storage and Maintenance

Pink® Batts® insulation should be protected from damage and weather. Store under cover in clean dry conditions. The installed product should remain dry at all times. If the product has become wet or damp, the source of the dampness (e.g. leak in roof) should be repaired immediately and any wet or damp insulation should be removed and replaced with new product 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

Accreditations/Appraisals/Certifications

BRANZ Appraised
Appraisal No. 238 [2012]
Appraisal No. 632 [2012]
Appraisal No. 767 [2012]

Licence No 2504017.
Thermal Building Insulants

Tasman Insulation New Zealand Ltd
Certified QMS
Quality
ISO 9001

‡ R3.6 ceiling product is manufactured in both New Zealand and Australia. Environmental Choice New Zealand applies to New Zealand made products only.

For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz

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TASMAN INSULATION NEW ZEALAND

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INSTALLATION INSTRUCTIONS

Wall

PINK® BATTS® WALL INSULATION

APPROVED BC190130 03/04/2019 Napier City Council Pg 88 of 207

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/**

Wall | PINK® BATTS® WALL INSULATION

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 insulation is installed once the cladding system is completely installed.

Retrofitting insulation in external walls without wall underlay/or in poor condition

a) Direct Fixed Cladding

- Use insulation that is at least 20mm thinner than the framing width - if the frame is 90mm we recommend to use **Pink® Batts® Classic R2.2 70mm** OR
- Fit inserts of Bitumac® 720 wall underlay.

b) Drained Cavity

- The insulation can be the same thickness as the frame. The use of horizontal strapping is recommended , OR
- Fit inserts of Bitumac® 720 wall underlay.

Pink® Batts® Masonry Wall Insulation

It is recommended 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.

CAUTION: Electrical cables and equipment installed prior 1989 may overheat and fail when partially or completely covered with bulk thermal insulation

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.

APPROVED BC190130 03/04/2019 Napier City Council Pg 89 of 207

Wall | PINK® BATTS® WALL INSULATION

Product Specifications

WALL - Thermal Insulation	PRODUCT CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER BALE (m^2)	APPROX. COVERAGE PER BALE* (m^2)	ENVIRONMENTAL CHOICE
Masonry						
R1.0 Pink® Batts® Masonry R1.0	7160110	1220 x 580	40	21.2	-	✓
R1.2 Pink® Batts® Masonry R1.2	7160134	1220 x 580	50	17.0	-	
70mm Wall Range						
R2.2 Pink® Batts® Classic R2.2 70mm Wall	7160248	1140 x 560	70	6.4	7.5	
90mm Wall Range						
R1.8 Pink® Batts® Classic R1.8 Wall	7127118	1140 x 560	90	16.6	19.6	✓
R2.2 Pink® Batts® Classic R2.2 Wall	7127122	1140 x 560	90	13.4	15.8	✓
R2.2 Pink® Batts® Steel R2.2 Wall	7160214	1220 x 610	90	15.6	15.6	✓
R2.2 Pink® Batts® R2.2 Narrow Wall	7160243	1140 x 360	90	9.0	11.2	✓
R2.4 Pink® Batts® Classic R2.4 Wall	7127124	1140 x 560	90	10.2	12.1	✓
R2.6 Pink® Batts® Ultra® R2.6 Wall	7127126	1140 x 560	90	9.6	11.3	✓
R2.6 Pink® Batts® Ultra® Steel R2.6 Wall	7160215	1220 x 610	90	9.7	9.7	✓
R2.6 Pink® Batts® Ultra® R2.6 Narrow Wall	7160244	1140 x 360	90	7.4	9.2	✓
R2.8 Pink® Batts® Ultra® R2.8 Wall	7127128	1140 x 560	90	6.4	7.5	✓
R2.8 Pink® Batts® Ultra® R2.8 Narrow Wall	7160247	1140 x 360	90	4.5	5.6	✓
140mm Wall Range						
R3.2 Pink® Batts® Ultra® R3.2 140mm Wall	7127132	1140 x 560	140	9.6	11.3	✓
R3.2 Pink® Batts® Ultra® R3.2 140mm Narrow Wall	7160245	1140 x 360	140	7.0	8.6	✓
R3.6 Pink® Batts® Ultra® R3.6 140mm Wall	7127136	1140 x 560	140	7.0	8.3	✓
R4.0 Pink® Batts® Ultra® R4.0 140mm Wall	7127140	1140 x 560	140	5.1	6.0	✓
R4.0 Pink® Batts® Ultra® R4.0 140mm Narrow Wall	7160246	1140 x 360	140	4.1	5.0	✓

* Coverage relates to standard structures (ie with framing allowance) therefore actual coverage may vary.
\# For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz/lifetime-warranty.

APPROVED BC190130 03/04/2019 Napier City Council Pg 90 of 207

Storage and Maintenance

Pink® Batts® insulation should be protected from damage and weather. Store under cover 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

Accreditations/Appraisals/Certifications

BRANZ Appraised
Appraisal No. 238 [2012]

Licence No 2504017.
Thermal Building Insulants

Tasman Insulation New Zealand Ltd
Certified QMS
Telarc. Registered
Quality ISO 9001

GREENGUARD

pink batts Lifetime WARRANTY

APPROVED BC190130 03/04/2019 Napier City Council Pg 91 of 207

TASMAN INSULATION NEW ZEALAND

DISTRIBUTED BY
Tasman Insulation New Zealand Ltd
9-15 Holloway Place, Penrose, Auckland,
New Zealand

This document supersedes all previous versions and may have been superseded; is a guide only and the purchaser should ascertain the suitability of this product for the end-use situation intended and when used in conjunction with other products; and is provided without prejudice to Tasman Insulation New Zealand Ltd (Tasman) standard terms of sale. Tasman retains the right to change specifications without prior notice. Refer to www.pinkbatts.co.nz or consult Tasman for further information. Do not use this product for any application not detailed in this document. All claims about this product are subject to any variation caused by normal manufacturing process and tolerances. The liability of Tasman and its employees and agents for any errors or omissions in this document or otherwise in relation to the product is limited to the fullest extent permitted by law. Except where the consumer acquires the goods for the purposes of a business, any rights a consumer may have under the Consumer Guarantees Act are not affected. The colour PINK and Pink® are registered trademarks of Owens Corning used under license by Tasman Insulation. Batts® is the registered trade mark of Tasman Insulation.

Lifetime product warranty Pink® Batts® insulation

We believe our Pink® Batts® insulation products will provide you with quality performance for the life of your home.

Tasman Insulation has been manufacturing Pink® Batts® products for New Zealanders for 50 years, and every day we work hard to ensure the quality of these products.

LIFETIME WARRANTY

We warrant that Pink® Batts® insulation products:

- are provided free from defects due to defective workmanship or materials, and
- will meet the specifications in Pink® Batts® insulation BRANZ Appraisal* for the lifetime of the building in which the Pink® Batts® product is installed.

Our warranty is subject to the terms and conditions set out overleaf, and applies only if the Pink® Batts® product is installed, used, and maintained in accordance with NZS4246 and our technical instructions in a residential home or building which is constructed to meet the New Zealand Building Code.

Nothing in this warranty document excludes or modifies any legal rights you may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified by law.

PINK® BATTS® INSULATION PRODUCTS

This warranty applies to the BRANZ appraised ceiling and wall products in Tasman's Pink® Batts® insulation range specified here: www.pinkbatts.co.nz. We may update or change this list from time to time.

USING, INSTALLING AND MAINTAINING PINK® BATTS® INSULATION

These resources set out the specifications and standards for use, installation, and maintenance of Pink® Batts® insulation.

Pink® Batts® installation instructions:

Our technical instructions for installing Pink® Batts® products can be found here: www.pinkbatts.co.nz

New Zealand Standard 4246:2006 (Incorporating Amendment No 1):

Sets out the appropriate methods of installing insulation products in common residential construction types in New Zealand.

BRANZ Appraisal No. 238 [2008]

Contains the technical specifications for Pink® Batts® insulation and the installation and conditions required in your home to ensure your Pink® Batts® product performs in accordance with the specifications for thermal insulation materials NZS4859.1:2002. This appraisal can be found at www.pinkbatts.co.nz

Homeowner's record

IMPORTANT: This information, including proof of purchase, is required for any warranty claim. We recommend you attach your proof of purchase to this homeowner's record and keep it in a safe place. If your Pink® Batts® product was installed by a builder, contractor, or installer, you must ensure that he or she has provided you with proof of purchase and details of the Pink® Batts® product installed.

Name:

Address of building:

Pink® Batts® product:

Date product installed in building:

Installer:

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VERSION No3053

APPROVED BC190130 03/04/2019 Napier City Council Pg 92 of 207

Terms and conditions of warranty

This warranty is given by Tasman Insulation New Zealand Limited ("Tasman") to the original end purchaser ("you" or "claimant") of specified Pink® Batts® insulation products (each a "product"), and is strictly subject to the following terms and conditions.

Procedure for making a warranty claim

1. Tasman will not be liable for any breach of warranty unless, within 30 days after a defect becomes reasonably apparent (or should reasonably have become apparent), you provide Tasman with:

a. written notice of your warranty claim;

b. a reasonable written description of how the product does not comply with this warranty; and

c. the information set out in the "Homeowner's Record" on page 1, or other evidence reasonably satisfactory to Tasman of the date(s) of purchase and installation of the affected product.

2. If the defect in the product was reasonably apparent, or should reasonably have become apparent, prior to installation of the product, then any warranty claim must be made prior to installation, and Tasman will have no liability to a claimant under this warranty or otherwise in statute, contract, tort, or otherwise at law or in equity in respect of the product.

3. You must:

a. bear all expenses incurred in making a claim under this warranty, including but not limited to costs of returning any defective product to us, and collecting any replacement product from Tasman or its agent; and

b. allow Tasman and its agents access, at no cost and at any reasonable time, to the building to inspect the affected product.

Installation requirements

4. The product must be installed, and used and maintained during the lifetime of the building strictly in accordance with:

a. the statements and conditions of BRANZ Appraisal No. 238 [2008];

b. Tasman's technical instructions for use, installation and maintenance of the product; and

c. NZ Standard 4246:2006: Energy Efficiency – Installing Insulation in Residential Buildings;

each as amended or replaced from time to time.

Meaning of 'building' and 'lifetime'

5. In these terms and conditions:

a. "building" means any 'household unit' (as that term is defined in the Building Act 2004) in which a claimant has installed or is using the product; and

b. "lifetime" means the duration of the useful or serviceable life of that building.

Transfer of warranty

6. This warranty may be transferred to each subsequent owner of the building in which the product is installed or used, subject to each owner being notified in writing of, and at all times being subject to, these terms and conditions. You agree you will no longer have any rights under this warranty following such transfer.

Benefits under this warranty

7. Your sole and exclusive remedy for any breach of this warranty is that Tasman will (at its sole option):

a. replace or repair the affected product;

b. supply equivalent products or goods;

c. pay the cost of replacing the affected product; or

d. refund the cost of the affected product.

8. Other than as provided in these terms and conditions, Tasman will have no liability to a claimant (whether in statute, contract, tort, or otherwise at law or in equity) in respect of any defects in the product or for any loss, damage, costs or expenses caused by the product or defects in the product. **Nothing in this paragraph 8 or otherwise in these terms and conditions excludes or modifies any legal rights you may have under the Consumer Guarantees Act, the Building Act, or any other legislation which cannot be excluded or modified at law.**

Limitations

9. Tasman will in no circumstances be liable for breach of warranty or otherwise in respect of defects in the product as a result of use, installation or maintenance of the product (whether by the claimant or any other person) other than in accordance with the requirements set out in paragraph 4 of this warranty.

10. Without limiting paragraph 9, Tasman Insulation will in no circumstances be liable for:

a. any damage or loss caused by a claimant or anyone other than Tasman, or by any other factor affecting the product or a building beyond Tasman's reasonable control, including but not limited to moisture, water, fire, lightning, salt air, chemicals, industrial fall-out, fumes, liquids, solids, animals or precipitation;

b. the removal of product installed or the installation of replacement or equivalent products, or the cost of removal or installation of replacement or equivalent products;

c. any direct, consequential, or indirect loss of any kind; or

d. any loss of profits, use, sales, turnover, reputation (or damage to it), production, anticipated savings, goodwill, business opportunity, customers, software or data, or loss of use of any software, data, premises or facilities, or loss under, or in relation to, any other contract; in each case whether of a direct, indirect or consequential nature.

11. All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law.

12. In accepting this warranty you irrevocably waive any other claims, actions, rights or remedies you may have against Tasman in respect of any defects in the product.

13. Subject to paragraph 8, this warranty only applies to an original end purchaser of the product, and does not apply to:

a. any person who purchases the product for use or installation in any works, erection, structure or construction other than a 'household unit' (as defined in the Building Act 2004); or

b. any person who has purchased the product in trade or for resupply to any other purchaser (except any builder, contractor or installer who purchases the product for use or installation in a building);

c. any installation or use of the product resulting in the product being consumed in the course of a process of production or manufacture.

For warranty claims please contact 0800 746 522/ 0800 PINKBATTS

APPROVED BC190130 03/04/2019 Napier City Council Pg 93 of 207

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Providing

THE SYSTEM THAT MATTERS

AUGUST 2008

BRANZ Appraised
Appraisal No. 614 [2008]

APPROVED BC190130 03/04/2019 Napier City Council Pg 94 of 207

ALUBAND™ / ALUMINIUM

Window Sealing System NCT

The **Thermakraft WINDOW SEALING SYSTEM**

The Window Sealing Tape

The Corner Moulded Piece

. . . with the Aluband Tool

Thermakraft Industries (NZ) Ltd

NCT • New Composite Technology

THE SYSTEM • THE METHOD Installation Guide

1 Cut the building wrap/air barrier at 45° away from each corner *(left pic)*, fold flaps tightly into the window or door opening and fix with staples on the back faces of the framing *(right pic)*.
Trim excess building wrap/air barrier to enable unimpeded access to the opening.

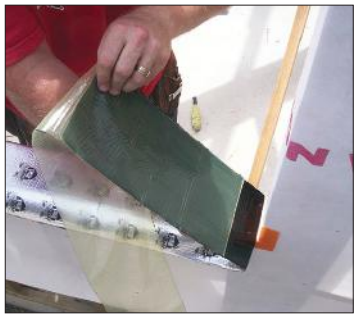
2 Fix the **Thermakraft** ALUBAND™ **Corner Moulded Piece™** (orange in colour) to the sill corners by way of staples or clouts to the two jambs as shown. The flexibility of the corner piece allows for a 5° chamfer (slope) on the timber sill where it is required for direct fix cladding. Now install the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** as in step 3. 150mm wide tape is used for 100mm wide window or door framing. 200mm wide tape is used for 140mm to 150mm wide reveals. With steel framed houses use Double Sided Tape to attach **Thermakraft** ALUBAND™ **Corner Moulded Piece™** to metal cladding.

Do not fix through the logo on the **Thermakraft** ALUBAND™ **Corner Moulded Piece™**

3 Measure 200mm up both jambs *(left pic)*, add 400mm to the length of the window sill and cut the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** to suit that measurement *(right pic)*.

4 Remove first the polyethylene protective film from the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape;** align the back edge of the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** with the inside edge of sill.

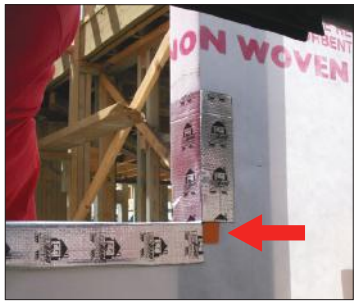
Do not lay **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** onto the interior surface of framing where it may interfere with wall linings.



5 Using the **Thermakraft** ALUBAND™ **Tool,** firmly press the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** onto the building wrap/air barrier to ensure good adhesion.
Using the **Thermakraft** ALUBAND™ **Tool,** ensure that the tape is fitted tightly into the jamb to sill corners.

6 At the sill/jamb corners cut the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** from the external edge of the frame outwards. Fold flaps back onto the building wrap/air barrier and press tape firmly for good adhesion.

The **Thermakraft** ALUBAND™ **Corner Moulded Piece™** is nearly all covered except for the logo showing on the outer bottom edge.



E. & O. E.

APPROVED BC190130 03/04/2019 Napier City Council Pg 95 of 207

THE SYSTEM • THE METHOD . . . . . Continued

7 Proceed to fix the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** to the top corners of the frame (200mm across lintel x 200mm down jamb). Remove first the backing film from the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape;** align the back edge of the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** with inside edge of lintel.

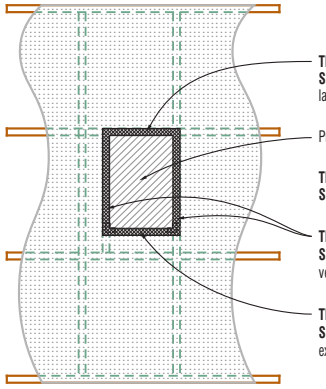
Using the **Thermakraft** ALUBAND™ **Tool,** ensure that the tape is fitted tightly into the corners. Cut the **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** from the external edge of the frame outwards. Fold flaps back onto the building wrap/air barrier and press tape firmly for good adhesion.

8 For the window or door lintel to jamb junction, apply a Butterfly using the 50mm wide x 100mm long **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape,** and fix at a 45° angle to the jamb with an overlap at the corner of 3mm (as per photo on right).

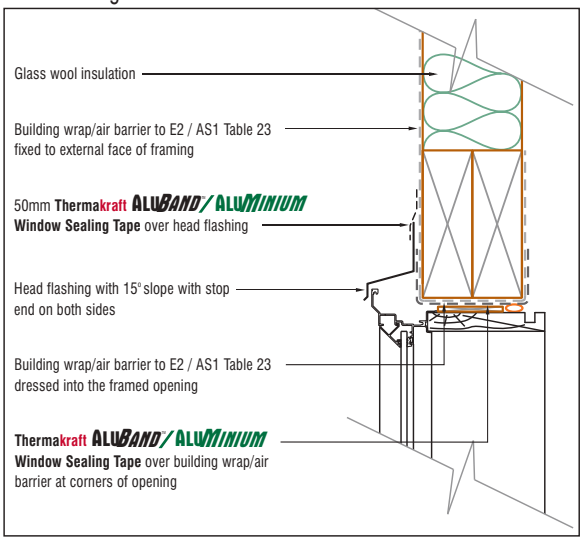
The **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing System** is now complete (as per this photo alongside).

9 Meter boxes with built-in flanges, to be taped with 50mm **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** along each flange to the building wrap/air barrier.

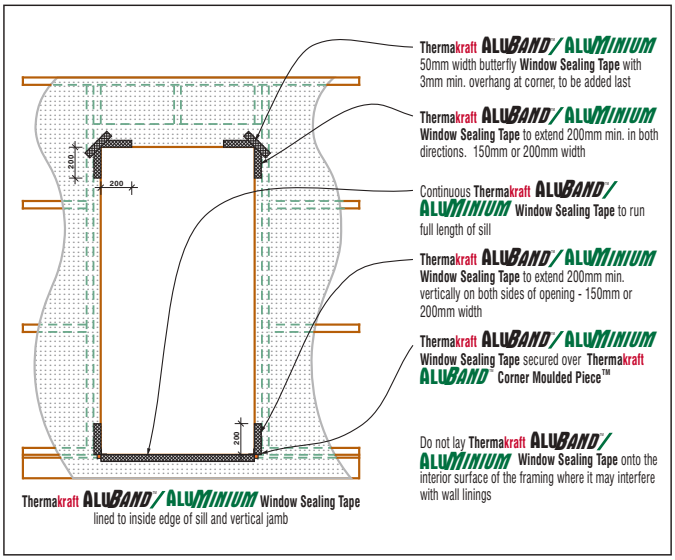
Frame openings for meter boxes without built-in flanges to be treated as for window openings. Refer steps 1-8.



10 50mm **Thermakraft** ALUBAND™/ALUMINIUM **Window Sealing Tape** is used to seal the up stand of the window head flashing to the building wrap/air barrier. Refer to the cladding manufacturer's details.



11 Door frames are to be treated similarly to window openings. The sill may be either a timber or a concrete floor.



E. & O. E.

APPROVED BC190130 03/04/2019 Napier City Council Pg 96 of 207

Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape is a polymeric faced high quality bituminous modified self adhesive tape with a polyethylene release backing and comes in 150mm wide, 200mm wide, 75mm wide & 50mm wide tapes.

The **Thermakraft ALUBAND™ Corner Moulded Piece™** is made from inert orange PE that is used in conjunction with the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** & building wraps, as part of the secondary drainage plane reqd to prevent the ingress of moisture into the framing.

A special **Thermakraft ALUBAND™ Tool** (green) is used to ensure proper adhesion and a tight fit into corners.

Applications

The **Thermakraft ALUBAND™/ALUMINIUM Window Sealing System** is designed to work with all kraft-based building papers that meet the requirements of Table 23 of E2/AS1, and the following synthetic wall underlays: Cover-Up, Diflex 130, Watergate, Tekton, Tyvek Home Wrap and Frameguard G3.

Thermakraft ALUBAND™/ALUMINIUM Window Sealing System (the System) is specially designed to provide a sure and lasting moisture proof seal at window and door openings.

Thermakraft ALUBAND™/ALUMINIUM Window Sealing System is ideal for sealing head flashings to the building wrap/air barrier as well as around meter boxes with built-in sealed flanges.

The system provides a moisture barrier at the most vulnerable point at the sill/jamb and jamb/lintel intersection.

DOOR FRAMES TO BE TREATED EXACTLY THE SAME AS THE WINDOW FRAME *(refer to Step 11 inside).*

Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape can be used on the following timber treatments: CCA, Boron & LOSP*.

*If **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** is used in conjunction with LOSP treated timber, the solvent must be allowed to flash off before installation. This can be tested by applying a small strip (approx 100mm x 50mm) to the treated timber for one hour. If the tape does not stick well, then the timber must be allowed to flash off for more time.

The **Thermakraft ALUBAND™/ALUMINIUM Window Sealing System** must not be exposed to weather for more than 90 days.

The **Thermakraft ALUBAND™ Corner Moulded Piece™** is designed to prevent the ingress of moisture at both the left and right hand window jamb to sill junctions. It is easy to install on timber framing using either staples or clouts fixed into the jambs.

The **Thermakraft ALUBAND™ Corner Moulded Piece™** is flexible allowing for use on sills with a 5° chamfer, required for direct fix cladding systems.

When using **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** for jamb/lintel intersections, please ensure a butterfly (100mm x 50mm wide tape) is fixed at 45° angle to the jamb *(refer to Step 8 inside).*

Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape 50mm to be adhered to the head flashing *(refer to Step 10 inside).*

Appraised

Thermakraft ALUBAND™/ALUMINIUM Window Sealing System has been appraised in New Zealand by BRANZ, Appraisal No. 614 [2008] - *appraisal available on request.*

Standard Roll Dimensions

Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape is available in the following sizes:

Roll Width	Roll Length	No. per carton
200mm	25.0m	2 rolls
150mm	25.0m	4 rolls
150mm	10.0m	12 rolls
75mm	25.0m	8 rolls
50mm	25.0m	12 rolls

House Pack

3 x 150mm x 25m rolls / 3 x 50mm x 10m rolls / 50 x **Thermakraft ALUBAND™ Corner Moulded Pieces™** / 1 x **Thermakraft ALUBAND™ Tool** / 1 x Data Sheet.

The **Thermakraft ALUBAND™/ALUMINIUM Window Sealing System** is expected to have a serviceable life equal to that of the cladding, when installed in accordance with this data sheet and the technical literature, provided it is not exposed to the weather or ultra-violet (UV) for a total of more than 90 days, or damaged on installation.

Thermakraft ALUBAND™/ALUMINIUM Window Sealing System when used with wall wraps listed in this data sheet and in accordance with this data sheet, will meet the Performance ***B2.3.1 (b) 15 years*** of the New Zealand Building Code.

The **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** must not be installed at temperatures of less than 10°C.

This printed material supersedes all those previous. **Thermakraft Industries (NZ) Ltd** retains the right to change products and specifications without prior notification. Do not use **Thermakraft** products in application other than that detailed in the product brochure, data sheets, relevant Standards, Codes of Practice, Building Legislation and/or Health & Safety Regulations, without obtaining written advice from **Thermakraft Industries (NZ) Ltd**. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. This information is provided without prejudice by **Thermakraft Industries (NZ) Ltd**.

Thermakraft Industries (NZ) Ltd

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E. & O. E.

APPROVED BC190130 03/04/2019 Napier City Council Pg 97 of 207

Thermakraft

CI/SfB

JUNE 2010

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY

APPLICATION AND INSTALLATION

Product Description

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY is specifically designed for use in Domestic and Commercial type buildings.

THERMAKRAFT 215 is a breathable, absorbent bituminous wall and roofing underlay.

THERMAKRAFT 215 will provide the following functions:

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

Applications

THERMAKRAFT 215 is suitable as a wall and roofing underlay where Fire Retardancy is **NOT** required, and with all cladding types.

THERMAKRAFT 215 is self supporting to 1200mm rafter/purlin spacing.

THERMAKRAFT 215 can be used as an Air Barrier.

THERMAKRAFT 215 must not be left exposed to the elements for more than 7 days. Cladding on the same day is recommended. If Fire Retardancy (FI <5) is required, use Thermakraft COVERTEK 407.

Installation Roofing

THERMAKRAFT 215 may be run vertically over purlins with a 150mm lap if roof pitch >8 degrees. Fix securely to purlins with 8mm staples or 20mm clouts. The membrane should be firmly laid to avoid excessive dishing between purlins.

THERMAKRAFT 215 may be run horizontally across rafter/trusses with a 150mm lap for roof pitches above 3 degrees. Fix securely with 8mm staples or 20mm clouts.

Control of Condensation

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

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

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

Storage

THERMAKRAFT 215 should be stood on end in dry conditions.
Protect from the weather and direct sunlight.

Roll Dimensions

1250mm x 40.0m = 50m² 20kg
1250mm x 20.0m = 25m² 10kg (2 per pack)
1450mm x 34.5m = 50m² 20kg

For more information regarding Thermakraft COVERTEK 407 **FIRE RETARDANT SELF SUPPORTING ABSORBENT BREATHABLE SYNTHETIC NON WOVEN ROOFING UNDERLAY** refer to the "DESIGNER and USER GUIDELINES" - Direct and Cavity Fix, or contact **Thermakraft Customer Services** on **0800 806 595.**

APPROVED BC190130 03/04/2019 Napier City Council Pg 98 of 207

E. & O. E.

Thermakraft

CI/SfB			
JUNE 2010			

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY

TECHNICAL SPECIFICATIONS

Technical Data

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY complies with the requirements of NZBC E2/AS1 Table 23.

Nominal Grammage 400g/m2

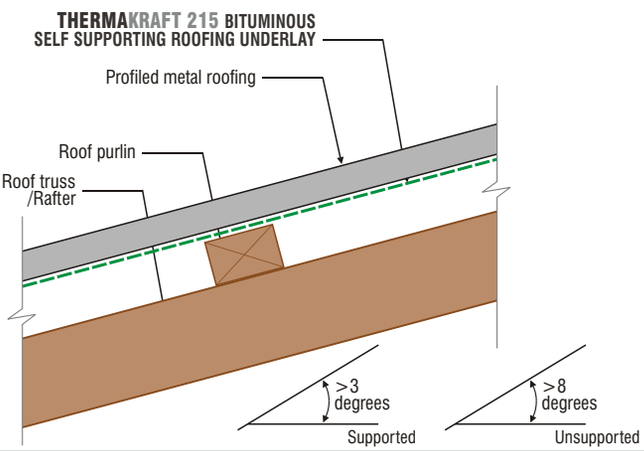
NZBC E2/AS1 TABLE 23 AS A WALL UNDERLAY REQUIREMENTS		
NZBC E2/AS1 TABLE 23 WALL UNDERLAY PROPERTIES	**PROPERTY PERFORMANCE REQUIREMENTS**	**PROPERTY PERFORMANCE**
Absorbency	≥100 gsm	Pass
Vapour Resistance	≤7 MN.s/g	Pass
pH of Extract	≥6 and ≤9	Pass
Shrinkage	≤0.5%	Pass
Water Resistance	≥100mm	Pass
Air Barrier	≥0.1 MN.s/m^3	Pass
Duty		Heavy

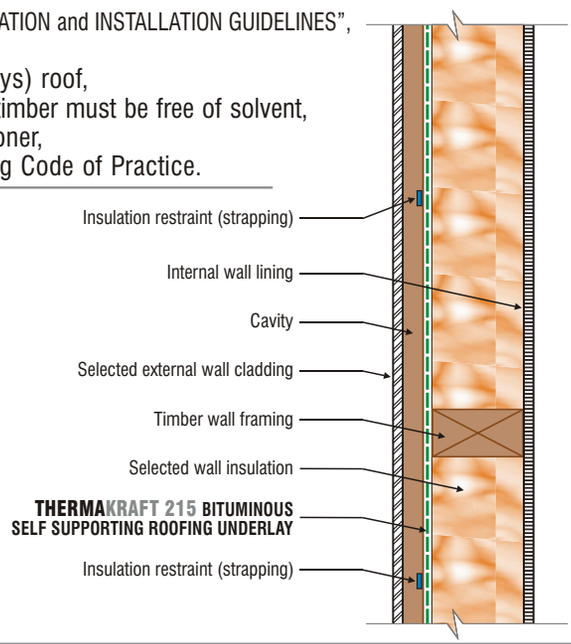
NZS2295:2206 Classification		
Flammability Index		**Non Fire Retardant**
Wind Zone	R2	Up to Very High
NZS2295:2006 Classification	R2	Self Supporting

Durability/Limitations

For **THERMAKRAFT 215** to meet the Performance Requirements of NZBC Clause B2, Durability B2.3.1(a) 50 years and B2.3.1(b) 15 years, E2 External Moisture, **THERMAKRAFT 215**:

- must be installed in accordance to the "APPLICATION and INSTALLATION GUIDELINES",
- run length no greater than 10 metres,
- is not left exposed for more than (7 days) roof,
- when used on LOSP treated timber, the timber must be free of solvent,
- installed by a licensed building practitioner,
- installed in accordance with the Roofing Code of Practice.





APPROVED BC190130 03/04/2019 Napier City Council Pg 99 of 207

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E. & O. E.

CI/SfB

JUNE 2010

Thermakraft

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY

APPLICATION AND INSTALLATION

Product Description

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY is specifically designed for use in Domestic and Commercial type buildings.

THERMAKRAFT 215 is a breathable, absorbent bituminous wall and roofing underlay.

THERMAKRAFT 215 will provide the following functions:

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

Applications

THERMAKRAFT 215 is suitable as a wall and roofing underlay where Fire Retardancy is **NOT** required, and with all cladding types.

THERMAKRAFT 215 is self supporting to 1200mm rafter/purlin spacing.

THERMAKRAFT 215 can be used as an Air Barrier.

THERMAKRAFT 215 must not be left exposed to the elements for more than 7 days. Cladding on the same day is recommended. If Fire Retardancy (FI <5) is required, use **Thermakraft** COVERTEK 407.

Installation Roofing

THERMAKRAFT 215 may be run vertically over purlins with a 150mm lap if roof pitch >8 degrees. Fix securely to purlins with 8mm staples or 20mm clouts. The membrane should be firmly laid to avoid excessive dishing between purlins.

THERMAKRAFT 215 may be run horizontally across rafter/trusses with a 150mm lap for roof pitches above 3 degrees. Fix securely with 8mm staples or 20mm clouts.

Control of Condensation

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

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

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

Storage

THERMAKRAFT 215 should be stood on end in dry conditions. Protect from the weather and direct sunlight.

Roll Dimensions

1250mm x 40.0m = 50m^2 20kg
1250mm x 20.0m = 25m^2 10kg (2 per pack)
1450mm x 34.5m = 50m^2 20kg

For more information regarding **Thermakraft** COVERTEK 407 **FIRE RETARDANT SELF SUPPORTING ABSORBENT BREATHABLE SYNTHETIC NON WOVEN ROOFING UNDERLAY** refer to the "DESIGNER and USER GUIDELINES" - Direct and Cavity Fix, or contact **Thermakraft Customer Services** on **0800 806 595.**

APPROVED BC190130 03/04/2019 Napier City Council Pg 100 of 207

E. & O. E.

Thermakraft

CI/SfB			
JUNE 2010			

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY

TECHNICAL SPECIFICATIONS

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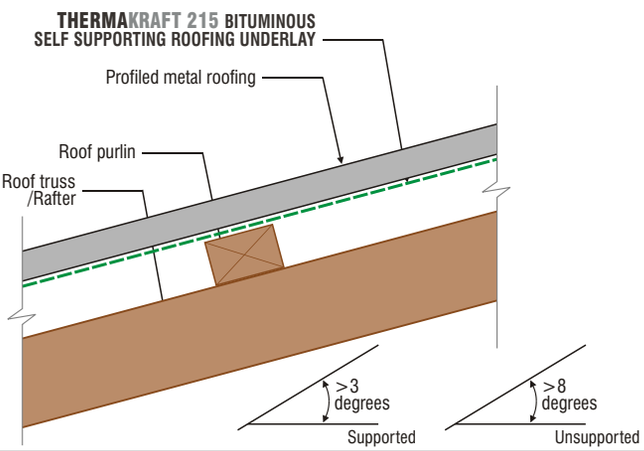

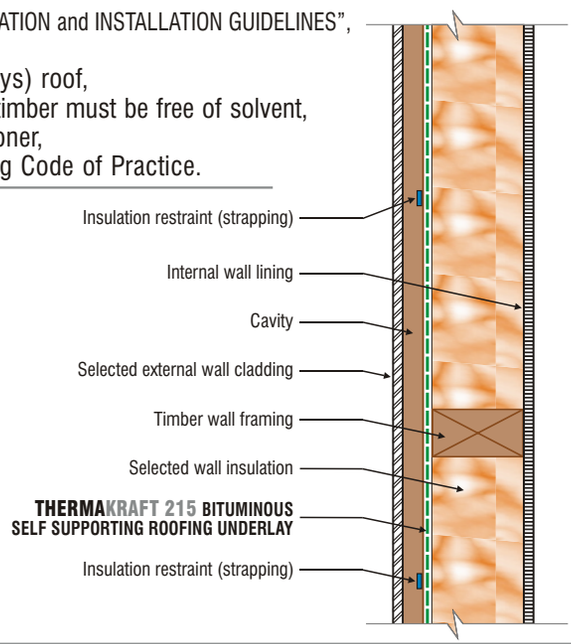

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E. & O. E.

James Hardie
a smarter way™

Linea®
WEATHERBOARD

Technical Specification

APRIL 2016 | NEW ZEALAND

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Contents

1	**APPLICATION AND SCOPE**	**3**
1.1	Application	3
1.2	Scope	3
1.3	Details	3
1.4	Specific Design	3
2	**DESIGN**	**3**
2.1	Compliance	3
2.2	Responsibility	3
2.3	Site and Foundation	3
2.4	Surface Clearances	4
2.5	Moisture Management	4
2.6	Structure	4
2.7	Wind Loading	4
2.8	Structural Bracing	4
2.9	Fire Rated Walls	4
2.10	Energy Efficiency	4
3	**FRAMING**	**5**
3.1	General	5
3.2	Timber Grade	5
3.3	Durability	5
3.4	Frame Construction	5
3.5	Tolerances	5
4	**PREPARATION**	**6**
4.1	Flexible Underlay or HomeRAB Pre-Cladding	6
4.2	Rigid Air Barrier	6
4.3	Flashing	6
4.4	Vent Strip	6
4.5	Cavity Battens	6
4.6	Intermediate Support	6
4.7	Corners	6
4.8	Junctions and Penetrations	6
5	**FIXING LINEA® WEATHERBOARD**	**7**
5.1	General	7
5.2	Fastener Durability	7
5.3	Nail Sizes and Fixing Method	7
5.4	Gun Nailing	8
6	**JOINTING**	**8**
7	**FINISHING**	**8**
7.1	Preparation and Priming	8
7.2	Sealants	8
7.3	Painting	8
8	**STORAGE AND HANDLING**	**8**
9	**MAINTENANCE**	**9**
10	**PRODUCT INFORMATION**	**9**
10.1	Manufacturing and Classification	9
10.2	Trim	9
10.3	Durability	9
10.4	Product Sizes and Mass	9
10.5	Size and Weight	9
11	**SAFE WORKING PRACTICES**	**10**
12	**PRODUCT SIZES**	**11**
13	**ACCESSORIES**	**12**
14	**DETAILS**	**14**
	PRODUCT WARRANTY	**51**

WE VALUE YOUR FEEDBACK

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

Ask James Hardie™
Fax 0800 808 988
literaturefeedback@jameshardie.co.nz

APPROVED BC190130 03/04/2019 Napier City Council Pg 103 of 207

CODEMARK™ 30018

1 Application and scope

1.1 APPLICATION

Linea® Weath^e^rboard is a 16mm thick, pre-primed bevel back fibre cement weatherboard and is classified as lightweight wall cladding suitable for residential and light commercial construction using timber framed external walls. Linea Weatherboard is available in 135mm, 150mm and 180mm widths.

James Hardie also has available:

- Axent™ Fascia in two widths. Axent Fascia is a 16mm thick, pre-primed fibre cement product designed to accommodate James Hardie soffit linings.
- Axent™ Trim comes in a variety of widths for use as decorative trims around openings and external corners. Axent Trim is a 16mm thick, pre-primed fibre cement product.

Specifier

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

Installer

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

Make sure your information is up to date

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

1.2 SCOPE

This specification covers the use of Linea Weatherboard on buildings that fall within the scope limitations of the New Zealand Building Code (The NZBC) Acceptable Solution E2/AS1, Paragraph 1.1.

This specification includes the use of Linea Weatherboard in both direct to stud and cavity construction method and must be read in conjunction with the current BRANZ Appraisals for Linea Weatherboard.

This specification also covers the use of Linea Weatherboard in cavity construction for specific design projects (SED) subject to a wind pressure of 2.5kPa (ULS) maximum. This document is intended for use by architects, designers, specifiers or builders who are involved in specifying Linea Weatherboard. The document also serves the purpose of an installation manual for this product.

1.3 DETAILS

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

1.4 SPECIFIC DESIGN

For use of Linea Weatherboard outside this published scope, the architect, designer or engineer must undertake specific design.

For advice on designs outside the scope of this specification, Ask James Hardie on 0800 808 868.

2 Design

2.1 COMPLIANCE

CodeMark 30018

Linea Weatherboard direct fixed and cavity cladding has been issued a CodeMark certificate number GM-10-30018 which confirms Linea Weatherboard is deemed to comply with the requirements of the NZBC. Please refer to our website www.jameshardie.co.nz for a copy of the CodeMark certificate. Linea Weatherboard also has a BRANZ Appraisal number 446 (2010) and 447 (2010) at www.branz.co.nz or www.jameshardie.co.nz.

2.2 RESPONSIBILITY

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

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

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

2.3 SITE AND FOUNDATION

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 104 of 207

2.4 SURFACE CLEARANCES

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

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

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

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

2.5 MOISTURE MANAGEMENT

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

Wall construction design must effectively manage moisture, considering both the interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration or that are artificially heated or cooled. Walls shall include those provisions as required by the NZBC Acceptable Solution E2/AS1 'External Moisture'. In addition, all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashings for waterproofing. The other materials, components and installation methods used to manage moisture in the walls, must comply with the requirements of relevant standards and the NZBC. For information in relation to designing for weathertightness, refer to BRANZ and the Ministry of Business Innovation & Employment (MBIE) updates on the following websites, respectively www.branz.co.nz and www.dbh.govt.nz.

2.6 STRUCTURE

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 engineering design in accordance with NZS 3603 and AS/NZS 1170. Where specific engineering design is required, the framing stiffness must be equivalent to or more than the framing provisions of NZS 3604. In all cases stud spacing must not exceed 600mm centres maximum for buildings designed to NZS 3604 and 400mm centres maximum for specific engineering design buildings subject to design wind pressures higher than 1.5kPa.

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

2.7 WIND LOADING

Linea Weatherboard cladding is suitable for use in all wind zones as defined in NZS 3604. It is also suitable for use in SED buildings exposed to wind pressures up to 2.5kPa (ULS).

For wind pressures higher than those mentioned above, contact James Hardie at 0800 808 868 for assistance.

2.8 STRUCTURAL BRACING

Linea Weatherboard direct fixed installed as per Linea Weatherboard specific bracing details will provide bracing for buildings designed and constructed in accordance with NZS 3604. The Linea Weatherboard bracing systems have been independently tested by SCION using direct fixed construction. The following range of bracings can be achieved

- Wind 75 – 130 BU'S/m
- Earthquake 67 – 101 BU'S/m

Refer to the James Hardie Bracing Design Manual for details.

2.9 FIRE RATED WALLS

Walls clad with Linea Weatherboard using a direct fix or cavity construction method can achieve fire ratings of up to 90/90/90 when constructed in accordance with the James Hardie 'Fire and Acoustic' Design Manual. Linea Weatherboard must be face fixed for Fire Rated applications.

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

2.10 ENERGY EFFICIENCY

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

Table 1

Insulation capability		
Climate Zone	**Construction R-Value Requirement**	**Minimum R-Value of Insulation Required**
1 and 2	1.9 m2 ºC/W	#R2.0
3	2.0 m2 ºC/W	#R2.2

APPROVED BC190130 03/04/2019 Napier City Council Pg 105 of 207

Total construction R-Value depends on the insulation material used and the framing ratio. The insulation material R-Values specified in this table are for studs spaced at 600mm c/c and nogs spaced at 800mm c/c.

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

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

3 Framing

3.1 GENERAL

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

For Steel Framing refer to James Hardie Claddings Installation to Steel Framing Technical Supplement.

3.2 TIMBER GRADE

Timber must be graded in accordance with NZS 3631 'New Zealand Timber Grading Rules'. The timber grade to be used must be in accordance with NZS 3604 requirements.

3.3 DURABILITY

To comply with the NZBC requirements the external framing must be treated to a minimum H1.2 treatment. Refer to the NZBC Acceptable Solution B2/AS1 Durability for further information about the durability requirements. For timber treatment information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round and Sawn Timber) for minimum timber treatment selection and treatment requirements. Also refer to framing manufacturer's literature for further guidance on timber selection.

Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturers.

Note: refer to NZS 3602 for information about the allowable moisture content in timber.

3.4 FRAME CONSTRUCTION

For buildings within the scope of NZS 3604 the framing sizes and set-out must comply with NZS 3604 with stud, nog/dwang centres as required by this specification.

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

3.4.1 Direct fixed construction method

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

- Studs must be provided at 600mm centres maximum.
- Nogs must be provided at 1200mm centres maximum.
- Double studs are required at internal corners.
- Extra packers may be required at external corners.
- Extra studs are required for aluminium internal corner sections.

3.4.2 Cavity construction method

The following framing must be provided for cavity construction method:

- When studs are at 600mm centres the nogs must be provided at 800mm centres maximum.
- When studs are at 400mm centres the nogs may be provided at 1200mm centres maximum.
- Double studs are required at internal corners.
- Extra packers may be required at external corners.
- Extra studs are required for aluminium internal corner sections.

3.4.3 Specific Engineering Design (SED)

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

- Stud spacing 400mm centres maximum
- Nog spacing 1200mm centres maximum
- Other requirements as per 3.5.2 above

3.5 TOLERANCES

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 106 of 207

4 Preparation

4.1 FLEXIBLE UNDERLAY OR HOMERAB PRE-CLADDING

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

4.2 RIGID AIR BARRIER

For EH wind zone or Specific Engineering Design (SED) projects where the design wind pressures are between 1.5kPa (ULS) and 2.5kPa (ULS), RAB Board (6mm) must be used. Refer to James Hardie Rigid Air Barriers installation manual for information regarding its installation.

4.3 FLASHING

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to weatherboard installation. Please refer to moisture management requirements in Clause 2.5. The flexible underlay must be appropriately incorporated with penetration and junction flashings. Materials must be lapped in such a way that water tracks down to the exterior on the face of flexible underlay. The selected flashing materials must comply with the durability requirements of Table 20 of the NZBC Acceptable Solution E2/AS1.

4.4 VENT STRIP

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

4.5 CAVITY BATTENS

Buildings with a risk score of 13-20 calculated in accordance with the NZBC Acceptable Solution E2/AS1 Table 3 require Linea Weatherboards to be installed on a cavity.

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

The timber battens must be minimum H3.1 treated in accordance with NZS 3640 (Chemical Preservation of Round and Sawn Timber) to comply with the durability requirements of B2/AS1.

Cavity battens must comply with E2/AS1 and:

- be minimum 18mm thick.
- be minimum as wide as the width of studs.
- must be fixed by the cladding fixings to the main framing through the flexible underlay.
- fix cavity battens to studs at maximum 600mm centres.
- until claddings are fixed the battens need only to be tacked to framing with 40 x 2.8mm nails at 800mm centres maximum.

(Batten fixing is required temporarily to keep them straight on the wall during construction.)

4.6 INTERMEDIATE SUPPORT

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

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

No intermediate supports are required:

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

4.7 CORNERS

Anticipated joist shrinkage must be allowed for in the design process. Do not run trims or aluminium extrusions continuously across solid floor joists. There are a number of options to select from when detailing external corners:

- 90º corner soaker in aluminium, copper or stainless steel. Refer to Figures 7 and 33.
- 135º corner soaker 180mm aluminium, contact James Hardie
- Box corners using Axent Trim. Refer to Figures 3, 4 and 30.
- Mitred corners to weatherboards. Refer to Figures 5 and 31.
- Aluminium boxed corners. Refer to Figures 6 and 32.

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

- Scribed corner. Refer to Figures 8 and 34.
- 90º or 135º Aluminium W-mould. Refer to Figures 9, 10, 35 and 36.

4.8 JUNCTIONS AND PENETRATIONS

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for Linea Weatherboards which meet the performance requirements of E2 'External Moisture', an approved document of the NZBC. Refer to Figures 11 to 22 and 38 to 51.

APPROVED BC190130 03/04/2019 Napier City Council Pg 107 of 207

5 Fixing Linea Weatherboard

5.1 GENERAL

The horizontal lap of Linea Weatherboards must be 30mm minimum. In certain scenarios you may require to creep up the lap. This must not exceed 33mm. Linea Weatherboards must be kept dry whilst in storage prior to and during fixing. Cut ends which are exposed after installation or where sealant is applied to the boards such as slimline box corners, internal corners, mitred external corners etc, must be primed prior to installation. Dust and loose material must be removed before priming.

A minimum H3.1 treated timber cant strip must be provided to support the bottom board on the wall. Refer to Figure 1 and Figure 26.

5.2 FASTENER DURABILITY

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

Table 2

Exposure conditions and nail selection prescribed by NZS 3604

NAIL MATERIAL

Zone D *	Zone C outside sea spray zone and Zone B and Geothermal hot spots	Bracing — All zones
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless	Grade 316 stainless

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

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

5.3 NAIL SIZE AND FIXING METHOD

Linea Weatherboards and Axent Trim must be fixed to timber with the types of nails specified in Tables 3 and 4, in accordance with the following requirements:

- Linea Weatherboard can either be face/exposed fixed or concealed fixed.
- Linea Weatherboard must be fixed into studs at maximum 600mm centres. Fixing centres to coincide with stud spacing. Refer to Figure 2 and 28.
- All concealed nails must be driven flush with the board surface.
- When concealed fixing Linea Weatherboards, nails must be driven under the lap of boards, except at all corners and vertical edges of openings where Linea Weatherboards must be face fixed. Refer to Figure 2 and Figure 29.
- Nails must be fixed 25mm from the end of the board when hand nailing. For gun nailing refer to Section 5.4.
- When using concealed fixing method, any gaps that may appear under the lap due to site conditions can be minimised by fixing a jolt head nail through the lap as per the exposed nailing method. Refer to Figure 2 and 29.
- When using concealed fixing method, Linea Weatherboard can also be tied together by face fixing through the lap using 32mm brad nails if desired.
- When face fixing Linea Weatherboard, the upper board must be pre-drilled before fixing with a jolt head nail.

Table 3

Nail requirements for Linea Weatherboards

DIRECT TO STUD FIXING UP TO AND INCLUDING VH WIND ZONE

Concealed Nailing over flexible underlay	
40 x 2.8mm HardieFlex™ nails	Finish flush with the board surface.

Face Nailing over flexible underlay	
60 x 3.15mm jolt head nails	Hot-dipped galvanised jolt head nail with pre-drilling* through the top weatherboard.
	Stainless steel jolt head nail with pre-drilling* through the top weatherboard.

Concealed Nailing over rigid air barrier	
50 x 2.8mm HardieFlex™ nails	Finish flush with the board surface.

Face Nailing over rigid air barrier	
75 x 3.15mm jolt head nails	Hot-dipped galvanised jolt head nail with pre-drilling* through the top weatherboard.
	Stainless steel jolt head nail with pre-drilling* through the top weatherboard.

CAVITY FIXING UP TO AND INCLUDING VH WIND ZONE

Concealed Nailing over flexible underlay	
60 x 3.15mm HardieFlex™ nails	Finish flush with the board surface.

Face Nailing over flexible underlay	
75 x 3.15mm jolt head nails	Hot-dipped galvanised jolt head nail with pre-drilling* through the top weatherboard.
	Stainless steel jolt head nail with pre-drilling* through the top weatherboard.

Concealed Nailing over rigid air barrier	
75 x 3.15mm HardieFlex™ nails	Finish flush with the board surface.

Face Nailing over rigid air barrier	
90 x 4.0mm jolt head nails	Hot-dipped galvanised jolt head nail with pre-drilling* through the top weatherboard.
	Stainless steel jolt head nail with pre-drilling* through the top weatherboard.

CAVITY FIXING EH WIND ZONE AND SED PROJECTS (1.5KPA - 2.5KPA WIND PRESSURE)

Face Nailing	
90 x 4.0mm jolt head nail	Hot-dipped galvanised jolt head nail with pre-drilling** through the top weatherboard.
	Stainless steel shank jolt head nail with pre-drilling** through the top weatherboard.

APPROVED BC190130 03/04/2019 Napier City Council Pg 108 of 207

Table 4

Nail requirements for trim	
Single Thickness	60mm jolt head nails. If fixing over Linea Weatherboard use predrilled* 75 x 3.15mm jolt head nails.
Double Thickness	60mm jolt head nails.
Single plus packer	If fixing over Linea Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled* hole. When fixing to timber support use 60mm jolt head nails.

* Use a 3.0mm drill bit. ** Use a 3.5mm drill bit

Note: Special fixing arrangements are required for bracing and fire-resistance rated wall systems. For more information Ask James Hardie on 0800 808 868.

5.4 GUN NAILING

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

- Gun-nailing must not be used when Linea Weatherboard is used for bracing.
- Nails must be no closer than 50mm from the ends of boards when gun nailing is used — double studs will be required.
- Be minimum length and gauge as per Table 3.
- Be finished flush with surface of board.

6 Jointing

The ends of Linea Weatherboards are jointed off-stud by means of a tongue and groove joint. Tongue and groove joints may be located centrally between studs but no closer than 100mm from the edge of a stud. The joints must be staggered by 600mm minimum. Flexible sealant must be applied in the tongue and groove joint at the time of installation.

7 Finishing

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

7.1 PREPARATION AND PRIMING

The Linea Weatherboard and Axent Trim must be dry before painting. Punch and fill all exposed nails a maximum of 2mm below the surface. Fill the hole with an exterior grade builders fill, allow to cure and sand smooth ready for priming. Prime the filled holes in accordance with paint manufacturer's specifications.

It is not recommended to seal under the lap of weatherboards as it helps circulation of air behind the weatherboard cladding.

7.2 SEALANTS

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

7.3 PAINTING

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

Linea Weatherboard must be painted within 90 days of installation. There is no restriction on the LRV of paint to be applied on the Linea Weatherboard. All exposed faces, including the top edges under the sills and bottom edges of Linea Weatherboard, Axent Trim and accessories must be finished with latex exterior paint system complying with any of parts 7, 8, 9, and 10 of AS 3730.

Dark coloured paints can be used on Linea Weatherboard and Trim. The dark colours in certain environments may fade over a period of time. Special paints/coatings are required in certain harsh environments.

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

8 Storage and handling

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

Linea Weatherboards and Axent Trim must be laid flat on a smooth level surface. To ensure optimum performance, store weatherboards under cover and keep dry prior to fixing. If the weatherboards should become wet, allow to dry thoroughly before fixing. Do not carry weatherboards on the flat, carry in the vertical position to avoid excessive bending.

APPROVED BC190130 03/04/2019 Napier City Council Pg 109 of 207

9 Maintenance

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

- Washing down exterior surfaces every 6-12 months*,
- Re-applying exterior protective finishes**,
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants,
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation close to or touching the building,
- The clearances between the bottom edge of Linea Weatherboard and the finished/unfinished ground must always be maintained.
- Stainless steel soakers used in extreme coastal conditions or in sea spray zones may show some signs of 'tea staining'. It is an aesthetic issue and to minimise staining soaker must be washed/polished frequently.

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

*In extreme coastal conditions or sea spray zones, wash every 3-4 months.

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

10 Product information

10.1 MANUFACTURING AND CLASSIFICATION

James Hardie New Zealand is an ISO 9001 Telarc certified manufacturer. Linea Weatherboard and Axent Trim are manufactured to meet the requirements of AS/NZS 2908.2: 2000 'Cellulose-Cement Products', Linea Weatherboard has a classification of Type A Category 3 in accordance with this Standard. Linea Weatherboard is an advanced lightweight cement composite building product incorporating James Hardie proprietary Scyon technology. The basic composition of product is Portland cement, ground sand, cellulose fibre and water.

Linea Weatherboard has a bevel back and tongue and groove at the ends for jointing. The bottom front edge of Linea Weatherboard is chamfered. The weatherboards are supplied pre-primed on their face and bottom edge with an acrylic primer.

Linea Weatherboards and Axent Trim are identified by the printing at regular intervals of the name Linea on the back face.

10.2 JAMES HARDIE TRIM

The Axent Trim, used for box corners, around windows and doors as well as special architectural features, is also made with the CLD technology and is supplied pre-primed with an acrylic primer.

10.3 DURABILITY

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

10.3.1 Resistance to moisture/rotting

Linea Weatherboard and Axent Trim have demonstrated resistance to permanent moisture-induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2:

- Water Permeability (Clause 6.2)
- Warm Water (Clause 6.4)
- Heat Rain (Clause 6.5)
- Soak Dry (Clause 6.6).
- Freeze-Thaw (Clause 8.2.3)

10.3.2 Control of External Fire Spread

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

10.3.3 Alpine regions

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

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

10.4 PRODUCT SIZES AND MASS

Available sizes of Linea Weatherboard and Axent Trim and its weight are given in Table 6.

10.5 SIZE AND WEIGHT

Linea Weatherboard is categorised as a Light Weight Wall Cladding as described in NZS 3604. Physical properties of Linea Weatherboard and Axent Trim are provided in Table 6.

APPROVED BC190130 03/04/2019 Napier City Council Pg 110 of 207

11 Safe working practices

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

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

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

James Hardie recommended safe working practices

CUTTING OUTDOORS

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

BEST

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

GOOD

- Dust reducing circular saw with HardieBlade™ Saw Blade.

SANDING/REBATING/DRILLING/OTHER MACHINING

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

IMPORTANT NOTES

1. For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best" — level cutting methods where feasible.
2. NEVER use a power saw indoors.
3. NEVER use a circular saw blade that does not carry the HardieBlade™ logo.
4. NEVER dry sweep — Use wet suppression or HEPA vacuum.
5. NEVER use grinders.
6. ALWAYS follow tool manufacturers' safety recommendations.

P1 or P2 respirators should be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.co.nz to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

APPROVED BC190130 03/04/2019 Napier City Council Pg 111 of 207

Working instructions

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

HardieBlade™ Saw Blade

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

Hole-forming

For smooth clean cut circular holes:

Mark the centre of the hole on the sheet.

Pre-drill a pilot hole.

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

For irregular holes:

Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face.

Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported.

Storage and handling

All James Hardie building products should be stored to avoid damage, with edges and corners of the sheets protected from chipping.

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

Quality

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

12 Product sizes

Table 6

Linea Weatherboard and Axent Trim sizes

						Coverage Information			
Product	Length (mm)	Width (mm)	Thickness (mm)	End Details	Effective Cover (mm)	No. of planks/ metre height (approx.)	Mass kg/lineal m (approx. at EMC)	Mass kg/m^2 (approx. at EMC)	Weight/ packs (60 units/ pack)
Linea Weatherboard 135	4200*	135	16	T & G	105	9.5	2.62	25.70	660.00
Linea Weatherboard 150	4200*	150	16	T & G	120	8.3	3.1	24.93	781.00
Linea Weatherboard 180	4200*	180	16	T & G	150	6.7	3.57	23.92	899.00
Axent Trim 84mm	2600	84	16	Square	N/A	N/A	1.6	N/A	N/A
Axent Trim 100mm	2600	100	16	Square	N/A	N/A	1.9	N/A	N/A

*Length is 4200mm plus 5mm for the tongue and groove making overall length 4205mm

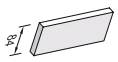
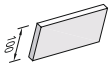
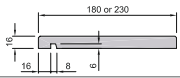
*The effective thickness of finished Linea Weatherboard on the wall at the lap is approximately 33 to 35mm

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 112 of 207

13 Accessories

Table 7

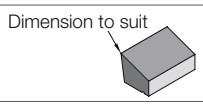
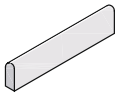
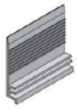
Accessories/Tools supplied by James Hardie			
Accessories	**Description**	**Size (mm)**	**Code**
	**External corner soaker 90º for Linea Weatherboards 180mm** • Aluminium • Copper • Stainless Steel	200 long	 **301186** **301188** **301197**
	**External corner soaker 135º for Linea Weatherboards 180mm** • Aluminium	200 long	 **301178**
	**External corner soaker 90º for Linea Weatherboards 150mm** • Aluminium • Stainless Steel	170 long	 **302820** **302821**
	**External corner soaker 90º for Linea Weatherboards 135mm** • Aluminium • Stainless Steel	155 long	 **301185** **301196**
	**External Slimline Box Corner Mould** Etched primed aluminium extrusion used to create external corner	2700 long 4000 long	**301195** **305809**
	**Box Corner 'Z' Flashing**	2700 long	**301203**
	**Internal 'W' Mould 90º** Etched primed aluminium extrustion used to create 90º internal corner	2700 long 4000 long	**301184** **305807**
	**Internal 'W' Mould 135º** Etched primed aluminium extrustion used to create 135º internal corner	2700 long	**301183**
	**Vent Strip** PVC moulding used as vermin proofing	3000 long	**302490**
	**JH Corner Under Flashing 50 x 50mm** PVC moulding used as under fashing for internal and external corners	3000 long	**303745**
	**Axent Trim 84mm**	84 x 2600 long	**401943**
	**Axent Trim 100mm**	100 x 2600 long	**401930**
	**HardieFlex™ nail - 5kg**	60 x 3.15mm	**302782**
	**HardieFlex™ nail - 5kg**	60 x 3.15mm	**302784**
	**HardieBlade™ Saw Blade** Diamond tip fibre cement circular saw blade. Spacers not included	4 tooth - 184mm	**300660**
	**HardieBlade™ Saw Blade** Diamond tip fibre cement circular saw blade. Spacers not included	6 tooth - 254mm	**303375**
	Axent Fascia - 180mm - 230mm	4200 long	**401843** **402230**

APPROVED BC190130 03/04/2019 Napier City Council Pg 113 of 207

Table 8

Accessories not supplied by James Hardie

James Hardie recommends the following products for use in conjunction with its Linea Weatherboard and Axent Trim.
James Hardie does not supply these products. There may also be some other accessories required depending upon the application. Please contact component manufacturer for information on their warranties and further information on their products.

Accessories	Description	Size (MM)	Material/ appearance
	**Head flashing** Required over window heads to be supplied by window installer. Material must comply with Table 20 and 21 of E2/AS1.	To suit	Etch Primed Aluminium/Powder Coated
	**D head or RounDrive Nail** Gun nail for concealed fixing Linea Weatherboard.	50 x 2.87 60 x 3.15	Hot Dip Galvanised Stainless Steel
	**HardieFlex™ Hot Dip Galv. Nails** For fixing cavity battens.	40 x 2.8mm	Hot Dip Galvanised
	Jolt Head Nail for face fixing to Linea Weatherboard. Hot Dip Galvanised or 316 Stainless Steel	50 x 2.8mm 60 x 3.15mm 75 x 3.15mm 90 x 4.0mm	Self colour
	**Joint sealant** Paintable flexible sealants are recommended for filling the joints. Refer to Section 7.2 for information.	Tube	Sika, Holdfast
	PEF Rod	Polyethylene foam	Sika or similar
	**Flexible tape** A flexible self-adhesive tape used in preparation of a window. Refer to the Window installation section in this manual for more information. e.g. Tyvek®, Marshall Innovations or similar.	Proprietary tape to adhere to flexible underlay	Tyvek, Marshall Innovations or similar
	**Flashing Material** as per Table 20, 'E2/AS1'		Flashing Fabricator
	Planted Sill		H3.1 minimum Treated Timber Timber Merchant or cut on site
	Titanium Coated High Speed Drill Bit. For pre-drilling prior to face fixing with jolt head.	3.0mm 3.5mm	
	Timber Scriber To scribe beside window, site cut to suit.	As required	H3.1 minimum Treated Timber Timber Merchant or cut on site
	Fibre Cement Cutting Blade Diamond tip 305mm diameter circular saw blade to fit drop saw.	305mm	Diamond Tipped
	Meter Box Refer Electrical Suppliers		
	Cant Strip Redway Developments 03 358 5775 Predrill the weatherboards when fixing using Redway Development Cant/Vent Strips	To suit	uPVC
	Inseal 3109 Sealing Strip.	5 x 3mm x 25mm	Black Compressible Foam
	CRC Builders Fill Two part exterior grade fill to finish over jolt head nails.		

APPROVED BC190130 03/04/2019 Napier City Council Pg 114 of 207

14 Details

Various details outlined in the following table are available on Pages 15 to 42.

Table 9

Details				
Description	**Direct fixed**		**Timber Cavity Batten Construction**	
	Figure	**Page**	**Figure**	**Page**
Foundation detail and soffit detail	Figure 1	15		
Weatherboard fixing	Figure 2	15	Figure 30	30
Boxed corner	Figure 3 & 4	16	Figure 31	31
Mitre corner	Figure 5	17	Figure 32	31
Aluminium box corner	Figure 6	17	Figure 33	31
External corner soaker	Figure 7	18	Figure 34	32
Internal corner	Figure 8	18	Figure 35	32
Internal 90º aluminium 'W' mould corner	Figure 9	19	Figure 36	33
Internal 135º aluminium 'W' mould corner	Figure 10	19	Figure 37	33
Window sill with facings			Figure 39	34
Window sill with sill tray and facings	Figure 11	20		
Window door and head with facings	Figure 12	20	Figure 40	35
Window door and jamb with facings	Figure 13	21	Figure 41	35
Window door and sill without facings	Figure 14	21	Figure 42	35
Window door and head without facings	Figure 15	22	Figure 43	36
Window door and jamb without facings	Figure 16	22	Figure 44	36
Head flashing termination	Figure 17	23	Figure 45	37
One piece apron flashing joint	Figure 18	23	Figure 46	37
Pipe penetration	Figure 19	24	Figure 48	38
Meter box at head	Figure 20	24	Figure 49	39
Meter box at sill	Figure 21	25	Figure 50	39
Meter box at jamb	Figure 22	25	Figure 51	40
Timber cavity fix meter box			Figure 52	41
Deck junction	Figure 23	26	Figure 61	47
Cantilevered timber deck junction	Figure 24	27	Figure 62	47
Sloping soffit to weatherboard junction	Figure 25	27	Figure 59	46
Timber cavity batten fixing			Figure 27	28
Foundation detail			Figure 28	29
Soffit detail			Figure 29	29
Batten layout at window opening			Figure 38	34
One piece gutter/wall junction			Figure 47	38
Floating lap over floor joist			Figure 53	42
Drainage joint			Figure 54	43
Enclosed deck balustrade to wall			Figure 55	43
Enclosed balustrade to wall			Figure 56	44
Enclosed deck	Figure 26	28	Figure 57	45
Parapet flashing			Figure 58	45
Sloping soffit and wall junction			Figure 60	46
Door sill support detail			Figure 63	48
Junction between Linea® Weatherboard and fascia board			Figure 64	49
Exclosed roof to wall intersection			Figure 65	50

APPROVED BC190130 03/04/2019 Napier City Council Pg 115 of 207

Figure 1: Direct fix foundation detail and soffit detail

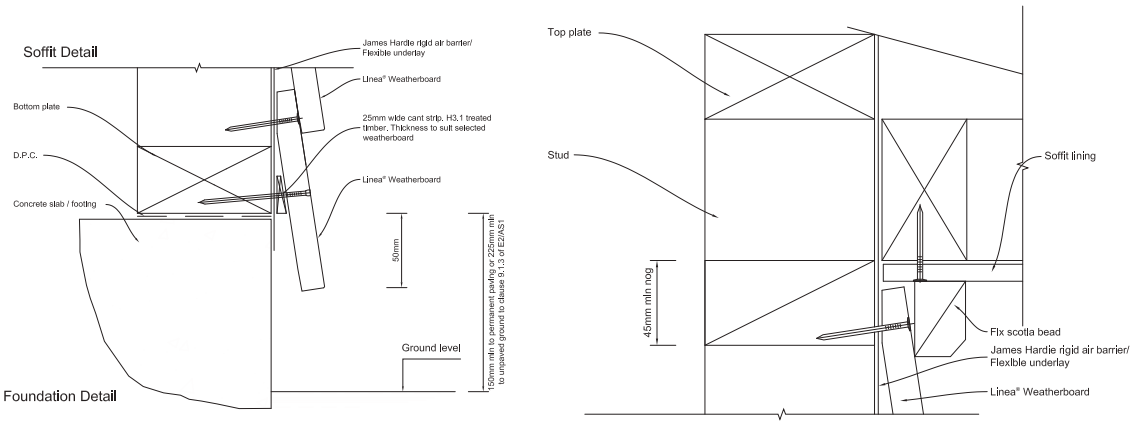
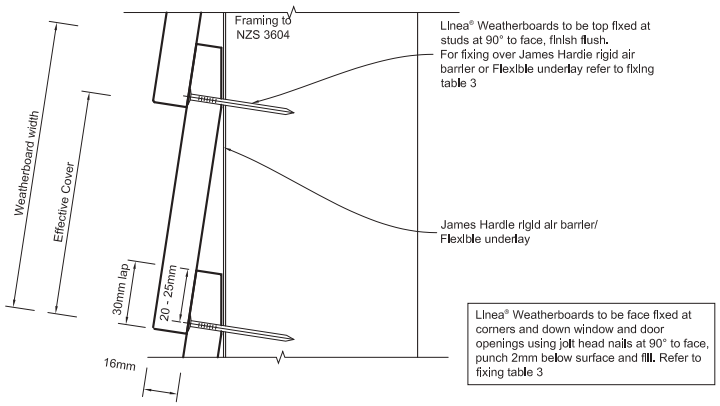
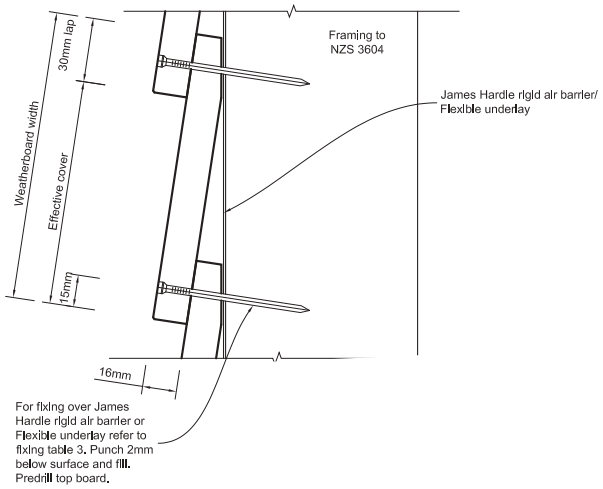
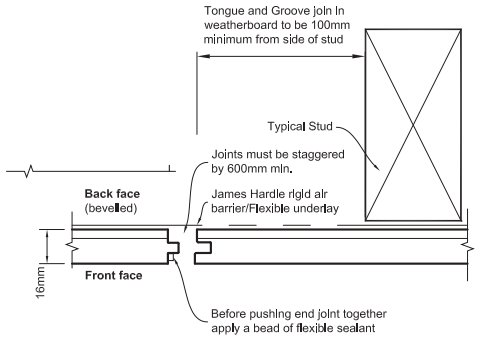


Figure 2: Direct fix weatherboard fixing

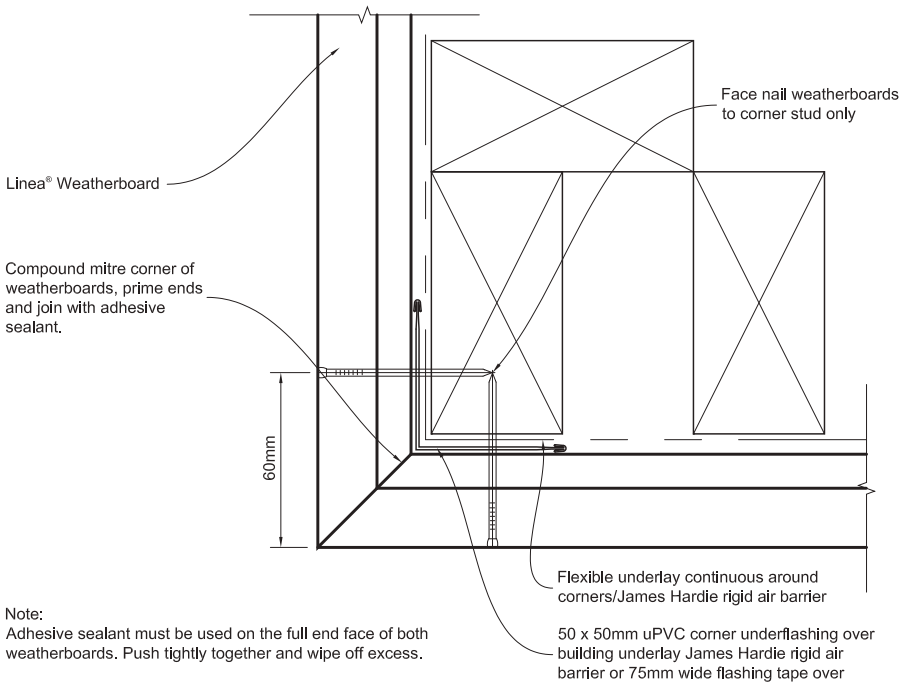






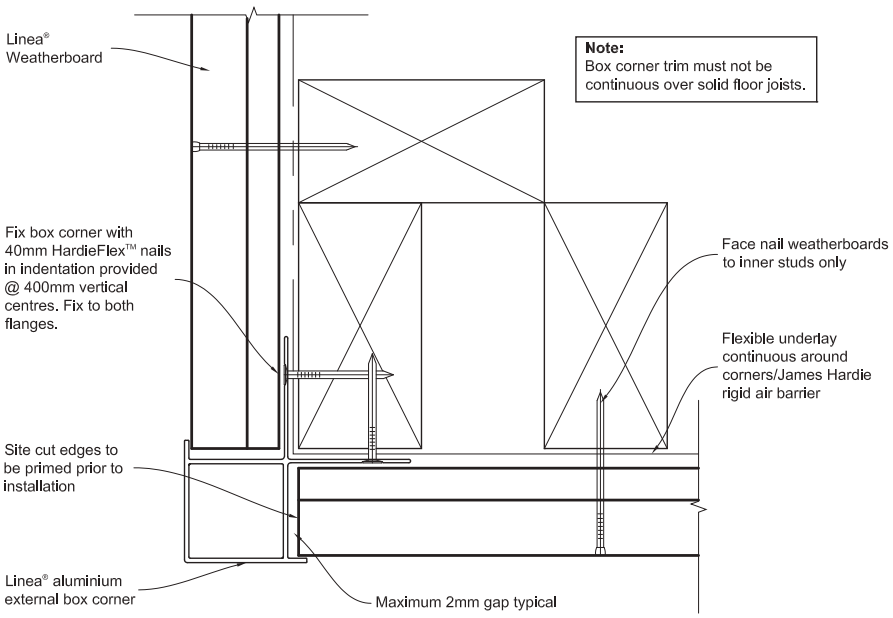
APPROVED BC190130 03/04/2019 Napier City Council Pg 116 of 207

Figure 5: Direct fix mitre corner



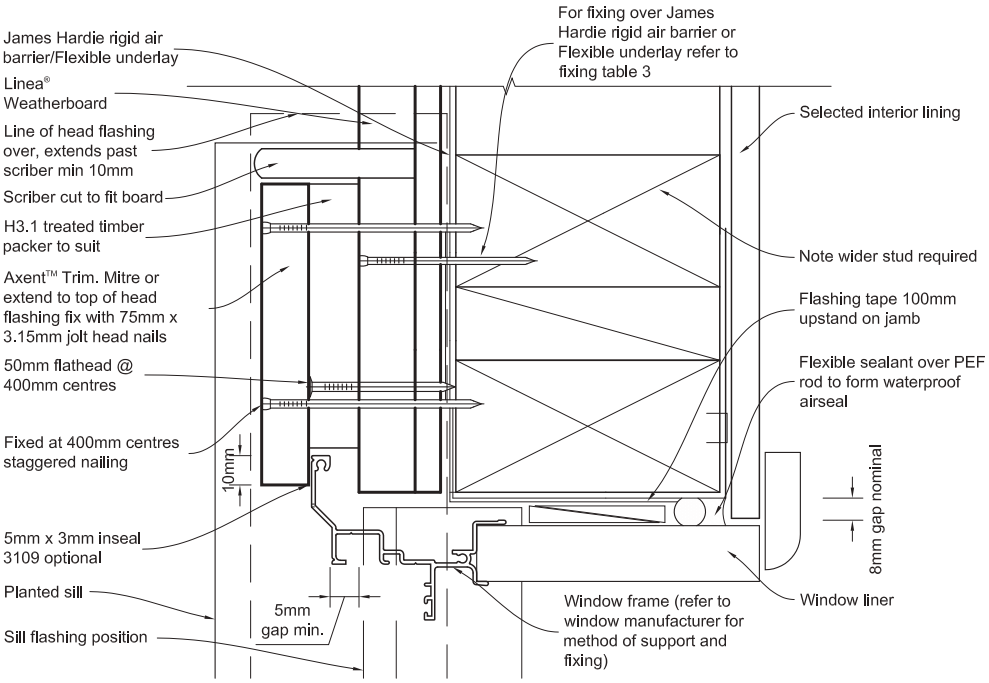
Note:
Adhesive sealant must be used on the full end face of both weatherboards. Push tightly together and wipe off excess.

Figure 6: Direct fix aluminium box corner



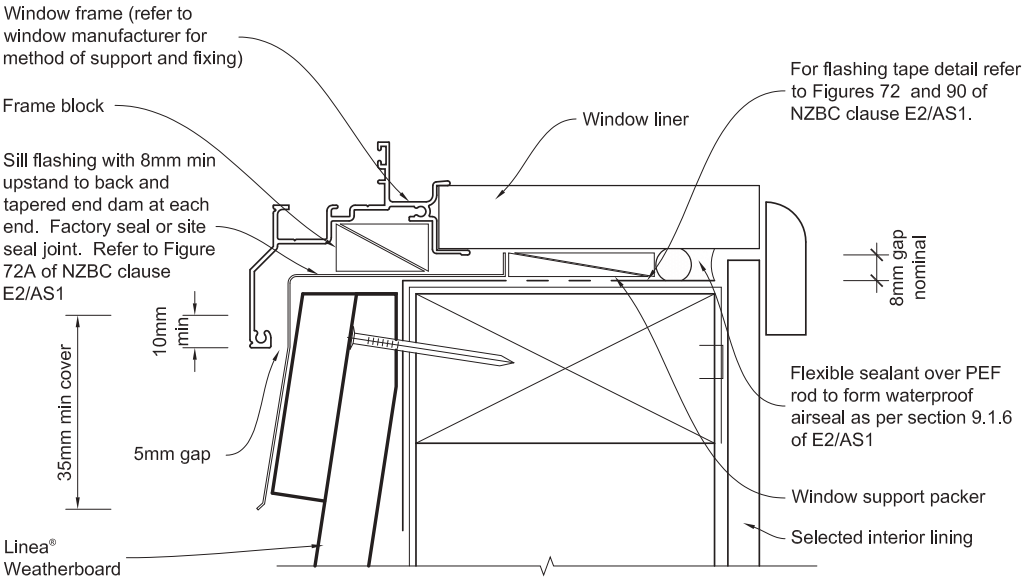
APPROVED BC190130 03/04/2019 Napier City Council Pg 117 of 207

Figure 13: Direct fix window and door jamb with facings



Note:
When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening.

Figure 14: Direct fix window and door sill without facings



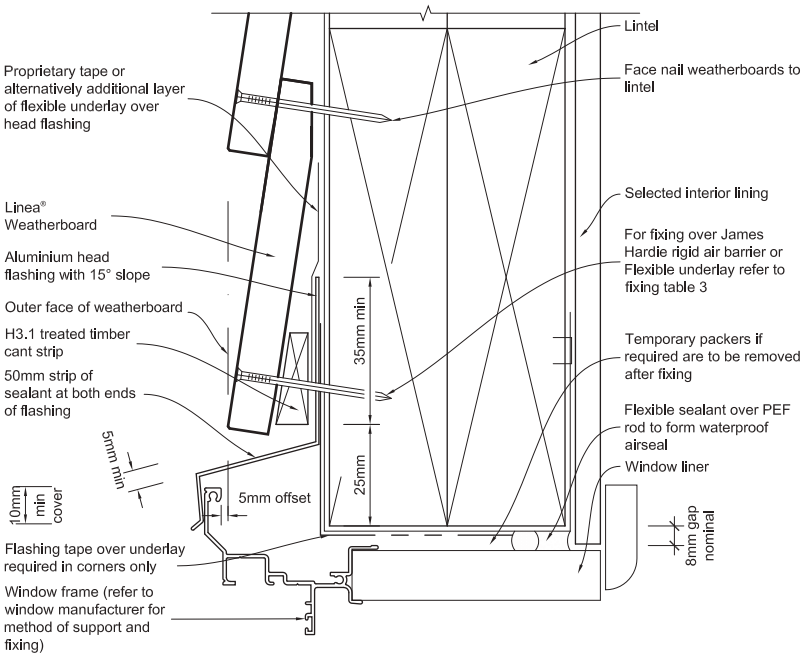
General notes for materials selection

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

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

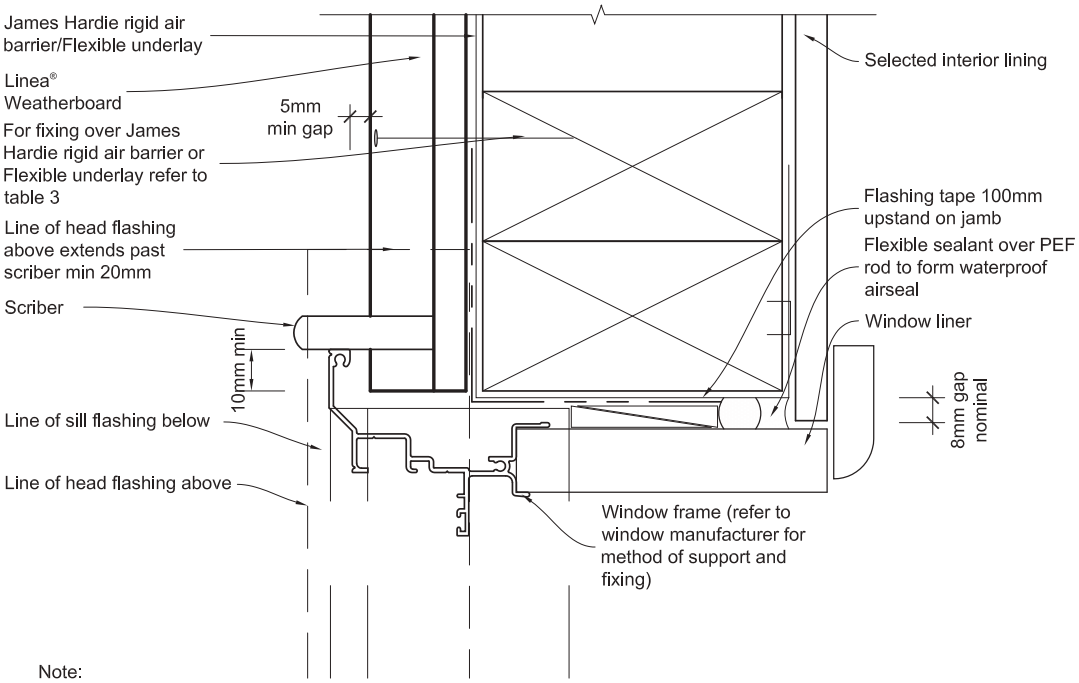
APPROVED BC190130 03/04/2019 Napier City Council Pg 118 of 207

Figure 15: Direct fix window and door head without facings



Note:
When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening.
Sealant must be installed between head flashing and window flange in VH wind zones. Refer Figure 71 of E2/AS1

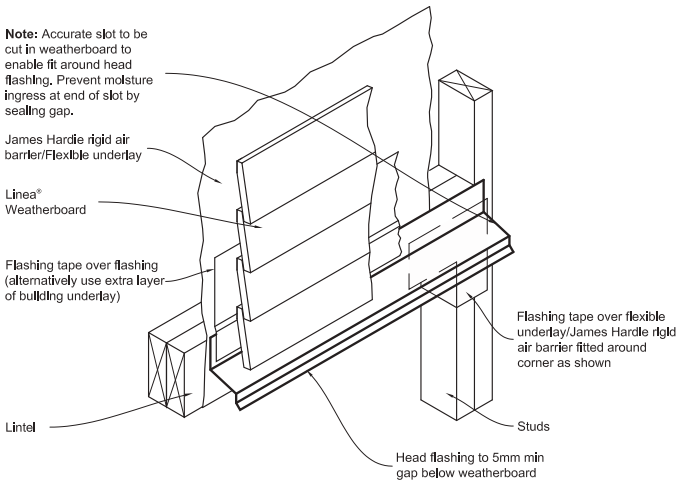
Figure 16: Direct fix window and door jamb without facings



Note:
When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening.
Alternatively window jamb can be formed as per E2/AS1 with jamb battens.

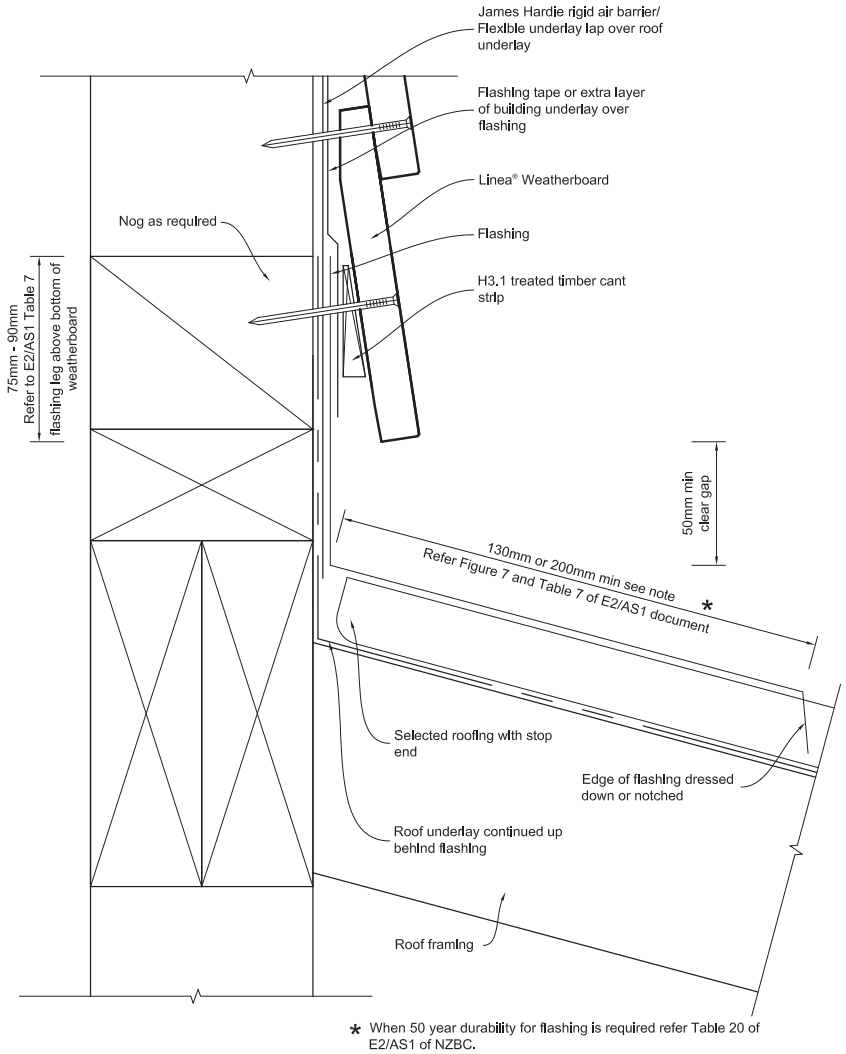
APPROVED BC190130 03/04/2019 Napier City Council Pg 119 of 207

Figure 17: Direct fix head flashing termination



Note:
When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening.

Figure 18: Direct fix one piece apron flashing joint



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

Vertical Section

APPROVED BC190130 03/04/2019 Napier City Council Pg 120 of 207

Figure 19: Direct fix pipe penetration

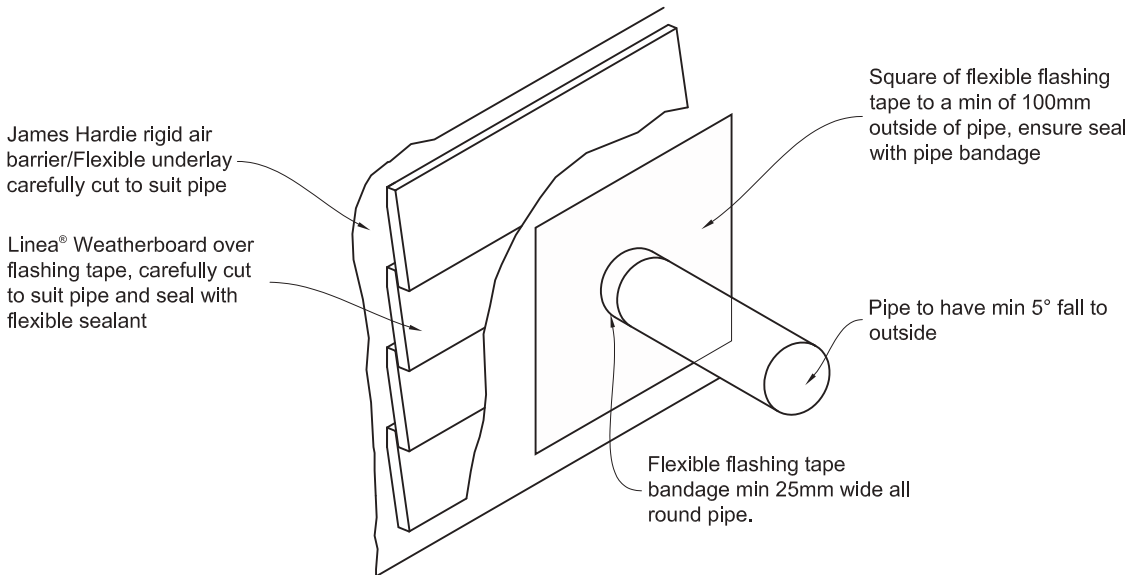
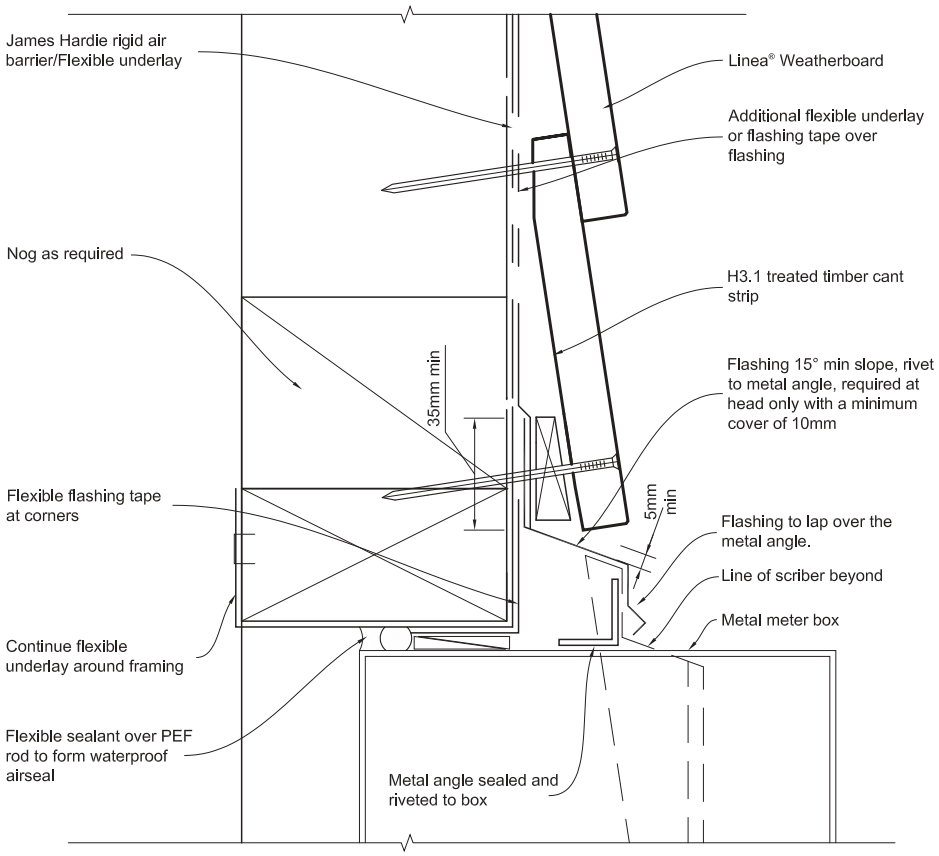


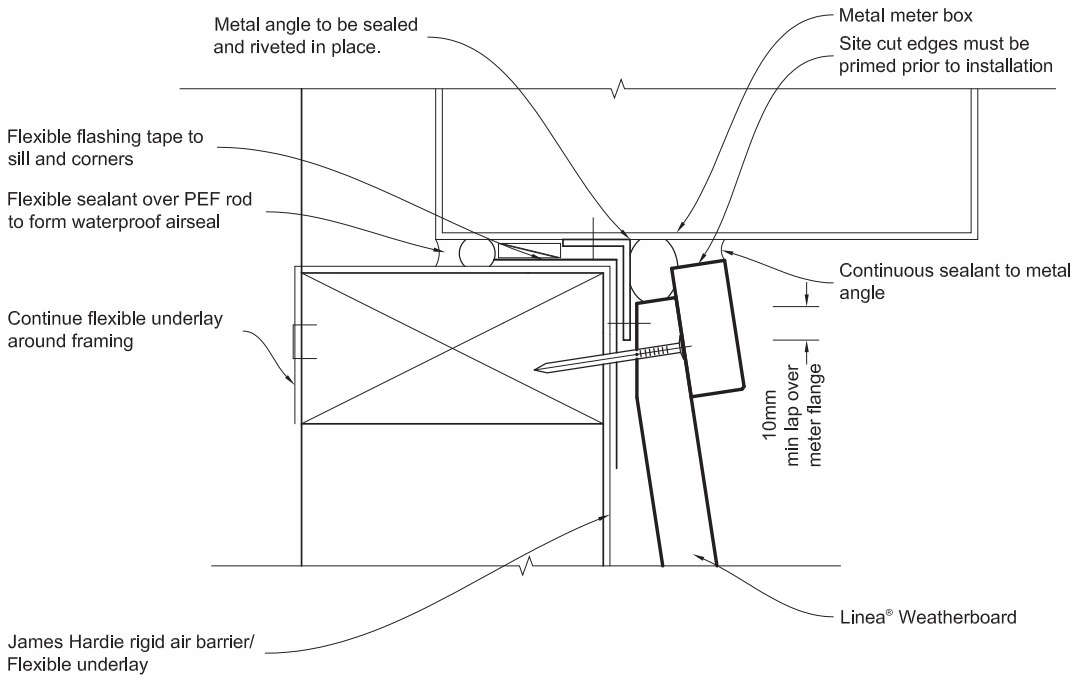
Figure 20: Direct fix meter box at head



Note:
When James Hardie rigid air barrier is used flashing tape to be applied to the entire opening.

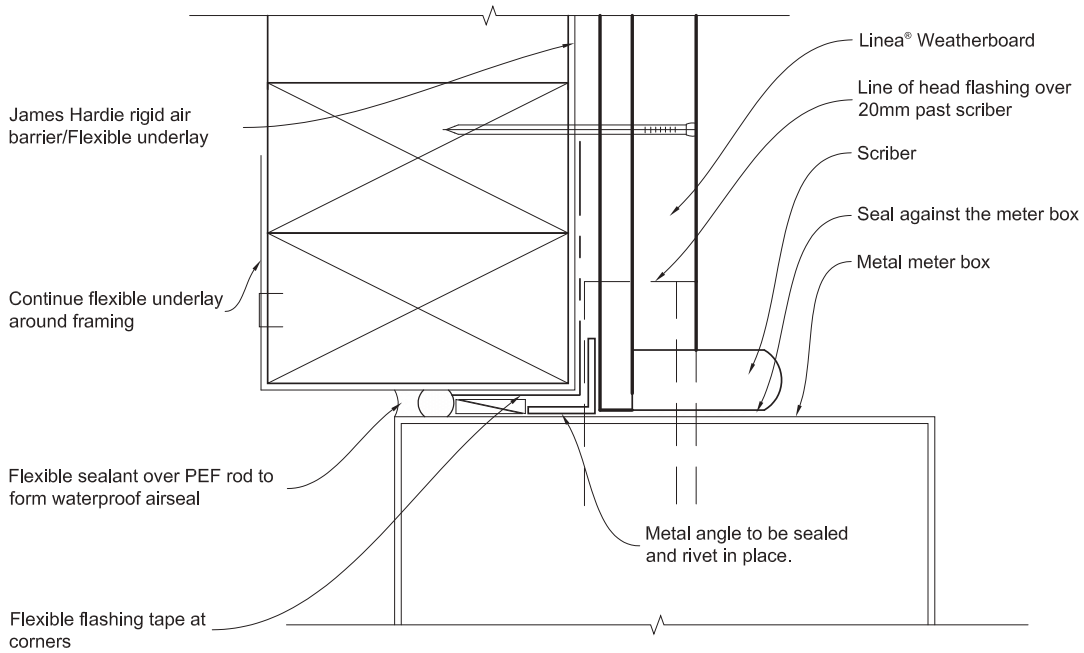
APPROVED BC190130 03/04/2019 Napier City Council Pg 121 of 207

Figure 21: Direct fix meter box at sill



Note:
When James Hardie rigid air barrieris used flashing tape to be applied to the entire opening.

Figure 22: Direct fix meter box at jamb



Note:
When James Hardie rigid air barrier is used flashing tape to be applied to the entire opening.

APPROVED BC190130 03/04/2019 Napier City Council Pg 122 of 207

Product Warranty

Linea®
WEATHERBOARD

April 2016

Warranty: James Hardie New Zealand ("James Hardie") warrants for a period of 25 years from the date of purchase that the Linea® Weath^{e}rboard (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the Axent™ Trim and accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

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

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

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

b) This warranty is not transferable.

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

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

e) The claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product.

f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces).

g) All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law.

h) If meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

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

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APPROVED BC190130 03/04/2019 Napier City Council Pg 123 of 207

Ask James Hardie™
Call 0800 808 868
www.jameshardie.co.nz

James Hardie
a smarter way™

GIB® PLASTERBOARD SYSTEMS

BEST PRACTICE SERIES

CEILING INSTALLATION

For best practice, and to avoid time-consuming and costly call-backs, Winstone Wallboards recommends the following best practice guidelines for quality ceiling installation. Framing dimensions and structured performance must comply with the requirements of NZS 3604:2011.

For full information, please refer to the latest edition of the GIB® Site Guide. Alternatively, contact the GIB® Helpline on 0800 100 442 during business hours.

For free on-site training, book online at gib.co.nz/skills-maintenance-request-form/ or call the GIB® Helpline.

TRIED. TRUSTED. TRUE.

GIB® is a registered trademark.

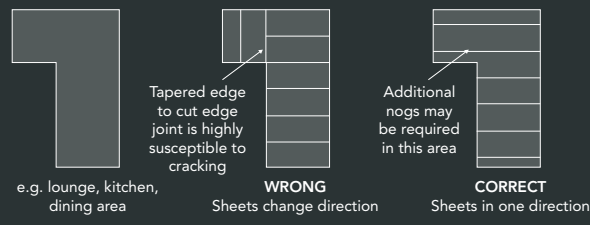
7 THINGS TO CONSIDER WHEN INSTALLING A QUALITY CEILING.

These recommendations are not a substitute for the full information contained in relevant GIB® technical literature.

STEPS

1 **Battens**
The use of GIB® Rondo® metal ceiling battens is recommended to achieve a stable substrate.

2 **Batten installation**
It is important that all ceiling battens run the same way within a ceiling plane. Although this may require some additional nogging to be installed, it ensures that all sheets' edge joints will be running in the same direction.



3 **Plasterboard**
Thicker 13mm GIB® Standard plasterboard is more rigid and less prone to sagging than 10mm plasterboard in a ceiling application. It is recommended that 13mm GIB® Standard plasterboard is supported at no more than 600mm centres, resulting in less battens being used for the job and less fasteners, meaning you will achieve an overall smoother finish. When batten, labour and board costs are taken into account, this system is cost effective as well as being the least prone to finishing defects.

Note: 10mm plasterboard will sag significantly more than the equivalent 13mm plasterboard on the same batten spacing. Given the wet humid conditions prevalent across many parts of New Zealand ceiling sag can be amplified. To meet the high expectations of the New Zealand market, Winstone Wallboards ceiling recommendation is 10mm plasterboard at 450mm batten spacing and 13mm plasterboard at 600mm batten spacing.

4 **Point loading**
To limit sag in GIB® plasterboard ceilings, long term uniformly distributed loads (e.g. fixtures and fittings and/or overlaid insulation) should not exceed 3kg/m2 unless independently supported.

5 **Back blocking**
Back blocking strengthens and stabilises joints between GIB® plasterboard sheets. It is primarily used to reinforce the point where butt joints occur but is also recommended for sheet edge joints.

6 **Fixing**
All ceiling sheets must be fixed at right angles to the ceiling framing.

7 **Control joints**
Install control joints in large open ceiling planes exceeding 12m or points where cracking is often predictable, such as at changes in direction.

APPROVED BC190130 03/04/2019 Napier City Council Pg 124 of 207

GIB® PLASTERBOARD SYSTEMS

BEST PRACTICE SERIES

No.5 QUALITY INTERIOR FINISH

No matter how smooth wall and ceiling linings may appear, they'll never be 100% physically flat and blemish free. This applies to any interior surface comprising jointed sheet type materials including fibrous plaster, plywood, MDF, plasterboard and even glass.

The following guidelines will help make any GIB® plasterboard surface imperfections less visible.

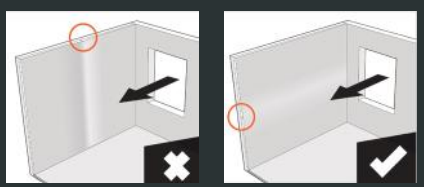
For more information, please refer to the brochure 'Interior Finishing – The fundamentals of a quality finish'. To request your FREE copy, contact the GIB® Helpline on 0800 100 442 or download at gib.co.nz/install

LOOK BEYOND THE SURFACE®

7 THINGS TO CONSIDER FOR A QUALITY INTERIOR FINISH.

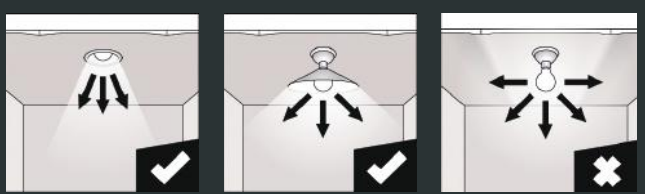
These recommendations are not a substitute for the full information contained in the brochure 'Interior Finishing –The fundamentals of a quality finish'.

1. Ensure timber framing is dry (less than 18% moisture content) and straight before fixing GIB® plasterboard. This will help prevent shrinkage, cracks, nail popping or other problems in the future.
2. The use of GIB® Rondo® metal ceiling battens is recommended on all ceilings as they hold no moisture, so will not shrink, bend, twist or warp. Metal battens help achieve and maintain a straight and true ceiling.
3. It's recommended that thicker, stronger 13mm GIB® plasterboard is used on all ceilings for extra rigidity and to help fight the effects of gravity and structural movement.
4. Fixing GIB® plasterboard sheets horizontally instead of vertically on walls reduces the number of joints, helping to achieve a more uniform appearance.



Horizontal fixing reduces the risk of shadowing from glancing light.

5. Choosing the right decorative finish is important, e.g. certain paint types and colours reflect light and tend to accentuate even the smallest surface imperfection. Light colours and flat or matte paints soften the effects of any surface irregularities.
6. Incorporating recessed downlights or light shades combined with soft diffuse bulbs will help to channel light downwards and reduce the amount of glancing or critical light.



7. Avoid positioning narrow windows hard against the end of a wall or ceiling, particularly on long walls or ceilings at the end of a room or hallway. Making a window wider and placing it away from the room corner should reduce the critical lighting effect.

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APPROVED BC190130 03/04/2019 Napier City Council Pg 125 of 207

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GIB® PLASTERBOARD SYSTEMS

BEST PRACTICE SERIES

No.4 WALL INSTALLATION

For best practice, and to avoid time-consuming and costly call-backs, Winstone Wallboards recommends the following best practice guidelines when installing GIB® plasterboard on walls. Framing dimensions and structure performance must comply with the requirements of NZS 3604:2011.

For full information, please refer to the latest edition of the GIB® Site Guide. Alternatively, contact the GIB® Helpline on 0800 100 442 during business hours.

For free on-site training, book online at gib.co.nz/training or call the GIB® Helpline.

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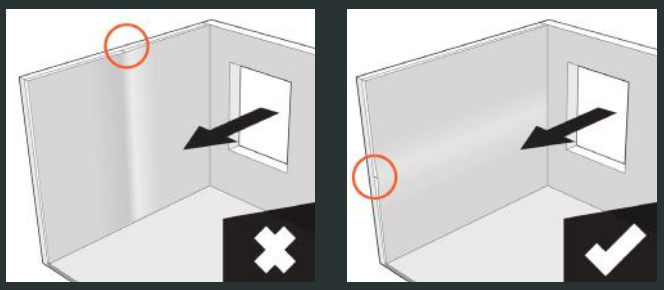
7 THINGS TO CONSIDER WHEN INSTALLING A QUALITY WALL.

These recommendations are not a substitute for the full information contained in relevant GIB® technical literature ('GIB® Site Guide - Dec 2014' & 'Interior Finishing – Mar 2013').

STEPS

1 Ensure timber framing is dry and straight before fixing GIB® plasterboard. This will help prevent shrinkage, cracks, nail popping or other problems in the future.

2 Fixing GIB® plasterboard sheets horizontally instead of vertically on walls reduces the number of joints, helping to achieve a more uniform appearance.



Horizontal fixing reduces the risk of shadowing from glancing light.

3 With curved walls, plasterboard sheets must be fixed horizontally.

4 Hold the plasterboard sheet tight against the framing and sink screws to just below the sheet surface, leaving the paper intact.

5 Do not fix nails or screws through; or closer than 200mm to adhesives. This can cause the nails or screws to 'pop' as the adhesive dries and shrinks.

6 Vertical joints must not coincide with the edge of windows or doors. These should be made above the opening, approximately 200mm to the edge of the opening.

7 AS/NZS 2589:2007 calls for control joints to be placed in walls at maximum 9m spacing in each direction or at other points which may be the subject of underlying structural movement. This is to relieve stresses imposed by structural movement or changes in humidity and temperature.

APPROVED BC190130 03/04/2019 Napier City Council Pg 126 of 207

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GIB® PLASTERBOARD SYSTEMS

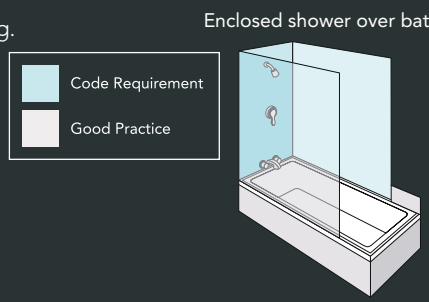
BEST PRACTICE SERIES

No.1 WET AREAS

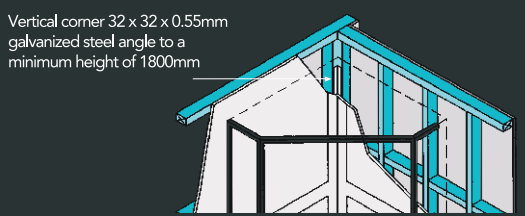
7 THINGS TO CONSIDER WHEN BUILDING OR RENOVATING A BATHROOM.

These recommendations are not a substitute for the full information contained in the GIB Aqualine® Wet Area Systems literature. Please refer to this literature before proceeding with any project.

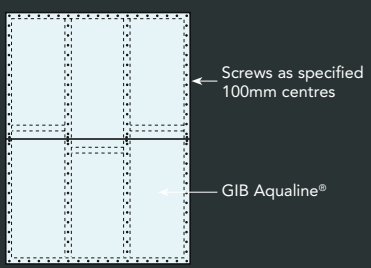
1. Always use GIB Aqualine® on walls and ceilings to help protect against moisture and steam damage.
2. Use waterproof membranes in the right areas – such as to the edge of showers, baths and vanities to be tiled.



3. To provide stability, a 32 x 32 metal angle must be attached to the internal corner of timber framed shower walls.



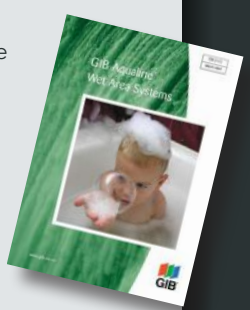
4. Fix GIB Aqualine® horizontally where possible to reduce joints and improve the finish.
5. Use 13mm GIB Aqualine® on ceilings to protect against moisture and steam.
6. When tiling*, fasteners are required at 100mm centres to the perimeter of the sheet and to all intermediate studs.



7. Bracing systems must not be located behind showers or baths because of durability requirements, renovation likelihood and other practical issues relating to fixing bracing elements.

For best practice, and to avoid time-consuming and costly call-backs, incorporate a wet area system that maintains integrity when inadvertently exposed to water and steam.

The GIB Aqualine® Wet Area Systems literature contains all the information you'll need to correctly install GIB® Wet Area Systems. If you don't already have one, you can get a FREE copy by calling the GIB® Helpline on **0800 100 442** or view online **gib.co.nz/wetareasystems**



LOOK BEYOND THE SURFACE®

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APPROVED BC190130 03/04/2019 Napier City Council Pg 127 of 207

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GIB® is a registered trademark. *10mm GIB Aqualine® is for tile weights up to 20kg/m² and 13mm GIB Aqualine® up to 32kg/m². Most wall tiles weigh under 20kg/m².

CBI 5113

March 2007

GIB Aqualine®
Wet Area Systems

APPROVED BC190130 03/04/2019 Napier City Council Pg 128 of 207

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GIB®

Introduction

MARCH 2007

THIS PUBLICATION

This publication is not intended as the definitive guide on wet area construction and wet area systems, but rather as a helpful guide to best practice around areas where there is intermittent water exposure and splash zones within residential and non-residential buildings – in particular, areas covered by the New Zealand Building Code (NZBC), Clause E3 Internal Moisture.

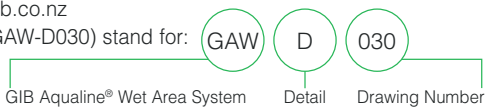
The information herein is designed to be helpful to designers, contractors and home-owners wishing to achieve a result that is easy to incorporate into modern design, simple and clear to construct, and that will satisfy the needs, requirements and expectations of both the NZBC and the end user.

Wet areas in the home often require relatively frequent and expensive renovation or repair, often because of the ingress of water to the structure of the building.

It is important to introduce materials and systems which have been specially designed to cope with the conditions that are common in wet areas, and to ensure they are installed correctly, using best practice, and are compatible to form a complete wet area system.

The code numbers shown with each "typical detail", e.g. GAW-D030, match the code numbers for drawings available as downloads on the GIB® website at www.gib.co.nz

The reference numbers (e.g. GAW-D030) stand for:



WHAT IS A WET AREA?

Generally, wet areas are described as spaces to where fresh water is reticulated, such as bathrooms, toilets, laundries and kitchens. Wet areas fall into two categories; these are well explained and documented in the NZBC, Clause E3.

1. Water splash areas – These are areas subject to intermittent splash of liquid water around sanitary fittings and appliances such as baths, vanities, laundry tubs, sinks, etc. These areas are required to have an impervious, easily cleaned surface.
2. Shower enclosures – These are areas subject to more frequent, larger quantities of water, and include shower enclosures and shower over bath areas. The NZBC E3/AS1 requires these areas to be impervious, and specifically excludes any paint and wallpaper finishes. Where ceramic tile or stone finishes are applied, E3/AS1 requires that they "shall be laid on a continuous impervious substrate or membrane".

The requirements of these wet areas are described on page 6 of this publication and in full in Clause E3 of the NZBC. Clause E3 also refers to other requirements not covered in this publication, such as ventilation, condensation control and overflow management, which will require separate consideration. Ongoing maintenance of wet areas is also important to maximise the life of the wet area.

GIB AQUALINE®

Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or moisture.

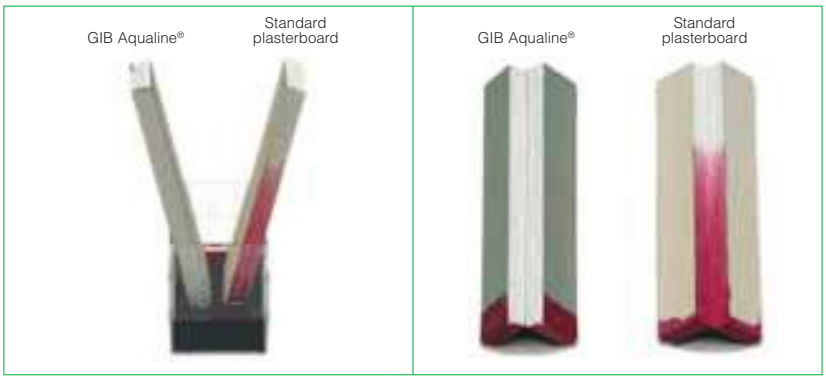
The NZBC does not call for water resistant linings in wet areas but it is highly desirable to incorporate lining materials which will maintain their integrity longer when exposed more frequently to water or steam and particularly to one-off events such as leakages or flooding of a room.

GIB Aqualine® is ideal in such situations because it features a water resistant wax polymer impregnated core.

Unlike other commonly used substrates, the GIB Aqualine® core not only resists penetration of water through the lining into the framing behind, but also resists water "wicking" up the core, a common cause of long-term damage where a water resistant lining has not been used.

GIB Aqualine® will maintain its integrity for extended periods, particularly where wicking over large areas can destroy the integrity of the interface between the lining and paint or wallpaper surfaces or between the lining and the tile adhesive.

The illustrations below graphically show the difference between GIB Aqualine® and standard plasterboard after a two-hour soak test in red dye.



APPROVED BC190130 03/04/2019 Napier City Council Pg 129 of 207

Introduction/Design Considerations

GIB AQUALINE® *continued*

Where to Use GIB Aqualine®

Though not required by NZBC, it is highly desirable to include GIB Aqualine® in all areas at risk of water or moisture damage, in order to prolong the life expectancy of that space.
They include:

	WALLS	CEILINGS
BATHROOMS	✓	✓
SHOWERS	✓	✓
LAUNDRY	✓	✓
KITCHEN	✓	
TOILET	✓	

Benefits

- Water resistant and durable to help protect against water damage
- Proven substrate for paint, wallpaper, tiles, sheet vinyl and rigid sheet shower linings with installations in over 300,000 bathrooms in New Zealand
- Suitable for both residential and non-residential applications
- Dimensionally stable, will not buckle or warp, hence an excellent substrate for ceramic tiles
- Conventional jointing methods
- Easy to cut and form openings
- Contains fibreglass and other additives for strength and fire resistance
- May be used in GIB® Bracing, GIB® Fire Rated and GIB® Noise Control Systems (see Compliance with the NZBC, Clauses B1, C3 and G6). Consult the appropriate GIB® literature for installation details
- Green face paper for ease of recognition.

Sheet Dimensions and Weights

SHEET DIMENSIONS (ALL SHEETS 1200mm WIDE AND TE/TE)		MAXIMUM WEIGHT/m²
Thickness (mm)	**Length (mm)**	
10	2400, 2700, 3000, 3600	7.8kg
13	2400, 2700, 3000, 3600	10.2kg

Handling and Storage

- GIB Aqualine® must be stored under cover, stacked flat and clear of the floor with sufficient support to avoid sagging
- GIB Aqualine® must be handled as a finishing material.

APPRAISAL

The document entitled *GIB Aqualine® Wet Area Systems* 2007 has been appraised by BRANZ, Appraisal Certificate, No. 427 (2007).

COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE (NZBC)

Structure – Clause B1

The design and material specification for steel and timber framing used in GIB Aqualine® systems must be in accordance with the performance requirements of NZBC Clause B1 (Structure). See Bracing in Wet Areas on page 5.

Durability – Clause B2

When installed and maintained in accordance with this literature, GIB Aqualine® tiled or vinyl covered systems have a serviceable life of at least 15 years. They comply with the requirements of NZBC Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers, showers over baths and splash-backs.
When used as a general wet area lining and maintained under normal dry internal conditions, GIB Aqualine® systems have a serviceable life of at least 50 years and comply with NZBC Clause B2 (Durability) for use within toilets, kitchens, bathrooms and laundries not directly exposed to liquid water.

Spread of Fire – Clause C3

GIB® Fire Rated Systems provide passive fire protection in accordance with the requirements of NZBC Clause C3 (Spread of Fire). When GIB Aqualine® is substituted into fire rated systems in place of the equivalent thickness GIB Fyreline®, the Fire Resistance Rating (FRR) of that system will be maintained.

APPROVED BC190130 03/04/2019 Napier City Council Pg 130 of 207

Design Considerations

MARCH 2007

COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE (NZBC) *continued*

Internal Moisture – Clause E3

When installed in accordance with this literature, tiled or vinyl covered GIB Aqualine® systems may be used in areas directly exposed to liquid water, such as showers, to provide an impervious and easily cleaned wall surface. These systems comply with the requirements of NZBC Clause E3 (Internal Moisture).

Hazardous Building Materials – Clause F2

At no stage during handling, installation, or serviceable life does GIB Aqualine® constitute a health hazard. It therefore meets the provisions of NZBC Clause F2 (Hazardous Building Materials). Dust resulting from the sanding of stopping compounds may be a respiratory irritant and the use of a suitable facemask is recommended.

Ventilation – Clause G4

NZBC Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes and to minimise the risk of moisture related problems such as condensation and mould growth, adequate heating and mechanical ventilation must be provided in kitchens, bathrooms and laundries.

Airborne and Impact Sound – Clause G6

GIB® Noise Control Systems can be used to provide ratings for Sound Transmission Class (STC) and Impact Insulation Class (IIC) in accordance with the requirements of NZBC Clause G6 (Airborne and Impact Sound). When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information contact the GIB® Helpline 0800 100 442.

LIMITATIONS

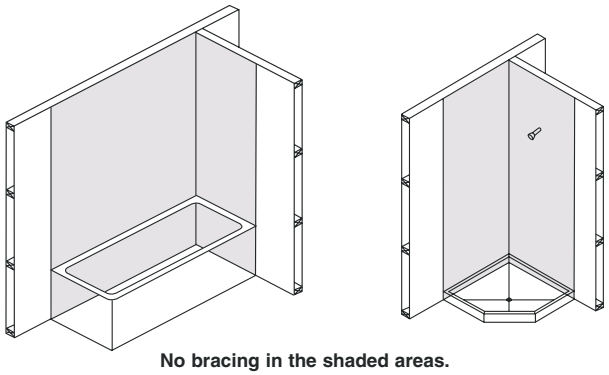
- GIB Aqualine® must not be used for bracing purposes in shower cubicles or above baths (see Bracing in Wet Areas below)
- Do not use GIB Aqualine® where it may be exposed for extended periods to humidities of 90% RH and above. Such areas include group shower or steam rooms as well as moisture and chlorine rich environments such as indoor swimming pools
- GIB Aqualine® must not be directly applied to solid plaster (gypsum or cement), wood based sheet linings or similar materials, masonry or concrete. GIB Aqualine® may only be applied to these materials where timber strapping or steel furring channels are installed
- GIB Aqualine® must not be installed over a vapour barrier or a wall acting as a vapour barrier
- Cracked or damaged sheets must never be used
- GIB Aqualine® must not be used in external applications
- GIB® plasterboard must not be exposed to temperatures in excess of 52°C for prolonged periods. Heat-generating devices may include halogen lighting, cooking elements, radiant heating, solid fuel exhausts and fire surrounds. Consult the appliance manufacturer for installation details.

BRACING IN WET AREAS

Bracing elements are required to have a durability of 50 years. GIB® bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members.

Otherwise, GIB® Bracing Systems can be used in water-splash areas as defined by NZBC Clause E3/AS1, provided these are maintained impervious for the life of the building.

GIB Aqualine® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. GIB Aqualine® can be used in place of GIB Braceline® in GIB® bracing elements 900mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100mm centres, using the GIB Braceline® corner fixing pattern.



No bracing in the shaded areas.

APPROVED BC190130 03/04/2019 Napier City Council Pg 131 of 207

Design Considerations

MARCH 2007

NEW ZEALAND BUILDING CODE

E3.3.4 requires impervious and easily cleaned surfaces to all surfaces adjacent to sanitary fixtures or laundering facilities.

E3.3.5 requires that surfaces of building elements likely to be splashed or contaminated in the course of the intended use of the building must also be impervious and easily cleaned.

E3.3.6 requires that surfaces of building elements likely to be splashed must be constructed in a way that prevents water from penetrating behind linings or into concealed spaces (e.g. wall cavities).

Walls in wet areas therefore need to be addressed according to whether they fall within the scope of one of the following descriptions:

1. Wall surface likely to be splashed
2. Shower walls. Although not a requirement of NZBC it is highly recommended that the wall surfaces within 150mm of the top edge of a bath, and the vertical faces immediately under the edge of a bath, are treated in the same way as for a shower wall.

WALL SURFACES IN AREAS LIKELY TO BE SPLASHED

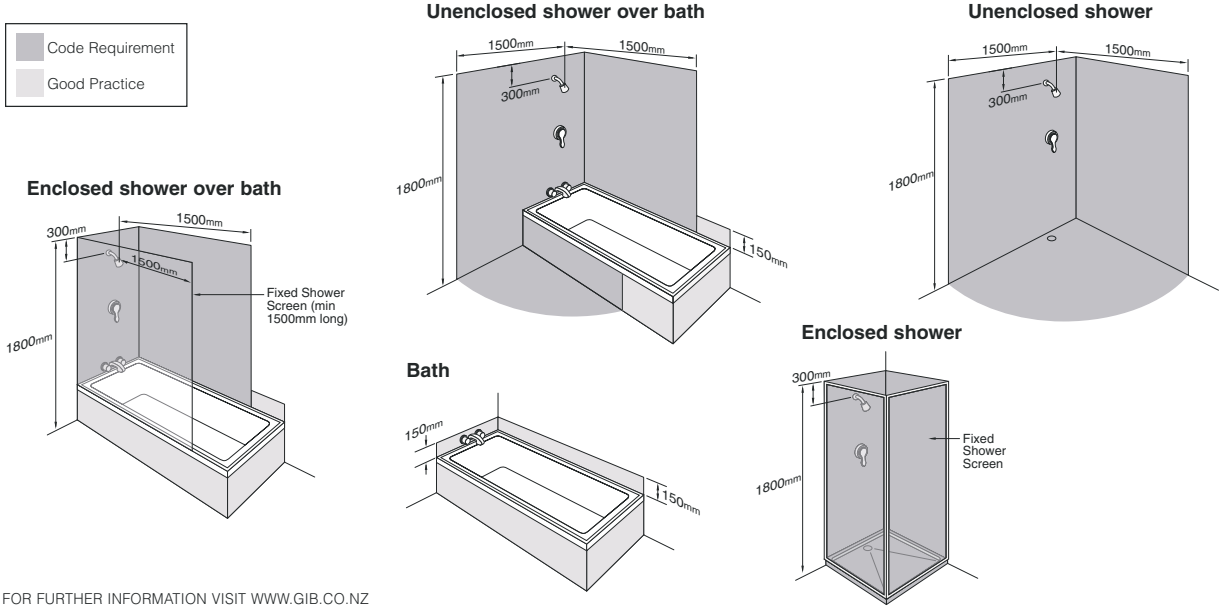
Suitable linings include:

a. Integrally waterproof sheet material (e.g. polyvinylchloride) with sealed joints
b. Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use
c. Cement based solid plaster or concrete having a steel trowel or polished finish (semi-gloss or gloss paint must be used if a paint finish is required)
d. Cork tile or sheet sealed with waterproof applied coatings
e. Monolithic applied coatings having a polished, non-absorbent finish (e.g. terrazzo)
f. Sheet linings finished with vinyl coated wallpaper, or semi-gloss or gloss coating
g. Water resistant sheet linings finished with decorative high pressure laminate or factory applied polyurethane or resin
h. Modular or multiple lining units which are themselves *impervious* and easily cleaned, and are installed with *impervious* joints
i. Timber or timber-based products such as particleboard sealed with waterproof applied coatings.

NB: Floor surfaces and floor/wall junctions are required by E3 to be impervious.

SURFACES IN SHOWERS AND AROUND BATHS

Suitable linings include all of the above, but **NOT including items (d) and (f) from the above list.**
Note that a waterproof membrane complying with AS/NZS 4858: 2004 **MUST** be applied to all lining materials used under ceramic tiles in these areas.
The waterproof membrane must extend to a 1500mm horizontal radius from a shower rose unless the shower is contained within a fixed enclosure. A shower curtain does not constitute a fixed enclosure.
Particleboard manufacturers recommend that in wet areas, panels should be protected with a suitable wet area membrane or an integrally waterproof sheet material. Some local authorities call for this treatment on all timber based floors. Local requirements should be checked before proceeding.
Dark grey shaded areas in the diagrams below represent the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membranes prior to tiling. Light grey shaded areas represent good practice.



APPROVED BC190130 03/04/2019 Napier City Council Pg 132 of 207

Design Considerations

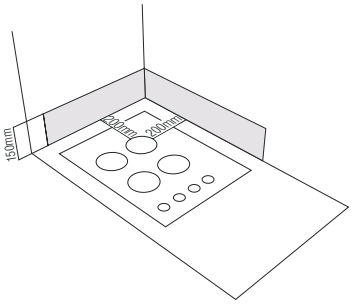
MARCH 2007

WALL SURFACES SURROUNDING COOKTOPS

The protection of combustible surfaces surrounding gas cooking appliances is covered by NZS 5261. Consult the current version of this standard to ensure compliance.

However, as a guide the following options are acceptable for wall surfaces within 200mm of the periphery of a gas element to a height of 150mm above the element for the full dimension (width and depth) of the cooktop surface area:

- 5mm ceramic tiles on GIB® plasterboard
- 5mm toughened glass on GIB® plasterboard
- or any system that can be demonstrated to meet the requirements of Clause 2.6.2.6 of NZS5261.



Because of the moisture generated by cooking, it is highly recommended that GIB Aqualine® is used in kitchen areas.

GIB® plasterboard products must not be exposed to temperatures in excess of 52°C for sustained periods. Check with the appliance manufacturer that this requirement will be met. However, it would be unusual for surfaces outside 200mm to exceed 52°C for sustained periods.

PENETRATIONS AND SEALANTS

As leaks and water ingress typically occur at junctions between building elements and at penetrations, it is essential that particular attention is given to these details at the time of installation. Lack of attention to detail can result in water damage that could remain undetected for a long time.

- Ensure that all cut-outs for pipe penetrations are made neatly, and slightly oversize, with a hole saw. These penetrations should be of a diameter no more than 12mm greater than that of the pipe
- Sealants should be of a mould inhibiting type and be neutral cure. Neutral cure silicones will generally meet these requirements
- Surfaces should be dry and free from dust before application, a minimum of a 4mm joint width provided and the depth should not exceed the width
- Gun a bead of silicone sealant to the full depth of the GIB Aqualine® in the following locations:
  - Around all tap/pipe bodies
  - The gap between the bath rim and the bottom edge of the GIB Aqualine®
  - Between the upstand of preformed shower bases and the bottom edge of the lining
  - Where an impervious junction is required at the floor/wall line, carefully seal the gap between the bottom edge of the board and the finished floor. Leave a 5-10mm gap at the bottom of the GIB Aqualine® wall lining for this purpose, ensuring the gap is free from dirt and dust
- Do not locate shower heads or taps on fire rated or intertenancy walls. Should this be unavoidable then refer to the publication *Penetrations in GIB® Fire Rated Systems*. Always use tested and approved proprietary solutions.

WATERPROOF MEMBRANES

- A waterproof membrane must be applied to **all** lining materials used as a substrate for ceramic tiles in a shower or shower over bath situation
- The wall surface in a shower or shower over bath situation is not complete and ready for tiling until coated with a waterproof membrane over the lining and the jointed areas shown shaded on page 6
- Only in-situ waterproofing materials which are manufactured to AS/NZS 4858:2004 “Wet Area Membranes” are recommended and applied to manufacturer’s recommendations. Typically, these types of membranes are not suitable for paint and wallpaper finishes
- Waterproof membranes must be fully cured and dry prior to application of tiling adhesives
- Embed reinforcing mats in the membrane at all internal corners of the shower (including floor/wall junctions)
- Preformed sheet membranes are also available and may be more suitable where curing times or specialist skills are an issue
- The details shown in this technical literature are generic in nature. For accurate detailing, follow the specifications provided by the supplier of the proprietary waterproof membrane.

TILING

GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10mm GIB Aqualine® up to 20kg/m^2
- 13mm GIB Aqualine® up to 32kg/m^2.

Note: Most ceramic and porcelain tiles weigh less than 20kg/m^2.

For further information on tiling consult the BRANZ *Good Practice Guide – Tiling*.

APPROVED BC190130 03/04/2019 Napier City Council Pg 133 of 207

Design Considerations

MARCH 2007

FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

- GIB Aqualine® is a suitable substrate for flexible vinyl wall finishes in wet areas of residential, commercial or institutional buildings
- Framing requirements and installation procedures for the GIB Aqualine® substrate shall be as per page 10 or 11, except that the lining gap at the floor should be reduced to 5mm when a pencil cove detail is used
- The installation of galvanised steel reinforcing angles (32 x 32 x 0.55mm) behind internal GIB Aqualine® corners is recommended for sheet vinyl applications in showers or shower over bath situations (see illustration page 14)
- The GIB Aqualine® lining must be jointed and stopped to a paint quality finish (Level 4) – trowel marks can telegraph through even a commercial grade 2mm vinyl
- A commercial grade vinyl is recommended for the wall finish in commercial or institutional bathrooms and showers
- In areas directly exposed to liquid water, all joints in flexible sheet vinyl must be heat welded
- Installation of the flexible vinyl must be carried out strictly in accordance with the specifications provided by the suppliers/manufacturers of the vinyl.

RIGID SHEET SHOWER LININGS

- The manufacturers/suppliers of thin (usually 2-3mm) and rigid acrylic shower linings commonly recommend direct adhesive fixing to wall linings using solvent-based adhesives
- Water temperature changes will cause movement of the thin acrylic sheet, which in turn will stress the adhesive and wall lining substrate
- **Do not preseal or paint** areas which are to be covered by the rigid shower linings
- The wall surface must be free of dust before installation of the lining
- Suppliers of rigid sheet acrylic shower linings recommend a minimum of 24 hours for the adhesive to cure fully prior to the shower being put into service
- Care must be taken to ensure that rooms are adequately ventilated and the adhesive is fully cured before the shower is used
- Consult the manufacturer/supplier of the shower lining for full installation details.

RENOVATIONS

Bathrooms, kitchens and laundries are the most renovated rooms in the house, partly due to fashion considerations and partly because of damage sustained by ingress of water and moisture within those spaces.
In most cases when renovating these rooms it is often easier and more cost-effective to remove the existing linings and replace them with GIB Aqualine®. This allows for a completely new start in the room and offers sound substrates for new surfaces such as tiling and painting, where otherwise flaking paint or damaged plasterboard may compromise good and sound finish or practice. At the very least re-lining will:

- Allow for inspection of framing where damage may have occurred and provide the opportunity to repair such damage
- Allow plumbing and electrics to be checked and altered or replaced where required
- Provide the opportunity to install thermal and acoustic insulation and water resistant linings where appropriate
- Make the job easier.

MAINTENANCE

Lack of maintenance is frequently the cause of premature and often very expensive failure of components and building elements within wet areas.
It is important to regularly inspect and repair any potential problem before it becomes a major problem and expensive to reinstate. Good maintenance should include:

- Ongoing ventilation. At the very least, good passive ventilation (e.g. window vents); but good active ventilation (e.g. extraction fans) of an appropriate size for the room is recommended
- Impervious coatings and surfaces should be checked for wear and damage and maintained and recoated before ingress of water to the substrate occurs
- Regular cleaning with appropriate cleaners so that build-up of matter, such as mould, is well controlled
- Sealants at junctions and penetrations should be checked for adhesion on a regular basis and replaced where adhesion failure to substrates occurs
- Where pipe leaks have become evident, however small, they should be repaired promptly and any area around such leaks dried out completely before any other repairs are carried out.

APPROVED BC190130 03/04/2019 Napier City Council Pg 134 of 207

Non-tiled Walls – Timber Framing

MARCH 2007

If bracing, noise control or fire rating considerations exist, consult the relevant GIB® technical publication, e.g. *GIB® Fire Rated Systems, GIB® Noise Control Systems, GIB® Bracing Systems*, for the appropriate information.

Wall Framing

Framing dimensions must comply with the requirements of NZS 3604:1999.

- The moisture content of timber framing shall be 18% or less at the time of lining
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard
- Nogs to be evenly spaced with a maximum spacing of 1350mm. Alternatively, nogs may be staggered 150mm maximum either side of a horizontal joint line
- Nogs are not required behind horizontal joints except in shower situations or specific fire or noise control systems.

Fasteners

- 10mm GIB Aqualine® – minimum 25mm x 6g GIB® Grabber® High Thread Drywall Screws or 30mm x 2.8mm GIB® Nails
- 13mm GIB Aqualine® – minimum 32mm x 6g GIB® Grabber® High Thread Drywall Screws or 30mm x 2.8mm GIB® Nails.

Fastener Centres

- 300mm centres to top and bottom plates and to perimeter studs
- Single fasteners to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges
- Daubs of GIBFix® adhesive at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed unless forming part of the perimeter of a bracing element.

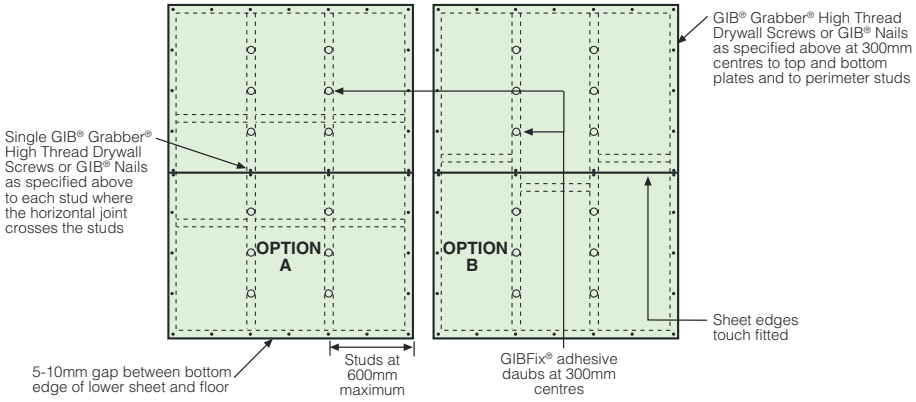
Lining

- Install the sheets leaving a 5-10mm gap at the floor line to allow for movement of the framing members and to allow for cleaning dirt and rubbish before sealing
- Sheets to be touch fitted.

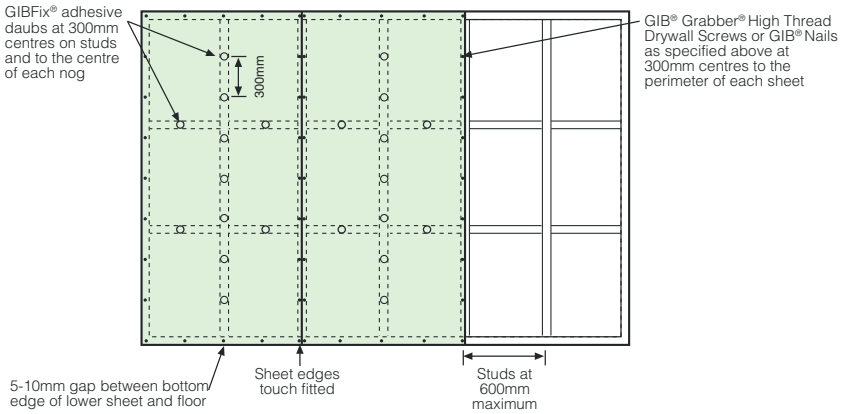
Jointing

- Jointing shall be carried out in accordance with the instructions in the *GIB® Site Guide*; GIB® AquaMix is recommended for the first two coats.

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



APPROVED BC190130 03/04/2019 Napier City Council Pg 135 of 207

Ceilings

MARCH 2007

Ceiling Framing

Framing dimensions and spacing must comply with the requirements of NZS 3604:1999 or relevant NZ Standard.
If bracing, noise control, fire rating considerations exist consult the relevant GIB® publication for appropriate information.

Fasteners

- Steel battens – 25mm x 6g GIB® Grabber® Self Tapping Drywall screws
- Timber battens or Joists – 32mm x 6g GIB® Grabber High Thread Drywall screws.

Adhesives

- Steel battens – GIBFix® All-Bond
- Timber battens – GIBFix® Wood Bond (not suitable for LOSP treated timber).

Fasteners Centres

- Single screws to the edges and centre of the sheets across each batten
- Screws to be 12mm from sheet edges
- Daubs of adhesive at 200mm centres between the screws
- Do not place adhesive at sheet edges or under fasteners, this may lead to screw or nail pops.

Lining

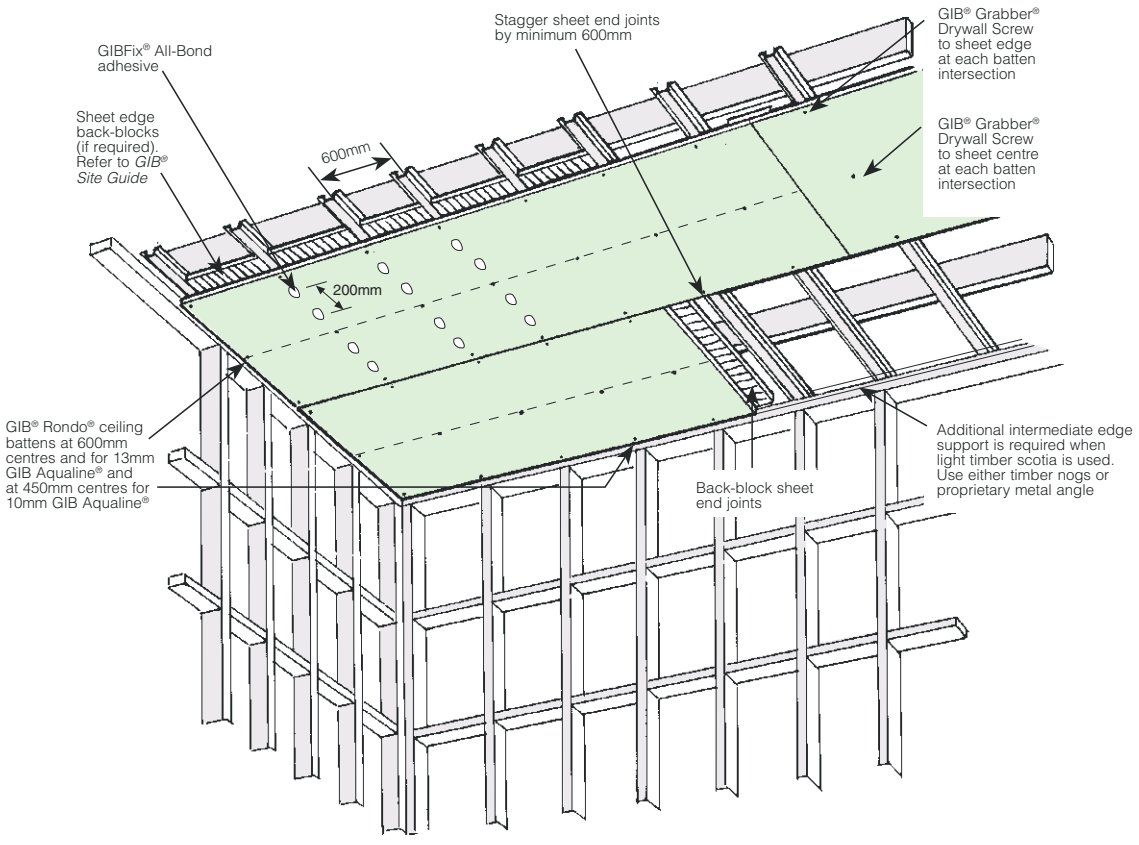
- The lining shall be fixed at right angles to the battens or joists
- Commence fixing from the centre of the sheets outwards
- Sheets to be touch fitted
- Use long length sheets to minimise sheet end butt joints
- Back-block sheet end butt joints
- See GIB® Site Guide for sheet edge backblocking requirements.

Batten Spacings

- 13mm GIB Aqualine® plasterboard – 600mm centres max
- 10mm GIB Aqualine® plasterboard – 450mm centres max.

Jointing

- All sheet joints must be paper tape reinforced and stopped in accordance with instructions in the *GIB® Site Guide*. Water resistant GIB® AquaMix is recommended for the first two coats.
- Do not fix tiles to GIB® plasterboard ceilings.



APPROVED BC190130 03/04/2019 Napier City Council Pg 136 of 207

Kitchen and Laundry

MARCH 2007

A

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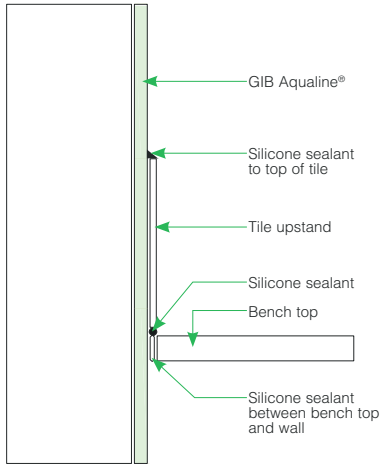

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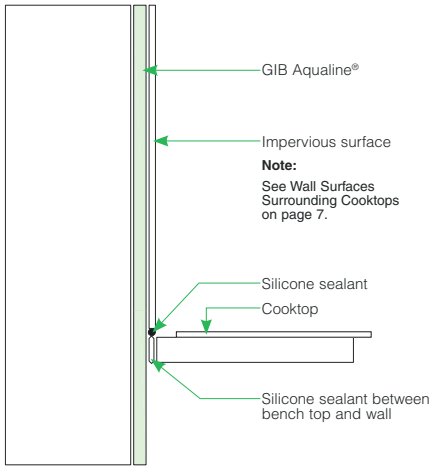

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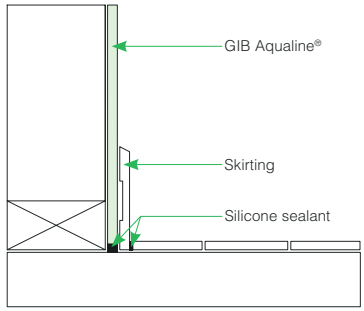


APPROVED BC190130 03/04/2019 Napier City Council Pg 137 of 207

Specification and Installation Checklist

MARCH 2007

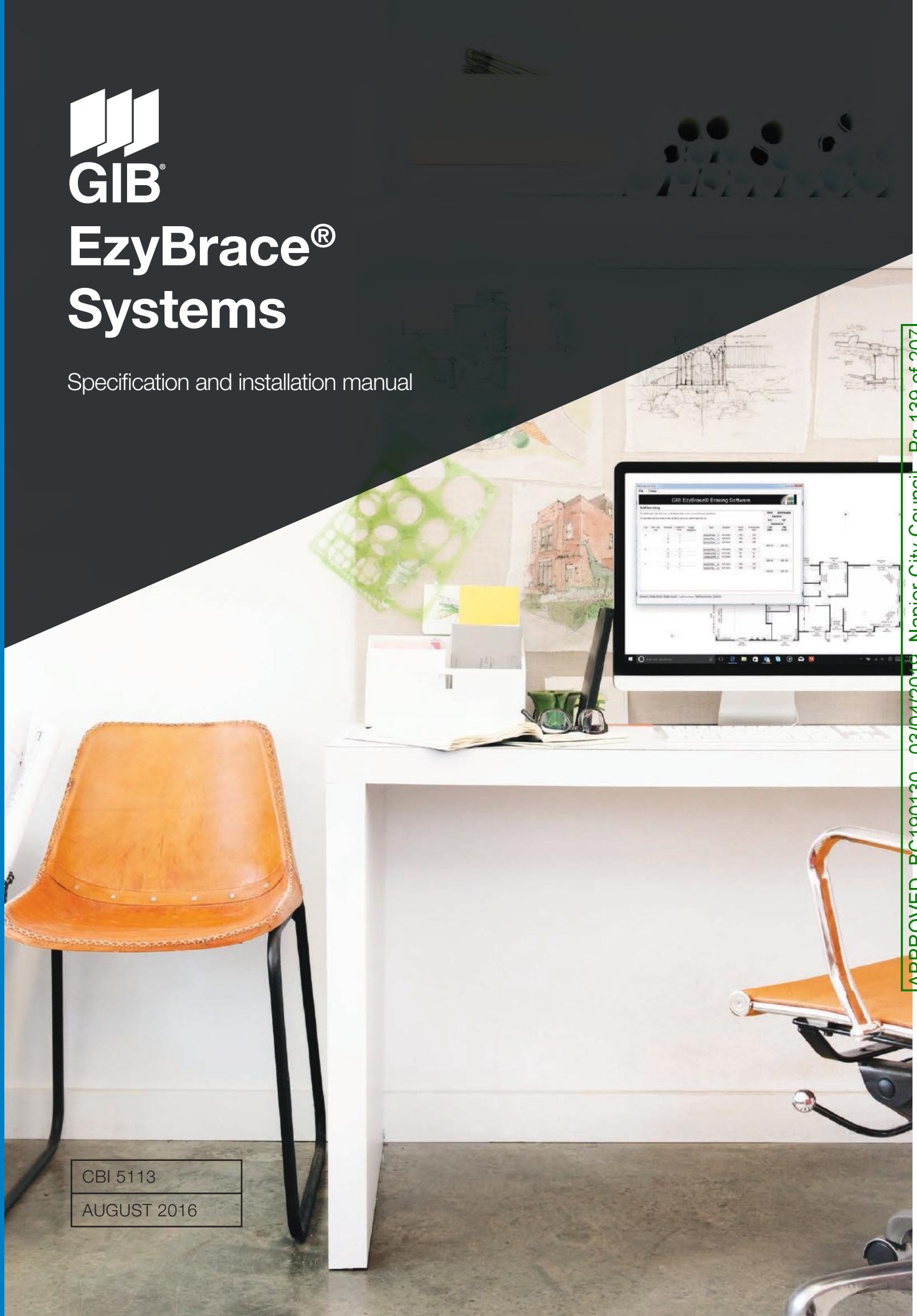
Contract ID	
Site Address	
Client Name	
Designer	
Builder	
Plasterboard Installer	
Plasterboard Supplier	
Tiler	
Shower Installer	

DESIGNER	YES	NO	CHECKED BY	DATE
GIB Aqualine® specified for wet areas and appropriate details included on plans?				
Are tiled areas clearly shown on plans?				
Is area requiring waterproof membrane clearly shown on plan?				
Is the waterproof membrane required to be installed by a licensed applicator? If so, is this noted on the documentation?				
No bracing behind shower or bath?				
BUILDER	**YES**	**NO**	**CHECKED BY**	**DATE**
Galvanised steel angle installed to the internal corners of tiled shower?				
All sheet joints in showers to be made on solid timber. This may require some additional dwangs for horizontal board installation.				
PLASTERBOARD INSTALLER	**YES**	**NO**	**CHECKED BY**	**DATE**
10mm GIB Aqualine® for tiles up to 20kg per m^2?				
13mm GIB Aqualine® for tiles up to 32kg per m^2?				
GIB Aqualine® mechanically fastened at 100mm centres when tiles are to be installed?				
All junctions between GIB Aqualine® and walls, floors, baths, showers and other elements are correctly sealed with appropriate sealant?				
Pipe penetrations sealed?				
PLASTERBOARD STOPPER	**YES**	**NO**	**CHECKED BY**	**DATE**
Air drying compound (e.g. GIB ProMix® or GIB Plus 4®) not to be used on areas to be tiled.				
Recommended that GIB® AquaMix is used in wet areas.				
TILER	**YES**	**NO**	**CHECKED BY**	**DATE**
Waterproof membrane applied to shower areas prior to tiling?				
SHOWER INSTALLER	**YES**	**NO**	**CHECKED BY**	**DATE**
GIB Aqualine® walls must not be sealed or painted under where acrylic linings are to be installed.				
Ensure GIB Aqualine® is free from dust before installation of acrylic liners.				
Sealant applied to top edge of acrylic shower linings?				
BUILDER/PLUMBER	**YES**	**NO**	**CHECKED BY**	**DATE**
Sealant applied under penetration face covers?				

APPROVED BC190130 03/04/2019 Napier City Council Pg 138 of 207

GIB® EzyBrace® Systems

Specification and installation manual



CBI 5113

AUGUST 2016

APPROVED BC190130 03/04/2019 Napier City Council Pg 139 of 207

NATIONAL SUPPORT

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GIB® HELPLINE

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APPROVED BC190130 03/04/2019 Napier City Council Pg 140 of 207

Based on learnings derived from the 2011 Canterbury earthquakes GIB EzyBrace® Systems have been updated to offer improved design flexibility and further simplification of the bracing design and build process.

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

- Improved user interface with simplified bracing design process.
- Increased functionality including exterior line check function, easy insert/deletion of bracing elements and built in software help function.
- Includes the new GIB® Bracing element GS2- NOM
- Allows the GIBFix® Framing System to be used in GIB EzyBrace® designs.

NEW GIB® BRACING ELEMENT GS2-NOM

- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute to bracing resistance.
- Potentially reduces the amount of fasteners[1]
- Encourages more even bracing distribution throughout the building.

[1] Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

- Large hole specification updated to use a more conservative methodology.
- Guidance included for fireplace flues and range hoods.

NEW — GIBFIX® FRAMING SYSTEM

- Reduced potential for fastener pop and joint cracking as a result of timber frame movement.
- Reduced potential for on-site call backs.
- Improved thermal performance.
- Reinforced plasterboard junctions.

BRANZ Appraised
Appraisal No.928 [2016]

APPROVED BC190130 03/04/2019 Napier City Council Pg 141 of 207

CONTENTS

System Summary **5**
GIB EzyBrace® Systems — August 2016 5
GIB® Plasterboard Substitution Table 5

Introduction **6**
Scope of Use 6
Finish Quality — Framing and Substrates 6
New GIBFix® Framing Systems 6
New GS2-NOM Bracing Element 6
Compliance with the NZ Building Code 7
CAD Design Detail 7
Appraisal 7

Bracing Resistance and Demand **8**
Bracing Resistance 8
Bracing Demand 9
Software Functionality 10

Design and Construction **12**
GIB® Plasterboard Linings 12
GIB EzyBrace® Systems in Water-Splash Areas 12
Renovation 12
Openings in Bracing Elements 12
Timber Framing 13
GIBFix® Framing System (Alternative Layout) 13
Guidelines for Intersection Walls 13
Top Plate Connections 14
Parapets and Gable End Walls 14
Bottom Plate Fixing 14
Bracing Strap Installation 15
GIB HandiBrac® Installation 16
GIB HandiBrac® Placement with GIBFix® Framing System Layout 17
Ceiling Diaphragms 18
Ceiling Battens in Ceiling Diaphragms 19
Openings in Ceiling Diaphragms 20
Length of GIB EzyBrace® Elements ('N' Type) 21
Length of GIB EzyBrace® Elements ('H' Type) 22

System Specifications **23**
GIB EzyBrace® Systems Specification — GS1-N 23
GIB EzyBrace® Systems Specification — GS2-NOM 24
GS2-NOM Adhesive Fixing Option at Door Jambs 25
GIB EzyBrace® Systems Specification — GS2-N 26
GIB EzyBrace® Systems Specification — GSP-H 27
GIB EzyBrace® Systems Specification — BL1-H 28
GIB EzyBrace® Systems Specification — BLG-H 29
GIB EzyBrace® Systems Specification — BLP-H 30

Sustainability and the Environment **31**

APPROVED BC190130 03/04/2019 Napier City Council Pg 142 of 207

GIB EzyBrace® Systems — August 2016

Winstone Wallboards Ltd accepts no liability if GIB EzyBrace® Systems are not designed and installed in strict accordance with instructions contained in this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication at any time. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. Check for the current publication at gib.co.nz/library before using this publication. If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442.

GIB EzyBrace® 2011 software and specification literature remains valid until futher notice.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights reserved.

Beware of substitution

The performance of GIB® Systems are very sensitive to design detailing and construction practices. All GIB® Systems have been developed specifically for New Zealand conditions and independently tested or assessed to ensure the required level of performance. It is important to use only GIB® branded components where specified and to closely follow the specified design details and construction practices, to be confident that the required level of performance and quality is achieved on site.

For further information call our GIB® Helpline on 0800 100 442.

GIB EzyBrace® Systems have been designed and tested using only the products specified. When additional GIB® plasterboard properties are required the table below provides acceptable alternative options.

	Acceptable alternative GIB® plasterboards								
Specified GIB® plasterboard	GIB® Standard	GIB Ultraline®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyreline®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	Note 1 and 3			
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3		

Note 1 *The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.*

Note 2 *The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.*

Note 3 *Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.*

APPROVED BC190130 03/04/2019 Napier City Council Pg 143 of 207

Scope of use

This document is a guide to wall bracing of light timber frame (LTF) buildings constructed in accordance with NZS3604:2011 Timber Framed Buildings and presents a simple and efficient method for calculating and incorporating bracing resistance. This information draws on recent experiences from seismic activity in New Zealand and seeks to minimise earthquake damage to plasterboard linings in LTF buildings.

This document outlines the main principles of bracing design and construction using GIB® plasterboard products and systems. Further detailed information can be found in the GIB® Bracing Supplement by visiting gib.co.nz/library. This 'live' on-line document is updated continuously in response to market feedback and Winstone Wallboards' development initiatives.

Finish quality — framing and substrates

Home owners are increasingly demanding a high quality of interior finish. Finish quality is heavily influenced by the substrate to which linings are fixed. Detailed information on 'Levels of Finish' is given in AS/NZS 2589 and the latest version of the GIB® Site Guide.

New GIBFix® Framing System

With increased NZ Building Code requirements and growing customer demand for thermal efficiency and high quality interior finishes, traditional framing practices present problems such as multiple framing members at wall intersections creating thermal 'bridges' and cavities where insulation cannot be installed effectively.

Figure 1 shows a traditional wall framing layout. Figure 2 shows the alternative GIBFix® Framing System layout.

Multiple timber framing members also take longer to dry resulting in an increased risk of fastener pops and blemishes resulting from timber frame movement.

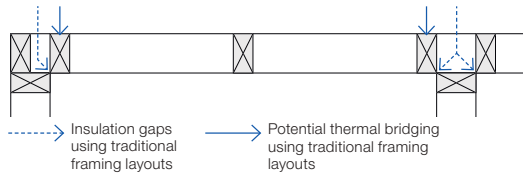
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

The GIBFix® Framing System can be used in conjunction with GIB EzyBrace® Systems.

Bracing resistance is not affected by the GIBFix® Framing System if the use of this alternative timber framing layout is preferred. Refer to the GIBFix® Framing System literature for more information.

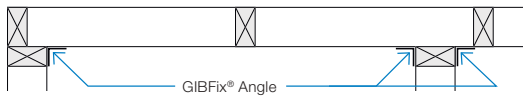
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFIX® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

The new GS2-NOM bracing element allows most homes to be braced with a single lining type and less fixings so that a high quality finish is maintained throughout.

GS2-NOM permits the contribution of 'nominally fixed' internal walls. Higher performance elements are commonly specified on external walls and where limited wall area is available or adjacent to significant openings.

Winstone Wallboards recommends the use of the GIBFix® Framing System in conjunction with GS2-NOM elements. Key benefits of this approach include:

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners[1].
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

APPROVED BC190130 03/04/2019 Napier City Council Pg 144 of 207

Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

The design and material specification for steel and timber framing used in conjunction with this literature must be in accordance with the performance requirements of NZBC Clause B1. GIB EzyBrace® Systems comply with the requirements of NZS 3604:2011, when designed and installed in accordance with this publication and relevant technical literature. NZS 3604:2011 is an acceptable solution to NZBC Clause B1.

NZBC CLAUSE B2 — DURABILITY

Under normal conditions of dry internal use GIB EzyBrace® Systems have a service life in excess of 50 years and satisfy the requirements of NZBC Clause B2. When in conditions of dry internal use, the components specified in this literature satisfy the requirements of NZBC Clause B2.

GIB® EzyBrace® Systems must not be specified in areas where 15 year durability applies and where linings are subject to direct water pressure, e.g. shower cubicle or shower over bath situations.

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

Under normal conditions of use, during handling, installation or serviceable life, the products detailed in GIB EzyBrace® Systems do not constitute a health hazard and meet the provisions of the NZBC Clause F2.

NZBC CLAUSE H1 — ENERGY EFFICIENCY

Buildings must be constructed to achieve an adequate degree of energy efficiency and the building envelope must provide adequate thermal resistance. The required thermal resistance (R-value) of timber framed external walls depends on climate zone but is commonly in the range from R 1.9 to R 2.0.

CAD design details

Where applicable drawings related to GIB EzyBrace® Systems have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box. CAD design details can be found at gib.co.nz/library.

Appraisal

GIB EzyBrace® Systems 2016 have been appraised by the Building Research Association of New Zealand (BRANZ), Appraisal No. 928 (2016) GIB EzyBrace® Systems, 2016.

It is of prime importance to comply with the details of design, construction and workmanship in this document.

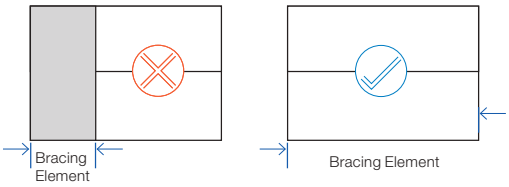
APPROVED BC190130 03/04/2019 Napier City Council Pg 145 of 207

Bracing resistance

WALL BRACING LAYOUT

When designing the bracing layout, carefully consider the final finished appearance and utilise full wall lengths where possible, avoiding unnecessary fastenings in the centre of a clear wall. Using the available wall length provides additional bracing and achieves improved aesthetics.

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

Distribute bracing by drawing a grid pattern of bracing lines along and across the building. Bracing lines must coincide as much as possible with the wall bracing elements. Pairs of elements may be counted on a single line provided they are no more than 2 metres apart and parallel. See figure 4.

Locate bracing evenly throughout the building and as close as practical to corners of external walls.

Space bracing lines no more than:

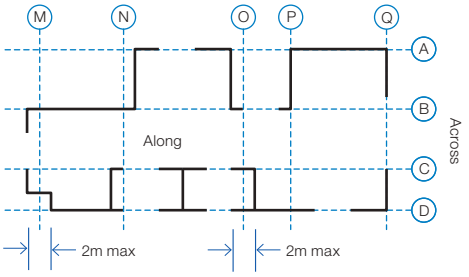
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

The construction of ceiling diaphragms is described in detail on p.18–20.

NZS3604:2011 requires that no bracing line shall have a capacity less than the greater of:

- 100 Bracing Units (BUs), or
- 15 x the external wall length (BUs) for bracing lines coinciding with external walls, or
- 50% of the total demand (D) divided by the number of lines (n) in the direction being considered (BUs).

FIGURE 4: BRACING GRID LAYOUT



The NZS3604 ‘rules’ are merely minimum guidelines and compliance with them does not in itself ensure even distribution. The designer is responsible for checking distribution. Poor distribution can cause torsional effects and localised or more significant damage in an earthquake event.

GIB EZYBRACE® SYSTEMS

The GIB EzyBrace® Specification Numbering System (and sub-components thereof) is protected by copyright and makes specification and identification of GIB EzyBrace® Systems transparent.

- 'GS' stands for GIB® Standard.
- 'BL' for GIB Braceline®
- 'P' for plywood.
- '1' and '2' for linings one or both sides.
- ‘N’ stands for 'no specific panel hold-down fixings'.
- 'H' stands for 'specific panel hold-down fixing' required.
- 'NOM' stands for 'nominal plasterboard fixing'. This refers to the standard fixing method used to install plasterboard as shown in the current GIB® Site Guide.

Where specific hold-down fixings are specified, refer to p.15-16. GIB HandiBrac® is fully contained within the framing cavity and does not interfere with lining installation and quality of finish.

Where no specific hold-down fixings are required, the minimum NZS3604:2011 bottom plate fixings apply.

Full bracing element construction details are provided in this technical literature.

Further general design and construction information can also be found in our GIB® Bracing Supplement by visiting gib.co.nz/library.

Specifying GIB EzyBrace® elements (minimum wall length 400mm)

Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

APPROVED BC190130 03/04/2019 Napier City Council Pg 146 of 207

Bracing demand

GIB EZYBRACE® CALCULATOR

The GIB EzyBrace® calculator is a software tool to determine the wind and earthquake bracing demand and to design the bracing resistance for light timber-framed buildings constructed in accordance with NZS 3604:2011.

The updated GIB EzyBrace® calculator combines an up-to-date user-friendly interface with the latest knowledge relating to the performance of GIB® plasterboard in light timber-framed structures when subjected to high winds or earthquakes. The calculator can be down-loaded free of charge by visiting gib.co.nz/ezybrace and can be installed on either Microsoft® or Apple® Mac environments.

DEMAND

Wind and Earthquake 'Demand' calculates the forces a structure must be able to resist during its 'design life'. The GIB EzyBrace® calculator's Demand sheet determines the number of Bracing Units required depending on building location, building dimensions and materials used. The Demand sheet closely follows the familiar format of our Excel based GIB EzyBrace® calculator, and includes additional features such as a pop-up help facility explaining required input.

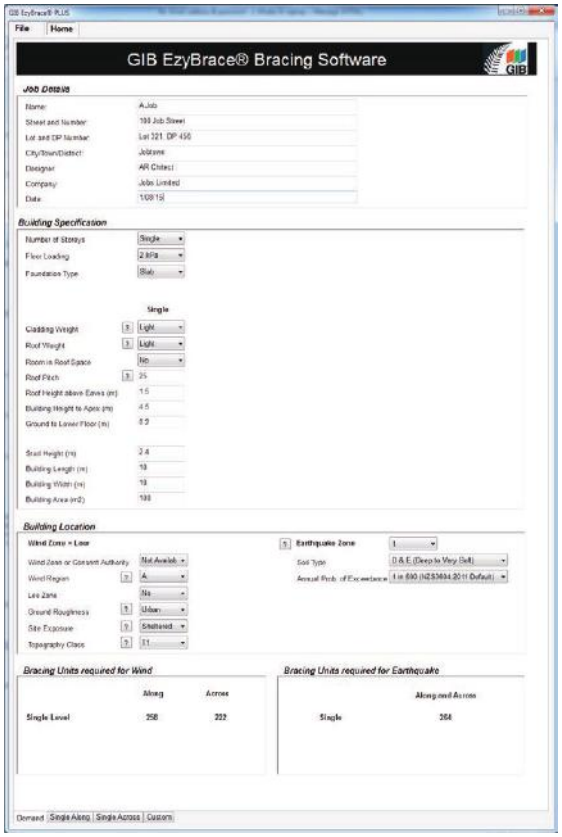
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

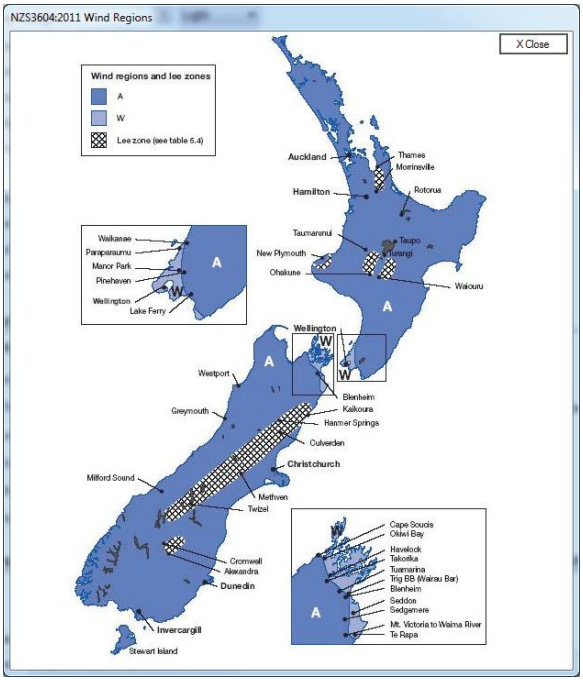
The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design life' of a light timber framed residential structure, a 'return period' of 500 years.

Many commercial and public buildings are designed for the more stringent requirement of a 10% probability of exceedance in a 100 or 250 year life expectancy.

A screen shot of the GIB EzyBrace® 2016 Demand Sheet and Help Facility is shown in figure 5.

FIGURE 5: GIB EZYBRACE® 2016 — DEMAND CALCULATION SHEET AND 'POP UP' HELP FACILITY





Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

APPROVED BC190130 03/04/2019 Napier City Council Pg 147 of 207

Timber framing

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

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

GIBFix® Framing System (alternative layout)

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

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

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

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

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

Guidelines for intersection walls

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

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

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

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)

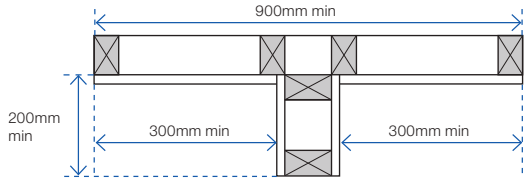


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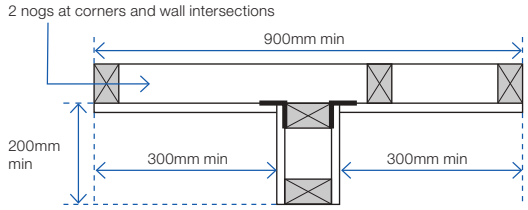
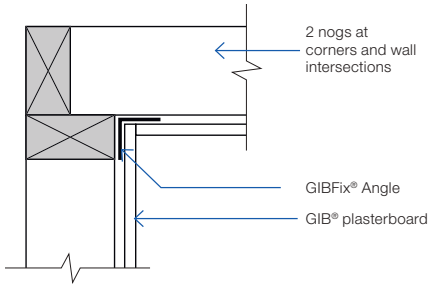
FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



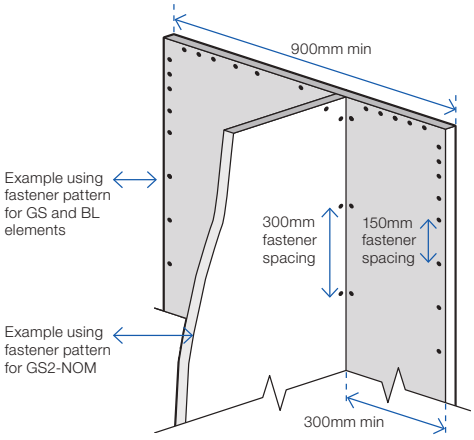
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 148 of 207

Top plate connections

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

Parapets and gable end walls

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

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

or

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

Bottom plate fixing

TIMBER FLOOR

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

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

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

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

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

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

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

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

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

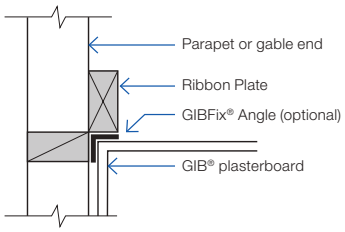
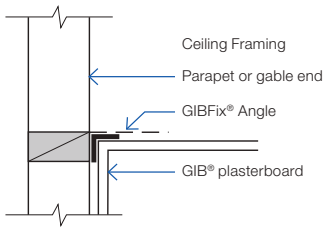


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



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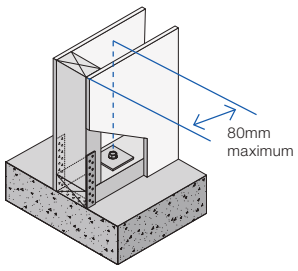
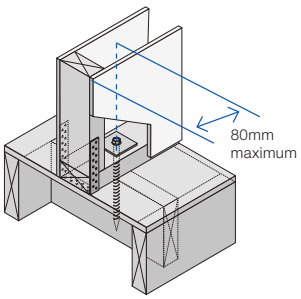
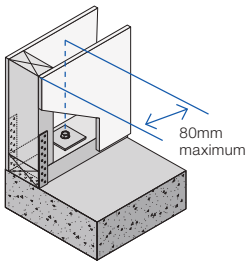
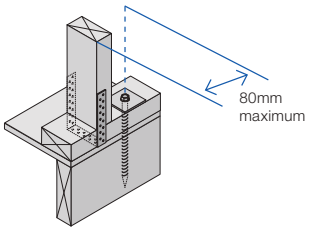
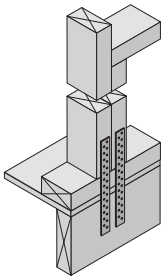
BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 149 of 207

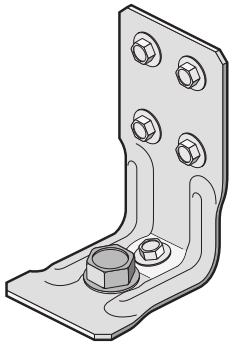
Bracing strap installation

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

Concrete floor	Timber floor
400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.	
Internal wall	
 GEB004	 GEB005
External wall	
 GEB006	 GEB007
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library.	2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.
	 GEB008
Hold-down fastener requirements	
Concrete floor	Timber floor
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.	12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element

APPROVED BC190130 03/04/2019 Napier City Council Pg 150 of 207

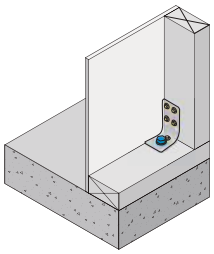
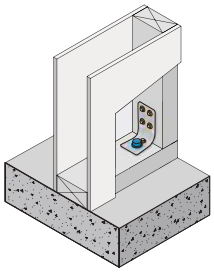
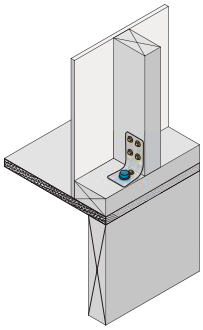
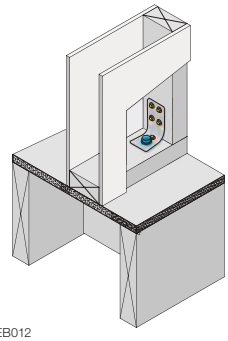
GIB HandiBrac® installation



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

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

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

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 151 of 207

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

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

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

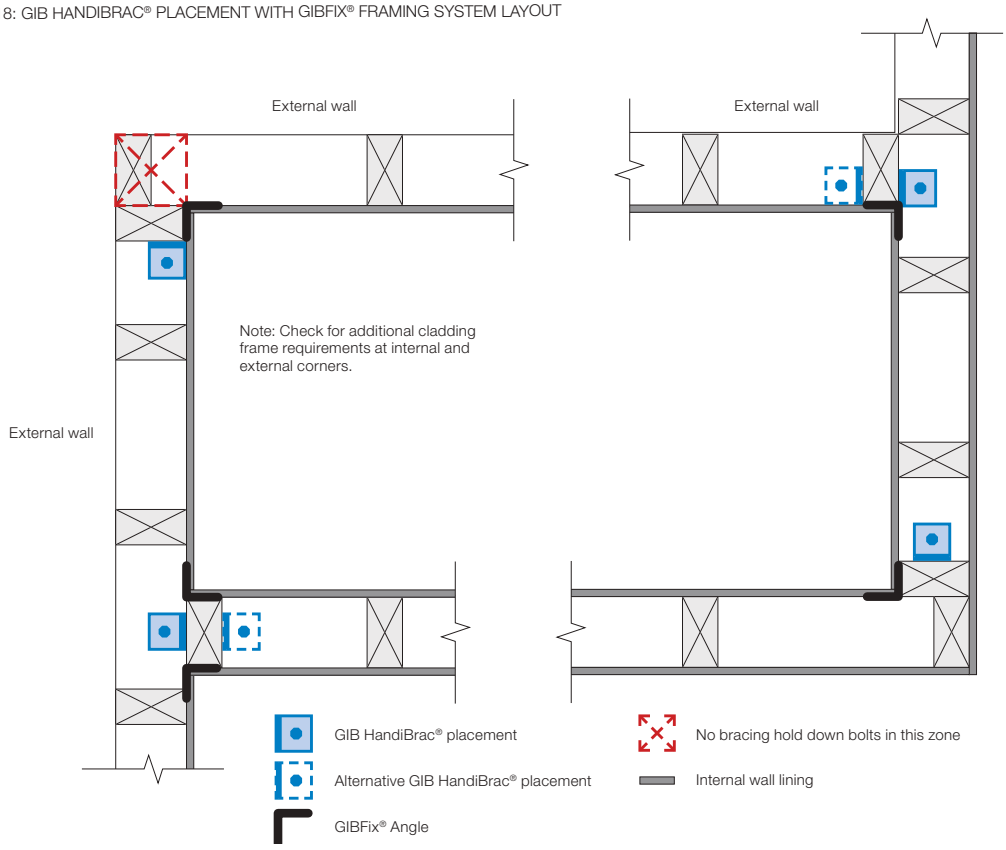
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

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

TIMBER FLOORS

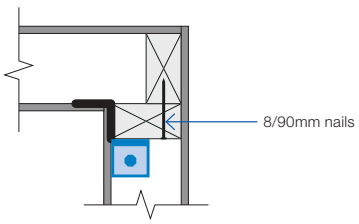
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

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



GEB013

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



GEB014

APPROVED BC190130 03/04/2019 Napier City Council Pg 152 of 207

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

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

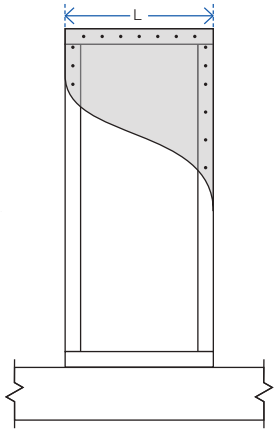
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

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

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

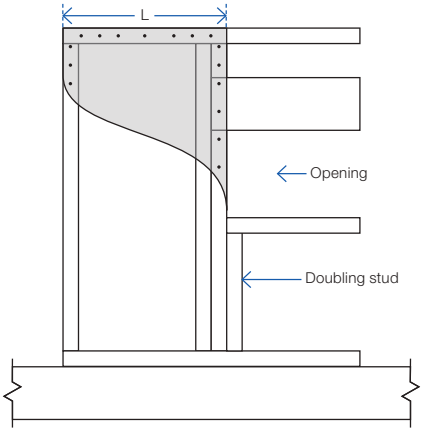
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



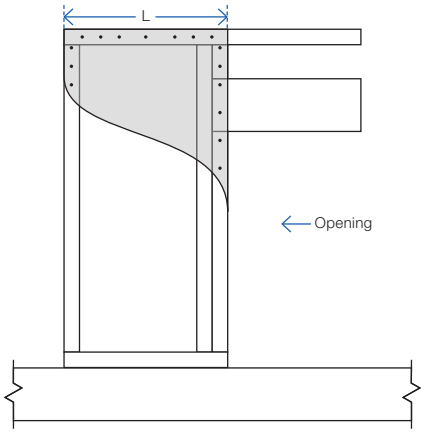
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



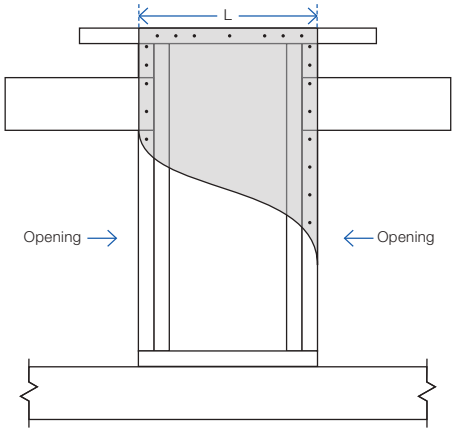
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



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

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



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

APPROVED BC190130 03/04/2019 Napier City Council Pg 153 of 207

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

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

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

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

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

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

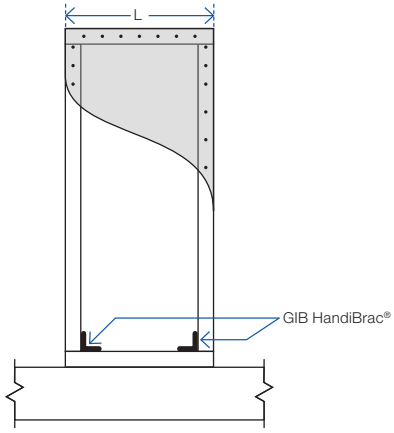
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

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

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

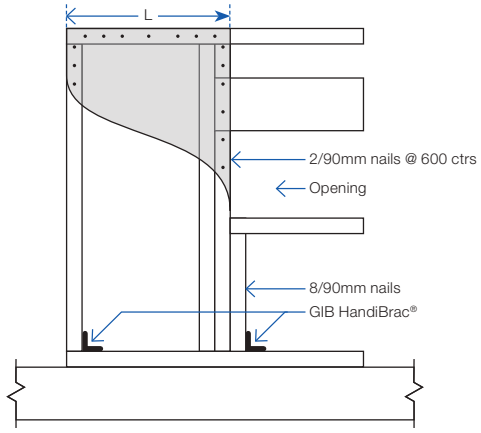
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



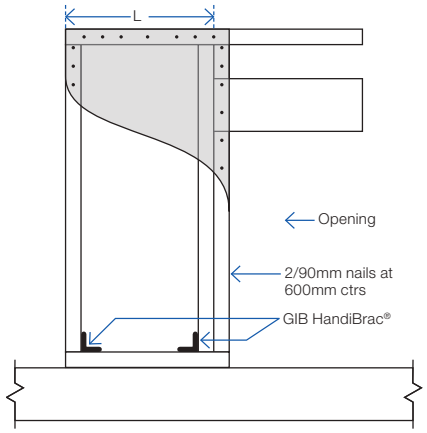
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



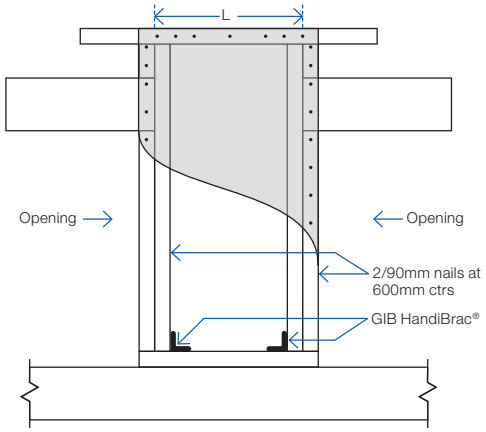
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



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

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



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

APPROVED BC190130 03/04/2019 Napier City Council Pg 154 of 207

GIB EzyBrace® Systems specification GS1-N

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

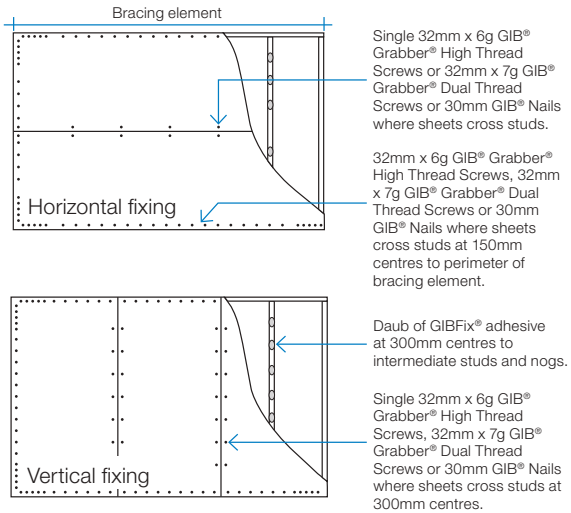
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

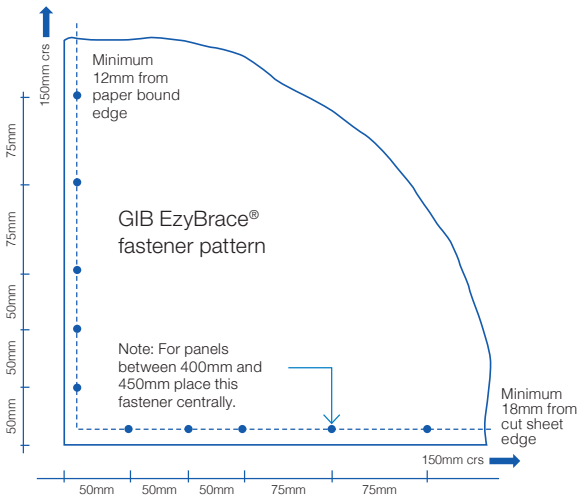
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

APPROVED BC190130 03/04/2019 Napier City Council Pg 155 of 207

James Hardie
a smarter way™

Axent™
FASCIA

Installation Manual

AUGUST 2014 | NEW ZEALAND

APPROVED BC190130 03/04/2019 Napier City Council Pg 156 of 207

Content

1 INTRODUCTION **3**

2 SAFE WORKING PRACTICES **5**
- Warning 5
- Recommended safe working practices 5
- Working instructions 6
- HardieBlade™ saw blade 6
- Storage and handling 6
- Quality 6

3 PREPARATION **6**
- Preparation 6
- Framing 6
- Fastener durability 6
- Fastener Types 6

4 INSTALLATION **7**
- Rafter spacing ≤600mm centres 7
- Rafter spacing 600 – 900mm 7
- Rafter spacing >900mm 8

5 JOINTING **8**

6 PRODUCT INFORMATION **8**
- General 8
- Durability 8

7 FINISHING AND MAINTENANCE **9**
- Preparation and Priming 9
- Sealants 9
- Painting 9
- Maintenance 9

WARRANTY **11**

APPROVED BC190130 03/04/2019 Napier City Council Pg 157 of 207

WE VALUE YOUR FEEDBACK

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

Ask James Hardie™
Fax 0800 808 988
literaturefeedback@jameshardie.co.nz

1 Introduction

What is it?
Thick and versatile Axent™ Fascia is the easy way to add finishing touches that keep their finish.

Where do you use it?
Designed to accommodate James Hardie soffit linings.

What are the key benefits?
DESIGN OPTIONS. Axent™ Fascia is available in 4200mm lengths and 230mm or 180mm widths.

Speed. Axent™ Fascia has tongue and groove ends for joining allowing for minimal wastage. Paint application is fast because the fascia is pre-primed, which means less paint and time is needed to achieve a high-quality finish.

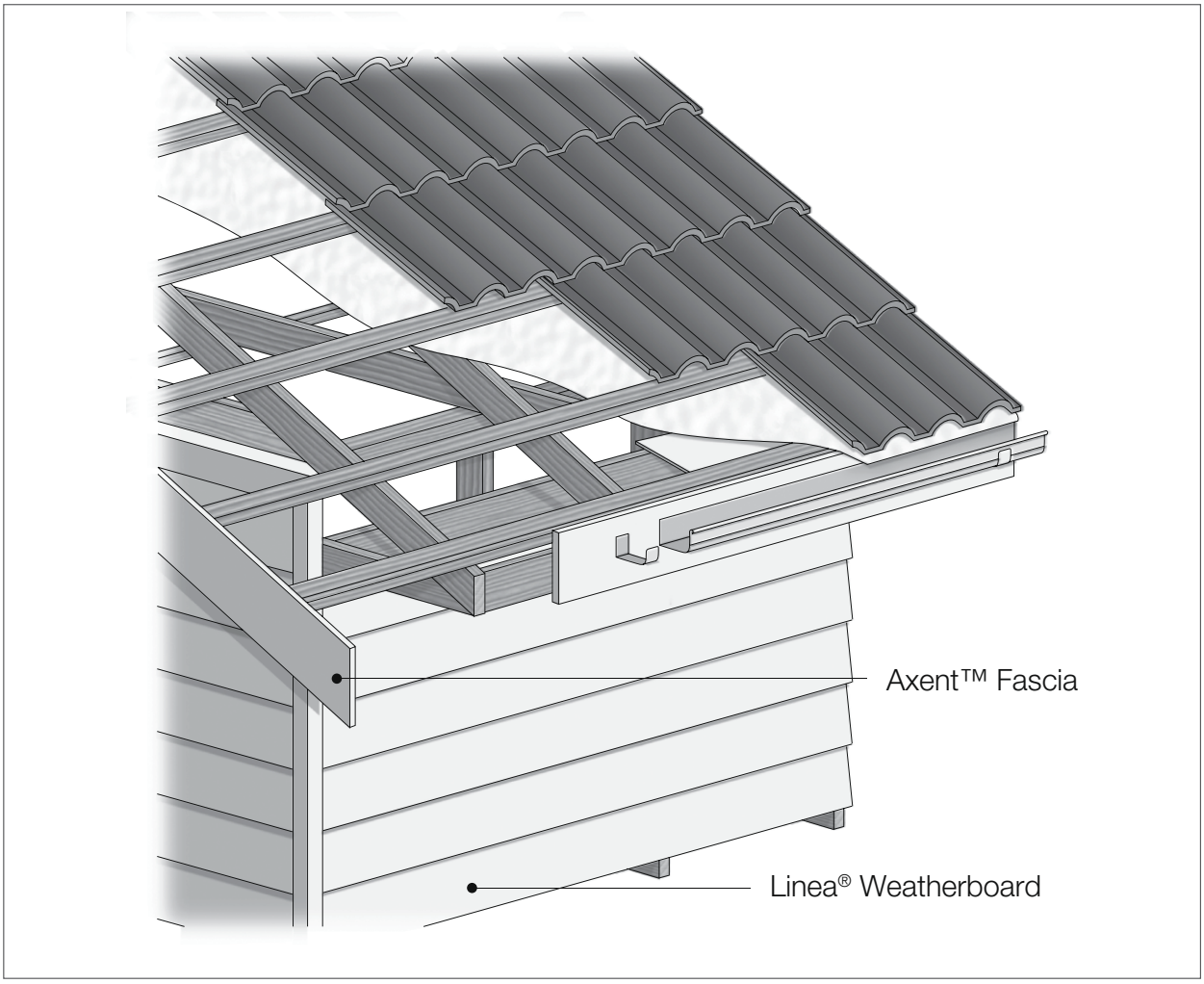
Low maintenance. Axent™ Fascia will maintain its integrity and general appearance. It resists shrinking, swelling and cracking to hold paint longer and can also be painted dark as well as light colours.

Made from Scyon. Axent™ Fascia is made from Scyon®, the advanced lightweight cement composite with heavy-duty performance. Not only is it resistant to fire and damage from rot, but it can also be gun nailed and is easy to cut- like timber. Axent™ Fascia has a 15 year product warranty when installed and maintained correctly.

Scope
Axent Fascia is suitable for use in buildings that fall within the scope of E2/AS1 or other residential or light commercial buildings covered by specific engineering design (SED).

Make sure your information is up to date
The specifier or other responsible party for the project must ensure that the information and details in this guide are appropriate for the intended application and that specific design and detailing is undertaken for areas which fall outside the scope of this documentation.

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



APPROVED BC190130 03/04/2019 Napier City Council Pg 158 of 207

Table 1

Axent Fascia

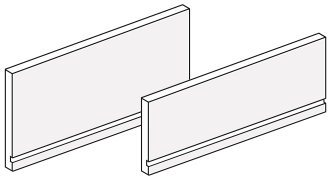
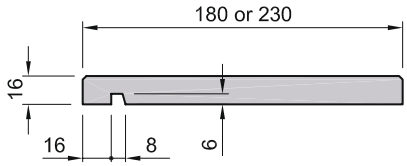
Product	Description	Quantity/Size
	Axent Fascia Low density fibre cement fascia with eave support groove machined into the back of the board. Ends have tongue and groove feature for easy jointing. 	Axent Fascia and Barge Thickness: 16mm Width: 180mm / 230mm Length: 4200mm Approx. mass: 3.5kg/m / 4.5kg/m

Table 2

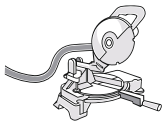
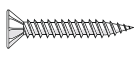
Product / Accessories / Tools

COMPONENTS SUPPLIED BY JAMES HARDIE

Accessories	Description	Product code
	HardieBlade™ saw blade Poly diamond blade, for fast, clean cutting of James Hardie fibre cement. Available in 184mm size.	300660
	HardieBlade™ saw blade Poly diamond blade, for fast, clean cutting of James Hardie fibre cement. Available in 254mm size.	303375

COMPONENTS NOT SUPPLIED BY JAMES HARDIE

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

Accessories	Description	Accessories	Description
	Jolt head nails 3.15 x 60mm galvanised or stainless steel jolt bullet head nails.		Compound mitre saw Dust reducing compound mitre saw used with HardieBlade™ saw blade. Makita: LS0714 / LS1016 / LS1216 Hitachi: C10FSB / C10FSH
	Vacuum extraction with HEPA filter Used with HEPA filter and paper bag for reduced dust exposure.		Fascia screw Self embedding coarse thread wood screw 40mm x 8-10g stainless steel.
	Fibre cement saw blade Poly diamond blade, for fast, clean cutting of James Hardie fibre cement. Available in 305mm size.		Flexible Sealant Sikaflex AT Façade, Bostik Safestud or similar

APPROVED BC190130 03/04/2019 Napier City Council Pg 159 of 207

2 Safe working practices

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

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

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

James Hardie recommended safe working practices

CUTTING OUTDOORS

1. Position cutting station so that wind will blow dust away from user or others in working area.
2. Use a dust reducing circular saw equipped with HardieBlade™ saw blade and HEPA vacuum extraction.

DRILLING/OTHER MACHINING

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

IMPORTANT NOTES:

1. NEVER use a power saw indoors.
2. NEVER use a circular saw blade that does not carry the HardieBlade™ logo.
3. NEVER dry sweep — Use wet suppression or HEPA Vacuum.
4. NEVER use grinders.
5. Always follow tool manufacturer's safety recommendations.

P1 or P2 respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.co.nz to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

APPROVED BC190130 03/04/2019 Napier City Council Pg 160 of 207

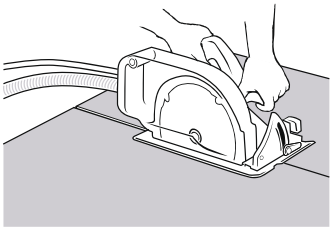
3 Preparation

WORKING INSTRUCTIONS

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

HARDIEBLADE™ SAW BLADE

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



STORAGE AND HANDLING

To avoid damage, all James Hardie building products should be stored with edges and corners of the sheets protected from chipping.

James Hardie building products must be installed in a dry state and protected from weather during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water, moisture, etc.

QUALITY

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

PREPARATION

Edges cut on site must be primed before installation with one coat of an oil based masonry primer and then painted (see page 7). Slight chamfering of cut edges is recommended to improve edge paint adhesion.

Do not install Axent Fascia such that it may remain in contact with standing water.

FRAMING

Axent Fascia and Barge can be fixed to timber framing compliant with NZS 3604 and for steel frame buildings. The framing used must comply with the relevant building regulations and standards and the requirements of this manual.

FASTENER DURABILITY

Fasteners must have the appropriate level of durability required for the intended location. This is of particular importance in coastal areas, areas subject to salt spray and other corrosive environments. Fasteners must be fully compatible with all other materials that they are in contact with to ensure the durability and integrity of the assembly. Contact fastener manufacturers for more information.

Use 316 stainless steel fixings in a Sea Spray Area Zone D or (Zone C where local area knowledge dictates a higher durability requirement) to comply with the durability requirements of the New Zealand Building Code (NZBC). Galvanised nails can be used in Zone C, and B as specified by NZS 3604.

FASTENER TYPES

When fastening Axent Fascia to timber rafter ends or sub-fascia use 60 x 3.15mm jolt head nails, or a 40mm x 8-10g screw.

Fasten gutter supporting brackets to Axent Fascia with screws. Do not use nails. When attaching gutter brackets or forming corners or junctions in Axent Fascia, only screw/nail through the face into rafters or timber blocking behind. Do not screw/nail into edges or ends.

When using jolt head nails, then the heads of the nails need to be finished or punched 2mm below the surface and filled with a water-proof exterior filling compound as per the manufacturer's recommendations. Punch below surface only suitable for jolt head nails. Screws can be finished flush with the board surface.

Note: Minimum edge distances for fastener fixing are to be 20mm from an edge and 100mm from the ends.

APPROVED BC190130 03/04/2019 Napier City Council Pg 161 of 207

4 Installation

RAFTER SPACING ≤600MM CENTRES

When fixing Axent Fascia to rafters at 600mm centres or less, fasten directly to the rafter ends. Axent Fascia is jointed using the 'tongue and groove' ends. Where these joints occur rafter blocking must be used, unless there is already a sub-fascia board. Fix board to blocking at 300mm maximum staggered centres and do not fix within 100mm of the 'tongue and groove' join, see Figure 1.

Axent Fascia can be cut along the top edge to suit the narrower widths. The cut edge must be sealed with an oil based masonry primer.

RAFTER SPACING 600MM – 900MM

For rafters spacing between between 600mm and 900mm the Axent Fascia must be fixed to the rafter ends and also be fixed to a chamfer batten at 300mm maximum spacings. These fixings are required in addition to the fixings into the rafter tails, see Figure 2.

Figure 1:
Fixing to rafters at 600mm centres or less

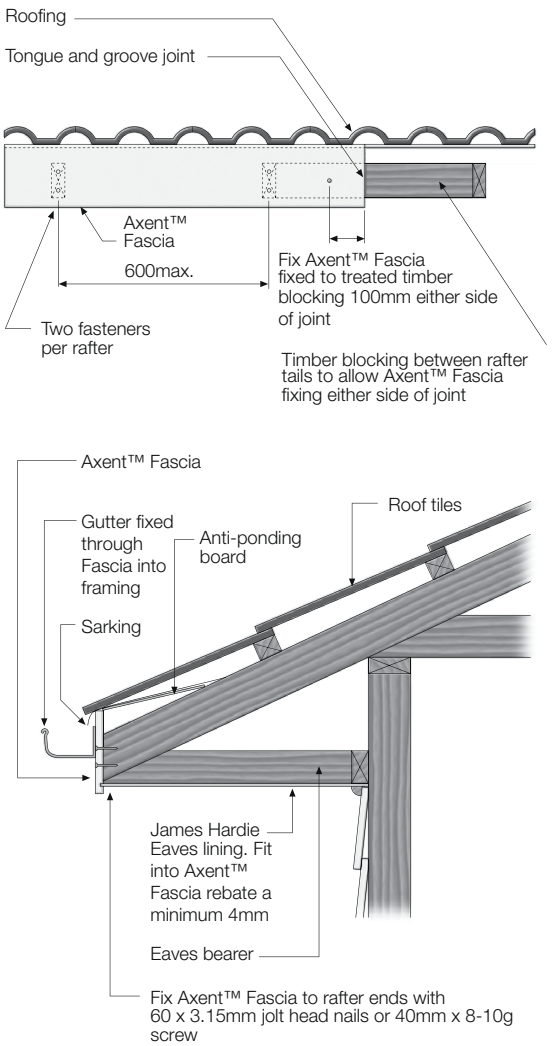
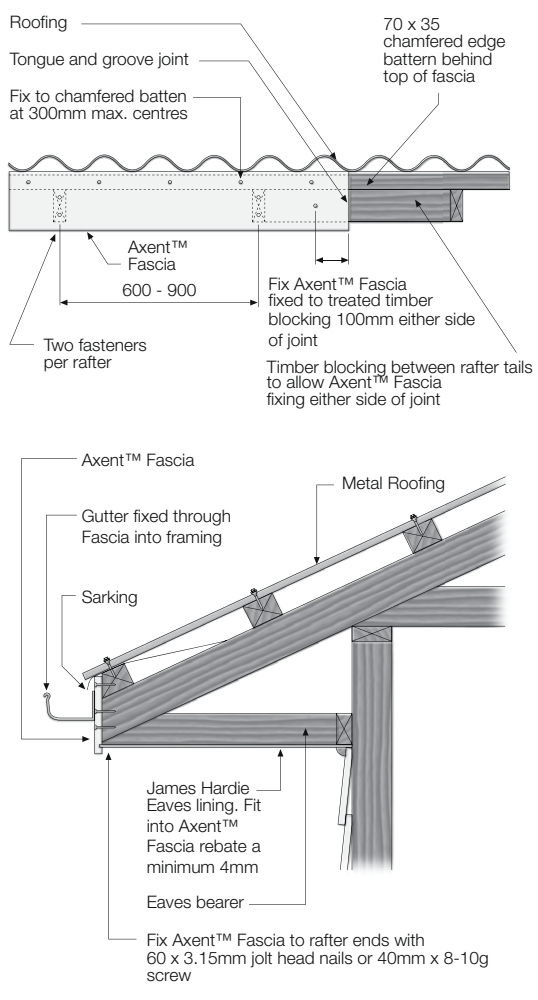


Figure 2:
Fixing to rafters at 600mm – 900mm centres or less



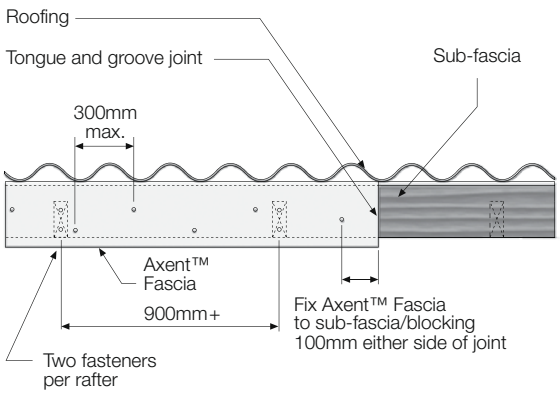
APPROVED BC190130 03/04/2019 Napier City Council Pg 162 of 207

RAFTER SPACING ⩾ 901MM

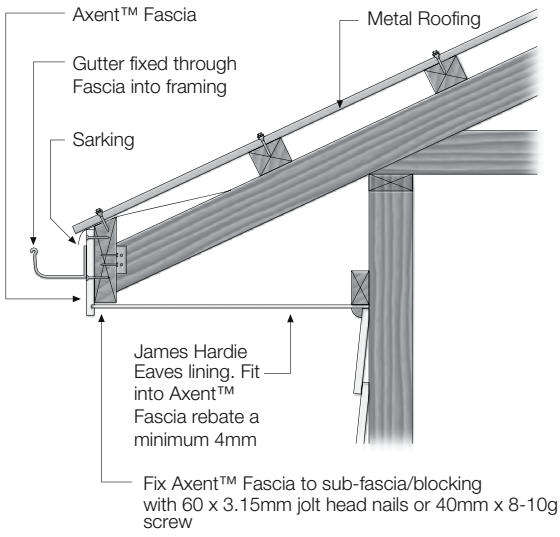
For rafter spacings over 900mm a structurally adequate timber sub-fascia/blocking must be used. The sub-fascia/blocking is typically a suitably treated exterior grade timber 35mm deep x 120mm high as a minimum.

This sub-fascia/blocking must be securely fastened to the rafters and the Axent Fascia is then fixed to it with fasteners at 300mm staggered centres, see Figure 3.

Figure 3:
Fixing to rafters at 900mm centres or greater



NOTE:
Joints in Axent™ Fascia and sub-fascia/blocking should be off-set by at least one rafter bay.



5 Jointing

The ends of Axent Fascia are jointed by means of a tongue and groove joint over timber blocking. Sealant must be provided in the tongue and groove joint.

6 Product information

GENERAL

Axent Fascia is a cellulose fibre reinforced cement, low density, building product. The basic composition is Portland cement, ground sand, cellulose fibre and water. Axent Fascia is manufactured to AS/NZS 2908.2 'Cellulose-Cement Products Part 2: Flat Panels' (ISO 8336 'Fibre Cement Flat Panels'). Axent Fascia is classified Type A, Category 2 in accordance with AS/NZS 2908.2. (ISO 8336). For Safety Data Sheets (SDS) visit www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

DURABILITY

Resistance to moisture/rotting

Axent Fascia has demonstrated resistance to permanent moisture induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2:

- Water permeability (Clause 8.2.2)
- Heat rain (Clause 6.5)
- Warm water (Clause 8.2.4)
- Soak dry (Clause 8.2.5)

Resistance to fire

Axent Fascia is classified as 'Non-Combustible Material' which is suitable for use in Fascia applications close to boundaries and complies with Performance C 3.7 of the NZBC Clause C3 Fire Affecting Areas Beyond the Fire Source.

APPROVED BC190130 03/04/2019 Napier City Council Pg 163 of 207

7 Finishing and maintenance

NOTE:

Protective coating of Axent Fascia is required in order to meet the durability requirements of the NZBC.

PREPARATION AND PRIMING

The Axent Fascia must be dry before painting. Punch and fill all jolt head nails a maximum of 2mm below the surface. Fill the hole with an exterior grade builders fill, allow to cure and sand smooth ready for priming. Prime the filled holes in accordance with paint manufacturer's specifications.

SEALANTS

Sealant used must meet the requirements of NZBC. It is recommended a BRANZ appraised sealant product is used. Appraisal certificate. Application and use of sealants must comply with manufacturer's instructions. Sealants, if coated, must be compatible with the paint system.

PAINTING

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

Axent Fascia must be painted within 90 days of installation. All exposed faces and bottom edges of Axent Fascia must be finished with quality exterior paint system complying with any of parts 7, 8, 9 and 10 of
AS 3730.

Dark coloured paints can be used on Axent Fascia. The dark colours in certain environments may fade over a period of time. Special paints/coatings are required in certain harsh environments.

MAINTENANCE

Regular cleaning and maintenance of the paint, finished surface, joints, junctions, penetrations, etc must be carried out at regular intervals. Maintenance must also meet the requirements of the relevant component manufacturer.

APPROVED BC190130 03/04/2019 Napier City Council Pg 164 of 207

Dulux DuSpec Datasheet

Dulux Weathershield X10 Semi Gloss

NZDD0790

Part A	529 LINE
Approvals	APAS-0280/2, Environmental Choice Certified.

Description

DULUX WEATHERSHIELD® X10 Semi Gloss is a 100% acrylic self priming paint for exterior use. Its unique MaxiFlex Stretch Technology gives a tough, flexible finish for long life protection from all New Zealand weather conditions.

Features

- Self priming
- Water based
- 100% acrylic paint with MaxiFlex
- The Dulux Promise*
- Versatility
- Tannin resistant
- Resistant to mould, dirt, stains and colour fade

Benefits

- Apply direct onto most bare surfaces
- 2 hour recoat and easy clean up.
- Excellent durability - expands & contracts with climate changes
- Long lasting.
- Recommended for all exterior surfaces eliminating variety of products.
- No primer required to prevent staining on bare timber.
- Film stays clean & vibrant

Uses

Use DULUX WEATHERSHIELD® X10 Semi Gloss over most exterior surfaces including, dressed and rough sawn timber, bricks, concrete, fibre cement board, masonry, Zincalume, and galvanised iron. Dulux is so confident in this product that it now carries a life time guarantee, *THE DULUX PROMISE; guaranteed for as long as you are living in your house. We guarantee, as long as Weathershield is applied in accordance with the instructions for use, Weathershield will not PEEL, FLAKE, or BLISTER for as long as you're living in your house. We should know, we've been testing exterior paint in New Zealand conditions for over 40 years. We believe in the quality of Weathershield so strongly, that if it doesn't deliver, we'll replace the product free of charge. It's the Dulux Promise. This guarantee does not cover paint failure caused by any breakdown of coatings applied previously, where Weathershield is applied over coatings not specified by Dulux or in the event of substrate failure. To claim you must be living in the house you have painted with Weathershield.

Performance Guide

Weather	Excellent resistance to weathering with very low level of chalking, colour change and dirt pick up.	**Heat Resistance**	Softens and suffers from dirt pick up over 70 degrees.
Water	Resists prolonged rain and condensation.	**Solvent**	Sensitive to aromatic hydrocarbons and alcohols.
Abrasion	Good resistance to abrasion.		

APPROVED BC190130 03/04/2019 Napier City Council Pg 165 of 207

Typical Properties

Gloss Level	25-35 at 60 degrees	**Thinner**	Water
Colour	Can be machine tinted to a comprehensive pastel and medium dark colour range		
Dulux Colour Base	DEEP, ULTRA DEEP, VIVID WHITE		
Components	1	**Number Of Coats**	2 or 3
Toxicity	Lead free. Dry film is non-toxic.	**V.O.C. Level**	62 g/L max
Sanding Properties	Good	**Touch Dry**	20 Minutes
Clean Up	Water		
Clean Up Description	Clean all equipment with water		
Application Method	Air Spray, Airless Spray, Brush, Roller		

Application Conditions

Solids By Volume 40

	Min	Max	Recommended
Wet Film Per Coat (microns)			63
Dry Film Per Coat (microns)			25
Recoat Time (min)	2 Hours	Indefinite	
Theoretical Spread Rate (m^2/L)			16

APPROVED BC190130 03/04/2019 Napier City Council Pg 166 of 207

Application Guide

Surface Preparation	▪ PRE-PRIMED TIMBER & PREVIOUSLY PAINTED SURFACES Occasionally an apparently sound old paint will lose adhesion when recoated, particularly if the new paint is darker in colour. To avoid this, check the adhesion of the old paint by cutting an 'X' through a clean area of the film with a sharp knife, press cellulose tape firmly across the cut and rip it off. If the old paint comes off with the tape it should be removed before repainting. Scrape off all loose and flaking paint. Fill any cracks or holes with a suitable filler. Sand all surfaces to a flat finish and remove greyed timber. Dust off. Apply 1 coat of Dulux Prepcoat 1 Step Acrylic Primer Sealer Undercoat. If previously painted surface is in good condition then no primer is necessary. TIMBER Apply 1 coat of Dulux Prepcoat 1 Step Acrylic Primer Sealer Undercoat. Fill nail holes with a flexible, exterior grade woodfiller. Sand all dressed timber. BRICK, MASONRY, FIBRO &FIBRE CEMENT BOARD Unpainted masonry surfaces should be cured for 28 days before painting. Ensure surface is sound and clear of any loose sand or cement. Fill holes with a grouting cement. Wash down with water using a stiff brush to remove all loose material. To remove any efflorescence (white slats) wipe down with a 5% solution of acetic acid (white vinegar). Hose down and allow to dry. Wash with a bleach solution and/or demossing chemical to remove mould, or moss. The hose down. Apply 1 coat of Dulux Prepcoat 1 Step Acrylic Primer Sealer Undercoat. GALVANISED IRON Clean with a Scotch Brite nylon pad and sugar soap solution. Thoroughly hose off. Apply 1 coat of Dulux All Metal Primer. ZINCALUME Wipe down with a clean damp cloth. Apply 1 coat of Dulux All Metal Primer. STEEL/WROUGHT IRON Remove all rust by scraping, sanding or wire brushing. Apply 2 coats of Dulux All Metal Primer.
Application Procedure And Equipment	▪ Brush, roller, conventional and airless spray ▪ Stir contents thoroughly before and during use with a broad flat stirrer, using an upward lifting action. BRUSH/ROLLER Soak brush and roller in water before starting and use while still slightly damp. Apply two generous coats of Weathershield X10. Apply three coats on all unpainted surfaces. For Weathershield X10 True Red, Bold Yellow, Blue, Orange and Extra Bright bases, to ensure excellent durability it is essential to apply a first coat of Dulux Prepcoat 1 Step Acrylic Primer Sealer Undercoat prior to the application of two topcoats of Weathershield X10. However, if the surface is previously painted in a pale colour and is in sound condition no primer is required. Under hot or windy conditions, up to 100ml DULUX Hot Weather Thinner may be added per litre to assist application. Use a short nap roller. Avoid excessive brushing or rolling back into paint which has been drying some minutes. AIRLESS & CONVENTIONAL SPRAY Suitable for application by all standard spray equipment. If necessary thin with up to 100ml/litre of water to aid atomisation. *NOTE* - Some colours may require more than 2 top coats and or the use of a tinted undercoat. This is particularly relevant when using bright or high chromatic coloured paints (e.g. colours derived off True Red, Bold Yellow, Orange, and Extra Bright base) or when painting over existing dark colours.

Health And Safety

MSDS Number	2312	**Using Safety Precautions**	For detailed information refer to the product label and the current Material Safety Data Sheet available through Dulux Sales and Customer Service offices.
MSDS Link	http://msds.duluxgroup.com/pdf/shess-en-cds-020-000000002312.pdf		
Health Effects	Splashes to the eye may cause eye irritation. When spraying, inhalation of mists may produce respiratory irritation.	**Protective Equipment**	Wear eye protection and when spraying wear a suitable mask.
Disposal	Do not contaminate stormwater with product or product washings. Do not pour product down the drain. Unwanted product should be brushed out on newspaper, allowed to dry and then disposed of via domestic waste collection. Empty containers should be left open in a well ventilated area to dry out. When dry, recycle the container via recycling programmes. Disposal of empty paint containers via recycling programmes may differ between local authorities. Check with your local council first.		

In the case of emergency, please call 0800 734 607

APPROVED BC190130 03/04/2019 Napier City Council Pg 167 of 207

Precautions And Limitations

All preparation and painting must conform to AS/NZS2311: Guide to Painting of Buildings.
Do not paint at temperatures below 10C or when the temperature may fall below 10C during the drying period. In Summer, paint on the shady side of the building. If conditions are hot and windy, cool the surface by hosing with water and paint the cool, damp surface. Do not apply to roofs or surfaces used for the collection of drinking water. In normal conditions, 7 days curing is required to develop full hardness and resistance properties. Occasionally when dew or condensation forms on a newly dried film, a slight milky deposit will be observed on the film. This is quite normal and does not impair the performance - simply hose or wipe it off with damp rag.

Caution - Check with your substrate manufacturer before painting colours of LRV<40

Transport And Storage

Pack A	529 LINE	**Shipment Name**	Not dangerous goods.; No special transport requirements

Size	**Weight**
1 Litre	1.5Kg
2 Litre	3.0Kg
4 Litre	5.8Kg
10 Litre	14Kg

Flash Point	NA	**UN Number**	NA
Dangerous Goods Class	NA	**Package Group**	NA

Disclaimer
Dulux, Selleys and Other marks followed by ® are registered trademarks. Marks followed by the symbol of ™ are trademarks.

The data provided within the Duspec system is correct at the time of publication, however it is the responsibility of those using this information to check that it is current prior to specifying or using any of these coating/product systems.
DISCLAIMER: Any advice, recommendation, information, assistance or service provided by any of the divisions of DuluxGroup (New Zealand) Pty Ltd or its related entities (collectively, DuluxGroup) in relation to goods manufactured by it or their use and application is given in good faith and is believed by DuluxGroup to be appropriate and reliable. However, any advice, recommendation, information, assistance or service provided by DuluxGroup is provided without liability or responsibility PROVIDED THAT the foregoing shall not exclude, limit, restrict or modify the right entitlements and remedies conferred upon any person or the liabilities imposed upon DuluxGroup by any condition or warranty implied by Commonwealth, State or Territory Act or ordinance void or prohibiting such exclusion limitation or modification. Coating/product systems can be expected to perform as indicated on the Duspec Spec Sheet so long as applications and application procedures of the individual products are followed as recommended on the appropriate Product data Sheet. "DuluxGroup" "Dulux" "Selleys" "Berger" "Berger Gold Label" "Hadrian" "Walpamur" "Levene" "Acratex" and Other marks followed by ® are registered trademarks. Marks followed by the symbol ™ are trademarks.

Please note that this document is only valid for 60 days from the date of issue.

DuluxGroup (New Zealand) Pty Ltd 150 Hutt Park Road NZ ACN 133 404 118

APPROVED BC190130 03/04/2019 Napier City Council Pg 168 of 207

Safety Data Sheet

NON-Hazardous Substance, NON-Dangerous Goods

1. MATERIAL AND SUPPLY COMPANY IDENTIFICATION

Product name: **529-Line Dulux Weathershield X10 Semi Gloss**

Synonyms:	**Product Code**	**Bar Code**
Dulux Weathershield X10 Semi Gloss Vivid White, 1L	52904912-1L	9400513131115
Dulux Weathershield X10 Semi Gloss Vivid White, 2L	52904912-2L	9400513194905
Dulux Weathershield X10 Semi Gloss Vivid White, 4L	52904912-4L	9400513131122
Dulux Weathershield X10 Semi Gloss Vivid White, 10L	52904912-10L	9400513131139
Dulux Weathershield X10 Semi Gloss Deep Base, 1L	52904914-1L	9400513131146
Dulux Weathershield X10 Semi Gloss Deep Base, 4L	52904914-4L	9400513131153
Dulux Weathershield X10 Semi Gloss Deep Base, 10L	52904914-10L	9400513131160
Dulux Weathershield X10 Semi Gloss Ultra Deep Base, 1L	52916101-1L	9400513131177
Dulux Weathershield X10 Semi Gloss Ultra Deep Base, 4L	52916101-4L	9400513131184
Dulux Weathershield X10 Semi Gloss Ultra Deep Base, 10L	52916101-10L	9400513131191

Recommended use: Surface coating. Applied by brush, roller or spray.

Supplier: Dulux New Zealand, a division of DuluxGroup (New Zealand) Pty Ltd
ABN: 55 133 404 118 / Co. 2355191
Street Address: 150 Hutt Park Road, Lower Hutt, New Zealand
Telephone: 0800 800 424

Emergency telephone number: **Australia – 1800 033 111** **New Zealand – 0800 734 607**

2. HAZARDS IDENTIFICATION

Based on available information, this material is not classified as hazardous according to criteria of EPA New Zealand.

DANGEROUS GOODS CLASSIFICATION

Not classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

3. COMPOSITION INFORMATION

CHEMICAL ENTITY	CAS NO.	PROPORTION
Ingredients determined to be non-hazardous	-	100%

APPROVED BC190130 03/04/2019 Napier City Council Pg 169 of 207

4. FIRST AID MEASURES

If poisoning occurs, contact a doctor or Poisons Information Centre (Phone Australia 131 126, New Zealand 0800 764 766).

Inhalation: Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin contact: If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. If swelling, redness, blistering or irritation occurs seek medical assistance.

Eye contact: If in eyes wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Ingestion: Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water to drink. Never give anything by the mouth to an unconscious patient. If vomiting occurs give further water. Seek medical advice.

PPE for First Aiders: Wear overalls, safety glasses and impervious gloves. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Hazchem Code: Not applicable.

Suitable extinguishing media: If material is involved in a fire use water fog (or if unavailable fine water spray), foam, dry agent (carbon dioxide, dry chemical powder).

Specific hazards: Non-combustible material.

Fire fighting further advice: Not combustible, however following evaporation of aqueous component residual material can burn if ignited. On burning may emit toxic fumes. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to vapour or products of combustion.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILLS
Wear protective equipment to prevent skin and eye contamination. Wipe up with absorbent (clean rag or paper towels). Allow absorbent to dry before disposing with normal household garbage.

LARGE SPILLS
Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contamination and the inhalation of vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Collect and seal in properly labelled containers or drums for disposal. If contamination of sewers or waterways has occurred advise local emergency services.

Dangerous Goods – Initial Emergency Response Guide No: Not applicable.

APPROVED BC190130 03/04/2019 Napier City Council Pg 170 of 207

7. HANDLING AND STORAGE

Handling: Avoid skin and eye contact and inhalation of vapour, mist or aerosols.

Storage: Store in a cool, dry, well-ventilated place and out of direct sunlight. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for leaks.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

National occupational exposure limits: No value assigned for this specific material by Safe Work Australia or Department of Labour New Zealand.

Biological Limit Values: As per the "National Model Regulations for the Control of Workplace Hazardous Substances (Safe Work Australia)" the ingredients in this material do not have a Biological Limit Allocated.

Engineering measures: Use only in well ventilated areas. Keep containers closed when not in use.

Personal protection equipment: B: OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES.

Wear overalls, safety glasses and impervious gloves. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

If risk of inhalation of exists, wear organic vapour/particulate respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716.

Hygiene measures: Keep away from food, drink and animal feeding stuffs. When using do not eat, drink or smoke. Wash hands prior to eating, drinking or smoking. Avoid skin and eye contact and inhalation of vapour, mist or aerosols. Ensure that eyewash stations and safety showers are close to the workstation location.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form / Colour / Odour: Coloured, viscous liquid with a mild, characteristic odour.

Solubility:	Miscible with water.
Specific Gravity (20 ℃):	1.290
Relative Vapour Density (air=1):	>1
Vapour Pressure (20 ℃):	N Av
Flash Point (℃):	N App
Flammability Limits (%):	N App
Autoignition Temperature (℃):	N Av
Melting Point/Range (℃):	N App
Boiling Point/Range (℃):	Approx. 100
pH:	8 - 10
Viscosity (40 ℃):	>21 mm^2/sec
Total VOC (g/Litre):	N Av

(Typical values only - consult specification sheet)
N Av = Not available N App = Not applicable

APPROVED BC190130 03/04/2019 Napier City Council Pg 171 of 207

10. STABILITY AND REACTIVITY

Reactivity: No reactivity hazards are known for the material.

Chemical stability: This material is thermally stable when stored and used as directed.

Hazardous reactions: No known hazardous reactions.

Conditions to avoid: Elevated temperatures.

Incompatible materials: Oxidising agents.

Hazardous decomposition products: Oxides of carbon and nitrogen, smoke and other toxic fumes.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Inhalation: Where this material is used in a poorly ventilated area, at elevated temperatures or in confined spaces, vapour may cause irritation to mucous membranes and respiratory tract, headache and nausea.

Skin contact: Contact with skin may result in irritation.

Ingestion: No adverse effects expected however large amounts may cause nausea and vomiting.

Eye contact: May be an eye irritant.

Acute toxicity

Inhalation: This material has been classified as non-hazardous.

Skin contact: This material has been classified as non-hazardous.

Ingestion: This material has been classified as non-hazardous.

Corrosion/Irritancy: Eye: this material has been classified as not corrosive or irritating to eyes.
Skin: this material has been classified as not corrosive or irritating to skin.

Sensitisation: Inhalation: this material has been classified as not a respiratory sensitiser.
Skin: this material has been classified as not a skin sensitiser.

Aspiration hazard: This material has been classified as non-hazardous.

Specific target organ toxicity (single exposure): This material has been classified as non-hazardous.

Chronic Toxicity

Mutagenicity: This material has been classified as non-hazardous.

Carcinogenicity: This material has been classified as non-hazardous.

APPROVED BC190130 03/04/2019 Napier City Council Pg 172 of 207

Reproductive toxicity (including via lactation): This material has been classified as non-hazardous.

Specific target organ toxicity (repeat exposure): This material has been classified as non-hazardous.

12. ECOLOGICAL INFORMATION

Avoid contaminating waterways.

Acute aquatic hazard: No information is available to complete an assessment.

Long-term aquatic hazard: No information is available to complete an assessment.

Ecotoxicity: No information available.

Persistence and degradability: No information available.

Bioaccumulative potential: No information available.

Mobility: No information available.

13. DISPOSAL CONSIDERATIONS

Persons conducting disposal, recycling or reclamation activities should ensure that appropriate personal protection equipment is used, see “Section 8. Exposure Controls and Personal Protection” of this SDS.

If possible material and its container should be recycled. If material or container cannot be recycled, dispose in accordance with local, regional, national and international Regulations.

14. TRANSPORT INFORMATION

ROAD AND RAIL TRANSPORT
Not classified as Dangerous Goods by the criteria of the “Australian Code for the Transport of Dangerous Goods by Road & Rail” and the “New Zealand NZS5433: Transport of Dangerous Goods on Land”.

MARINE TRANSPORT
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

AIR TRANSPORT
Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

APPROVED BC190130 03/04/2019 Napier City Council Pg 173 of 207

15. REGULATORY INFORMATION

This material is not subject to the following international agreements:

Montreal Protocol (Ozone depleting substances)
The Stockholm Convention (Persistent Organic Pollutants)
The Rotterdam Convention (Prior Informed Consent)
Basel Convention (Hazardous Waste)
International Convention for the Prevention of Pollution from Ships (MARPOL)

This material/constituent(s) is covered by the following requirements:

- All the constituents of this material are listed on the *Australian Inventory of Chemical Substances (AICS)*.

16. OTHER INFORMATION

Literary reference

This Safety Data Sheet has been prepared by Chemical Data Services Pty Ltd (chemdata.com.au) on behalf of its client.

Reason(s) For Issue: 5 Yearly Revision
Format Change.
Minor Text Changes.

Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This SDS summarises at the date of issue our best knowledge of the health and safety hazard information of the product, and in particular how to safely handle and use the product in the workplace. Since DuluxGroup (Australia) Pty Ltd and DuluxGroup (New Zealand) Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, review this SDS in the context of how the user intends to handle and use the product in the workplace.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company.

Our responsibility for product as sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available upon request.

APPROVED BC190130 03/04/2019 Napier City Council Pg 174 of 207

Product Specifications

Performance		
> Storage Capacity	L	180
> No. Of People	(Moderate Climate)	2 - 3
> No. Of People	(Cold Climate)	1 - 2
Electrical Connection	VAC / Hz	240 / 50
Dimensions		1720 x 488mm (HxW)
Max Thermostat Setting	°C	70
Min Thermostat Setting	°C	60
Water Connection Inlet & Outlet	"/mm	RP ¾/20
T&PR Connection	"/mm	RP ½/15
T&PR Setting	kPa	1000
Max Water Supply Pressure w/out ECV	kPa	800
Max Input	kW	3
Approx Wt Empty	kg	64
Booster Thermostat Setting	°C	na
Boost Capacity (L)	L	na

APPROVED BC190130 03/04/2019 Napier City Council Pg 175 of 207

316581G
May 2018

INSTALLATION INSTRUCTIONS
&
OWNERS GUIDE

RHEEM MAINS PRESSURE ELECTRIC HOT WATER HEATERS

APPROVED BC190130 03/04/2019 Napier City Council Pg 176 of 207

Congratulations for choosing a Rheem Water Heater

It is important that you take a few minutes
to read this booklet as it may save you
time and trouble later.
If you require any further information or your
water heater needs to be serviced, please contact the
Rheem Service Department on 0800 657 335,
or the nearest service centre
(look in the Yellow Pages under “Plumbers”)
Or visit www.rheem.co.nz

Important to the Installer

Do not leave this booklet inside the element cover
after installation
Please leave the booklet with the water heater’s owner

IMPORTANT INFORMATION

GENERAL

- The information contained in this manual, and all other information or advice given at any time by Rheem New Zealand Limited in connection with the purchase, installation or use of a Rheem water heater, is given in good faith. Subject to any rights the owner may have under the “Consumer Guarantees Act 1993”, Rheem New Zealand Limited will not be liable to any person for any inaccuracy or omission in the information or advice arising through the fault or negligence of Rheem New Zealand Limited or any other person or through any other cause whatsoever.
- This water heater is not intended to be operated, adjusted or tampered with by young children or infirm persons. Young children should be supervised to ensure they do not play with the water heater.

ABOUT YOUR WATER HEATER

Q. DOES THE WATER QUALITY AFFECT THE WATER HEATER?

A. Your water heater is suitable for most public water supplies, however, some water qualities may have a detrimental effect on it. **If you are in a known harsh water area please refer to page 6**.

Q. HOW HOT SHOULD THE WATER BE?

A. All models (temperature range 60 - 70°C) require an authorised person to make any temperature adjustments. For reasons of safety and economy, we advise the thermostat is adjusted to the lowest setting that meets your needs.

The New Zealand Building Code requires a stored temperature setting of not less than 60°C. A tempering valve set at a maximum of 55°C must be used on domestic wet areas.

Q. HOW DO I KNOW IF THE WATER HEATER IS INSTALLED CORRECTLY?

A. Refer to the installation requirements on page 4.

Q. HOW LONG WILL THE WATER HEATER LAST?

A. There are a number of factors that affect the life of the water heater. These include; the water quality, water pressure, water temperature and the usage pattern, however, your Rheem water heater is supported by a comprehensive warranty (refer to page 7).

The life of the water heater may be extended by arranging for an authorised person to inspect the anode and replace it, if required.

The suggested time after installation when the anode should be inspected is:
Vitreous Enamel 8 years
Optima 10 years

For softened water supplies or in areas of poor water quality, it is recommended the anode be inspected 3 years earlier than shown (refer to "Water Quality" on page 6).

HOW THE WATER HEATER WORKS

SINGLE AND TWIN ELEMENT MODELS

Water stored within the water heater is heated by the electric heating element. The thermostat controls the electricity supply to the heating element so that a constant water temperature is maintained. As the cold water is heated it expands approximately 1/50 of its volume and, as a result, a small amount of water is discharged from the cold water expansion valve.

NON-SIMULTANEOUS ELEMENT MODELS

The two heating elements are wired for non-simultaneous operation, so that only one heating unit can operate at a time. The bottom heating unit is usually connected to an off-peak (overnight) supply and the top heating unit to a continuous supply. **The red link wire must be removed from the terminal block during installation if two separate power supplies are to be used**. Leaving the link in place ensures both elements operate correctly with a single power supply.

The basic operation is as follows: when the water temperature at the top of the water heater has reached the set temperature, the thermostat switches the top element off. This creates a circuit to the bottom heating element by switching the neutral.

SAFETY

On all models, a Temperature and Pressure Relief valve is supplied with each water heater. It can be found inside the front cover and must be mounted on top of the water heater.

Also fitted to the water heater is a thermostat, which incorporates an over-temperature thermal cut-out device.

⚠ ***Warning:*** *The operation of the thermal cut-out indicates a possible dangerous situation. The thermostat and thermal cut-out is to only be adjusted or reset by an authorised service person.*

APPROVED BC190130 03/04/2019 Napier City Council Pg 177 of 207

These safety devices must not be tampered with, or removed, and under no circumstances operate the water heater unless both devices are fitted.

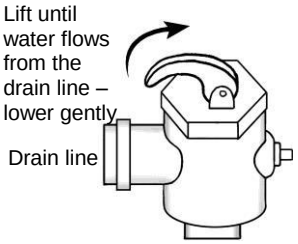
REGULAR CARE

MANUALLY OPERATING THE TEMPERATURE AND PRESSURE RELIEF (TPR) VALVE:

The easing lever (see diagram. 1) on the TPR valve should be operated regularly to remove lime deposits and verify that it is not blocked. **It is very important that you raise and lower the lever gently.**

⚠ ***Warning:*** *To ensure the relief valve is working correctly, operate the relief valve easing lever at least every six months. Failure to do this may result in the water heater over-pressurising.*

DIAGRAM 1



Water Heater

If water does not flow freely from the drain line or the valve fails to completely close and water continues to be discharged, contact the Rheem Service Department, phone **0800 657 335,** or the nearest Rheem Service Centre (look in the Yellow Pages under "Plumbers).

GOING ON HOLIDAYS:

If you plan to be away from home for one or two nights, we suggest that you leave the water heater switched on. However, if you plan to stay away more than a few nights, conserve energy by switching the water heater off at the isolating switch, or at the main switchboard. In locations where freezing could occur, you should leave the water heater turned on.

SAVE A SERVICE CALL

CHECK THE ITEMS BELOW BEFORE MAKING A SERVICE CALL. YOU MAY BE CHARGED FOR SERVICE IF THE FAULT IS NOT RELATED TO THE WATER HEATER MANUFACTURE OR PARTS SUPPLIED WITH THE WATER HEATER BY RHEEM.

WATER DISCHARGING FROM EXPANSION CONTROL VALVES

It is normal for the cold water expansion valve and the temperature and pressure relief valve to discharge a small quantity of water during the heating cycle. If either of these valves discharge more than a bucket full of water in 24 hours, one of the following may be the cause.

- **Continuous dribble**
  Try gently raising the easing lever on the relief valve for a few seconds. This may dislodge small particles of foreign matter and clear the fault.
- **Heavy flow of hot water until the water is cold – then stops while the water reheats**
  Immediately turn off the electricity supply to the water heater. Call the Rheem Service Department or look in the Yellow Pages under "Plumbers" for your nearest Rheem Service Centre or www.rheem.co.nz to arrange an inspection.
- **A steady flow of water (often at night)**
  This may indicate that your cold water pressure sometimes rises above the design pressure of the water heater. A Pressure Limiting valve should be installed, or if one is installed, it may need replacing.

NOT ENOUGH HOT WATER (or no hot water)

- **Is the electricity turned on?**
  Check the switch marked 'water heater' at the switchboard and the water heater isolating switch.
  Check the fuse or circuit breaker marked 'water heater'.

WHERE THE WATER HEATER IS CONNECTED TO AN OFF PEAK (NIGHT RATE) ELECTRICAL TARIFF, THE SUPPLY MAY NOT BE AVAILABLE AT CERTAIN TIMES OF THE DAY.

- **Do you have the correct size heater for your requirements?**
  Refer to the sizing guide in the Rheem sales literature or the Rheem website.
- **Is one outlet (especially the shower) using more hot water than you think?**
  Carefully review the family's hot water usage and if necessary, check the shower flow rate.
  For maximum efficiency we recommend the flow rate through the shower is between 8 to 10 litres per minute (mixed hot and cold). This can be achieved by installing a flow control valve if provision is not made to fit a flow restrictor in the shower rose.
- **Ensure the thermostat setting is appropriate. Note, some models require an authorised person to make electrical thermostat adjustments.**

HIGH ELECTRICITY BILLS

- **Consider recent changes to your hot water usage pattern and check if there has been an increase in tariffs since your previous account.**
- **Is either of the expansion valves discharging too much water?**

APPROVED BC190130 03/04/2019 Napier City Council Pg 178 of 207

- **Is one outlet (especially the shower) using more hot water than you think?**
- **Is there a leaking hot water pipe, dripping hot water tap, etc?**
  Even a small leak will waste a surprisingly large quantity of hot water and energy. Replace faulty tap washers, and have your plumber rectify any leaking pipe-work.

INSTALLATION

Please take careful notice of the advice given as Rheem New Zealand Limited will not be liable for any loss or damage suffered as a result of the incorrect installation of the water heater, or any failure to check the capability of the electrical supply wiring to the water heater.
The water heater must be installed by a certified person or registered plumber and the installation must comply with the New Zealand Building Code, Rheem Installation Instructions, AS/NZS 3000 electrical installations and all local codes and regulatory authority requirements. Note that no warranty costs will be payable where the water heater is located in a position that does not comply with the Rheem water heater installation instructions or relevant statutory requirements, where the unit is installed in a position that does not allow safe or ready access, the cost of that access shall not be payable (refer to "Rheem Warranty" on page 7).

- **WATER HEATER LOCATION**
  Water heaters with a galvanised outer casing are only suitable for indoor installations, whereas water heaters with a painted casing are suitable for both indoor and outdoor installations.
  Clearance must be allowed for servicing and removal of the water heater and it must be accessible without the use of a ladder or scaffold. (Typical clearances are: TPR valve removal 135 mm, Element Cover and Element Removal 400 mm). Also, you must be able to read the information on the rating plate and if possible, leave headroom of one water heater length so the anode can be inspected or replaced.
- **CONNECTION SIZES**
  - Hot and Cold water connections: RP *¾ / 20.*
  - Relief valve connection: RP ½ / 15.
- **INLET/OUTLET CONNECTIONS**
  A union must always be provided at the cold water inlet and hot water outlet for disconnection reasons. All connection sockets on the water heater are parallel threaded and therefore tapered brass nipples must be used to ensure watertight connections. Both connections are fitted with plastic liners and it is important that they remain in situ for the water heater to function properly. These liners will be pushed into the correct position as the fitting is being screwed in.
- **NON RETURN VALVE**
  A non return valve must be installed on the cold water line to the water heater.
- **PIPE SIZES**
  The cold water line to the water heater should be the same size or bigger than the hot water line from the water heater. For best results, choose the most suitable pipe size for each individual application.
- **COLD WATER EXPANSION VALVE**
  A cold water expansion valve must be fitted to the cold water line to the water heater.
- **TEMPERATURE AND PRESSURE RELIEF VALVE**
  When fitting the temperature and pressure relief valve, ensure the probe has not been bent. Seal the thread with PTFE tape, or similar, as recommended by the valve manufacturer and screw the valve into the off-centre socket. Do not use a wrench on the valve body – use the spanner flats provided. Drain the TPR valve with a pipe the same size as the valve outlet. The drain must run downwards to a visible point outside the house, preferably over a gully trap.
  In some setups or circumstances, such as if freezing could occur, an air break must be provided in the drain within 300 mm of the TPR valve, refer to the New Zealand Building Code - Clause G12 for requirements and acceptable solutions for the running of hot water drain line(s).

Warning: The drain line from the TPR valve must be in copper. *A Rheem mains pressure water heater must* ***not*** *be installed and operated without a suitable (valve that complies with AS 1357.1) temperature and pressure relief valve. Under no circumstances block the outlet of this valve or its drain pipe.*

- **WATER SUPPLY PRESSURE**
  Maximum permitted mains water pressure - refer product label and Table 5.2 AS/NZS 3500.4. Note inlet pressure control valve is required where maximum permitted mains pressure is likely to be exceeded.
  Minimum inlet pressure: 60 kPa
- **PRESSURE LIMITING/REDUCING VALVE**
  If the water supply pressure exceeds the requirements of Table 5.2 AS/NZS 3500.4, a pressure limiting valve with a maximum setting of 500 kPa is to be fitted in the installation.
- **SAFE TRAY AND SEISMIC RESTRAINTS**
  The water heater must be installed with a properly drained safe tray where there is the possibility of water damage to furniture, carpets or building. All water heaters must be restrained to protect against seismic forces. (Refer to the Zealand Building Code for acceptable solutions.)

APPROVED BC190130 03/04/2019 Napier City Council Pg 179 of 207

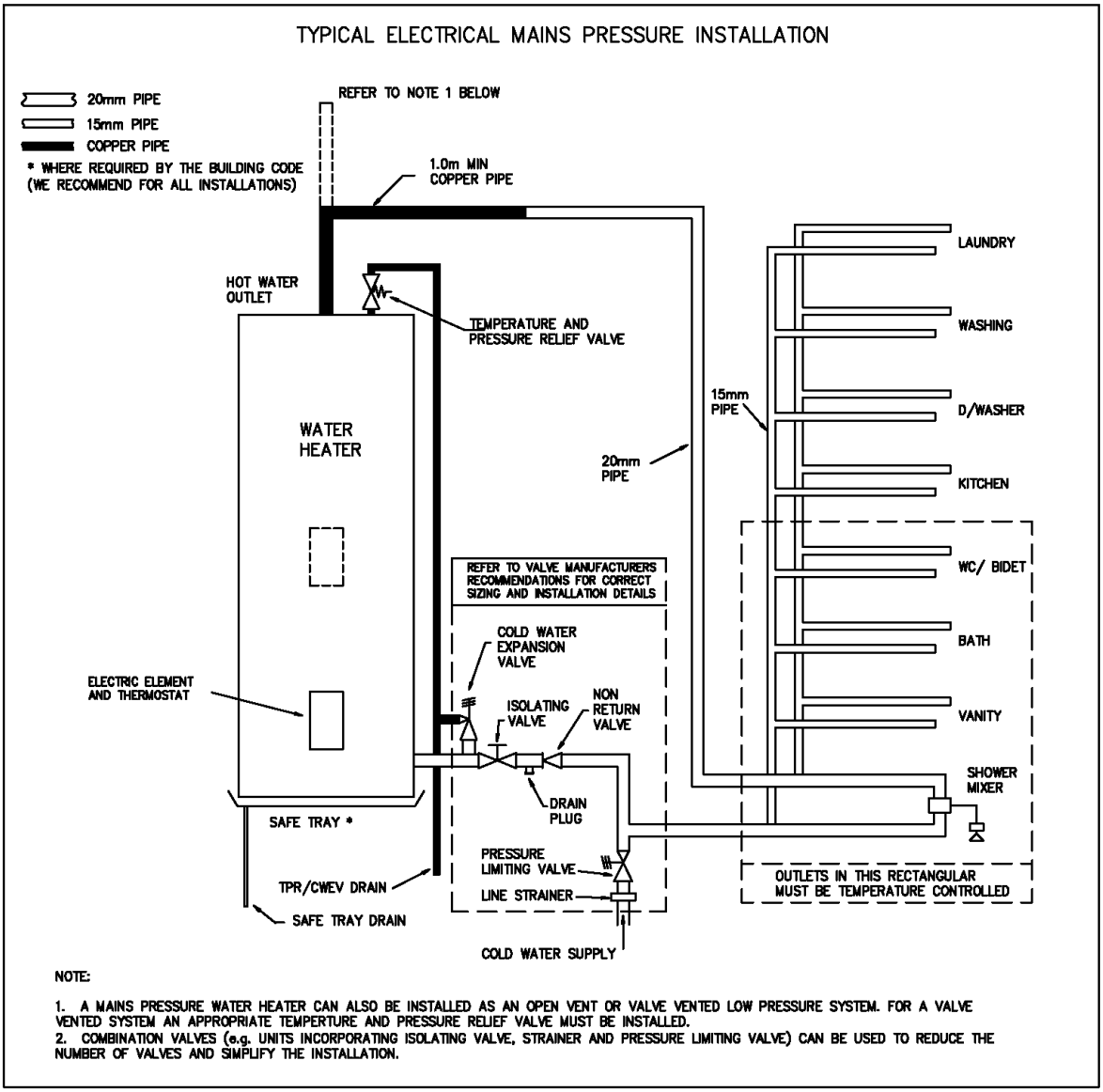


DIAGRAM 2:

CONNECTIONS - ELECTRICAL

The electrical installation must be completed in accordance with AS/NZS 3000. All water heaters are designed for 230 VAC, 50 Hz mains operation and a means of disconnection from the power supply must be incorporated in the fixed wiring during installation.

A flexible 20 mm conduit is required for the electrical cable to the water heater. The conduit is to be connected to the unit with a 20 mm plain to screw adaptor. Connect the power supply wires directly to the terminal block and earth tab connection, ensuring there are no excess wire loops inside the front cover. For details, refer to the wiring diagram on the inside of the element cover. **A separate heating element earth wire is not required because the element earths by the thread of the element boss or the flange being in contact with the element socket.**

COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

⚠ ***Warning:*** *The power supply to the water heater must not be switched on until the water heater is filled with water and an "earth continuity test", as outlined in Annex A of AS/NZS 60335.1 has been carried out. Failure to do so will damage the element and shorten its life and may create a dangerous situation.*

- Open all of the hot water taps in the house (don't forget the shower). Open the cold water isolation valve fully to the water heater to force the air out of the taps. As water flows freely from each tap, close it. Check the pipe-work for leaks.
- Switch on the electrical supply at the isolating switch to the water heater.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater on completion of the installation, such as on a building site or where the premises is vacant, then;

- Switch off the electrical supply at the isolating switch to the water heater.
- Close the cold water isolation valve at the inlet to the water heater.

APPROVED BC190130 03/04/2019 Napier City Council Pg 180 of 207

DRAINING THE WATER HEATER

- Switch off the electrical supply at the isolation switch to the water heater.
- Close the cold water isolation valve.
- Operate the relief valve easing lever to release the pressure in the water heater.
- Drain the water heater through the drain valve or plug.
- Undo the top outlet union or operate the relief valve easing lever again to let air into the water heater and allow the water to drain

WHAT YOU SHOULD KNOW ABOUT WATER QUALITY

WATER SUPPLY CHEMISTRY

Water quality can have a detrimental effect on water heater operation, components and life expectancy and may affect the warranty.

⚠ ***Warning****: This water heater must be installed in accordance with advice given to be covered by the Rheem warranty.*

Your Rheem water heater is manufactured to suit the water condition of most local authority water supplies. However, some water supplies can have a detrimental effect on the water heater and its operation and/or life expectancy. This water heater must only be connected to a water supply which complies with these specifications for the Rheem warranty to apply. If you are unsure of your water chemistry you may be able to obtain information from your local water supply authority or you can contact Rheem and we will provide you with contact details of a suitable agency capable of testing your water for compliance with Rheem standards. Water quality tests must be carried out at the owner's cost.

HARSH WATER AREAS

Rheem water heaters are designed for use in areas where the Total Dissolved Solids (TDS) content of the water supply is less than 2500 mg/L.

In areas where the TDS exceeds 600 mg/L it is possible the standard magnesium anode fitted to the water heater, may be excessively active. To alleviate this, the magnesium anode should be replaced with an aluminium anode. Where the TDS of the water is less than 40 mg/L, such as when the water has been deionised or is from an alpine supply, a high potential anode should be used. The changing of anodes must be carried out by a plumber or qualified service person.

CAUTION

If your water supply has a TDS greater than 600 mg/L and the anode has not been changed, there is a possibility of hydrogen gas accumulating in the top of the water heater during long periods of no use.

If, under these conditions, the water heater has not been used for two or more weeks the following procedure should be carried out before using any electrical appliances (e.g. automatic washing machines and dishwashers) which are connected to the hot water supply.

The hydrogen, which is highly flammable, should be vented safely by opening a hot tap and allowing the water to flow. There should be no smoking or naked flames near the tap whilst it is turned on. Any hydrogen gas will be dissipated as indicated by an unusual spurting of the water from the tap. Once the water runs freely again any hydrogen in the system will have been released.

SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties. In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. When scaling water has a saturation index greater than +0.40 an expansion control valve must be fitted on the cold water line after the non-return valve.

Where the saturation index exceeds +0.80, low watts density elements should be used. Where the saturation index is less than -1.0, a corrosive resistant heating unit should be used (contact your local Rheem Service Department or an authorised service person).

Scaling water is water that containing levels of calcium carbonate (total hardness in excess of 200 mg/litre at any time when the water heater is operating) Scaling water can block and prevent the pressure & temperature relief valve from operating, resulting in damage to the water heater storage cylinder and water components. A cold water expansion control valve must be fitted where in all areas with scaling water to assist in preventing blockage of the pressure and temperature relief valve.

⚠ ***Warning:*** *Failure to install an expansion control valve where scaling water conditions occur may result in the water storage cylinder failing or under certain circumstances over pressurising.*

To avoid damage to the storage cylinder and components Rheem strongly recommends scaling water be treated before entering the water heater by fitting appropriate water filters, conditioners, etc – refer to your local water authority for information on water in your area. A build up of white sediment on the hot taps or shower rose can be indicative of scaling water. Contact Rheem if this condition is observed.

APPROVED BC190130 03/04/2019 Napier City Council Pg 181 of 207

⚠ ***Warning:*** *Damage caused by scaling water can affect the Rheem warranty.*

The Rheem warranty of this water heater will not cover resultant faults on components, including storage tank, due to the effects of sludge and/or sediment as a result of connection to a water supply from silted or untreated sources, i.e. springs, dams, bores, rivers or town supplied from a bore.

WATER HEATERS NOT INSTALLED IN ACCORDANCE WITH THE ABOVE ADVICE WILL NOT BE COVERED BY THE RHEEM WARRANTY.

RHEEM WARRANTY

Mains Pressure Electric Water Heater Product Warranty New Zealand Only

In addition to your legal right, in New Zealand Rheem New Zealand Limited makes the following promise to the owner. We will repair or, if necessary, replace a defective unit or part of it, which has failed due to faulty manufacture on the following terms and conditions:

1. THE RHEEM WARRANTY – GENERAL

1.1 This warranty is given in respect of sales in New Zealand by Rheem New Zealand Limited of 475 Rosebank Road.

1.2 Rheem offer a trained and qualified national service network who will repair or replace components at the address of the unit subject to the terms of the Rheem warranty in New Zealand – contact your Rheem Service Centre on 0800 657 335.

1.3 For details about this warranty, you can contact your Rheem Service Centre in New Zealand on 0800 657 335.

1.4 The terms of this warranty are set out in section 2 and apply to units manufactured after 1st July 2016.

1.5 If a subsequent version of this warranty is published, the terms of that warranty will apply to units manufactured after the date specified in the subsequent version.

2. TERMS OF THE RHEEM WARRANTY AND EXCLUSIONS TO IT

2.1 The decision of whether to repair or replace a faulty component is at Rheem New Zealand Limited's sole discretion.

2.2 Where a failed component or unit is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new Rheem warranty.

2.3 Where the unit is installed outside the boundaries of a metropolitan area, defined by Rheem as further than 25 km from a Rheem service centre, the cost of transport, insurance and travelling between the Rheem service centre and the installed site shall be the owner's responsibility.

2.4 Where the unit is installed in a position that does not allow safe or ready access, the cost of that access, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility. In other words, the cost of dismantling or removing cupboards, doors, walls, roofs or trap doors and the cost of any special equipment to bring the unit to floor or ground level or to a serviceable position is not covered by this warranty.

2.5 This warranty only applies to the original and genuine Rheem unit in its original installed location and any genuine Rheem replacement parts. It does not cover any plumbing, gas fitting or electrical parts supplied by the installer, that are not an integral part of the unit, e.g. pipe-work, pressure limiting valve, stop valves, non-return valves, electrical switches, pumps and fuses.

2.6 The Rheem warranty does not cover faults that are a result of:

a) Accidental damage to the unit or any component, for example Acts of God such as floods, storms, fires, lightning strikes and the like and Third party acts or omissions.

b) Misuse or abnormal use of the unit.

c) Installation or use not in accordance with the Owner's Guide and Installation Instructions, New Zealand Building Code requirements or with relevant statutory and local requirements including failure to install a properly drained safe tray where required by the owners guide and installations.

d) Connection at any time to a water supply that does not comply with the water supply guidelines as outlined in the Owner's Guide and Installation Instructions, or poor water quality outside the limits specified in the owners guide and installation instructions.

e) Repairs, attempts to repair or modifications to the unit by a person other than Rheem Service or a Rheem Accredited Service Technician.

f) Faulty plumbing or faulty power supply.

g) Failure to maintain the unit in accordance with the Owner's Guide and Installation Instructions.

h) Transport damage.

i) Fair wear and tear from adverse conditions (for example, corrosion).

j) Cosmetic defects.

2.7 If you require a call out and we find that the fault is not covered by the Rheem warranty, you are responsible for Rheem Service Centre call out costs. If you wish to have the relevant component repaired or replaced by Rheem that service will be at your cost.

2.8 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims however arising including under contract or tort for damage to furniture, carpet, walls, foundations or any other consequential loss or incidental expenses either directly or indirectly due to leakage from Rheem unit, or due to leakage from fittings and/ or pipe work of metal, plastic or other materials caused by water temperature, workmanship or other modes of failure.

2.9 This warranty excludes to the extent permissible all implied warranties set out in the sale of goods act 1908 (New Zealand) and all guarantees set out in the consumers guarantees act 1933 (New Zealand) to the extent that the goods are acquired for the purpose of resupply in trade consumption in the course of a process of production or manufacture or repairing or treating in trade other goods or fixtures on land.

APPROVED BC190130 03/04/2019 Napier City Council Pg 182 of 207

3. WHAT IS COVERED BY THE RHEEM WARRANTY FOR THE UNITS DETAILED IN THIS DOCUMENT

3.1 The following Warranty terms apply for all Rheem Water Heaters manufactured after 1st June 2018. Rheem will repair or replace a faulty component of your unit if it fails to operate in accordance with its specifications as follows:

Warranty Cover	**The period from date of installation, in which the fault must appear, in order to be covered**		*Domestic use is defined as; when the appliance is installed in a single family domestic dwelling.
What components are covered	**Domestic use***	**Non-domestic use***	**What coverage you receive**
Low & Mains Pressure	**Years**		**(Excludes Optima)
All components	1	1	Repair or replacement of failed component, or if necessary, replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	5	1	Repair or replacement of the complete water heater, free of charge, including labour.
Cylinder only - Vitreous Enamel (Thermostat setting must be below 70°C)	10	3	Repair or replacement of the complete water heater, free of charge. Installation and labour cost are the responsibility of the owner.
Optima	**Years**		
All components	3	1	Repair or replacement of failed component, or if necessary, replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	5	1	Repair or replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	12	5	Repair or replacement of the complete water heater, free of charge. Installation and labour cost are the responsibility of the owner.

4. ENTITLEMENT TO MAKE A CLAIM UNDER THIS WARRANTY

4.1 To be entitled to make a claim under this warranty you need to:

a) Be the owner of the unit or have consent of the owner to act on their behalf.

b) Contact Rheem New Zealand Limited Service Department without undue delay after detection of the defect and, in any event, within the applicable warranty period.

c) Return the faulty component or unit as directed by the Rheem New Zealand Limited Service Department.

4.2 You are **not** entitled to make a claim under this warranty if your unit:

a) Does not have its original serial numbers or rating labels.

b) Is not installed in New Zealand.

5. HOW TO MAKE A CLAIM UNDER THIS WARRANTY

5.1 If you wish to make a claim under this warranty, you need to:

a) Contact Rheem New Zealand on 0800 657 335 and provide owner's details, address of the unit, a contact number and date of installation of the unit or if that's unavailable, the date of manufacture and serial number (from the rating label on the unit).

b) A Rheem service centre will arrange for the unit to be tested and assessed on-site.

c) If Rheem determines that you have a valid warranty claim, Rheem will repair or replace the unit in accordance with this warranty.

5.2 Any expenses incurred in the making of a claim under this warranty will be borne by you.

RHEEM SERVICE DEPARTMENT
475 Rosebank Road, Avondale, Auckland

www.rheem.co.nz

FOR SERVICE TELEPHONE
Phone: 0800 657 335
Fax: 09 829 0222
or refer to your local Yellow Pages under "Plumbers"
for your nearest Rheem Service Centre

APPROVED BC190130 03/04/2019 Napier City Council Pg 183 of 207

CAVIUS™

THE WORLD'S

SMALLEST

smoke alarm

10 YEAR

LONGLIFE BATTERY

PLEASE READ THIS USER GUIDE CAREFULLY

APPROVED BC19013O

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CAVIUS™

Cavius DIY Smoke Alarm
Model 2008-002 / 10012 / 10013 / 10014
Manufactured by CAVIUS

PLEASE READ THE USER GUIDE CAREFULLY BEFORE INSTALLATION AND RETAIN FOR FUTURE USE.

For large text option and maintenance guide visit
www.cavius.co.nz/resources
www.cavius.com.au/resources

APPROVED BC190130

THE WORLD'S

SMALLEST

smoke alarm

The CAVIUS™ is smoke alarm is a photoelectric alarm designed to be installed into residential homes, camper-vans and caravans.

It is not recommended for boats.

CERTIFIED TO AUSTRALIAN STANDARD AS3786:2014

APPROVED BC190130


MOUNTING BASE
CHAMBER FILTER
TEST/HUSH BUTTON
ALARM AUDIBLE ALERT
APPROVED BC190130

The best locations in your home to install the smoke alarm:

- Place a smoke alarm between possible fire sources and bedrooms as a minimum.
- Smoke alarms on each floor, in hallways and stairways.
- Smoke alarms in each room such as bedrooms and living rooms.

Additional smoke alarms will increase the security. The NZ and Australian Fire Services recommend smoke alarms in every bedroom, hallway and living area for early fire detection.

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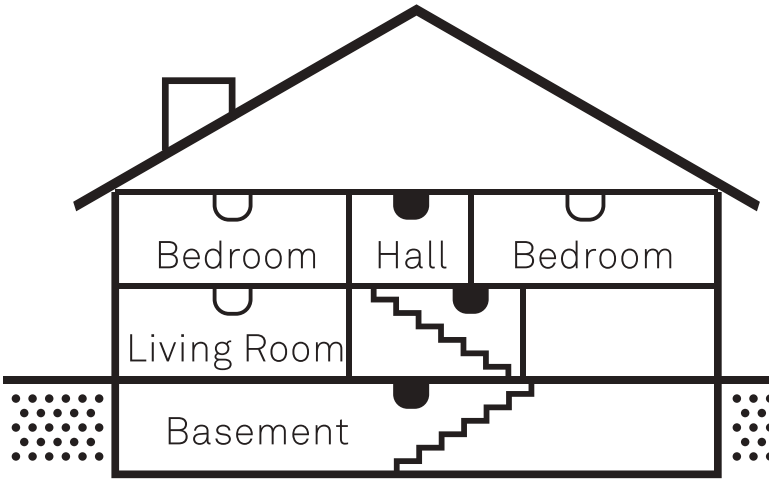
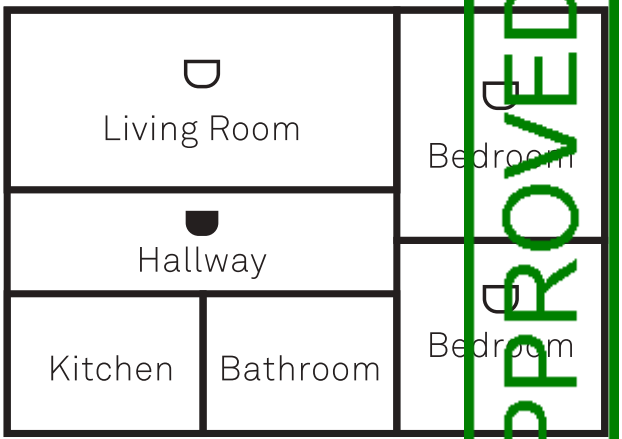


MINIMUM INSTALLATION

OPTIMUM INSTALLATION



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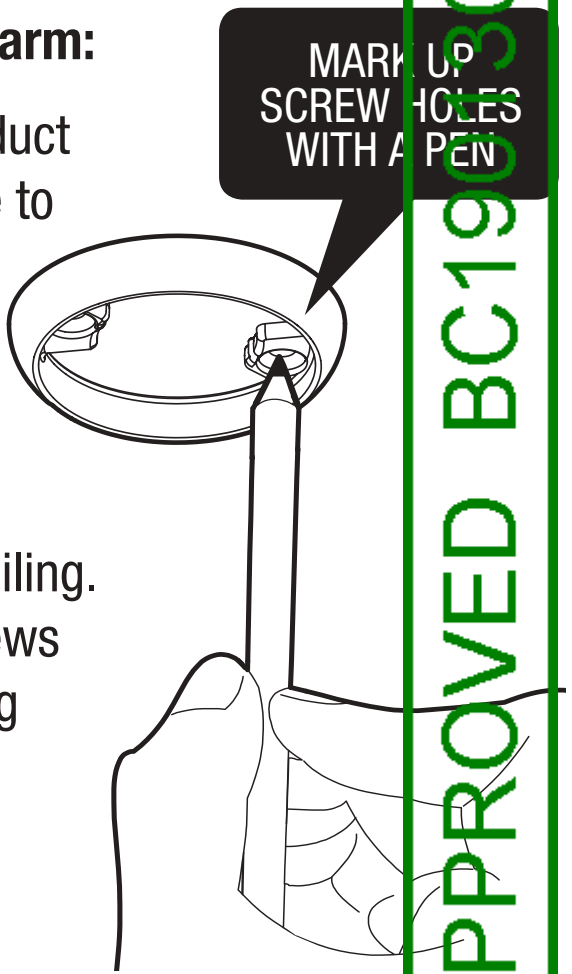
Installation of smoke alarm:

Info: The label in the product must not be removed due to important information regarding the product.

1. Use the mounting base ring to mark the screw holes on the ceiling. Use the enclosed screws and plugs for installing the mounting base.



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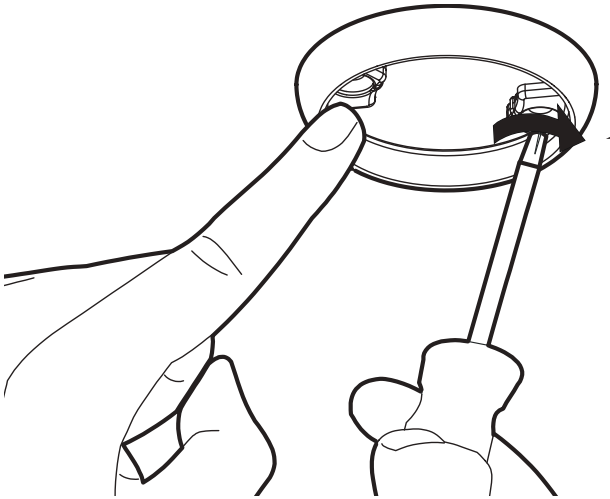
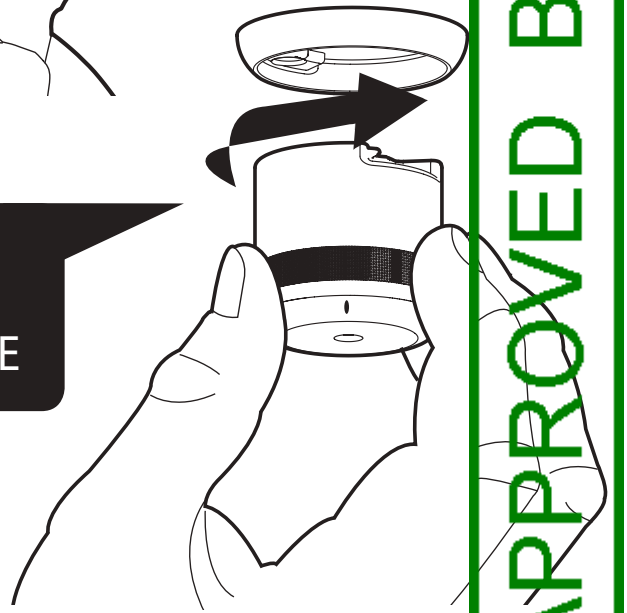


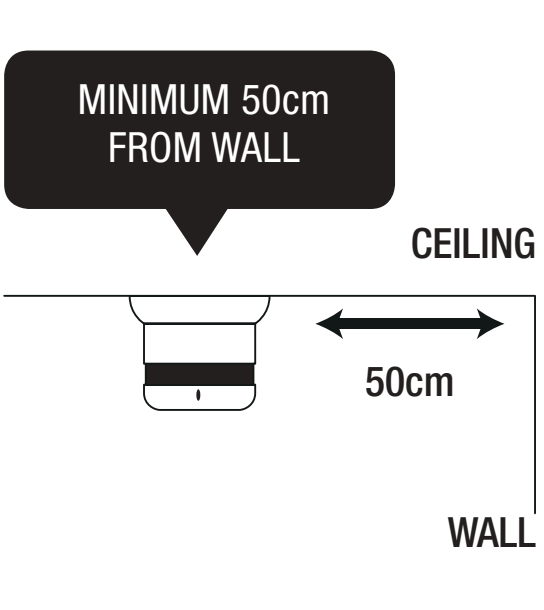
USE THE ENCLOSED SCREWS AND PLUGS FOR INSTALLATION

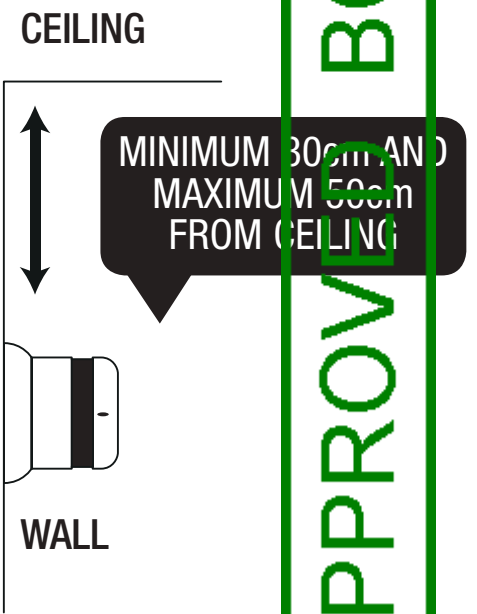


CLICK THE SMOKE ALARM FIRMLY INTO THE BASE TO ACTIVATE

APPROVED BO 30130

Placement: Designed for placement on ceiling (preferred) or wall. The smoke alarm should be a minimum 50 cm from the wall, with a minimum of one smoke alarm per floor and a maximum distance between smoke alarms of 10 metres.





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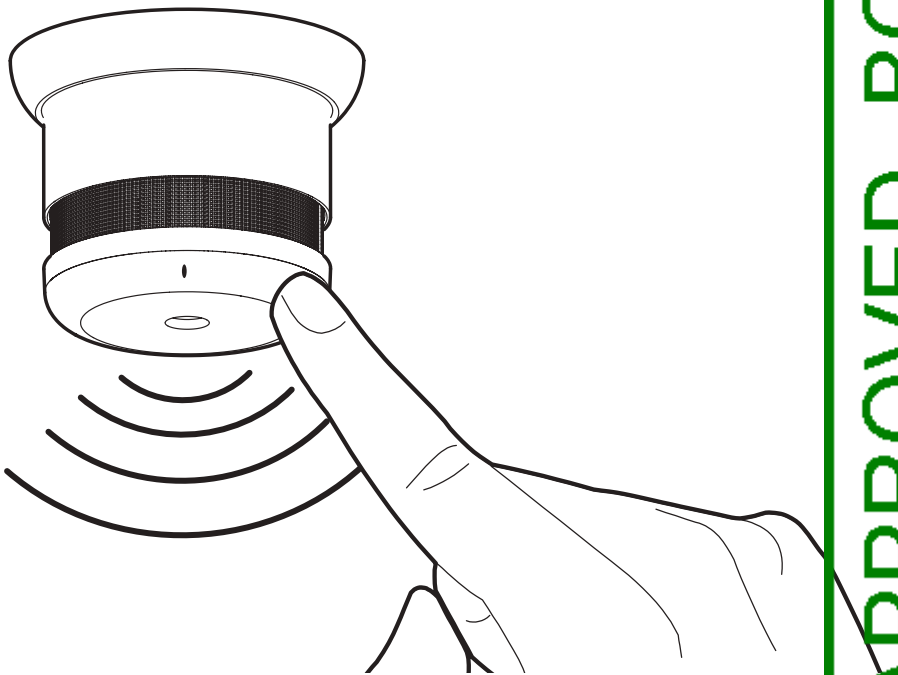
2. After mounting, allow 5 seconds for the alarm to power up and then test the smoke alarm by pushing the test button (which is the entire top of the alarm). The alarm should produce a loud sound



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The smoke alarm may NOT be placed:

- In dusty rooms
- At the top of high pointed ceilings, instead place a minimum of 50cm to a maximum of 150 cms from the appex.
- Within 50cm of a wall.
- In rooms where the temperature goes outside +5º to 45ºC or above 90% relative humidity non condensing.
- In kitchens, garages, or too close to fireplaces. In areas that get damp or where gases may occur.

Place the smoke alarm where it is reachable in order to test the battery and complete maintenance.

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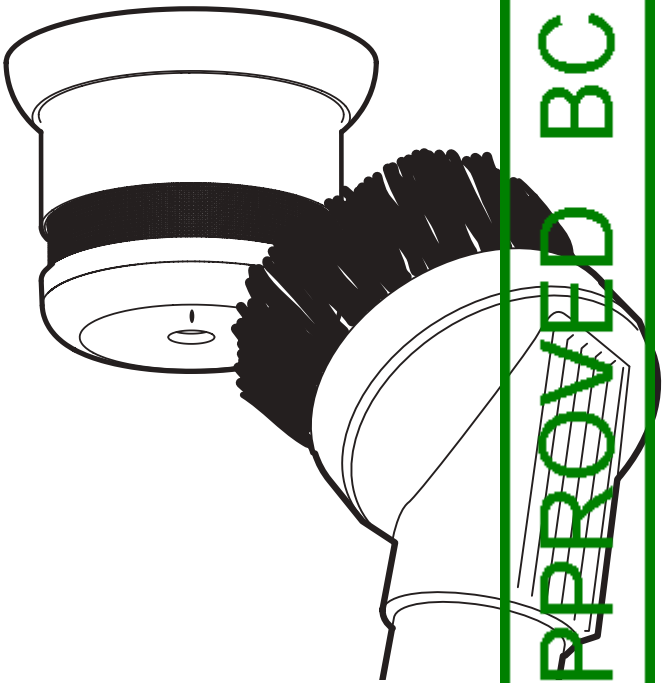
Maintenance: The smoke alarm should be vacuum cleaned once per quarter, and can be wiped with a slightly damp cloth (do not open the alarm).

Test the smoke alarm once per month by pushing the test button.
The smoke alarm should produce a loud alarm tone.



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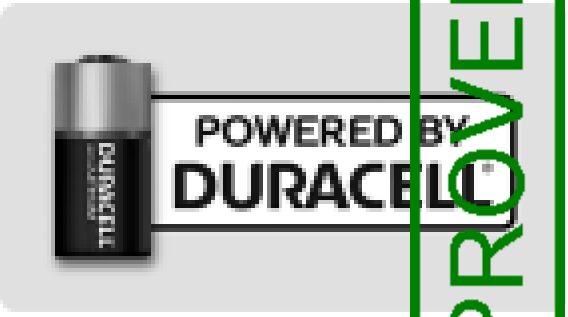
FUNCTIONAL INFORMATION

Type of alarm: CAVIUS™ smoke alarm is a photo electric smoke alarm.

Alarm signal: Fire alarm activation is indicated by a series of repeated tones. The minimum sound level is 85 dB at 3 metres.

Battery: Powered by a non-replaceable 3v CR123 A DURACELL Lithium battery with 10-year life (included).



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Low battery indicator: A short acoustic “beep” will sound and the LED will flash every 48 seconds when the battery is near the end of its life. In this stage it will continue for a minimum of 30 days.

You must change the smoke alarm after 10 years of use, or if the smoke alarm has suffered any damage. The smoke alarm is not active unless it is clicked into the mounting base.

Always test the smoke alarm after clicking into the mounting base, allow 5 seconds before testing.

10YEAR
LONGLIFE BATTERY

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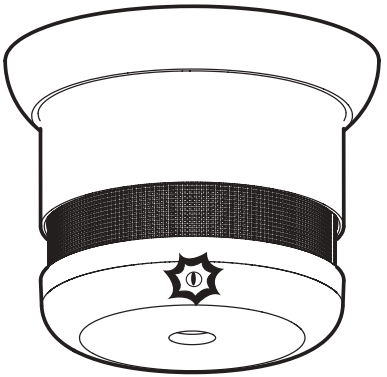
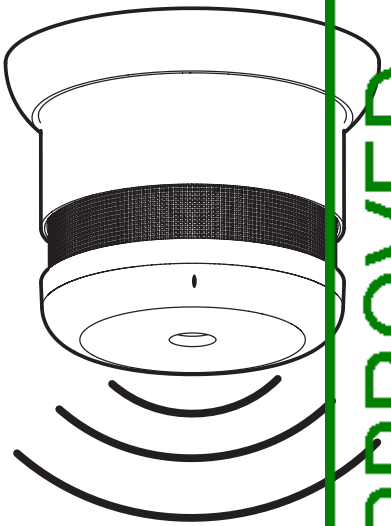
Smoke alarm signal: The smoke alarms have a visual and acoustic signal. In the passive state, the LED will flash every 48 seconds to indicate normal function. In alarming state the LED will flash and the alarm will emit a sweeping sound pattern designed to alert occupants.





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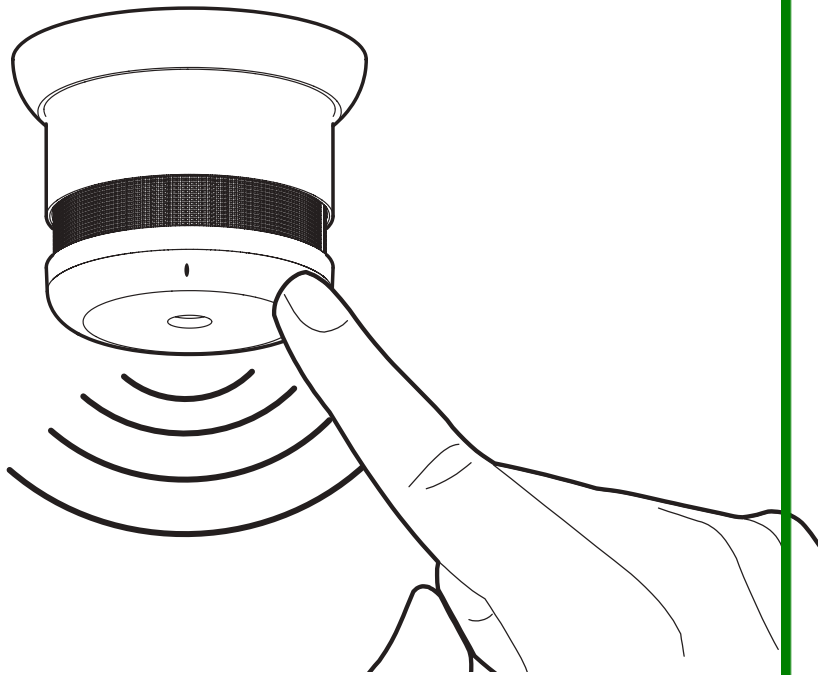
Hush function: In case of unintentional or false alarms, press the hush button for 2 seconds (which is the entire bottom of the alarm). This will mute the alarm for 10 minutes, after which time the alarm will automatically resume its normal function.



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Fault finding: If the smoke alarm activates without a visible smoke or fire presence, then possible causes could be:

- Dust particles which have entered the smoke chamber, these can be removed by vacuuming around the mesh.

If the smoke alarm does not work when the test button is pushed, please check our Trouble Shooting Guides at;
www.cavius.co.nz *and* ***www.cavius.com.au***

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Other information:

- Do not paint the smoke alarm.
- Note the local country regulations regarding installation of mains powered smoke alarms in new buildings.

Disposal: For battery and product, please dispose properly at end of life. This is electronic waste that should be recycled.

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MANUFACTURED BY:
CAVIUS Aps
Julsøvej 16 - DK8600 Silkeborg
www.cavius.com - info@cavius.com
Manufactured in P.R.C.

DISTRIBUTOR INFORMATION:

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Papamoa, Bay Of Plenty 3151, New Zealand.
www.cavius.co.nz
Hotline: 0800 766533 or 07 542 2191

REP ELEC.
Locked Bag 45, Plumpton, NSW 2761, Australia.
www.cavius.com.au - **PH:** 1300 555 586

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Warranty:

Your CAVIUS™ smoke alarm has a 5 year warranty from the date of purchase against defect in material and workmanship. Faulty units during this period can be returned to the place of purchase. You must provide the proof of purchase date and such defects will be repaired, or replaced at the distributors option, without charge. This Warranty only covers defects in materials or workmanship in normal residential use and does not cover damage resulting from negligent handling, misuse or lack of reasonable care. This warranty is in lieu of any other warranty either expressed or implied.

AS3786:2014

Model Number 2008-002 / 10012 / 10013 / 10014

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Product overview:

Type of mounting	☑ Ceiling and Wall Mounting	
Main power supply	☑ Internal power source (battery included)	
Battery duration	☑ 10 years	
Interconnectable device	☐ Yes	☑ No
Suitable for installation in mobile home	☑ Yes	☐ No

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Connection to external auxiliary devices	☐ Yes	☑ No
Radio link	☐ Yes	☑ No
Individual alarm indicator	☑ Yes	☐ No
Alarm silence facility (10min)	☑ Yes	☐ No
No radioactivity infrared technology	☑ Yes	☐ No
Accessibility option	☐ Yes	☑ No

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