

## **SPECIFICATION**

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

# **Palmerston Island New Cyclone Shelter**

## **Architectural**

Palmerston Island, Palmerston Island, Cook Islands

Project Ref: 710471

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# 1239 OPERATION & MAINTENANCE

## 1 GENERAL

This general section relates to operation and maintenance (O&M) documentation as listed in this section, as referred to within the body of this specification, and as referred to within separate specifications/documents relating to this project. This documentation is required by the principal so that they can operate and maintain the contract works.

### Operation and maintenance documents

#### 1.1 OPERATION AND MAINTENANCE INFORMATION

Provide operation and maintenance documentation necessary to operate and maintain the works. This documentation is to include:

- Contractors name and contact details.
- A complete list of subcontractors' names, addresses and telephone numbers noting which portions of the contract each provided.
- A complete list of equipment and appliances including serial numbers, manufacturers' names and sources of supply.
- Copies of all manufacturers' and suppliers' product literature containing maintenance requirements/instructions, for any products in the building work.
- Information for operation and maintenance as required by work sections. Refer to SCHEDULES.
- Operation and maintenance manuals as required by work sections. Refer to SCHEDULES.
- Maintenance contract proposals as required by work sections. Refer to SCHEDULES.
- Final as built documents.
- Originals of all warranties and guarantees properly executed.
- Other information listed or referred to in this general section.
- Operation and maintenance information required by other project documents.

#### 1.2 MAINTENANCE REQUIREMENTS

Provide details of any maintenance requirements required by the Building Act. In addition provide maintenance requirements for items including:

- Details of suggested building washing programme.
- Details of suggested re-painting programme.
- Location of flushing points for sub soil drainage systems.
- Location of surface water filter systems requiring regular cleaning.
- Overflow relief gully location and means of keeping charged.

#### 1.3 EQUIPMENT AND APPLIANCE MANUALS AND OPERATING INSTRUCTIONS

Provide equipment and appliance manuals and operating information including details of all isolating valves and switches.

#### 1.4 SELECTIONS INFORMATION

Provide details of actual selections used in the construction of the works including:

- Tapware type and supplier details.
- Sanitary ware including accessories type and supplier details.
- Light fitting type and supplier details.
- Door hardware type and supplier details.
- Carpet type and colour including underlay and the supplier details.
- Vinyl flooring type and colour including supplier details.
- Overlay timber floor type and supplier details.
- Tile type and supplier details.
- Fire supplier details.
- Aluminium joinery system and finish.
- Paint type and colours used.

Include brochures and other information included with the items supplied.

#### 1.5 SELECTIONS INFORMATION - SUBSTITUTIONS

Provide details of any selections used in the construction of the works that are different from what was specified.

### Documentation format

## 1.6 O&M DOCUMENTATION FORMAT

Unless otherwise specified in a work section,

- Provide O&M drawings at scales appropriate to the detail to enable good legibility.
- Provide manufacturers documentation at the original scale.
- Provide written text generally in A4 format using a font not less than 10 point.

Submit O&M documentation in both hard copy and as electronic portable document format (PDF) files.

### **Submission and review**

## 1.7 O&M DOCUMENTATION SUBMISSION & REVIEW

Unless otherwise specified in a work section, provide draft O&M documentation no later than the date of practical completion or the date on which the principal takes occupation of the works, whichever occurs first.

Submit O&M documentation to the named reviewer for review.

- Where no time is stated in a specific section, allow 10 working days for review by the reviewer. Where a large amount of documentation is involved more time will be necessary.
- Where no person is named in a specific section as the reviewer, submit the O&M documents to the contract administrator.
- Submit a proposed index system (as required for final documentation) to the contract administrator for review.

O&M review indicates only that the reviewer is satisfied that the documents are legible. The review is not a check of the accuracy of the documents, however the reviewer may comment on any aspect of the documentation and require the documents to be revised and resubmitted. Review of operation and maintenance documentation does not relieve the contractor of responsibility for the correctness of the documentation.

The reviewer may advise that:

- The O&M documentation has been reviewed and has been accepted without the need for further modification. The information can be included in the final documentation; or
- The O&M documentation has been reviewed and the information can be included in the final documentation subject to revision required by notes, annotations or comments provided; or
- The O&M documentation has been reviewed and is not acceptable, refer to notes, annotations or comments provided. Resubmit corrected/altered documentation for review.

Amalgamate the reviewed accepted and corrected O&M documentation into the final O&M documentation

### **Final documentation**

## 1.8 SUBMISSION OF FINAL DOCUMENTATION

Prior to the end of the defects notification/liability period, provide complete O&M documentation in both hardcopy and electronic form.

## 1.9 FINAL O&M DOCUMENTATION - HARDCOPY

Provide the hard copy version of the O&M documentation in a loose-leaf binder with a contents index identifying operation and maintenance documents, requirements, manuals, operating instructions and selections. In addition include the project name, contractor's name and the date of practical completion on the index page.

Include indexed sections to identify all operation and maintenance manuals that are not contained within the binder. Provide a copy of the front cover or other identifying feature of the manual within the section with a note stating "this manual has been provided separately".

Provide a title on the binder edge "Operation and maintenance instructions for (project name)". If more than one binder is required identify each binder by number and ranking (e.g. Volume 2 of 3) and group information logically between the binders for ease of reference.

Provide operation and maintenance manuals clearly and neatly marked on the spine or front cover so as to identify the project name. Where operation and maintenance manuals are a collection of loose leaf documentation, provide documentation in a loose-leaf binder as described above.

## 1.10 FINAL O&M INFORMATION - ELECTRONIC COPY

Provide a copy of all hardcopy information in PDF format arranged in logical named folders. In addition provide DWG files of documentation if available.

#### 1.11 REVIEW OF FINAL DOCUMENTATION

The contract administrator may review the final documentation and require alteration and resubmission.

## 2 SELECTIONS

### O&M Documentation

#### 2.1 FINAL DOCUMENTATION - INFORMATION FOR OPERATION AND MAINTENANCE

Provide a complete electronic copy to the contract administrator.

Provide two hardcopy sets of completed O&M documentation to the contract administrator. At least one set is to contain all available original documentation. The contractor is to retain a third hardcopy set for their records.

Provide any documentation (including required original documentation) as required to the relevant territorial authority.

#### 2.2 FINAL DOCUMENTATION - OPERATION AND MAINTENANCE MANUALS

Provide a complete electronic copy to the contract administrator.

Provide two hardcopy sets of completed maintenance manuals to the contract administrator. At least one set is to contain all available original documentation. The contractor is to retain a third hardcopy set for their records.

Provide any documentation (including required original documentation) as required to the relevant territorial authority.

### Maintenance contract proposals

#### 2.3 MAINTENANCE CONTRACT PROPOSALS

Unless otherwise specified in a work section, provide maintenance contract proposals to the contract administrator no later than the date of Practical Completion. Provide in electronic and hardcopy form.

## 3 SCHEDULES

#### 3.1 SCHEDULE OF INFORMATION FOR OPERATION AND MAINTENANCE

The following work sections have information for operation and maintenance requirements; refer to these sections for details:

4239JH	James Hardie Soffits
6700R	Resene Painting General

# 4161T THERMAKRAFT UNDERLAYS, FOILS & DPC

## 1 GENERAL

This section relates to the application of **Thermakraft Ltd**, DPC, DPM, underfloor foil insulation, wall underlays, roofing underlays and accessories.

### 1.1 RELATED WORK

Refer to 4311SC Steel & Tube Metal Commercial Roofing for Roofing

### 1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

NZMRM                      New Zealand Metal Roofing Manufacturers Inc.

The following definitions apply specifically to this section:

Wall underlay              the same meaning as defined in [NZBC E2/AS1](#), covering kraft based and synthetic wall underlays, sometimes called, wall wraps, building wraps or building papers.

### Documents

### 1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[NZBC C/AS1-AS7](#)              Protection from fire

[NZBC E2/AS1](#)                External moisture

AS 1530.2                    Methods for fire tests on building materials, components and structures - Test for flammability of materials

[NZS 2295](#)                      Pliable, permeable building underlays

[AS/NZS 2904](#)                Damp-proof courses and flashings

[NZS 4214](#)                    Methods of determining the total thermal resistance of parts of buildings

[AS/NZS 4389](#)                Roof safety mesh

[AS/NZS 4534](#)                Zinc and zinc/aluminium-alloy coatings on steel wire

[NZMRM CoP](#)                NZ metal roof and wall cladding Code of Practice

### 1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Thermakraft documents relating to work in this section are:

Thermakraft product manual and technical data sheets.

[BRANZ Appraisal 329](#) - Supercourse 500™ Damp-Proof Course and Concealed Flashing

[BRANZ Appraisal 651](#) - Thermakraft Covertex™ 407 Fire Retardant Self-Supporting Roof Underlay

[Code Mark Certificate 30028](#) - Thermakraft Covertex 407™ Absorbent Breathable Roof Underlay

Manufacturer/supplier contact details

Company:                      Thermakraft Ltd

Web:                            [www.thermakraft.co.nz](http://www.thermakraft.co.nz)

Email:                          info@thermakraft.co.nz

Telephone:                    0800 806 595

### Warranties

### 1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against failure of materials and execution. **Thermakraft Ltd** warrant performance of products if design and installation complies with relevant technical literature, NZBC, and recognised industry Codes of Practice. Copy of **Thermakraft™** Product Warranty available on request.

## Requirements

### 1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified materials, or associated products, components or accessories.

### 1.7 INSTALLATION SKILL LEVELS

Installers to be experienced in the installation of **Thermakraft™** products and familiar with **Thermakraft™** technical literature and the related documents listed in this design i.e. [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice.

## 2 PRODUCTS

### Materials

#### DPC

### 2.1 EMBOSSSED POLYETHYLENE

Supercourse 500™ hi-impact polyethylene film to [AS/NZS 2904](#) and embossed on both sides. Thickness 500 microns minimum, manufactured for use as a damp-proof course and concealed flashings around doors and windows and to [BRANZ Appraisal 329](#). Refer to SELECTIONS for type of jointing tape.

#### DPM

### 2.2 DAMP-PROOF MEMBRANE - MEDIUM DUTY, BLACK

Thermathene Black™, a minimum of 250 microns polyethylene film. Complies with [NZS 3604](#), 7.5.4, Damp-proof Membrane, to [NZBC E2/AS1](#). Refer to SELECTIONS for type of jointing tape.

### Roofing underlays

### 2.3 SYNTHETIC FIRE RETARDANT SELF SUPPORTING NON-WOVEN ROOFING UNDERLAY

CoverTek™ 407, a fire retardant non-woven self-supporting roofing underlay, consisting of two spun-bonded polyolefin fabric layers bonded to a micro porous inner layer, designed for use as a water absorbent, breathable, water resistant roofing underlay for sloped roofs. CoverTek™ 407 has a flammability index of ≤ 5, tested to AS 1530.2, to [NZBC C/AS1-AS7](#), meets the requirements for suspended fabrics, [BRANZ Appraisal 651](#) and [Code Mark Certificate 30028](#). Can be used in areas exposed to view in occupied spaces.

### Accessories

### 2.4 MULTI-FIT SEALS FOR UNDERLAY PENETRATIONS

Thermakraft™ Multi-Fit seals are a UV resistant EPDM material which forms a weathertight air seal for pipes and penetrations with a high strength acrylic adhesive suitable for use on all underlay systems. Available for use with pipes 15-110mm and cables 7-22mm both are pre-punched ensuring a tight accurate fit. No special tools required for installation.

### 2.5 WIRE NETTING

75mm galvanized hexagonal wire netting to [AS/NZS 4534](#).

### 2.6 TAPE

Thermakraft™ tapes to compliment the underlay. Pressure sensitive aluminium foil tapes for joining foil insulation and vapour barriers. These include:

- Thermakraft™ White General Purpose Underlay Tape
- Thermakraft™ Foil Tape 150
- Thermakraft™ Window Sealing Tapes, used to repair damaged bituminous underlays

## 3 EXECUTION

## Conditions

### 3.1 GENERAL REQUIREMENTS

Design application and installation of **Thermakraft** Building products to [NZBC E2/AS1](#), BRANZ Appraisals, **Thermakraft** Technical Literature and Industry Codes of Practice.

### 3.2 STORAGE

Store building underlays and accessory materials, under conditions that ensure no deterioration or damage. Store rolls in an upright position on a smooth floor and protected from sunlight, UV radiation and moisture.

### 3.3 INSPECTION

Before starting work, check that the building construction phase will allow work of the required standard. Carry out remedial work identified before laying underlay.

## Application DPC

### 3.4 DPC TO LOSP/CCA TREATED TIMBER

Lay Supercourse 500™ DPC under LOSP or CCA treated bottom plate of all timber framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

### 3.5 DPC TO TIMBER / STEEL

Lay Supercourse 500™ DPC under the bottom plate of all timber / steel framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier. Refer to SELECTIONS for type.

### 3.6 DPC TO MASONRY AND BRICK VENEER

Lay Supercourse 500™ DPC along base of cavity and fix top edge to studs with galvanized clouts. Turn DPC out over concrete rebate under bottom course of veneer.

## Application - DPM

### 3.7 DPM TO CONCRETE FLOOR

Lay DPM under concrete floor substrate over sand blinding, in a single layer with 150mm overlaps at joints to provide a waterproof barrier. Refer to SELECTIONS for type. Tape all joints and penetrations with **Thermakraft**™ White GP underlay tape.

## Application - roofing underlay

### 3.8 WIRE NETTING

Lay 75mm galvanized wire netting at right angles across the purlins and drawn taut before fixing. Tie edges of netting together with galvanized wire clips.

### 3.9 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixing clips. Lay underlay to avoid excessive dishing between purlins. When used vertically, limit individual runs to 10 metres for bituminous underlays. Do not lay vertically on roof pitches under 10° without support.

Lay horizontally across the rafter/trusses starting at the gutter line with succeeding sheets in true alignment and lapping 150mm. Scribe around and fit neatly to all penetrations. Avoid prolonged exposure by installing the roof immediately.

## Application - commercial roof underlays

### 3.10 ROOF UNDERLAY INSTALLATION

Apply from the lowest point to allow laps to shed water. All edge and end laps must be overlapped by a minimum of 150mm. Ensure that the underlay is properly fixed to the surface at perimeters or around penetrations.

## Completion

### 3.11 CLEAN UP

Clean up as the work proceeds.

3.12 LEAVE  
Leave work to the standard required by following procedures.

3.13 REMOVE  
Remove debris, unused materials and elements from the site.

## 4 SELECTIONS

For further details on selections go to [www.thermakraft.co.nz](http://www.thermakraft.co.nz).  
Substitutions are not permitted to the following, unless stated otherwise.

### Damp Proof Course

#### 4.1 THERMAKRAFT - SUPERCOURSE 500™ DPC

Location: under all timber bottom plates supported by concrete floors  
Type: Supercourse 500™ DPC  
Jointing tape: Thermakraft™ window sill tape 75mm Aluband™

### Damp Proof Membrane

#### 4.2 THERMATHENE BLACK™

Location: under ground floor slab  
Type: Thermathene Black™  
Jointing tape: Thermakraft™ White General Purpose Underlay Tape

### Roofing Underlays

#### 4.3 COVERTEK ROOFING UNDERLAYS

Location: under roofing iron  
Type: CoverTek™ 407 fire retardant non-woven roofing underlay  
Jointing tape: Thermakraft™ window sill tape 75mm Aluband™

### Wire Netting

#### 4.4 WIRE NETTING

Location: under roof insulation  
Type: Suitable plastic or plastic coated netting (Zone D and Zone E)

# 4239JH JAMES HARDIE SOFFITS

## 1 GENERAL

This section relates to the supply and fixing of James Hardie products to the underside of exterior soffits, verges and eaves. It includes:

- James Hardie HardieFlex™ Eaves Lining

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind actions
<a href="#">AS/NZS 2908.2</a>	Cellulose-cement products - Flat sheet
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3604</a>	Timber-framed buildings
NASH Standard	Residential and low-rise steel framing Part 1: Design Criteria

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie documents relating to this part of the work:  
James Hardie® Eaves and Soffits Installation Manual  
James Hardie Fire and Acoustic Design Manual.

Manufacturer/supplier contact details

Company:	James Hardie New Zealand
Web:	<a href="http://www.jameshardie.co.nz">www.jameshardie.co.nz</a>
Email:	<a href="mailto:info@jameshardie.co.nz">info@jameshardie.co.nz</a>
Telephone:	0800 808 868

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years: For James Hardie™ **HardieFlex**.  
(refer to James Hardie™ product warranty)

15 year: For accessories supplied by James Hardie (refer to James Hardie™ product warranty)

From: Date of purchase

- Provide this warranty on the manufacturer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

#### 1.4 QUALIFICATIONS

Workers / Installers / applicators to be experienced, competent trades people familiar with the materials and techniques specified.

#### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

#### 1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Provide relevant James Hardie maintenance requirements at completion of the work.

### Performance

#### 1.7 PERFORMANCE - SPECIFIC DESIGN - WIND

The design wind pressures are to [AS/NZS 1170.2](#), for specific design wind zone (beyond Extra High Wind Zone). Only specifically designed or approved details included in the Contract Documents can be used.

## 2 PRODUCTS

### Materials

#### 2.1 HARDIEFLEX™ EAVES LINING

James Hardie HardieFlex® Eaves Lining 4.5mm and 6mm thick cellulose fibre reinforced cement sheet. Manufactured to AS/NZS 2908.2 from Portland cement, ground sand, cellulose fibre and water.

### Components

#### 2.2 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to [NZBC E2/AS1](#), Table 20, Material selection for fixing material, and [NZBC E2/AS1](#), Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Fixing	Fixing Material	Zone
Screw	Stainless steel	B, C, D, E

Check against SED (specific engineering design) requirements for microclimate conditions. Refer to SELECTIONS for fastener type.

#### 2.3 COMPONENTS - HARDIEFLEX™ EAVES LINING

#### 2.4 SOFFIT JOINTERS AND MOULDS

Extruded uPVC jointer, capping and scotia mould.

#### 2.5 POLYPROPYLENE TAPE

Polypropylene tape, 30mm minimum width. Used for butt joints.

#### 2.6 FASTENER

HardieDrive Screw, 316 stainless steel, 30mm x 7g

#### 2.7 SEALER

Inseal® 3259, 1.5mm thick x 50mm wide black compressible medium density closed cell foam tape. Used for expressed joints.

#### 2.8 JOINT REINFORCING TAPE

Polypropylene tape, 30mm minimum width. Used for Butt joints.

### Components - General

#### 2.9 FLEXIBLE JOINT SEALANT

Refer to SELECTIONS.

## 3 EXECUTION

### Conditions

#### 3.1 STORAGE

Take delivery of products dry and undamaged. Store on-site, lay flat on a smooth level surface clear of the ground. Protect materials, finished surfaces, edges and corners from damage, water and moisture.

#### 3.2 HANDLING

Move/handle goods in accordance with James Hardie requirements. Avoid distortion and contact with potentially damaging surfaces. Do not drag sheets across each other, or across other materials. Protect edges, corner and surface finish from damage. Reject and replace goods that are damaged or will not provide the required finish. Install materials in a dry state.

**3.3 SUBSTRATE - TIMBER FRAMING**

Do not commence work until the substrate is of the standard required for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by [NZS 3602](#) to minimise shrinkage and movement after sheets are fixed.

**3.4 COMMENCE WORK**

Do not commence work until the roof has been installed.

**Application - general****3.5 SHEET LAYOUT**

All sheet edges must be fully supported by framing or rebates in fascia and barge boards.

**3.6 OFFSET PATTERN SHEET LAYOUT**

All sheet edges must be fully supported by framing or rebates in fascia and barge board. Sheets must be laid in an offset pattern so that adjacent end joints do not coincide.

**3.7 CUTTING SOFFIT CLADDING**

Cut sheets dry using score and snap method, hand guillotine method or fibreshear heavy duty method. If these methods are not feasible, use an alternative manufacturer approved method.

**3.8 CIRCULAR HOLE FORMING**

Mark the centre of the hole on the sheet, pre-drill a pilot hole. Use the pilot hole as a guide for a hole saw fitted to a heavy duty electric drill.

**3.9 IRREGULAR HOLE FORMING**

Drill a series of small holes around the perimeter of the proposed hole, tap out the waste piece from the sheet face.

**3.10 SEAL EDGES**

Seal Villaboard® Soffit Lining sheet edges with Multiplast Resin in a diluted form prior to flush stopping.

**3.11 BUTT JOINT**

Paint sheet edges prior to installation.

**3.12 CONTROL JOINT**

Install control joint to James Hardie installation manual requirements.

**3.13 FASTENER - SIZE AND LAYOUT**

Fix sheets to framing using fasteners as nominated in SELECTIONS. Fix to James Hardie installation manual requirements.

**3.14 SEALANTS**

Application and use of sealants to manufacturer's instructions. Check with sealant manufacturer prior to coating over sealants.

**3.15 FINISHING OVER DRIVEN FASTENERS**

Fill over driven fasteners with James Hardie Base Coat to the required level of finish.

**3.16 PAINTING**

Refer to painting section/s for protective coating system.

**Completion****3.17 COMPLETE**

Ensure the work is complete with all components, accessories, trim, sealant and finishing properly installed so the soffit cladding system is completely weathertight.

**3.18 REPLACE**

Replace all damaged or marked elements.

**3.19 CLEAN**

Clean surfaces.

3.20 LEAVE  
Leave work to the standard required for following procedures.

3.21 REMOVE  
Remove debris, unused materials and elements from the site.

#### 4 SELECTIONS

For further details on selections go to [www.jameshardie.co.nz](http://www.jameshardie.co.nz)  
Substitutions are not permitted to the following, unless stated otherwise.

##### Materials

#### 4.1 HARDIEFLEX™ EAVES LINING

Location: Brand/type: James Hardie HardieFlex®;trade;  
Eaves Lining Thickness: 6mm  
Width: 600mm  
Fixing Method: Hardie drive Screw  
Fixing type: Stainless steel Fastfix fastener and Sikaflex-11FC Sika adhesive  
Joint detail: Butt joint with 30mm wide polypropylene or flashing tape (1mm gap)

##### Painting

#### 4.2 PAINTING

Refer to painting section/s for details.

# 4311SC STEEL & TUBE PROFILED METAL COMMERCIAL ROOFING

## 1 GENERAL

This section relates to the supply and fixing of **Steel & Tube®** profiled metal roofing for commercial and industrial buildings, complete with accessories.

It includes:

Custom Orb

### 1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays, foils and DPC.

### 1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc.
LBP	Licensed Building Practitioner

### Documents

### 1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
NZBC G12/AS1	Water Supplies
AS/NZS 1170.2	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
NZS 2295	Pliable, permeable building underlays
NZS 3403	Hot-dip galvanised corrugated steel sheet for building purposes
AS/NZS 2728	Pre-finished/pre-painted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays - Materials
AS/NZS 4200.2	Pliable building membranes and underlays - Installation requirements
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

### 1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

**Steel & Tube®** literature, including:

Product Guide

Product Technical Statements

Design Guide

NZ Steel: Specifiers and Builders Guide

NZ Steel: Installers Guide

Copies of the above literature are available from **Steel & Tube®**

Web: [www.steelandtube.co.nz](http://www.steelandtube.co.nz)

Email: [info@steelandtube.co.nz](mailto:info@steelandtube.co.nz)

Telephone: Freephone 0800 333 247

### Warranties

### 1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty in accordance with published supplier's guidance on materials, environments and building types:

15 years minimum	For perforation
15 years minimum	For coatings

Warranty period and conditions for Colorcote® coatings are product specific and dependent on the project location and exposure zone. Obtain confirmation of warranty details from Pacific Coilcoaters web site [www.colorcote.co.nz/about-us/warranties](http://www.colorcote.co.nz/about-us/warranties)

Provide warranties in **Steel & Tube®** standard **Warranty Plus** format.  
Refer to the general section 1237 WARRANTIES for additional requirements.

#### 1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

Warrant this work under normal environmental and use conditions against weatherproofing failure.

- |          |                                  |
|----------|----------------------------------|
| 5 years: | For workmanship                  |
| Form:    | Roofing installers standard form |
- Provide warranties in **Steel & Tube®** standard **Warranty Plus** format.
- Commence the warranty from the date of installation.

Include a copy of the **Steel & Tube®** maintenance requirements with the warranty.  
Refer to the general section 1237 WARRANTIES - INSTALLER/APPLICATOR for additional requirements.

#### Requirements

#### 1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Steel & Tube®** products, or associated components and products.

#### 1.8 QUALIFICATIONS

Roofers to be **Steel & Tube®** Approved Installers. A list of approved installers can be obtained from the **Steel & Tube®** website, by telephone or from the local **Steel & Tube®** sales office.

Web: [www.steelandtube.co.nz](http://www.steelandtube.co.nz)  
Email: [info@steelandtube.co.nz](mailto:info@steelandtube.co.nz)  
Telephone: Freephone 0800 427 663

#### Compliance information

#### 1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer's, importer's or distributors warranty
- Installer's warranty
- Producer Statement - Construction from the installer
- Other information required by the BCA in the Building Consent Approval documents.

#### Performance - Wind

#### 1.10 DESIGN PARAMETERS - SPECIFIC DESIGN

The design wind pressures are to [AS/NZS 1170.2](#).  
Refer to roof plan/s.

#### 1.11 FIXINGS, WIND

Design and use the fixings/fixing pattern appropriate for the wind design parameters and [NZMRM CoPNZ](#) 'Metal Roof and Wall Cladding Code of Practice'. Refer to **Steel & Tube®** 'Product Technical Statements' for the selected profile. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Fixing pattern to also take into account fixing method and purlin spacing.

#### Performance - General

#### 1.12 PERFORMANCE

Install roofing material and associated flashings and accessories in accordance with the [NZMRM CoP](#) NZ 'Metal Roof and Wall Cladding Code of Practice' to form a weather tight and durable roofing system, including all penetrations through the roof and junctions with walls and parapets.

#### 1.13 DRINKING WATER

Roofing for collecting potable water to NZBCG12/AS1.

#### 1.14 CO-ORDINATE

Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof. Ensure that all necessary members are positioned so that flashing can be fastened at both edges through the roof profile or cladding to the primary structure.

## 2 PRODUCTS

### Materials

#### 2.1

PRE-FINISHED ALUMINIUM 5005 OR 5052 ALLOY H34 OR H36 TEMPER FOR ROLL FORMING TO SUIT APPLICATION

5005 or 5052 alloy H34 or H36 temper for roll forming to suit application.

### FIXINGS

#### 2.2 FASTENERS GENERALLY

Fixings and fasteners are to be compatible with all materials, the environment and meeting the requirements of the NZ Building Code. Installation is to be in accordance with [NZBC E2/AS1](#) and/or the NZ 'Metal Roof and Wall Cladding - Code of Practice'. Minimum Category 4 and durability not less than the roofing material being fixed. Screw fasteners to be head stamped identifying the manufacturer and class.

#### 2.3 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by the roofing manufacturer and with a minimum Category 4 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 30mm.

#### 2.4 RIVETS

Sealed aluminium, minimum diameter 4mm, for use with zinc coated, zinc/aluminium coated or aluminium roofing.

### Components

#### 2.5 FLASHINGS GENERALLY

To E2/AS1, 4.0, **Flashings**.

Grade 0.55mm BMT for galvanized, aluminium/zinc-coated and pre-painted steel, and 0.90mm for aluminium (or 0.70mm for small aluminium flashings) to the same standards as the profiled sheets, notched where across profile or provided with a soft edge. Where flashings are required but are not detailed, design to **Steel & Tube®** approved recommendations and designs.

#### 2.6 FLASHINGS TO VERGE, RIDGE AND HIP

To E2/AS1, 4.0, **Flashings**.

Supplied by the roofing manufacturer to match or to suit the roofing.

#### 2.7 BOOT FLASHINGS

EPDM proprietary pipe flashing laid on 45° bias to roofing, with over-flashing (soaker flashing) if required.

A boot flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided use an over-flashing back to the ridge and fix the boot flashing to that.

### Accessories

#### 2.8 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

**2.9 UNDERLAY AND REFLECTIVE FOIL**

Refer to 4161 UNDERLAYS, FOIL AND DPC.

**2.10 SEALANT**

Neutral curing silicone or MS polymer sealant as required by **Steel & Tube®** and used as directed.

**2.11 CLOSURE STRIPS**

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

**2.12 LAP SEALING TAPE**

Closed cell self-adhesive 'Trimseal™' lap tape.

**3 EXECUTION****Conditions****3.1 INSPECTION**

Inspect the roof framing and supporting structure to ensure that it is complete and fully braced ready for roofing and free from any misalignments or protrusions that could adversely affect the roofing.

**3.2 FRAMING TIMBER MOISTURE**

For transverse flashing the timber framing moisture content to be a maximum of 18%. Transverse flashing can be temporarily tacked in place and final fixing carried out when moisture content is acceptable.

**3.3 STORAGE**

On delivery, visually inspect sheets for damage and accept only packs of undamaged roofing. Reject all damaged material, as 'touch-ups' are not acceptable. Stack roofing and accessories on clean, level areas of the site and protect from mechanical damage, wind damage and contamination. Loosely cover dry sheeting, with any wet sheeting fillet or cross stack to allow air to circulate. Remove strippable protective film, if applied, prior to prolonged exposure to sunlight.

**3.4 HANDLING**

Avoid distortion and contact with damaging substances, including cement. Do not drag sheets across each other or other materials. Protect edges and surface finishes from damage; keep material undercover until the product is to be installed. Use soft, flat soled shoes when fixing and for all other work on the roof.

**3.5 SEPARATION**

Place isolators between dissimilar metals and separate roofing from treated timber and cement based materials. Do not use unpainted lead sheet or copper in contact with, or allow water run-off onto, galvanized or Zinalume® materials.

**Installation****3.6 INSTALLATION OF PROFILED ROOFING - GENERALLY**

Install and fix roofing in accordance with [NZBC E2/AS1](#) and [NZMRM CoP](#) NZ 'Metal Roof and Wall Cladding Code of Practice' recommendations. Refer to **Steel & Tube®** Product Technical Statements for fixing patterns and details for each selected profile and area of the roof. Use only fixings as recommended by **Steel & Tube®**, and paint colour-matched fixings and accessories before installation.

**3.7 FIX INSULATION**

Refer to thermal insulation section(s).

**3.8 SUPPORTING STRUCTURE**

Ensure supporting structure is in accordance with drawings and with sufficient fixing points for roofing, flashing and safety mesh. Provide a fall for roof drainage minimum as required by selected profile.

**3.9 PURLIN SPACING / SPANS**

Maximum purlin spacing to be in accordance with **Steel & Tube®** 'Product Technical Statements' for the selected profile. Fix sheets to every purlin.

## Application

### 3.10 SET-OUT

Carefully set out with consideration of the position of side laps to take account of the line of sight. Ensure all sheets are square and over-sailing the gutter true to line. Check during fixing to eliminate creep or spread and string lines along purlin centres to keep fastenings in line.

### 3.11 END LAPS

Install in continuous lengths without end laps. End laps are not generally permitted, except where specifically detailed. Where end laps are unavoidable, seal both ends of the lap with sealing tap or sealant and 4mm sealed rivets at maximum 50mm centres, to detail in [NZMRM CoP](#) NZ (Metal Roof and Wall Cladding Code of Practice).

### 3.12 FIXING GENERALLY

Install and fix in accordance with [NZBC E2/AS1](#), the [NZMRM CoP](#) requirements, and to **Steel & Tube®** recommendations. Paint colour matched fixings and accessories before installation.

### 3.13 MARKING AND CUTTING

Cut only using shearing tools. Do not use black lead pencils for marking aluminium/zinc coated products; use ink pen, chalk line or coloured pencil only. Remove all cutting and drilling debris from the roof as work proceeds.

### 3.14 FIX SHEETS

Fix sheets in place using the fastening system required by **Steel & Tube®** for specified profiles, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet.

### 3.15 THERMAL MOVEMENT

Roof fixing and jointing to conform to **Steel & Tube®** requirements for thermal movement. [NZBC E2](#) /AS1: 8.4.10 'Allowance for expansion', note specific design is required for lengths exceeding 18 metres.

### 3.16 STOP ENDS AND DOWNTURNS

Form stop-ends at the upper end of sheets. Form downturns at the gutter line where the roof pitch is less than 8 degrees. Form using purpose made tools.

### 3.17 FLASHING

Flash roof to parapets, walls and penetrations to detail. Where no detail is provided flash to [NZMRM CoP](#) recommendations and **Steel & Tube®** requirements. Cut accurately and fix using sealant and rivets to detail and to **Steel & Tube®** requirements to form a weatherproof cover. For highly visible flashing, plan joints/junction to take account of the aesthetic requirements.

### 3.18 USE OF SEALANTS

Select and use sealants only as recommended by **Steel & Tube®**. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

### 3.19 FLASHING PENETRATIONS

Flash all penetrations through the roof. Fit pipe flashing with a proprietary collar flashing to manufacturer's requirements, with other penetrations flashed as detailed to provide a weathertight installation. Ensure that all flashing is located to avoid any ponding of water.

### 3.20 INSTALL RIDGING

Install ridging by fastening to the purlins through the leading edge of the roofing. Do not fasten transverse flashing to timber with moisture content >18%.

## Completion

### 3.21 REPLACE

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

### 3.22 LEAVE

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

**3.23 REMOVE**

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

**4 SELECTIONS**

For further details on selections go to [www.steelandtube.co.nz](http://www.steelandtube.co.nz)  
Substitutions are not permitted to the following, unless stated otherwise.

**Coating system****4.1 COATING SYSTEM - EXPOSURE ZONE E (CAT 5)**

Project Exposure Zone D to [NZS 3604](#), C 4 to ISO 9223.

Profile/location: Custom Orb / corrugated  
Base material: MARINE GRADE ALUMINIUM  
Coating system: COLORCOTE ALUMIGARD  
Coating colour: GULL GREY

**Roofing****4.2 STEEL & TUBE - CUSTOM ORB, CORRUGATE ROOFING**

BMT/material: 0.9mm  
Framing material: TIMBER  
Fixing: 14-14x31 Alutite with neoprene washer with Corrugate load spreading profile Ali washer & 30mm EPDM  
Fixing pattern: Refer to Steel & Tube Custom Orb literature for details

**Accessories****4.3 FLASHING - GENERALLY**

Profile: refer to architectural detail  
BMT/material: 0.9mm  
Coating system: To match roofing  
Coating colour: To match roofing

**4.4 CLOSURE STRIP**

Brand: Ecofoam™ or pre-notched perforated metal closers

**4.5 DEKTITE PIPE FLASHING**

Brand/Type: Dektite™

# 4521AC APL COMMERCIAL ALUMINIUM WINDOWS & DOORS

## 1 GENERAL

This section relates to the fabrication, supply and installation of **APL Window Solutions** commercial window and door systems manufactured by either **Altherm**, **First** or **Vantage**.

It includes:

- APL Architectural Series aluminium windows and doors
- Shopfront system
- Hardware and furniture
- Flashings and sealants

### 1.1 RELATED WORK

Refer to appropriate glazing sections for glass types

### 1.2 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WANZ	Windows Association of New Zealand
WEERS	Window Energy Efficiency Rating System
PQAS	Powder Coating Quality Assurance System

#### Documents

### 1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
NZBC F4/AS1	Safety from falling
NZBC H1/VM1	Energy efficiency
NZBC H1/AS1	Energy efficiency
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
AAMA 2604.05	Performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4303	Ventilation for acceptable indoor air quality
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
WANZ Installation Guide	The WANZ Guide to Window Installation as described in E2/AS1 Amendment 6
WANZ PQAS	Powder Coating Quality Assurance System
WANZ SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)
BRANZ BU 337	Protecting Window Glass from Surface Damage
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels
US Federal Specification	
TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

#### 1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Altherm Specifier's Guide

First Specifier's Guide

Vantage Specifier's Guide

APL Window Energy Efficiency Rating System (WEERS) Report Series

Manufacturer/supplier contact details

Company:	<b>APL Window Solutions</b>
Web:	<a href="http://www.altherm.co.nz">www.altherm.co.nz</a>
	<a href="http://www.firstwindows.co.nz">www.firstwindows.co.nz</a>
	<a href="http://www.vantage.co.nz">www.vantage.co.nz</a>
	<a href="http://www.aplnz.co.nz">www.aplnz.co.nz</a>
Email:	<a href="mailto:specifiersguide@aplnz.co.nz">specifiersguide@aplnz.co.nz</a>
Telephone:	07 849 2113

#### Warranties

#### 1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For fabrication
5 years:	For hardware

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements

#### 1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years:	For installation
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- Provide this warranty in the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

#### 1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified APL aluminium system, or associated components and products.

#### 1.8 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.

#### 1.9 COMPLIANCE

Windows and doors to be manufactured and installed to [NZBC E2/AS1](#).

#### 1.10 SHOP DRAWINGS

Shop drawings to show the general arrangement of the aluminium joinery including, but not be limited to:

Construction details (minimum scale 1:5) showing the interface between joinery elements and the building structure including: -

- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Interaction between claddings and linings
- Flashing details
- Sealants and air seals
- Non standard fixing details including bracketing

And where required the following: -

- Design calculations
- Producer Statement in the form PS1 Producer Statement Design
- Rebate sizes
- Dimensions of all typical elements and of any special sizes and shapes
- Provision for the exclusion and/or drainage of moisture
- Provision for adjustment of fixings to ensure true alignment of windows and doors
- Sealant types and full size sections of all sealants and backing rods
- Provision for thermal movement
- Provision for seismic movement and movement under wind loads
- Sequence of installation
- Glazing specification and details

Where requested provide the following additional information

- Information of Professional Indemnity Insurance held by the person providing the calculations and shop drawings

Complete shop drawing review before commencing fabrication.

#### 1.11 CERTIFICATION

Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of [NZS 4211](#).

## Performance

### 1.12 PERFORMANCE - WINDOWS AND DOORS

To [NZS 4211](#), including:

- deflection, opening sashes, air infiltration, water penetration, ultimate strength, torsional strength of sashes, marking.

Refer to SELECTIONS.

### 1.13 STRUCTURAL/WEATHER-TIGHTNESS

The structural and weather-tight performance of the completed joinery, the glazing and infill panels is the responsibility of the window fabricator.

## Performance - Wind (design by contractor)

### 1.14 DESIGN PARAMETERS - SPECIFIC DESIGN

Design the installation to the wind pressure parameters of [AS/NZS 1170.2](#) Refer to SELECTIONS for ULS and SLS

## 2 PRODUCTS

### 2.1 MAGNUM DOORS

Refer to SELECTIONS for type and finish.

### 2.2 SHOPFRONT

Refer to SELECTIONS for type and finish.

## Materials

### 2.3 ALUMINIUM EXTRUSIONS

Alloy designation to comply with [AS/NZS 1866](#). Branded and extruded for anodising or powder coating.

### 2.4 ALUMINIUM SHEET AND STRIP

Complying with [AS/NZS 1734](#) of suitable thickness. Rolled for anodising or powder coating.  
Alloy designation: 5251 - H16 or 5005 - H16

### 2.5 STAINLESS STEEL SHEET AND STRIP

Type: 316 austenitic steel  
Finish grade: 2B (satin lustre)

### 2.6 GLASS

Refer to the glazing section for glass types and installation.

## Reveals

### 2.7 REVEALS - TIMBER PAINTED

Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.

## Accessories

### 2.8 FLASHINGS GENERALLY

To [NZBC E2/AS1](#), 9.1.10 **Windows and Doors**. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

## Components

### 2.9 GLAZING GASKETS

Thermoplastic rubber. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.

### 2.10 HARDWARE AND FURNITURE

Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Refer to SELECTIONS for type and finish. Key alike all lockable window hardware able to be keyed alike.

#### 2.11 FIXING BRACKETS

Designed by manufacturer to specific design.

#### Sealants

#### 2.12 STRUCTURAL SEALANT

Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a  $\pm 40\%$  movement factor complying with US Federal Specification [TT-S-001543A](#).

#### 2.13 WEATHERING/INSTALLATION SEALANT

Building sealant used in accordance with manufacturer's instructions for weather sealing aluminium frames to the cladding, complying with US Federal Specification TT S 0011534A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus ( $\pm 25\%$  movement) to US Federal Specification TT S 00230C.

#### Finishes

#### 2.14 TRADITIONAL ANODISED ALUMINIUM

To [WANZ SFA 3503-03](#). Refer to SELECTIONS for thickness and colour

### 3 EXECUTION

#### Conditions - generally

#### 3.1 DO NOT DELIVER

Do not deliver to site any elements which cannot be unloaded immediately into suitable conditions of storage.

#### 3.2 UNLOAD WINDOW JOINERY

Unload, handle and store elements in accordance with the window manufacturer's requirements.

#### 3.3 AVOID DISTORTION

Avoid distortion of elements during transit, storage and handling.

#### 3.4 PREVENT DAMAGE

Store windows and doors on site in a clean and dry environment in such a manner as to prevent damage to prefinished surfaces. Stack the units in a vertical position resting on their sills, with layers interleaved between to prevent rubbing. Keep paper and cardboard wrappings dry.

#### 3.5 PROPRIETARY ELEMENTS

Fix in accordance with the window manufacturer's requirements.

#### 3.6 PROTECTIVE COVERINGS

Retain protective coverings and coatings to BRANZ BU 337 and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.

#### 3.7 ADDITIONAL PROTECTION

Supply and fix additional protection as necessary to prevent marking of surfaces which will be visible on completed work.

#### Conditions - fixings and fastenings

#### 3.8 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS. Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless steel or if not exposed to the weather may they be hot-dip galvanized steel with a coating weight of 610 g/m<sup>2</sup> complying with [AS/NZS 4680](#).

### 3.9 INSTALLATION FIXING

To [NZBC E2/AS1](#), 9.1.10.8, **Attachments for windows and doors**. Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings. Install packers between reveals and framing at fixing points, except at the head.

#### Assembly

### 3.10 FABRICATION

Fabricate frames as detailed on shop drawings. Install fixing brackets, glazing, hinges, stays and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

### 3.11 TIMBER / PVC REVEALS

Before fixing to aluminium frames, ensure that timber reveals which are being painted have been primed on all surfaces. Securely fix reveals through aluminium fin.

### 3.12 HARDWARE GENERALLY

Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.

### 3.13 SAFETY STAYS

Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with [NZBC F4/AS1](#) 4.0, Opening windows.

#### Installation - windows and doors

### 3.14 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS.

### 3.15 EXPOSED FIXINGS AND FASTENINGS

Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 304 stainless steel.

### 3.16 PROTECTED FIXINGS AND FASTENINGS

Fixings and fastenings not exposed to the weather may be hot-dip galvanized steel with a coating weight of 610 g/m<sup>2</sup> complying with [AS/NZS 4680](#).

### 3.17 CORROSION PROTECTION

Before fixing, apply suitable barriers of bituminous coatings, stops or underlays between dissimilar metals in contact, or between aluminium in contact with concrete.

### 3.18 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

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

Required preparatory work includes the following:

- wall cladding underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to [NZBC E2/AS1](#):9.1.5 **Wall underlays to wall openings**.
- Full height 20mm jamb battens to [NZBC E2/AS1](#) figure 72A (direct fix only)
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).
- application of waterproof sealer to all door and window sills in concrete floor or concrete sill situations. To door sills only, apply a suitable membrane over the sealer.
- all in accordance with the shop drawings, where applicable.

### 3.19 INSTALLATION

Fix to comply with the reviewed shop drawings and installation details including flashings and bedding compounds, pointing sealants and weathering sealants.

### 3.20 INSTALL FLASHINGS

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

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

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

### 3.21 COMPLETE AIR SEAL

To [NZBC E2/AS1:9.1.6 Air seals](#). Form an air-tight seal by means of proprietary expanding foam or sealants used with PEF backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

### 3.22 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

## Application - jointing and sealing

### 3.23 SEAL FRAMES ON SITE

Seal frames to each other and to adjoining structure and finishes, to the requirements of the window and sealant manufacturer and to make the installation weathertight. In very high and extra high or greater wind zones, seal between the window head and the head flashing. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.

### 3.24 PREPARE JOINTS

Ensure joints are dry. Remove loose material, dust and grease. Prepare joints in accordance with the sealant manufacturer's requirements, using required solvents and primers where necessary. Mask adjoining surfaces which would be difficult to clean if smeared with sealant.

### 3.25 BACK UP

When using back-up materials do not reduce depth of joint for sealant to less than the minimum required by the manufacturer of the sealant. Insert polyethylene rod or tape back-up behind joints being pointed with sealant.

### 3.26 SEALANT FINISH

Tool sealant to form a smooth fillet with a profile and dimensions required by the sealant manufacturer. Remove excess sealant from adjoining surfaces, using the cleaning materials nominated by the sealant manufacturer and leave clean.

## Completion - cleaning

### 3.27 REMOVE TRADE DEBRIS

Remove trade debris by appropriate means on a floor by floor basis as each floor is completed and again before any work is covered up by others. Arrange for general removal.

### 3.28 TRADE CLEAN

Trade clean window frames, operable windows and doors, glass and other related surfaces inside and out at the time of installation to remove marks, dust and dirt, to enable a visual inspection of all surfaces.

## Completion

### 3.29 PROTECTIVE COVERINGS

Retain protective coverings and coatings and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.

### 3.30 REPLACE

Replace damaged, cracked or marked elements.

### 3.31 PROTECTION

Protect finishes against damage from adjacent and following work.

### 3.32 SAFETY

Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Masking tape must not be used for this purpose.

## 4 SELECTIONS

For further details on selections go to [www.aplnz.co.nz](http://www.aplnz.co.nz).

Substitutions are not permitted to the following, unless stated otherwise.

### Performance

#### Performance - Wind (design by contractor)

#### 4.1 DESIGN PARAMETERS - SPECIFIC DESIGN

The design wind pressures are to [AS/NZS 1170.2](#).

SLS Refer to structural design

ULS Refer to structural design

### Finishes

#### 4.2 TRADITIONAL ANODISED ALUMINIUM FINISH

Thickness grade: 25 microns

Colour: BLACK

### Glazing

#### 4.3 GLASS

Type/thickness: Refer to appropriate glazing sections for type and thickness.

### Hardware

#### 4.4 WINDOW HARDWARE

Window fastener: ALTAIR LOW PROFILE

Location	Item
ALL WINDOWS	Louvres 152mm glass, smooth polished finish to edges

#### 4.5 DOOR HARDWARE

Locks & handles: REFER TO HARDWARE SCHEDULE

Location	Item
	Parliament hinges
External doors	Hold back devices
External doors	Patio bolts
N/A	Door restrictors
N/A	Twin bolt bifold lock

#### 4.6 HARDWARE FINISH

Finish: Powder coat

Colour: Black

### Flashings and Sealant

#### 4.7 FLASHINGS

Material/type: ALUMINIUM

Pattern: Formed to suit details provided

#### 4.8 WEATHERING SEALANT

Type: 1-part polyurethane moisture curing, elastic joint sealant

Colour: Black

**Reveals****4.9 TIMBER JAMB REVEALS**

Timber species:	PINE
Grade/treatment:	FINGER JOINTED / H3.1
Thickness:	25mm
Reveals:	FLUSH FOR ARCHITRAVES
Finish:	PAINT

**Shopfront system****4.10 APL SHOPFRONT - 100MM**

Brand:	APL Shopfront
Window No.:	ALL
Frame size:	100mm
Glazing system:	ALTAIR BREEZWAY 152mm

**Commercial doors****4.11 APL MAGNUM SERIES - HINGED DOOR**

Brand/type:	APL Magnum Doors
Door No.:	ALL LOWER LEVEL DOORS & ALL UPPER LEVEL EXTERNAL DOORS ONLY
Door sections:	50mm deep (min)
Stiles:	110mm wide (min)
Bottom rail type:	110mm
Hardware:	Cylinder mortice lock - Refer to Door Hardware Schedule Finger turn on inside (egress doors) 5 hinges (min)
Hardware finish:	Refer to Door HardwareSchedule

**4.12 APL PLASMA ENTRANCE DOOR**

Brand/type	Plasma Entrance Door
Door No.:	Refer to Door schedule
Door sections:	45mm
Hardware:	Refer to Door Hardware Schedule
Face Finish:	Anodised 25 microns, colour = Black

# 4610VR CSR VIRIDIAN RESIDENTIAL GLAZING

## 1 GENERAL

This section relates to the supply and fixing of **Viridian** products for external and internal joinery in residential type buildings and includes:

- windows and doors frameless shower and bath screens
- mirrors and mirror frames

### 1.1 RELATED WORK

Refer to 4521AC APL for ALUMINIUM JOINERY

#### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC F4/AS1</a>	Safety from falling
<a href="#">NZBC F9/AS1</a>	Means of restricting access to residential pools
<a href="#">NZBC H1/AS1</a>	Energy Efficiency
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind loads
<a href="#">AS/NZS 2208</a>	Safety glazing materials in buildings
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 4211</a>	Specification for performance of windows
<a href="#">NZS 4218</a>	Thermal insulation - Housing and Small Buildings
<a href="#">NZS 4223.1</a>	Glazing in buildings - Glass selection and glazing
<a href="#">NZS 4223.Supp1</a>	Glazing in buildings - Supplement 1 to <a href="#">NZS 4223.1:2008</a> and <a href="#">NZS 4223.4:2008</a>
<a href="#">NZS 4223.2</a>	Glazing in buildings - Insulating glass units
<a href="#">NZS 4223.3</a>	Glazing in buildings - Human impact safety requirements
<a href="#">NZS 4223.4</a>	Glazing in buildings - Wind, dead, snow and live action
<a href="#">NZS 4243.1</a>	Energy Efficiency - Large Buildings - Building thermal envelope
<a href="#">AS/NZS 4666</a>	Insulating glass units
<a href="#">BRANZ BU 337</a>	Protecting window glass from damage

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:  
Viridian Architectural Glass, Architectural Glass Guide

Manufacturer/supplier contact details

Company: **CSR Viridian**  
 Web: [www.viridianglass.com](http://www.viridianglass.com)  
 Email: [ahamilton@csr.com.au](mailto:ahamilton@csr.com.au)  
 Telephone: 0800 80 80 60

#### Warranties

### 1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years: For insulating glass units  
 5 years: For laminated glass

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### Requirements

## Performance

### 1.5 THERMAL STRESS ANALYSIS

Obtain the glass manufacturer's thermal stress analysis for spandrel panels and for tinted, reflective and other solar control vision glasses for review before placing final order.

### 1.6 ENERGY EFFICIENCY

Provide glazing to meet the energy requirements of, [NZS 4218](#) and [NZBC H1/AS1](#) for housing and small buildings, or [NZS 4243.1](#). Refer to SELECTIONS and schedules for location and type of glazing.

## 2 PRODUCTS

### 2.1 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Viridian** glass, products or systems.

#### Materials

### 2.2 LAMINATED GLASS

Grade A safety glazing material to [AS/NZS 2208](#) with PVB or CIP resin interlayer.

### 2.3 TOUGHENED GLASS

Grade A safety glazing material to [AS/NZS 2208](#).  
Heat soaked toughened glass to [NZS 4223.1](#), Appendix E, required for critical areas.  
Refer to SELECTIONS.

#### Components, general

### 2.4 JOINTING, PUTTY AND SEALING MATERIALS

Ensure jointing, putty and sealing materials compatible with glass substrates. Confirm compatibility with laminated glass, IGUs and coatings.

#### Components, aluminium and uPVC glazing

### 2.5 GLAZING TAPE AND GASKETS

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

### 2.6 SETTING BLOCKS

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

## 3 EXECUTION

#### Conditions

### 3.1 GENERAL REQUIREMENTS

To [NZS 4223.1](#), [NZS 4223.2](#), [NZS 4223.3](#) as modified by [NZBC B1/AS1](#), 7.3.1, and [NZS 4223.4](#). All external glazing to be wind and watertight on completion.

### 3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 337.

### 3.3 GLASS CONDITION

All glass of accurate size with clean, undamaged edges and surfaces.

### 3.4 GLASS THICKNESS

If not specifically stated in the glazing schedule determine the minimum thickness of glass for each sheet as required by [NZS 4223.1](#), [NZS 4223.3](#), [NZS 4223.4](#), and [NZS 4223](#). Supp 1. For windows tested to [NZS 4211](#), ensure glass meets the requirements of the window testing.

Determine the final glass thickness based on whether wind loading or human impact considerations govern.

### 3.5 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to [NZS 4223.1](#), Section 4, **Glazing**.

#### **Conditions - human impact safety requirements**

### 3.6 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to [NZS 4223.3](#) as modified by [NZBC B1/AS1](#), 7.3.1, for thickness and maximum areas of safety glass.

### 3.7 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in [NZS 4223.3](#), as modified by [NZBC B1/AS1](#), 7.3.1, that also comply with the relevant requirements of [AS/NZS 2208](#). Ensure material is permanently marked and if cut by the distributor or installer mark each piece to [NZS 4223.3](#), 2.8 Identification.

### 3.8 CONTAINMENT

Edge cover to comply with [NZS 4223.1](#), Section 4 Glazing, table 5. Otherwise to [NZS 4223.3](#), 2.3 Edge cover.

#### **Assembly**

### 3.9 WORKING OF GLASS

All working of glass as required in [NZS 4223.1](#).

### 3.10 EDGE WORK AND BEVELLING

Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.

### 3.11 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

### 3.12 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

#### **Application aluminium**

### 3.13 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to [NZS 4223.1](#).

- Bead glaze to Section 4, **Glazing**.
- Channel glaze to Section 4, **Glazing**, Section 5, **Framed, Unframed, Partly Framed Glass Assemblies**.

### 3.14 INSTALL SAFETY GLASS

To [NZS 4223.3](#).

#### **Finishing**

### 3.15 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface.

#### **Completion**

### 3.16 TRADE CLEAN

Clean off or remove safety indicators at completion of the building.

### 3.17 REPLACE

Replace damaged, cracked or marked elements.

### 3.18 LEAVE

Leave work to the standard required by following procedures.

### 3.19 REMOVE

Remove debris, unused materials and elements from the site.

## 4 SELECTIONS

For further details on selections go to [www.viridianglass.com](http://www.viridianglass.com)

Substitutions are not permitted to the following, unless stated otherwise.

### Performance - wind

#### 4.1 WIND - SPECIFIC DESIGN

The design wind pressures are to [AS/NZS 1170.2](#).

SLS ~ Pa

ULS ~ Pa

### Glass by type

#### 4.2 VTOUGH™ SAFETY GLASS - TOUGHENED GLASS

Location: ALL LOUVRES

Brand/pattern: VTOUGH™ safety glass

Thickness: 6 mm

#### 4.3 VIRIDIAN VLAM™ PVB LAMINATED GLASS

Brand/type: VIRIDIAN VLAM™ PVB laminated

Colour: TRANSLUCENT

Interlayer: 0.38mm Standard

Thickness: 6.38mm nominal overall

# 4710AG AUTEX GREENSTUF® THERMAL & ACOUSTIC INSULATION

## 1 GENERAL

This section relates to **Autex Industries Limited** GreenStuf® polyester fibre insulation installed, laid, hung or fitted as thermal and/or acoustic insulation.

### 1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

BIB	Building Insulation Blanket
GSM	Grams per Square Metre
STC	Sound Transmission Class
NRC	Noise Reduction Coefficient
Rw	Weighted sound reduction index

### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC C/AS1-AS7</a>	Protection from fire
<a href="#">NZBC C/VM2</a>	Protection from fire
<a href="#">NZBC H1/AS1</a>	Energy efficiency
<a href="#">AS/NZS 3000</a>	Electrical installations
<a href="#">NZS 4218. 2009</a>	Thermal insulation - Housing and small buildings
<a href="#">NZS 4243.1</a>	Energy Efficiency - Large buildings - Building thermal envelope
<a href="#">NZS 4246</a>	Energy efficiency - Installing bulk thermal insulation in residential buildings
<a href="#">AS/NZS 60598.2.2:2016</a>	Luminaires- Particular Requirements - Recessed luminaires
<a href="#">AS/NZS 60695.11.5</a>	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance
<a href="#">AS/NZS ISO 9001</a>	Quality management systems - requirements
<a href="#">ISO 9705</a>	Fire Tests: Full scale room test for surface products

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Autex Insulation documents relating to work in this section are:

Autex Insulation Product Manual, including:

Data sheet	GreenStuf® Thermal insulation - Pad Form
Data sheet	GreenStuf® Thermal insulation - Roll Form

Data sheet	GreenStuf® Building Insulation Blanket
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Data sheet	GreenStuf® Skillion Roof Blanket
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Data sheet	GreenStuf® ASB (Autex Sound Blanket)
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Data sheet	GreenStuf® BaffleBlock
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Installation Instructions - GreenStuf® Thermal Insulation

Installation Instructions - GreenStuf® Underfloor insulation

Installation Instructions – GreenStuf® ASL Soffit Liner

[BRANZ Appraisal 380](#) - Autex Greenstuf® Polyester Thermal Insulation

[BRANZ Appraisal 734](#) GreenStuf® Underfloor Insulation

BRANZ Fire Assessment Report FAR 4045 - Assessment Report on Autex GreenStuf® with Variations to Tested Product

Autex Insulation Acoustic Design Guide  
 Autex Insulation Residential Design Guide  
 Environmental Choice NZ (license No. 2508037) Autex Greenstuf® polyester thermal (resistive - type) insulation

Manufacturer/supplier contact details  
 Company: **Autex Industries Limited**  
 Web: [www.autex.co.nz](http://www.autex.co.nz)  
 Email: [enquiries@autex.co.nz](mailto:enquiries@autex.co.nz)  
 Telephone: 0800 428 839

## Warranties

### 1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

- 50 year product durability warranty for Autex polyester insulation products
- Provide this warranty on the Autex Insulation Certificate of Warranty standard form

## Requirements

### 1.5 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with Autex Insulation materials and techniques specified.

For a list of preferred installers contact Autex.

### 1.6 NO SUBSTITUTIONS

This work section relates to [NZBC](#) compliant systems and under the building consent process substitutions are not permitted to any specified insulation, associated products, components or accessories.

Autex GreenStuf® products have been selected on specific performance criteria, including product weights and densities and their reduced environmental impact. No substitutions allowed.

## Performance

### 1.7 NZBC H1 COMPLIANCE CERTIFICATE

Provide Autex H1 Energy Efficiency Compliance Certificate as required.

### 1.8 SOUND RATING REQUIREMENTS

Provide sound rated wall, floor and ceiling systems as scheduled.

### 1.9 FIRE GROUP NUMBERS

The Group Number Classification to [NZBC C/AS2-AS6](#), table 4.1, has been determined in accordance with [NZBC C/VM2](#) Appendix A, following testing and data reduction to ISO 9705.

Product	Group number
GreenStuf®, all variations up to 4,800GMS Refer to BRANZ Fire Assessment Report FAR 4045	1-S

## 2 PRODUCTS

### Materials - thermal

#### 2.1 POLYESTER FIBRE THERMAL INSULATING SKILLION ROOF BLANKET

Autex GreenStuf® Skillion Roof Blanket - 100% polyester fibres thermally bonded to form a flexible insulation material designed to achieve high R-Value performance in restricted cavities such as Skillion Roofs. Manufactured in NZ under [AS/NZS ISO 9001](#) and ISO 14001 quality and environmental management systems. Refer SELECTIONS for details.

NOTE: All GreenStuf® Polyester insulation is compliant with [AS/NZS 60695.11.5](#) and can safely be installed abutted to downlights classified CA 80, CA 90, CA 135 and can be safely installed covering downlights classified IC, IC-4 and IC-F.

### Materials - acoustic

## 2.2 POLYESTER FIBRE ACOUSTIC INSULATION

Autex GreenStuf® - 100% polyester fibres thermally bonded to form a rectangular pad, and/or flexible blanket / roll. Manufactured in NZ under [AS/NZS ISO 9001](#) and ISO 14001 quality and environmental management systems. Refer SELECTIONS for details.

NOTE: All GreenStuf® Polyester insulation is compliant with [AS/NZS 60695.11.5](#) and can safely be installed abutted to downlights classified CA 80, CA 90, CA 135 and can be safely installed covering downlights classified IC, IC-4 and IC-F.

### Components

## 2.3 TAPES

Proprietary plastic tape, stapled across framing to retain insulation in unlined wall and ceiling locations.

## 2.4 STAPLES / GUN STAPLER

Gun stapler and staples (standard or stainless steel as appropriate) for fixing GreenStuf® Masonry Wall Blanket and GreenStuf® Underfloor in place.

# 3 EXECUTION

### Conditions

## 3.1 STORAGE

Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, puncturing and damage to edges of sheet materials. Do not use damaged materials.

## 3.2 HANDLING

Avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

## 3.3 INSPECTION

Before starting installation of Autex GreenStuf® insulation materials, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, wall and roofing underlays and vapour barriers are in place.

### Application

## 3.4 INSTALL INSULATION - GENERAL

Lay, install, fit and fix to [NZBC H1/AS1](#): Energy efficiency, 2.0 Building thermal envelope, and to manufacturer's requirements. Install in housing to [NZS 4218](#) and [NZS 4246](#). Install in large buildings to [NZS 4243.1](#) and [NZS 4220](#). Allow insulation to re-loft/relax prior to installation. Do not cover vents. Allow a clear gap around metal flues as recommended by the fireplace manufacturer. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

## 3.5 INSULATION CLEARANCES GENERALLY

Insulation may need to have a gap to some mechanical and electrical services and equipment, including ducts and chimneys. The gaps should be to the [NZS 4246](#) based tables below or to the equipment manufacturers requirements if they require larger gaps. Smaller gaps to manufacturers requirements can be used for equipment specifically manufactured with heat shielding or similar (excludes light fittings). Installed gap not to be more than 50mm bigger than the required gap. The following tables are subject to:

- The requirements of [NZS 4246](#) The insulation is exposed to the source of heat or equipment etc.
- Insulation has passed the needle flame test to [AS/NZS 60695.11.5](#) and/or is non-combustible.
- Gaps to hot surfaces may have to be increased with non-compliant insulation and plastic/polymeric type insulation (EPS, XPS, PIR, etc), check with insulation manufacturer.
- Gaps to hot surfaces may be able to be reduced with non-combustible insulation, check with equipment manufacturer.
- "Secure insulation" if required means, glue, mechanical fix, or provide fixed barriers at gap edge of insulation to hold in place. Rigid or semi rigid insulation may only need a firm friction fit (secure loose pieces).
- Loose fill insulation will require fixed barriers to [NZS 4246](#) to maintain gaps.

**LIGHT FITTINGS**

Type of fitting	Minimum insulation clearance	Comments
Unmarked recessed	100mm	New or old unmarked & unknown fittings and/or insulation. Secure insulation.
CA 80, CA 90 or CA 135 recessed	Abut in residential. 100mm in others	Do NOT cover the fittings
IC, IC-F or IC-4 recessed	Abut in residential. 100mm in others	Cover in residential only. Do NOT cover in others
Independent control gear	Place on top of insulation & 50mm from fitting	If not on top allow 50mm clearance to insulation, do not cover. Includes, transformers, ballasts & drivers etc.
Surface fittings not exposed to insulation	Nil	Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.
Surface fittings & exposed insulation	200mm	This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Secure insulation.

**EXTRACTS, VENTS, PIPES & ROOF UNDERLAY**

Application	Minimum insulation clearance	Comments
Ducted fan motors	50mm	Includes ducted rangehoods, extractors etc. Applies to the motor unit and electrical enclosures (not the ducts)
Ducted fan ducts	Abut	Excludes motor unit and electrical enclosures.
Unducted fan motors usually discharging to ceiling space	200mm	Includes unducted, rangehoods, extractors etc, discharging into roof space. To prevent debris falling into motor. Clearance may be able to be reduced, by providing a fixed barrier around the vent.
Passive vents (still in use)	200mm	To prevent debris falling through. Clearance may be able to be reduced, with more cohesive insulation, like some of the rigid plastic types or providing a fixed barrier around the vent.
Plumbing penetrations through floors	100mm	Keep gap between pipe penetration and floor insulation in case of leaks.
Roofing material/underlay	25mm	From underside of roofing or flexible roofing underlay, to prevent wicking

**3.6 CHECK FOILS**

Ensure foils are dry, clean, bright, undamaged and free of debris before installing insulation.

**3.7 CHECK WALL AND ROOF UNDERLAYS**

Ensure these are dry, clean, undamaged and free of debris before being covered.

**3.8 FIT POLYESTER FIBRE THERMAL INSULATING SKILLION ROOF BLANKET**

Friction fit Autex GreenStuf® Skillion Roof Blanket between the framing, or in place to completely fill the whole of the cavities. Slightly oversize length for friction fit. Use off-cuts to fill small spaces around penetrations. Leave no gaps and maintain full thickness of the insulation over the whole of the installation. Do not cover vents and leave gap around metal flues to the manufactures requirements. Ensure clearance from building elements to [AS/NZS 3000](#), figure 4.9.

**3.9 FIT POLYESTER FIBRE ACOUSTIC PADS / BLANKET / ROLL - TIMBER STUD WALLS**

After the wall lining is fixed to one side of the wall/partition, friction fit Autex GreenStuf® Sound Solution acoustic insulation segment / blanket in place to completely fill the whole of the cavities. Leave no gaps. Slightly oversize to retain friction fit, carefully tear by hand or cut across blanket, fit to cavity. Maintain full thickness of acoustic insulation over whole installation. Fix in place with plastic tape as necessary.

### 3.10 CLEAN UP

Clean up as the work proceeds, so no spare offcuts or any other matter or item remain behind cladding or linings.

### 3.11 LEAVE

Leave work to the standard required by following procedures.

### 3.12 REMOVE

Remove debris, unused materials and elements from the site.

## 4 SELECTIONS

For further details on selections go to [www.autex.co.nz](http://www.autex.co.nz).

Substitutions are not permitted to the following, unless stated otherwise.

### 4.1

#### AUTEX GREENSTUF® SKILLION ROOF BLANKET - POLYESTER FIBRE THERMAL INSULATION

Location:	ROOF PLANE
Brand:	Autex GreenStuf® Skillion Roof Blanket
R-Value:	R3.6
Thickness:	165
Product weight:	2,800
Density:	17.0

### 4.2

#### AUTEX GREENSTUF® SOUND SOLUTION® - POLYESTER FIBRE ACOUSTIC INSULATION, INTERNAL WALLS (TIMBER STUD)

Location:	INTERNAL UPPER WALLS
Brand:	Autex GreenStuf® Sound Solution®
R-Value:	R1.8
Thickness:	90mm
Product weight:	1,000GSM
Density:	11.1kg/m <sup>3</sup>
Minimum wall STC:	STC 42

# 5111H JAMES HARDIE FIBRE CEMENT SHEET LININGS

## 1 GENERAL

This section relates to the supply and installation of James Hardie Villaboard® Lining and HardieGroove™ Lining for:

- internal wall linings
- ceiling linings

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">AS/NZS 2589</a>	Gypsum linings - Application and finishing
<a href="#">AS/NZS 2908.2</a>	Cellulose-cement products - Flat sheet
<a href="#">NZS 3602</a>	Timber and wood-based products for use in buildings

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie documents relating to this part of the work:  
Villaboard® Lining  
HardieGroove™ Lining

Manufacturer/supplier contact details

Company:	James Hardie New Zealand
Web:	<a href="http://www.jameshardie.co.nz">www.jameshardie.co.nz</a>
Email:	<a href="mailto:info@jameshardie.co.nz">info@jameshardie.co.nz</a>
Telephone:	Ask James Hardie™ on 0800 808 868

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For James Hardie™ VILLABOARD. (refer to James Hardie™ product warranty)
15 years:	For accessories supplied by James Hardie (refer to James Hardie™ product warranty)
From:	Date of purchase

- Provide this warranty on the manufacturer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

#### 1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

#### 1.5 COMPLIANCE

Fibre cement sheets to [AS/NZS 2908.2](#).

### Performance

#### 1.6 SURFACE FIRE PROPERTIES

Group Number to [NZBC C/AS2-AS7](#), table 4.1. Unfinished fibre cement board has a group number of 1-S when complying with parameters of [NZBC C/VM2](#), Appendix A, table A1.

## 2 PRODUCTS

## Materials

### 2.1 PLAIN FIBRE CEMENT SHEET LININGS

James Hardie Villaboard® Lining manufactured from treated cellulose fibre, portland cement, sand and water. Cured by high pressure autoclaving and manufactured to [AS/NZS 2908.2](#). Sealed on the face.

## Components

### 2.2 SCREWS FOR POWER SCREW GUN DRIVING

Timber framing  
6mm and 9mm linings: Villadrive 6 gauge x 30mm self embedding screws or HardieDrive™ self embedding stainless steel screws

### 2.3 WALL BOARD ADHESIVE

Polyurethane wallboard adhesive. Refer to James Hardie product installation manual.

## Accessories

### 2.4 CONTROL JOINTS SECTION

45mm x 10mm shaped PVC control joint or Rondo P35 jointer.

### 2.5 EXTERNAL CORNER SECTIONS

30mm x 30mm x 1.2mm PVC angle.

### 2.6 POLYETHYLENE TAPE

Self adhesive polyethylene for behind expressed joints and expressed control joints.

### 2.7 JOINT REINFORCING TAPE

52mm wide perforated paper tape.

### 2.8 BEDDING COMPOUND

James Hardie® Base Coat compound powder.

### 2.9 FINISHING COMPOUND

James Hardie® Top Coat premixed.

### 2.10 SEALANT

Silicone or polyurethane sealant. Refer to the James Hardie installation manual.

## 3 EXECUTION

### Conditions

#### 3.1 MOISTURE CONTENT

Maximum moisture content of timber framing to [NZS 3602](#).

#### 3.2 PROTECT

Protect joinery, fittings and finishes already in place from water staining or damage from lining installation.

#### 3.3 BUILDING

Ensure building is weatherproof before lining work commences.

#### 3.4 STORAGE

Take delivery of products dry and undamaged on pallets, and keep on pallet. Protect edges and corners from damage and covered to keep dry until fixed.

#### 3.5 HANDLING

Avoid distortion and contact with potentially damaging surfaces. Carry sheets vertically. Do not drag sheets across each other, or across other materials. Protect edges, corners and surface finish from damage.

### 3.6 SUBSTRATE

Do not commence work until the substrate is of the standard required by the relevant manufacturer's technical literature for the specified finish; plumb, level and in true alignment. Maximum moisture content of timber framing to [NZS 3602](#).

#### **Application**

### 3.7 FIXING FLUSH JOINTED WALLS, PAINT OR WALLPAPER

Prepare and fix recessed edge sheets to James Hardie installation manual. Fix with screws and/or nails at edges.

### 3.8 FIXING FLUSH JOINTED CEILINGS, PAINT

Fix ceiling battens at 600mm centres maximum. (Do not fix sheets to the underside of roof trusses). Fix sheets in an offset pattern so that adjacent end joints do not coincide. Break the ceiling into bays not exceeding 9 metres x 6 metres and provide control joints at the perimeter of each bay. Provide control joints at the junction of large ceilings and narrow passages.

### 3.9 FIXING IN CERAMIC TILED AREAS

Prepare and fix sheets, horizontally or vertically and stagger joints where possible, to James Hardie installation manual.

### 3.10 PROVIDE VERTICAL CONTROL JOINTS

Provide vertical control joints at 7.2 metre centres maximum for general application and 4.2 metres centres maximum for tiled applications. Provide acoustic sealant in walls having an acoustic rating.

### 3.11 PROVIDE HORIZONTAL CONTROL JOINTS

Provide horizontal control joints at 7.2 metres centres maximum for general application and 4.2 metre centres maximum for tiled applications.

### 3.12 PROVIDE EXTERNAL CORNER ANGLE

Provide perforated PVC external corner angle or paper faced rigid spine corner mould to external corners.

### 3.13 INTERNAL CORNERS

When used in tiling applications provide a Lumberlock Stud saver to framed internal corner prior to fixing of Villaboard® Lining. Provide perforated PVC corner mould, or paper faced rigid spine corner mould or solid blocking to internal corners.

### 3.14 SILICONE JOINTS

Provide polyethylene tape behind joints finished with flexible sealant.

#### **Levels of Finish**

Refer to [AS/NZS 2589](#).

Refer to SELECTIONS/drawings for required levels of finish.

### 3.15 LEVEL 0, 1 and 2 FINISHES

Refer to James Hardie installation manual.

### 3.16 LEVEL 4 FINISH

Application:	This is generally the accepted level of finish for domestic construction. It is used where light textures or wall coverings and smooth textured finishes and satin/flat/low sheen paints are illuminated by non-critical lighting.
Jointing/setting:	Refer to flush jointing recommendations on page 11 James Hardie Villaboard® Lining installation manual.
Finish:	For use where light-texture coatings or wallpaper or other lightweight wall coverings are to be applied. For painted finishes in non-critical lighting areas flat and low-sheen textured paints are to be applied. Gloss and semi-gloss paints are not generally suitable over this level of finish as any minor blemish will show under critical light. The weight, texture and sheen level of wall coverings applied over this level of finish must be carefully evaluated. Joints and fasteners must be adequately concealed if the wallcovering material is lightweight, contains limited pattern, has a gloss finish, or any combination of these features is present. Unbacked vinyl wall coverings are not suitable over this level of finish.

## Joint Finishing

### 3.17 JOINT FINISHING FOR LOW SHEEN PAINT

Apply James Hardie Base Coat to fill recess. Firmly embed perforated paper tape in joints and cover with a thin layer of James Hardie Top Coat over all joints, angles, fastener heads and accessories and allow to dry. Apply a second coat of James Hardie Top Coat over the recess and feather the edges to achieve a level 4 finish.

### 3.18 JOINT FINISHING FOR TILED AREAS

Joints and corner joints set with James Hardie Base Coat reinforced with perforated paper tape to achieve a level 3 finish.

## Completion

### 3.19 REPLACE

Replace damaged or marked elements.

### 3.20 CLEAN

Clean adjoining surfaces and fittings of spots, marks, dust and droppings.

### 3.21 LEAVE

Leave work to the standard required by following procedures.

### 3.22 REMOVE

Remove debris, unused materials and components from the site.

## 4 SELECTIONS

### Linings

#### 4.1 JAMES HARDIE VILLABOARD® LINING

Location:	TIMBER FRAMED WALLS & CEILINGS
Type:	James Hardie Villaboard® Lining
Thickness:	9mm RECESSED 2 SIDES
Fixing method:	SCREW & ADHESIVE

#### 4.2 FIXING FLUSH JOINTED WALLS, PAINT OR WALLPAPER

Location:	ALL INTERNAL WALLS
Fasteners:	HARDIEDRIVE 7 GUAGE x 30MM SELF EMBEDDING SCREW

#### 4.3 FIXING FLUSH JOINTED CEILINGS, PAINT

Location:	ALL UPPER LEVEL CEILINGS EXCEPT MULTI-PURPOSE ROOM
Finish:	PAINT
Abutment detail:	FLUSH

4.4     FIXING CERAMIC TILED AREAS

Location:               BATHROOMS  
Fasteners:             VILLADRIVE 6 GUAGE x 30mm self embedding screw

4.5     LEVELS OF FINISH

To conform to the following levels of finish:

Location	Finish level
all	4

# 5230 INTERIOR DOORS

## 1 GENERAL

This section relates to the supply and installation of interior doors.

### 1.1 RELATED SECTIONS

Refer to glazing section/s for glass type and thickness.

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[NZS 3602](#) Timber and wood-based products for use in building  
[NZS 3610](#) Specification form profiles of mouldings and joinery

## 2 PRODUCTS

### 2.1 TIMBER

To [NZS 3602](#).

### 2.2 PROFILES, FACINGS, SCRIBERS AND ARCHITRAVES

Traditional profiles to [NZS 3610](#). Proprietary profiles and special profiles as detailed. Pencil radius corners of profiled schedules for paint finish.

### 2.3 DOORS, PAINTED

Doors as scheduled (without clashing strips).

### 2.4 DOOR HINGES

Size and gauge to carry door. 4 hinges per door.

## 3 EXECUTION

### 3.1 SITE MEASURE

Confirm framed openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery. Confirm lintel head and sill deflection for sliding or bi-fold door systems is within the manufacturer's specified tolerances. Provide not less than 10mm unless otherwise required.

### 3.2 EXECUTION GENERALLY

Manufacture to the methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

### 3.3 FACTORY FIT HARDWARE

Factory fit the following where specified: -

- Hinges

### 3.4 FACTORY FINISHING

Before delivery to site: -

- Brace square and provide protection to assemblies during delivery to site. Where factory glazed, indicate the presence of transparent glasses with whiting, tape or signs compatible with the glass type.

### Internal doors

### 3.5 INTERNAL JOINERY FRAMES

Fabricate as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish.

### 3.6 DOOR FRAMES, SOLID REBATED

Fabricate as detailed. Hang doors to operate freely on hinges, sliding, or bi-fold gear and to the door manufacturer's requirements. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish. Fit hardware.

### 3.7 DOOR LINERS

Heads and jambs finished minimum 18mm, with 10mm planted door stops. Width to match width of lined walls. Hang doors on hinges, sliding, or sliding-folding gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

#### **Completion**

### 3.8 CHECK

Check and adjust operation of all sashes, doors, hardware and furniture.

### 3.9 TEMPORARY PROTECTION

On completion remove any temporary protection and leave ready for following work.

## **4 SELECTIONS**

### 4.1 SOLID CORE DOOR

Brand/type:  
 Door facing: HMR MDF  
 Glazing: Laminated safety  
 Finish: paint  
 Glass: REFER TO 4610VR  
 Hardware: REFER TO HARDWARE SCHEDULE

#### **Accessories**

### 4.2 DOOR HINGES

Interior doors

Type:	Loose pin
Size:	89mm
Material:	Zinc-plated steel
Pin:	Loose-pin zinc-plated steel

# 6221A ARDEX TILING SOLUTIONS

## 1 GENERAL

This section relates to the preparation of floor and wall surfaces for tiling systems with ARDEX Tiling Solutions:

- Levelling screeds
- Primers
- Waterproofing systems
- Adhesives
- Sealants
- Grouts

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[NZBC D1/AS1 & VM1](#) Access routes

AS 1315 Portland Cement

AS 3740 Waterproofing of domestic wet areas

AS 3958.1 Ceramic tiles - Guide to the installation of ceramic tiles

AS 4586 Slip resistance classification of new pedestrian surface materials

[AS/NZS 4671](#) Steel reinforcing materials

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

#### 1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

ARDEX Tiling Solutions

[BRANZ Appraisal 472](#) - Superflex® Wet Area Membranes

Copies of the above literature are available from ARDEX

Web: [www.ardex.co.nz](http://www.ardex.co.nz)

Email: [ardexspec@ardexnz.com](mailto:ardexspec@ardexnz.com)

Telephone: 0800 2 ARDEX (27339)  
09-636 0005 Auckland  
04-568 5949 Wellington  
03-373 6900 Christchurch

### Warranties - waterproofing

#### 1.3 WARRANTY

Warrant this waterproofing work under normal environmental and use conditions against failure of materials and execution

Warranty period:	Materials	15 years
	Execution	2 years

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

### Warranties - tiling

#### 1.4 WARRANTY

Warrant this tiling work under normal environmental and use conditions against failure of materials and execution

Warranty period: 2 years

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

## Requirements

- 1.5 **NO SUBSTITUTIONS**  
Substitutions are not permitted to any specified ARDEX materials, or associated products, components or accessories.
- 1.6 **QUALIFICATIONS**  
Waterproofing work to be carried out by an ARDEX approved waterproofing applicator. Tiling to be carried out by competent workers experienced with the materials and in the techniques specified.
- 1.7 **SAMPLES**  
Submit on request samples of the tiles specified, sufficient to show the pattern and the range of colour finish.
- 1.8 **DEFLECTION CRITERIA FOR SUSPENDED FLOORS**  
Check that the floor is rigid enough for the tiling. Deflection of suspended floors should not exceed 1/360th of the span under dead load and live load.
- 1.9 **PROVIDE SPARE TILES**  
Provide spare tiles. Refer to SELECTIONS for type and quantity.
- 1.10 **SYSTEMS ARDEX PROJECT**  
Contact ARDEX with any relevant key dates and for a list of approved applicators. The contractor is to contact ARDEX prior to starting the contract.  
Web: [www.ardex.co.nz](http://www.ardex.co.nz)  
Email: [ardexspec@ardexnz.com](mailto:ardexspec@ardexnz.com)  
Telephone: 0800 2 ARDEX (27339)

## Performance

- 1.11 **SLIP RESISTANCE – SURFACES EXEMPT FROM TESTING**  
Slip resistance for walking surfaces comply with [NZBC D1/AS1](#), Table 2.
- 1.12 **QUALITY ASSURANCE**  
Prepare an inspection and test plan (ITP) for the work. Record on the ITP the inspections and checks as they are made. Make ITP's available for inspection.  
  
Refer to ARDEX Tiling flow chart and check list.

## 2 PRODUCTS

### Materials - preparation

- 2.1 **ARDEX A48 SCREED**  
ArDEX A 48 Premixed, rapid-set, cement screed preparation that has been designed for all types of floor coverings and is especially effective when installing moisture sensitive coverings and ArDEX undertile waterproofing systems.
- 2.2 **ARDEX PRIMER**  
ArDEX Multiprime is an internal or external primer suitable for porous substrates. Suitable for concrete, wood and fibre-cement sheet substrates. Alternatively, ArDEX P 9 is a single-part, water-based primer for non-porous substrates. Contact ArDEX for recommendations.

### Materials - Waterproofing

- 2.3 **INTERNAL WATERPROOFING SYSTEM**  
ArDEX Superflex WPM 001, is a BRANZ Appraised, pre-mixed liquid waterproofing membrane specifically designed for use under tiles.

### Materials - Additives

**Materials - Tile adhesives****2.4 ARDEX X78**

Ardex X 78 is a high-performance, fibre-reinforced, polymer-modified floor tile adhesive, which has been specially formulated with Microtec Technology to give exceptional properties of adhesion. When mixed with water, Ardex X 78 is an extremely smooth, creamy, pourable mortar is produced which easily enables full coverage to be achieved on the back of floor tiles. It also has double extended open time and non-lipping capabilities.

**Materials - Sealants - grouts****2.5 ARDEX SEALANTS**

Ardex SE acetic cure silicone is ideal for movement joints within a tiling system. Sealants and back-up materials as described in clause 2.7 of AS 3958.1 and clause 2.6 of AS 3740. Colours match some grout colours

**2.6 ARDEX GROUTS**

Ardex EG 15 epoxy grout with excellent stain and chemical resistance for joints 1.5mm to 15mm wide.

**Components****2.7 STRIPS AND WEATHERBARS**

Unless otherwise specified tile trim, edge strips, floor finish divider strips and weather bars shall be aluminium.

**3 EXECUTION****General****3.1 HANDLING AND STORAGE**

Take delivery of packets of tiles undamaged and dry. Handle tiles with care to avoid chipping, soiling and damage. Store on hard level standings in non-traffic, non-work areas that are enclosed, clean and dry.

**3.2 CHECK TILES**

Check tiles to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern. Reject tiles that are damaged.

**3.3 CONFIRM LAYOUT**

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.

**3.4 SETTING OUT**

Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.

**3.5 PREPARATION OF BACKGROUNDS**

Prepare backgrounds in accordance with AS 3958.1, section 4 and to the manufacturer's instructions for the selected substrate. See also the Ardex Flooring manual by visiting [www.ardex.co.nz/](http://www.ardex.co.nz/)

**Conditions****3.6 SERVICES AND ACCESSORIES**

Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.

**3.7 DO NOT START**

Do not start laying tiles until concrete floors are cured, moisture content of floors is such that shrinkage is complete, thermal movement has been accommodated and the levels and surface finish will allow for tile laying of the required standard.

**3.8 SUBSTRATE TEMPERATURE**

Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.

**3.9 MOISTURE CONTENT**

Ensure the floor is dry and if in doubt check for moisture content by hygrometer. Do not proceed with tiling work until readings for the whole area show 75% relative humidity or less. Alternatively, see ARDEX moisture barriers.

**Application****3.10 APPLICATION GENERALLY**

Prepare backgrounds as described in AS 3958.1, Section 4. Suitably prepare backgrounds and substrates to the manufacturer's instructions to receive the bedded finish. Remove all dirt, dust, grease, oil, loose particles and any other form of contamination or deleterious material. Ensure that substrates are sound and dry.

Installation to be in accordance with AS 3958.1, Section 5, including setting out, fitting, movement joints, sealants, tile finish and joints, and grouting.

**3.11 BACKGROUND MATERIALS**

Ensure that the installation of background materials and substrate materials meets relevant standards and the manufacturer's instructions. Inspect background and substrate materials for any conditions unsuitable for tiling over. Do not commence work until the affected area is rectified. Confirm any specific preparation required for the adhesive being used.

**Waterproofing****3.12 WET AREA WATERPROOFING**

Provide waterproofing to wet areas as described in AS 3740.

Material: Refer to SELECTIONS

Locations: Extent of wet areas as described in AS 3740 and as shown on the drawings.

Installation: Supply and install waterproofing membrane to the manufacturer's recommendations by an Ardex Approved Superflex Waterproofing Applicator.

**Screed / Cement Render****3.13 ARDEX A 38, ARDEX A48 or FORTISCREED**

Prepare and apply screed system as per Ardex's requirements and instructions, including substrate preparation, mixing, applying, number of coats, finishing and curing. Protect from damp, condensation and water for at least 24 hours once application is completed.

**Tiling****3.14 ADHESIVE APPLICATION METHODS**

Ensure that the whole of the back of the tile is in good contact with the adhesive with no voids. Remove a tile periodically during installation to ensure correct coverage. Do not fix tiles over skinned adhesive.

Notched trowel method

- Adhesive application to be as described in AS 3958.1, clause 5.6.2(a). Notched trowel sizes shall be 6mm x 6mm x 6mm, 10mm x 10mm x 10mm, 12mm x 12mm x 12mm. Use an appropriately notched trowel to achieve full coverage.

**3.15 SETTING OUT**

Setting out, cutting and fitting of tiles to be as described in AS 3958.1, clauses 5.4.2 and 5.4.3. Set out tiling as shown on the drawings. Confirm bond and pattern before installing. Provide even and correct falls to floor tiles where required, including falls to floor wastes. Ensure that a level finish is provided at wall lines. Where falls are not required ensure that the tiles are laid level.

**3.16 TILE FINISH AND JOINTS**

Provide tile finish and joints, including tolerances, as described in AS 3958.1, clause 5.4.6. Joint widths to be suited to tile and to the manufacturer's instructions.

**3.17 MOVEMENT JOINTS**

Provide movement joints as described in AS 3958.1, clause 5.4.5 and AS 3740, clause 3.13.7.

Depth:	Movement joints to go right through the tile and bed to the background.
Width:	Minimum 6mm.
Corner locations:	In wall tiling at internal vertical corners; in floor tiling at walls, columns, nibs, hobs and similar.
Interruptions:	Around sanitary fixtures, around fixtures interrupting the tile surface; at junctions with joinery fixtures, including window and door frames and built in cupboards; at changes in substrate or background.
Large areas:	In floor tiling provide joints at not less than 4.5 metres spacing in both directions and 3.5 metres externally. In wall tiling provide vertical joints at not less than 3.5 metres spacing along the length of a wall. In wall tiling, provide horizontal joints at each story rise in the height of a wall. Over all existing expansion joints.

**3.18 GROUTING**

Grout tiling to AS 3958.1, clause 5.7.

**3.19 SILICONE**

Apply Ardex SE acetic cure or Ardex ST neutral cure silicone to movement joints between tiles, and at junctions to tiled walls and tiled floors. The silicone should only be fixed to two surfaces to allow movement. On flat joints use a polyethylene tape or release agent and on floor to wall joints greater than 10mm deep use a backing rod.

**Completion****3.20 REPLACE**

Replace damaged tiles or elements.

**3.21 CLEANING**

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

**3.22 LEAVE**

Leave work to the standard required by following procedures.

**3.23 REMOVE**

Remove debris, unused materials and elements from the site.

**3.24 PROTECT TILES**

Protect tiles from damage. Ensure tiles are not disturbed by foot traffic for at least 24 hours after laying and after grouting. Provide protection to tiles by laying sheet material such as insulating board for the period between completion of laying and completion of the contract works.

**4 SELECTIONS**

Substitutions are not permitted to the following, unless stated otherwise.

**Tile Selections****4.1 TILES**

Location:	Kitchen, Bathrooms
Supplier:	Local Cook Island supplier
Type:	Floor = 300x300 non-slip, Wall = Porcelain 300x100
Pattern/number:	Floor = stack bond, Wall = stretcher bond
Colour:	White
Edging:	extruded aluminium 1/4 round

**4.2 PROVIDE SPARE TILES**

Tile:	Floor & wall
Number of tiles:	1m <sup>2</sup> each

**Systems ARDEX typical application selections****4.3 COMMERCIAL FLOORS AND WALLS (ON CONCRETE, CFC SHEET, PLASTERBOARD)**

Substrate Floors:	Concrete
Substrate Walls:	VILLABOARD
Primer:	Ardex Multiprime
Screed:	Ardex A48
Levelling:	Ardex LQ92
Waterproofing:	Ardex Superflex WPM 002
Tile adhesive floor:	Ardex X78
Tile adhesive wall:	Ardex X77
Grout:	Ardex EG 15 Epoxy grout
Grout colour:	Grey
Silicone:	Ardex
Silicone colour:	Grey

# 6700R RESENE PAINTING GENERAL

## 1 GENERAL

This section relates to the general matters related to **Resene** painting work.

### 1.1 RELATED WORK

Refer to 6721R RESENE PAINTING INTERIOR

Refer to 6711R RESENE PAINTING EXTERIOR

### 1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

MPNZA Master Painters New Zealand Association Inc.

SIPDS Surface Information & Preparation Data Sheets

#### Documents

### 1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[Health and Safety at Work Act 2015](#)

[AS/NZS ISO 9001](#) Quality management systems - Requirements

MPNZA Health and Safety Program

### 1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Resene Surface Information & Preparation Data Sheets (SIPDS)  
(hard copy or at [www.resene.co.nz](http://www.resene.co.nz))

Resene Product Data Sheets  
(hard copy or at [www.resene.co.nz](http://www.resene.co.nz))

Resene Putting your safety first

Copies of the above literature are available from Resene

Telephone: 0800 RESENE (0800 737 363)

#### Warranties

### 1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal conditions of use against failure referring to the Resene Promise of Quality in the Resene One-Line specifications and product data manual.

#### Requirements

This painting specification is written based on information available at the time of writing.

### 1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Resene coating system, or associated components and products. Do not combine paints from different manufacturers in a paint system.

If in the applicator's own expertise and judgement an amendment to this specification is required, or where a substrate preparation, or required painting system is not covered in this specification, this shall be brought to the attention of the contract administrator and any amendment agreed before work proceeds any further.

### 1.7 QUALIFICATIONS

Painters to be experienced competent workers, familiar with the materials and the techniques specified and with the Resene coating systems and be members of the Master Painters New Zealand Association Inc.

The applicator is to have the necessary skill, experience and equipment to undertake the work. The applicator remains responsible for ensuring proper completion of the work.

Painters to be selected from the Resene Eco.Decorator programme. The Resene Eco.Decorator programme is designed to recognise a nationwide network of environmentally responsible, quality focussed painting contractors.

Refer to [www.resene.co.nz/ecodecorator.htm](http://www.resene.co.nz/ecodecorator.htm) for a list of Eco.Decorators in your area.

## 1.8 PRIOR TO WORK COMMENCING

Before any work commences painters should verify, with Architects or specifying authority, that their paint matches a previously supplied standard card or panel. Differently coloured paints will vary in price, opacity and durability. Resene normally only specify two coats of colour but with certain colours, such as yellows and oranges, three coats may be needed. Refer to SELECTIONS for location and type.

## 1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents: Maintenance guide for Resene paint finishes [www.resene.co.nz/comn/services/maintenance.htm](http://www.resene.co.nz/comn/services/maintenance.htm). Provide this information prior to practical completion.

## 1.10 HEALTH AND SAFETY

Refer to and comply with the requirements of the [Health and Safety at Work Act 2015](#) including the obligation to:

- Eliminate hazards and if hazards cannot be eliminated or isolated, then minimise the hazards in this work by using the proper equipment and techniques as required by the MPNZA Health and Safety Program.
- Supply protective clothing and equipment.
- Inform the contractor as well as the employees and others on site of those hazards and put in place procedures for dealing with emergencies.

## 1.11 SAFETY DATA SHEETS

Obtain from Resene (phone 0800 RESENE, or [www.resene.co.nz](http://www.resene.co.nz)) the safety data sheet for each product used and comply with the required safety procedures. Keep sheets on site.

### Performance

## 2 PRODUCTS

### Materials

### 2.1 MATERIALS GENERALLY

Do not combine paints from different manufacturers in a paint system.

Use only Resene products (which are guaranteed for consistency and performance under [AS/NZS ISO 9001](#) and APAS) prepared, mixed and applied as directed in the Resene One-Line Specifications and Product Data Manual. This specification has been written using where practical and available both low/no VOC and Environmental Choice approved products.

### 2.2 DARK COLOURS

Darker colours in areas of high sun exposure place significant stress on the coating and substrate. Resene 'CoolColour' technology reduces heat absorption of a wide range of colours. Contact your local Resene Representative or visit [www.resene.co.nz](http://www.resene.co.nz) for more information or visit [www.resene.co.nz/coolcolour](http://www.resene.co.nz/coolcolour). View a list of Resene colours that can be made using Resene CoolColour technology at [www.resene.co.nz/colourlibrary](http://www.resene.co.nz/colourlibrary).

### 2.3 THINNERS/ADDITIVES

Use only if and when expressly directed by Resene for their particular product in a particular application. Always wear gloves when handling any solvents including turpentine as harmful chemicals may be absorbed into the body through the skin.

### Accessories

### 2.4 ACCESSORIES

Contact your local Resene ColorShop for a full range of accessories and usage advice.

### 3 EXECUTION

#### Conditions

#### 3.1 EXECUTION

To conform to required trade practice, which shall be deemed to include those methods, practices and techniques contained in the Master Painters New Zealand Association Inc. Specification manual.

#### 3.2 TREATED SURFACES

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.

#### 3.3 ANCILLARY SURFACES

The descriptions of areas in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-faced natural finish is required or items are completely prefinished. In cases of doubt obtain written instructions before proceeding.

#### 3.4 HARDWARE

Do not paint hinges or hardware that cannot be removed. Before commencing work carefully remove hardware, fixtures and fittings, set aside where they cannot be damaged or misplaced and replace on completion. Refer to SELECTIONS for hardware, fixtures and fittings for removal.

#### 3.5 PROTECTION

Supply, lay and fix drop sheets, coverings and masking necessary to protect adjoining, fixtures, fittings and spaces from paint drops, spots, spray and damage.

#### Application - preparatory work

#### 3.6 SURFACE PREPARATION

Refer to the Resene Surface Information & Preparation Data Sheets (SIPDS) and product data manual for surface preparation sheets (or obtain them by phoning 0800 RESENE, or at [www.resene.co.nz](http://www.resene.co.nz)) listed in the materials systems schedule clauses. Carry out the preparatory work required by them for each of the substrates.

#### 3.7 SHARP EDGES, CRACKS AND HOLES

Remove and/or repair sharp edges, cracks and holes if present, as outlined in the preamble of the Resene One-Line specifications and product data manual.

Elastomeric sealants, if used, should not be painted. The paint film will not match the flexibility of the sealant and may severely limit its effectiveness.

#### 3.8 REMEDIAL WORK

If any substrate or surface, that even with the preparation work called for in this section, cannot be brought up to a standard that will allow painting or clear finishing of the required standard then do not proceed until remedial work is carried out.

#### 3.9 GAP FILLING

Make good cracks, holes, indented and damaged surfaces. Use suitable gap fillers to match the surface being prepared. Any special priming requirements of the fillers must be satisfied. Allow to dry or set before sanding back level with the surface. Prime or seal timber before using putty.

Exterior and wet areas: Use only Portland cement base or water-insoluble organic base gap fillers.

#### 3.10 OFF-SITE WORK

Carry out this work under cover in a suitable environment with suitable lighting. Store items, both before and after coating, in a clean, dry area protected from the weather and mechanical damage, properly stacked and spaced to allow air circulation and to prevent sticking. Specific instructions for transport to site to avoid damage to the factory applied paint system may be required particularly for metallic top coat paints.

**3.11 PRIMING JOINERY**

Pre-treat any cut surfaces of preservative treated timber before priming. Ensure L.O.S.P. treated joinery has dried sufficiently to lose solvent odour. Pre-treat bare timber with Resene TimberLock (see Data Sheet D48) to improve the durability of subsequent coats.

Liberally coat end grain, allow to soak in and then recoat.

**3.12 CONCEALED JOINERY SURFACES**

Where off-site coatings are specified they must be applied to surfaces including those concealed when incorporated into the building.

**3.13 CONCEALED METAL SURFACES**

Apply primer to suit the coating system to surfaces which will be concealed when incorporated into the building.

**3.14 EXTERNAL DOORS**

Prime or seal and paint bottom edges before hanging.

**3.15 BEAD GLAZING**

Stained, varnished, or painted joinery to have the first two coats of a suitable primer and one undercoat, applied to rebates and beads before glazing.

**3.16 PUTTY FRONTING - LINSEED GLAZING PUTTIES**

According to the putty manufacturer's instructions allow putty to set, then prime with Resene Wood Primer (see Data Sheet D40) or Resene Enamel Undercoat (see Data Sheet D44). Fully protect the putty by completing the Resene coating system as soon as it is sufficiently firm. Glazing putties not based on linseed oil to be over coated according to the putty manufacturer's instruction.

**Application - generally****3.17 PAINTING GENERALLY**

Comply with the Resene SIPDS Surface Information & Preparation Data Sheets or Resene One-Line specifications and product data manual data sheets and the additional requirements of this work section.

Ensure large wall areas that require more than one container of paint per coat, have enough paint boxed (mixed) together to complete the final coat. This will not apply if a single factory batch of paint, rather than shop tinted paint, is applied.

**3.18 MIXING**

Although generally supplied ready to use, all paints must be thoroughly mixed to lift any settled pigment and ensure the paint is homogeneous.

**3.19 ENVIRONMENT**

Defer painting of exterior surfaces until weather conditions are favourable - warm dry days without frost or heavy dews. Avoid painting in direct sunlight any surfaces that absorb heat excessively. As far as possible apply paint in the temperature range 15°C to 25°C. If temperatures fall outside the range of 10°C and 35°C do not paint unless paints with the necessary temperature tolerance have been specified. Resene Hot Weather Additive can be added to most Resene waterborne top coats to extend open time when application is undertaken at elevated temperatures or conditions that will cause rapid loss of water from the applied wet film. Do not apply solvent borne paint if moisture is present on the surface.

**3.20 SEQUENCE OF OPERATIONS**

Painting work to generally follow the following sequences:

- Complete surface preparation before commencing painting.
- Apply primers, sealers, stains, undercoats, paints and clear coatings in the sequences laid down by Resene.
- Allow the full drying time between coats laid down by Resene.
- Do not expose primers, undercoats and intermediate coats beyond Resene's recommendations before applying the next coat.
- Finish broad areas before painting trim.
- Ensure batch numbers of tins are matched for whole areas.
- Internally, paint ceilings before walls and walls before joinery, trim and other items.

**3.21 APPLICATION**

Select brush, roller, or pad and apply coatings to the requirements of Resene to obtain a smooth, even coating of the specified thickness, uniform gloss and colour.

**3.22 LIGHTLY SAND**

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. A more thorough sanding to provide a mechanical key for the new paint system may be required depending upon the condition or age of the existing paint system..

**3.23 DEFECTIVE WORK**

Correct defective work immediately and recoat as required, following precisely the Resene system being applied. The same applies to transportation damage to site of factory painted items.

**3.24 EACH COAT**

Each coat of paint and the completed paint system to have the following qualities and properties:

- Uniform finish, colour, texture, sheen and hiding power and the proper number of coats applied.
- No blemishes such as runs, sags, crinkling, fat edges, entrained paint skins, hairs, dust, bare or starved patches, cracks, significant brush marks, ladder marks and blistering.
- Proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application.

**Completion****3.25 CLEAN**

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at the completion of the building works. Clean glass inside and out to a shining finish. Use the Resene Washwise on site 'paint equipment clean-up water' reclamation system to minimise the environmental impact of cleaning paint application tools.

**3.26 LEAVE**

Leave the whole of this work uniform in gloss and colour, of correct thickness, free from painting defects, clean and unmarked and to the standard required by following procedures.

**3.27 REMOVE**

Remove drop sheets, coverings and masking to leave surrounding surfaces and areas clean, tidy and undamaged. Remove debris, unused materials and elements from the site.

**3.28 REPLACE**

Replace hardware without damage to it or the adjoining surface and leave hardware properly fitted and in working order.

**3.29 DISPOSAL OF PAINTS AND THINNERS**

Note: The use and disposal of paint and thinners represents a significant environmental hazard. Ensure all paint and thinners are disposed of in the following manner:

- When requested hand over part used paint containers to client for maintenance touch ups.
- Recycle leftover paint at a Resene ColorShop as part of the Resene "Paintwise programme". Contact your local Resene ColorShop for details or view information online at [www.resene.co.nz/paintwise.htm](http://www.resene.co.nz/paintwise.htm).
- Donate left over paint to local community groups.
- Solvent based paints, paint thinners, turpentine, mineral spirits and solvents require special disposal procedures. Do not pour down sewer or stormwater drains, sinks or into the ground. If they cannot be recycled they must be disposed of in a refuse dump licensed to take toxic waste.

**3.30 MAINTENANCE**

Good maintenance of coating systems involves a routine of regular cleaning as well as regular inspections. Regular inspections of the coating systems are recommended to identify breakdown, accidental damage to or undesirable deterioration of the paint.

Wash down of exterior coatings should be undertaken on an annual basis using Resene Paint Prep and Housewash (see Data Sheet D812).

Refer the Resene Caring for your paint finish brochure and the Resene website, [www.resene.co.nz/comn/services/maintenance.htm](http://www.resene.co.nz/comn/services/maintenance.htm).

## **4 SELECTIONS**

### **4.1 SELECTIONS**

Refer to 6711R RESENE PAINTING EXTERIOR and 6721R RESENE PAINTING INTERIOR for selections.

# 6711R RESENE PAINTING EXTERIOR

## 1 GENERAL

This section relates to the surface preparation, painting and clear finishing of new and existing exterior substrates using **Resene** architectural and decorative coating systems.

### 1.1 RELATED WORK

Refer to 6700R RESENE PAINTING GENERAL for general matters related to painting work.  
Refer to 6721R RESENE PAINTING INTERIOR for interior paint systems.

## 2 PRODUCTS

### Materials

### 2.1 PAINT TYPES GENERALLY/ THINNERS AND ADDITIVES

Refer to 6700R RESENE PAINTING GENERAL for product clauses.

## 3 EXECUTION

### Conditions

### 3.1 EXECUTION

Refer to 6700R RESENE PAINTING GENERAL for execution clauses.

## 4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

### Paint system schedules

### 4.1 EXTERIOR FINISHES

Substrate	Resene SIPDS number	Colour
Timber Joinery/Fascias/Barges	No2	TBC
Timber balustrade	No2	TBC
Concrete Masonry	No3	TBC
uPVC downpipes	No5	TBC

### Resene exterior paint systems

#### Exterior cementitious - new

### 4.2 RESENE NEW EXTERIOR IN-SITU CONCRETE – WEATHERTIGHT MEMBRANE

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 3/1
1st coat	Resene Concrete Primer D405, Acrylic Concrete Primer
2nd coat:	Resene X-200 D62, Acrylic Weathertight Membrane
3rd coat:	Resene X-200 D62, Acrylic Weathertight Membrane

### 4.3 RESENE NEW EXTERIOR CONCRETE BLOCK/MASONRY- WEATHERTIGHT MEMBRANE

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 2/1
1st coat	Resene X-200 D62, Acrylic Weathertight Membrane
2nd coat:	Resene X-200 D62, Acrylic Weathertight Membrane
3rd coat:	Resene X-200 D62, Acrylic Weathertight Membrane

#### Exterior timber - new

### 4.4 RESENE NEW EXTERIOR TIMBER - FACTORY PRIMED

Surface Prep:	Resene SIPDS No2 and Spec Sheet 2: 2/1
1st coat:	Resene Wood Primer D40, Solvent-borne Primer (NEC)
2nd coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic
3rd coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic

### **Exterior fibre cement cladding - new**

#### **4.5 RESENE NEW EXTERIOR FIBRE CEMENT SOFFITS**

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 4/1
1st coat:	Resene Concrete Primer D405, Acrylic Concrete Primer
2nd coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic
3rd coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic

#### **4.6 RESENE NEW EXTERIOR PVC DOWNPIPES**

Surface Prep:	Resene SIPDS No5 and Spec Sheet 5: 1/1
Primer:	Not required
1st coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic
2nd coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic

# 6721R RESENE PAINTING INTERIOR

## 1 GENERAL

This section relates to the surface preparation, painting and clear finishing of new and existing interior substrates using **Resene** architectural and decorative coating systems.

### 1.1 RELATED WORK

Refer to 6700R RESENE PAINTING GENERAL for general matters related to painting work.  
Refer to 6711R RESENE PAINTING EXTERIOR for exterior paint systems.

## 2 PRODUCTS

### Materials

### 2.1 PAINT TYPES GENERALLY/ THINNERS AND ADDITIVES

Refer to 6700R RESENE PAINTING GENERAL for product clauses.

## 3 EXECUTION

### Conditions

### 3.1 EXECUTION

Refer to 6700R RESENE PAINTING GENERAL for execution clauses.

## 4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

### Resene interior paint systems

#### Interior timber - new

### 4.1 RESENE NEW INTERIOR TIMBER JOINERY - SKIRTING

Surface Prep:	Resene SIPDS No2 and Spec Sheet 2: 9/1
1st coat:	Resene Quick Dry D45, Waterborne Acrylic Primer Undercoat
2nd coat:	Resene Lustacryl D310, Waterborne Enamel
3rd coat:	Resene Lustacryl D310, Waterborne Enamel

### 4.2 RESENE NEW INTERIOR TIMBER WALLS, CEILINGS - PLYWOOD - CLEAR

Surface Prep:	Resene SIPDS No2 and Spec Sheet 2: 10/1
1st coat:	Resene Aquaclear Satin D59, Waterborne Urethane Varnish
2nd coat:	Resene Aquaclear Satin D59, Waterborne Urethane Varnish
3rd coat:	Resene Aquaclear Satin D59, Waterborne Urethane Varnish

#### Interior fibre cement - new

### 4.3 RESENE NEW INTERIOR FIBRE CEMENT, WALLS - DRY AREAS

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 6/1
1st coat:	Resene Quick Dry D45, Waterborne Acrylic Primer Undercoat
2nd coat:	Resene SpaceCote Low Sheen D311, Waterborne Enamel
3rd coat:	Resene SpaceCote Low Sheen D311, Waterborne Enamel

### 4.4 RESENE NEW INTERIOR FIBRE CEMENT, WALLS - WET AREAS

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 6/1
1st coat:	Resene Sureseal D42, Solvent-borne pigmented sealer (NEC)
2nd coat:	Resene SpaceCote Low Sheen D311, Waterborne Enamel
3rd coat:	Resene SpaceCote Low Sheen D311, Waterborne Enamel

### 4.5 RESENE NEW INTERIOR FIBRE CEMENT, CEILINGS - DRY AREAS

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 6/1
1st coat:	Resene Quick Dry D45, Waterborne Acrylic Primer Undercoat
2nd coat:	Resene SpaceCote Flat D314, Waterborne Enamel
3rd coat:	Resene SpaceCote Flat D314, Waterborne Enamel

#### 4.6 RESENE NEW INTERIOR FIBRE CEMENT, CEILINGS - WET AREAS

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 6/1
1st coat:	Resene Sureseal D42, Solvent-borne pigmented sealer (NEC)
2nd coat:	Resene SpaceCote Flat D314, Waterborne Enamel
3rd coat:	Resene SpaceCote Flat D314, Waterborne Enamel

#### **Interior cementitious - new**

#### 4.7 RESENE NEW INTERIOR CONCRETE BLOCKS, WALLS - DRY AREAS

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 6/1
1st coat:	Resene Quick Dry D45, Waterborne Acrylic Primer Undercoat
2nd coat:	Resene SpaceCote Low Sheen D311, Waterborne Enamel
3rd coat:	Resene SpaceCote Low Sheen D311, Waterborne Enamel

# 7411MA MARLEY RAINWATER DISPOSAL SYSTEMS

## 1 GENERAL

This section relates to **Marley** rainwater disposal systems.  
It includes;

- uPVC spouting and downpipes
- Stratus Design Series® spouting and downpipes
- associated accessories necessary to complete the installation

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E1/AS1</a>	Surface water
<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">AS/NZS 4020</a>	Testing of products for use in contact with drinking water

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Marley Rainwater Sales Brochures  
Marley Product Catalogue  
Marley - Spouting and Downpipe DIY Installation Guide  
Marley Stratus Design Series® Sales brochure  
Marley Stratus Design Series® - Design and installation guide

Manufacturer/supplier contact details

Company: **Marley New Zealand Limited**

Web: [www.marley.co.nz](http://www.marley.co.nz)

Email: [info@marley.co.nz](mailto:info@marley.co.nz)

Telephone: 0800 MARLEY (0800 627 539)

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier Guarantee:

15 years: Against defects in material and manufacture

- Commence the guarantee from the date of purchase
- Refer to Marley NZ Guarantee available at [www.marley.co.nz](http://www.marley.co.nz)

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

#### 1.4 QUALIFICATIONS

Installers to be experienced, competent workers familiar with the materials and techniques specified.

#### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified Marley systems, components and associated products listed in this section.

### Performance

#### 1.6 TEST

Test the completed Marley rainwater disposal system with water to ensure, spouting is laid to correct fall, that both spouting and downpipes are unobstructed and that no ponding occurs in spouting.

#### 1.7 DESIGN

Layout, falls and capacity of spouting to falls and the size and position of downpipes to comply with [NZBC E1/AS1](#).

## 1.8 DRINKING WATER

All Marley spouting and downpipe systems are tested for the collection of rainwater and drinking purposes to [AS/NZS 4020](#). Care should be taken to ensure water is not contaminated by other sources.

## 2 PRODUCTS

### Materials

#### 2.1 UPVC SPOUTING/DOWNPIPES

Marley uPVC spouting and downpipe systems in white and grey uPVC.

### Products

#### 2.2 MARLEY SPOUTING

Marley spouting system, complete with Marley fittings including jointers, brackets, expansion outlets, end caps and corners supplied by Marley. Spouting to be sized to comply with [NZBC E1/AS1](#) and installed to [NZBC E2/AS1](#) 8.1.6, **Gutters**. Refer to SELECTIONS for type.

#### 2.3 MARLEY DOWNPIPES

Marley downpipe system, complete with Marley fittings including bends, clips, joiners and junctions supplied by Marley. Refer to SELECTIONS for type.

### Components

#### 2.4 MARLEY MCS SOLVENT WELDING CEMENT

Only Marley MCS® Solvent Welding Cement to be used in conjunction with the spouting and downpipe systems to manufacturer's instructions. Colour match to spouting or downpipes.

#### 2.5 EXPANSION OUTLET/DROPPERS

Marley expansion outlet/droppers, compatible with spouting and downpipe profile.

#### 2.6 SCREW FIXINGS - TIMBER FASCIA

Stainless steel, grade 304 finish, self tapping screws 6g x 20mm pan head or wafer head.

#### 2.7 FABRICATION

Special items can be fabricated by Marley to specific dimensions on request including but not limited to angle flats, angle rakes, outlets and adaptors.

## 3 EXECUTION

### Conditions

#### 3.1 HANDLING AND STORAGE

Handle and store Marley downpipes, spouting and accessories to avoid damage. Store on site under cover, on a clean level area, stacked to eliminate movement and away from work in progress. Store out of direct sunlight. Refer to Marley installation guides for further details.

#### 3.2 SUBSTRATE

Check that fascias, barges or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

#### 3.3 THERMAL MOVEMENT

Make adequate provision in the jointing of the spouting for thermal movement in the length of the spouting by using Marley expansion joiners and/or expansion outlets. Refer to Marley expansion technical information.

#### 3.4 ENVIRONMENTAL

Marley Spouting and Downpipe systems are suitable for most environmental conditions and will never rust, rot or corrode.

#### 3.5 RECYCLING

All Marley manufactured spouting and downpipe systems are 100% recyclable and Marley operates recycling programs with industry suppliers where uPVC pipes can be returned from site for recycling at Marley.

## Application

### 3.6 INSTALL MARLEY SPOUTING

Install to Marley's current published installation instructions available at [www.marley.co.nz](http://www.marley.co.nz). Ensure only Marley MCS® Solvent Welding Cement to be used in conjunction with the spouting systems to manufacturer's instructions. From high points fix brackets true-to-line to give a fall of 5mm every 10 metres to outlets. Set spouting brackets at 300mm centres. Make adequate provision for thermal movement.

### 3.7 INSTALL MARLEY DOWNPIPES

Install to Marley's current published installation instructions available at [www.marley.co.nz](http://www.marley.co.nz). Ensure that all joints are sealed properly using Marley MCS® Solvent Welding Cement. Assemble downpipes, solvent cement jointed complete, fit to outlets, fix with pipe clips every 1.2 metres, fix pipe clips with 304 stainless steel screws, plumb and discharging into the stormwater gully or pipe inlet to the Marley required practice.

## PAINTING MARLEY UPVC DOWNPIPES

### 3.8 PAINTING

After installation use a mineral based undercoat and two coats of 100% weatherable acrylic paint. Do not paint the inside of downpipes or brackets.

## Completion

### 3.9 REPLACE

Replace damaged or marked elements.

### 3.10 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

### 3.11 REMOVE

Remove debris, unused materials and elements from the site.

## 4 SELECTIONS

For further details on selections go to [www.marley.co.nz](http://www.marley.co.nz)  
Substitutions are not permitted to the following, unless stated otherwise.

### uPVC system - spouting

#### 4.1 MARLEY UPVC SPOUTING - MAGNUM®

Manufacturer:	Marley
Profile/type:	Marley Magnum® half-round
Size:	189mm
Cross section:	14,300mm <sup>2</sup>
Colour:	Grey
Bracket type:	External

### uPVC system - downpipes

#### 4.2 MARLEY UPVC DOWNPIPES - MAGNUM®

Manufacturer:	Marley
Profile/type:	Marley Magnum® 100mm Round
Size:	110mm
Colour:	Grey
Bracket type:	Stand off

## Miscellaneous items

**Painting**

4.3	PAINTING	
	Brand/type:	waterbourne enamel exterior
	Finish/colour:	to match building

# 7701PC PDL & CLIPSAL ELECTRICAL

## 1 GENERAL

This section relates to the wiring for **Schneider Electric** domestic and small scale commercial installations, including:

- power
- lighting
- Phone / Data / TV Wiring (VDI Systems)
- complete with componentry
- electrically-powered fittings

### 1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

MCB	miniature circuit breaker
RCCB	residual current-operated circuit breakers
RCBO	residual current-operated circuit breaker with over current protection
RCD	residual current device
PCB	printed circuit board
TPS	tough plastic sheathed
GLS	general lighting service
CFL	compact fluorescent lamp
ELV	extra low voltage
PTC	permit to connect
SIA	security integration architecture
LED	light emitting diode
LCD	liquid crystal display
VDI	voice, data, image
PIR	passive infrared
SENZ	Schneider Electric New Zealand
TCF	Telecommunications Carriers' Forum

### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC F7/AS1	Warning systems
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3080	Telecommunications installations - Generic cabling for commercial premises
AS/NZS 3085.1	Telecommunications installations - Basic requirements
AS/NZS 3100:2009	Approval and test specification - general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3133	Approval and test specification - Air-break switches
AS/NZS 3190	Approval and test specification - Residual current devices (current-operated earth - leakage devices)
AS/NZS 3350.1	Safety of household and similar electrical appliances - General requirements
AS/NZS 3439.3	Low - voltage switchgear and controlgear assemblies - Particular requirements for low - voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
AS 3786	Smoke alarms
NZS 4961	Electric cables
AS/NZS 5000.2	Electric cables - Polymeric insulated - For working voltages up to and including 450/750 V
AS/NZS 60598.2.2:2001	Luminaires - Particular requirements - Recessed luminaires
AS/NZS 61008.1	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) - General rules
AS/NZS 61009.1	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - General rules
AS/NZS ISO/IEC 15018	Information technology - Generic cabling for homes
PTC 225	Star-wiring boxes and small office/home office (SOHO) cabling installations

TCF Premises Wiring Code of Practice 2011  
 Electricity (Safety) Regulations 2010 (Reprint as at 4 April 2016)

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

PDL	PDL Iconic Series
PDL	600/500 series
PDL	Modena and Strata 800 series
PDL	Electrical Solutions Guide
PDL & Clipsal	Catalogue and Price Guide

Schneider Electric Wiser C-Bus Home Control

Manufacturer/supplier contact details

Company: **Schneider Electric New Zealand Ltd**

Web: [www.pdl.co.nz](http://www.pdl.co.nz)

[www.clipsal.com](http://www.clipsal.com)

[www.schneider-electric.co.nz](http://www.schneider-electric.co.nz)

Email: [sales@nz.schneider-electric.com](mailto:sales@nz.schneider-electric.com)

Telephone: 0800-652-999

### Warranties

**1.4 WARRANTY - MANUFACTURER/SUPPLIER**

Provide a material manufacturer/supplier warranty:

1 year	Warranty applies to materials under normal environmental and use conditions against failure of materials and execution
2 years	Warranty applies to C-Bus materials under normal environmental and use conditions against failure of materials and execution
4 years	Warranty applies to C-Bus materials under normal environmental and use conditions against failure of materials and execution, if installer is SENZ approved

Refer to SENZ standard terms and conditions of supply for further details.

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

**Requirements****1.5 COMPLY**

Comply with the Electrical (Safety) Regulations (2010), [AS/NZS 3000](#), [AS/NZS 3008.1.2](#) and TCF Premises Wiring Code of Practice for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

**1.6 QUALIFICATIONS**

Carry out work under the supervision of an electrical licensed supervisor.

**1.7 SAFETY OF INSTALLATION - DESIGN BY ELECTRICAL ENGINEER**

Before installation work commences obtain from the electrical engineer a Certified Design. The Certified Design is to comply with the Electrical (Safety) Regulations (2010), regulation 58.

**1.8 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN**

Before installation work commences provide a Certified Design. The Certified Design is to comply with the Electrical (Safety) Regulations (2010), regulations 58. It must be signed by the designer of the installation.

**1.9 ELECTRICAL CERTIFICATE OF COMPLIANCE**

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations (2010), prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect as required by regulation 70.

**1.10 ELECTRICAL SAFETY CERTIFICATE**

Provide an Electrical Safety Certificate (ESC), as required by the Electrical (Safety) Regulations 2010, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

**2 PRODUCTS****2.1 MAINS SUPPLY, SINGLE PHASE**

Tough plastic sheathed neutral screened cable to [AS/NZS 5000.2](#) and [AS/NZS 3008.1.2](#), with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

**2.2 CABLES**

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

Lighting circuits:	Domestic: 1.0mm <sup>2</sup> on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm <sup>2</sup> on 16 amp MCBs
Power circuits:	2.5mm <sup>2</sup> on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm <sup>2</sup> on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm <sup>2</sup> on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm <sup>2</sup> on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Range circuits:	Single phase: 6mm <sup>2</sup> on 32 amp MCBs

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

## 2.3 METER BOX

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

## 2.4 DISTRIBUTION BOARD

Flush or surface mount boards manufactured to [AS/NZS 3439.3](#) and installed in accordance with [AS/NZS 3000](#). Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

## 2.5 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCDs meet Type A and comply with AS/NZS 61008.1, AS/NZS 61009.1, or [AS/NZS 3190](#). MCB breaking capacity to be determined for each installation. Generally 4.5kA is used for residential applications.

## 2.6 WALL BOXES

Single grid size or equivalent to be manufactured from either plastic or metal, with 2 or more gang sizes to be manufactured in metal.

## 2.7 SWITCH UNITS

Single pole switches to be sixteen amp minimum rated, double pole or intermediate to be 10 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units. Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units, locator units and 2 way units.

## 2.8 SWITCHED SOCKET UNITS

10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to AS/NZS 3133, [AS/NZS 3100](#), and [AS/NZS 3112](#), single or multi gang as detailed.

## 2.9 SMOKE ALARMS

Type 1 domestic smoke alarm to [NZBC F7/AS1](#). 1.2 Descriptions of alarm systems. Alarm to AS 3786. A wired 230 volt ionised smoke detector type.

## 2.10 SURGE PROTECTION

Protection for the homes appliances with medium surge protection devices fitted to the switchboard. For variable electronic equipment fit fine surge protection to switched socket outlets.

## 2.11 DATA WIRING

To [AS/NZS ISO/IEC 15018](#). Cables and RJ45 connectors Telepermitted to PTC225 standards. Category 6 rated or higher cable.

## 2.12 LIGHT FITTINGS

Install LED fittings – dimmable where desired. Ensure control gear is suitable for dimming if this is required.

## 2.13 OUTDOOR SWITCHES & SOCKETS

Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches to IP56 minimum, and sockets to IP53 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.

### 3 EXECUTION

#### 3.1 MAIN SUPPLY

Lay underground mains to the network utility operator's requirements. Excavate trench, install cable and marker tape and backfill.

#### 3.2 METER BOX

Fit to meter box manufacturer's and network utility operator's requirements where detailed. Recess into external wall in sheltered area and flashed to weatherproof to [NZBC E2/AS1 fig 69](#). Arrange for meter installation inspection and connection.

#### 3.3 DISTRIBUTION BOARD

Fit to board manufacturer's requirements where detailed and to [AS/NZS 3000](#). Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

#### 3.4 CIRCUIT PROTECTION

Install MCBs at distribution board to AS/NZS3000 to protect each final sub circuit.

#### 3.5 EARTH BONDS

Bond together and to earth all plumbing fittings not adequately isolated, to [AS/NZS 3000](#); the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.

#### 3.6 MAIN EARTH

Provide a plastic toby box or uPVC tube to contain and protect the earth pin. Fix the connecting earth wiring closely and securely against wall surfaces.

#### 3.7 EARTH LEAKAGE PROTECTION

RCD protection installed to [AS/NZS 3000](#).

#### 3.8 DOMESTIC INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to [AS/NZS 3000](#).

#### 3.9 HIGH RISK AREA INSTALLATIONS

Use fixed wired RCD protected socket outlets to 30mA or 10mA in areas that may represent increased risk of electric shock to the user:

- Areas frequented by infants ([AS/NZS 3000](#) recommends 10mA)
- Wet areas: bathrooms, laundries, kitchens
- Near pools and water features
- Where intended for use with cleaning equipment
- Hand held tools subject to movement in use, i.e. workshops, garages

#### 3.10 SET-OUT

Unless specifically detailed, the position of outlets and equipment shown on drawings is indicative of requirements. Study documents and site conditions to ensure no conflict with other services or features will arise. Resolve conflicts and discrepancies before proceeding with work affected.

Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

#### 3.11 CABLING

Install wiring systems to [AS/NZS 3000.3](#)

Adhere to this standard at all times to all requirements.

Basic requirements or recommendations:

All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.

**3.12 CABLING CIRCUITS**

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of 8 light switch units or 4 double or single switched socket units on any circuit. Minimum 2 lighting circuits per floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits.

**3.13 WALL BOXES**

Flush mounted in cavity construction and selected as appropriate to fit products to be mounted. Fix vertically mounted wall boxes to studs. Fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.

**3.14 SWITCH AND SOCKET UNITS**

Fit all single and double switch units and socket at the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch units:	1000mm above finished floor
Socket units:	150mm above work benches
	400mm above finished floor

Label all switch units that control electrical equipment or special lighting circuits with marked switches if desired.

**3.15 ISOLATING SWITCHES**

Locate isolating switches in agreed positions when not specifically shown on the drawings.

**3.16 LIGHT FITTINGS**

Install light fittings in locations and at heights detailed, and in accordance with the fitting manufacturer's requirements.

**3.17 DATA WIRING**

Install data wiring to outlet positions shown on the drawings. Install in conduit for outlets on masonry surface.

**3.18 SMOKE ALARMS**

Install smoke alarms to [NZBC F7/AS1](#) and to the alarm manufacturer's requirements, fitted neatly and without damage to the surrounding finish.

**3.19 SURGE PROTECTION**

Install surge protection devices to manufacturer's requirements and in accordance with [AS/NZS 3000](#). When fitting medium protection at the switchboard, protect the device by a dedicated MCB.

**3.20 ELECTRIC POWERED FITTINGS AND EQUIPMENT**

Install and wire fittings and equipment to individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

**3.21 OUTDOOR/EXTERIOR SERVICES**

Install all wiring systems in accordance with section 3 of [AS/NZS 3000](#).

Adhere to this standard at all times to all requirements.

Basic requirements or recommendations:

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.

Use the appropriate rated fittings for power control and power supply. Weather protected switches to IP56, and sockets to IP53 as a minimum. Install to manufacturers specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

**Completion**

### 3.22 COMPLETION

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

## 4 SELECTIONS

For further details on selections go to [www.pdl.co.nz](http://www.pdl.co.nz), [www.clipsal.com](http://www.clipsal.com), [www.schneider-electric.co.nz](http://www.schneider-electric.co.nz).

Substitutions are not permitted to the following, unless stated otherwise.

### Materials

#### 4.1 PDL SELECTIONS - FITTINGS AND HARDWARE

Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

#### 4.2 METER BOX

Location:	Level 2 entry foyer
Brand / type:	PDL Superboard

#### 4.3 PDL DISTRIBUTION BOARD

Location:	Level 2 entry foyer
Brand / type:	PDL Superboard
MCB:	Schneider Electric Domae
RCCB:	Schneider Electric Domae
RCBO:	Schneider Electric Domae
Surge protectors:	Schneider Electric Domae
Modular contractors:	Schneider Electric
Main switch:	Schneider Electric
Timers:	Schneider Electric
AFDD:	Schneider Electric

#### 4.4 PDL INTERIOR OUTLETS - 500 SERIES

Switch / socket outlets	PDL 500 series
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#### 4.5 PDL & CLIPSAL MISCELLANEOUS SWITCHES & SOCKETS

Light dimmers:	PDL to match selected series
Timer switch:	PDL to match selected series
Push button switch:	PDL to match selected series
	Clipsal to match selected series
Engraved switches:	Clipsal to match selected series
Symbol switch:	PDL to match selected series
PIR sensor switch:	PDL to match selected series
Toggle (2 position) switch:	PDL to match selected series
Waterproof switches:	PDL to match selected series

Shaver and earth leakage protected socket outlets:	PDL Powerguard RCD
Surge protection device (fine)	PDL to match selected series

USB sockets:	PDL to match selected series
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Fan speed controller:	PDL to match selected series
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#### 4.6 INTERNAL LIGHT FITTINGS

Pendant lights:	
Ceiling lights:	Thorn COLLEGE LED, surface 61, 4w
Wall lights:	Thorn LEOPARD LED IP65 surface 17w
Ceiling lights:	Thorn AQUAFORCE II LED surface IP65 41, 7w

#### 4.7 PDL EXTERIOR SWITCHES AND SOCKETS

Weatherproof socket outlets: PDL WP / 56 series

Timer switch: PDL WP / 56 series

Weatherproof switch: PDL WP / 56 series

Daylight switch: PDL WP / 56 series

#### 4.8 PDL EXTERNAL LIGHT FITTINGS

Wall lights: Thorn LEOPARD LED IP65 surface 17w

Floodlights: Clipsal FLS LED Floodlight Series

Pole lights:

Security lights:

Security light sensors: Clipsal FLS LED Sensor Floodlight

#### 4.9 PDL MISCELLANEOUS ELECTRICAL ITEMS

Smoke alarms: Clipsal Fire Tek range

Extractor fan: Clipsal Airflow

#### 4.10 ELECTRICAL APPLIANCES

Range: refer to FF&E schedule

#### 4.11 OWNER SUPPLY ELECTRICAL ITEMS

Item: refer to FF&E schedule

Brand / type: