Clarkson House

Project Specification

41 Smith Road, Wānaka, New Zealand
Project Ref: 2504
Date: 15 October 2026



PROJECT SPECIFICATION Works, materials and workmanship for construction in accordance with the accompanying drawings.

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1013 DOCUMENT CONTROL

1 DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

Company:	Architype Ltd.
Postal Address:	PO Box 5510, Dunedin 5054
Street Address:	42 Queens Gardens, Dunedin, 9016
City:	Dunedin
Telephone:	+643 552 0621
Email:	info@architype.co.nz

1.2 DOCUMENT DETAILS

Project Name:	Clarkson House
Project Number:	2504
Client:	John & Rebecca Clarkson
Version:	1.0

1.3 REVISION CONTROL

Issue:	Building Consent
Revision:	BC1
Issued to:	Client,
Date of Issue:	12.10.2026
Reviewed by:	Hunter Dale
Approved by:	Tim Ross

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1220 PROJECT

1 GENERAL

This general section describes the project including:

- A description of the work
- Design construction safety
- Principal's Health & Safety matters
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK

A 5 bedroom residential dwelling on a rural site with semi enclosed courtyard and external seating area. The building is clad in metal tray, timber and local stone with large glazed openings.

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY

The project designers are unaware of unusual or atypical features, which a reasonably experienced contractor may not be aware of, that may present a hazard or risk during a typical construction process. The Contractor is still required to undertake its own assessment, to determine if they consider there are any further safety matters and provide for these in carrying out the construction of the work.

Principal's Health & Safety Matters

1.5 PRINCIPAL'S KNOWN SITE HAZARDS

Site hazards known to the principal are:

N/A

1.6 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

Obtain a copy of the principal's site health and safety plan.

Site

1.7 SITE

The site consists of: A rural subdivision facing North. The site is generally flat with a building platform in the middle of the site. To the East and West of the Site are neighbouring buildings. The site is accessed from a central driveway on the South boundary

As shown on drawing: A0-01

1.8 LEGAL DESCRIPTION

The site of the works, the street address and the legal description are shown on the drawings.

Site environment - Durability

1.9 EXPOSURE ZONE

The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.

The site zone is: Zone B

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Site environment - Wind

1.10 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

The design wind pressures are to NZS 3604, Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.

Building wind zone High (refer to NZS 3604, table 5.4)

Site environment - Seismic

1.11 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

The zone is to NZS 3604, Section 5 Bracing design, 5.3 Earthquake bracing demand.

The earthquake zone is: Zone 3

Archaeological discovery

1.12 REPORT FINDING ANY ANTIQUITIES AND ITEMS OF VALUE

Report the finding of any fossils, antiquities and other items of value, to the Contract Administrator. All to remain undisturbed until approval is given for removal.

Pre-1900, items or evidence of human activity on the site, come under the Heritage New Zealand Pouhere Taonga Act 2014. If such items or evidence is discovered work must stop immediately and the Contract Administrator must be notified immediately. The site may be classified as an Archaeological Site under the Act, and the Contract Administrator or Owner must contact the Heritage New Zealand for authority to proceed.

Post-1900 items remain the property of the owner, pre-1900 items may remain the property of the owner or the Crown subject to what is found.
Known archaeological information relating to this site includes the following: -
No known archaeological information



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1232 INTERPRETATION & DEFINITIONS

1 GENERAL

This general section relates to definitions and interpretation that are used in this specification.

Definitions

1.1 DEFINITIONS

Hold point:	A stage of the construction where the contract administrator and any other nominated person requires notice to be given that particular work is to be carried out. Work may not proceed on that particular part until the contract administrator and any other nominated person has advised that work can continue. A notice period of 2 Working Days is required unless stated otherwise.
Notification point:	A stage of the construction where the contract administrator and any other nominated person requires notice to be given that particular work is to be carried out. Work may continue and the contract administrator and any other nominated person may choose whether or not they wish to witness the particular work being carried out. A notice period of 2 Working Days is required unless stated otherwise.
Product:	A thing or substance produced by natural process or manufacture.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Provide and fix:	"Provide" or "fix" or "supply" or "fix" if used separately mean provide and fix unless explicitly stated otherwise.
Required:	Required by the documents, the New Zealand Building Code or by a statutory authority.
Review:	Review by the contract administrator and other consultants is for general compliance only. Review does not remove the need for the contractor to comply with the stated requirements, details and specifications of the manufacturers and suppliers of individual components, materials and finishes. Neither can the review be construed as authorising departures from the contract documents.
Working day:	Working day means a calendar day other than any Saturday, Sunday, public holiday or any day falling within the period from 24 December to 5 January, both days inclusive, irrespective of the days on which work is actually carried out.
Workplace:	Workplace means the place where work is being carried out, or is customarily carried out, for a business or undertaking including any place where a worker goes, or is likely to be, while at work (under Health and Safety at Work Act 2015).

1.2 PERSONNEL

Principal:	The person defined as "Principal" in the conditions of contract.
Contractor:	The person contracted by the principal to carry out the contract.
Contract administrator:	The person appointed by the principal to administer the contract on the principal's behalf. Where no person has been appointed by the principal, it means the principal or the principal's representative.

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMA	American Architectural Manufacturers Association
AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
ASTM	American Society for Testing and Materials

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AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc.
BCA	Building Consent Authority
BPIR	Building Product Information Requirements
BRANZ	Building Research Association of New Zealand
BS	British Standard
COP	Code of practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HERA	Heavy Engineering Research Association
LBP	Licensed Building Practitioner
MBIE	Ministry of Business, Innovation and Employment
MPNZA	Master Painters New Zealand Association Inc
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NZTA	New Zealand Transport Agency
NUO	Network Utility Operator
OSH	Occupational Safety and Health
PCBU	Person Conducting a Business or Undertaking (under Health and Safety at Work Act 2015)
RBW	Restricted Building Work
SARNZ	Scaffolding and Rigging New Zealand Inc
SED	Specific Engineering Design
TA	Territorial Authority
TNZ	Transit New Zealand (Transit New Zealand is now New Zealand Transport Agency NZTA - some specifications are still prefixed TNZ)

1.4 DEFINED WORDS

Words defined in the conditions of contract, New Zealand Standards, or other reference documents, to have the same interpretation and meaning when used in their lower case, title case or upper case form in the specification text.

1.5 WORDS IMPORTING PLURAL AND SINGULAR

Where the context requires, words importing singular only, also include plural and vice versa.

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1232S1 EXPLANATION OF SCHEDULE SECTIONS

1 GENERAL

This general section provides an explanation of schedule sections and their relationship to general sections and work sections. Specific schedule sections contained within this specification are also identified.

1.1 EXPLANATION OF SCHEDULE SECTIONS

A schedule section identifies work sections that contain common requirements, as identified in the title of the schedule section. For example 1235S1 SCHEDULE OF SHOP DRAWINGS identifies work sections that have requirements for shop drawings. Details of the requirements are contained in the identified work sections with additional requirements contained in the general section 1235 SHOP DRAWINGS.

Some schedule sections are identified by the 4 digit CBI (Co-ordinated Building Information) number of the general section that they relate to, followed by the letter "S" followed by a numeral (1-9). The numeral allows for multiple schedule sections to be associated with the same general section.

Other schedule sections that do not share a common CBI number with a general section, have their own unique 4 digit CBI number, followed by the letter "S" followed by a numeral. These schedule sections contain additional subject content relating to the schedules and the identified work sections.

1.2 SCHEDULE SECTIONS

The following Schedule sections are contained within the specification:

1235S1	Schedule of Shop Drawings
1238S1	Schedule of As Built Documentation
1239S1	Schedule of Operation & Maintenance Info
1270S1	Schedule of Samples & Prototypes
1270S2	Schedule of Spares & Maintenance Products
1278SR	Schedule Of Slip Resistance Testing

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1234 DOCUMENTATION

1 GENERAL

This general section relates to documentation required by the Territorial Authority / Building Consent Authority for compliance with the New Zealand Building Code. It also includes documentation relating to:

- Substitutions
- Manufacturers' documents
- Branded work sections
- Care of construction documents
- Confidentiality of documents
- Receipt of construction documents

Building Consent Authority documentation

1.1 BUILDING CONSENT

Obtain the original building consent forms and documents from the owner and keep them on site, preserve the condition of consent forms and documents. Liaise with the building consent authority for all notices to be given and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

1.2 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004

- to carry out any work not in accordance with the building consent.
- to carry out Restricted Building Work by anyone other than a Licensed Building Practitioner licensed for that type of work.

The resolution of matters concerning building code compliance to be referred to the contract administrator for a direction and then if required to the BCA for consent.

Where any alteration is requested by the territorial authority or any other authority, do not undertake such alteration until the matter has been referred to the contract administrator for direction.

1.3 PROJECT PERSONNEL

Provide names and contact details of the contractor's key personnel and tradespersons who are involved with the project. Review the list once a month and reissue it if changes have been made.

Licensed Building Practitioner documentation

1.4 LICENSED BUILDING PRACTITIONERS

Provide LBP details. Provide names, LBP numbers, areas of practice and contact information. Provide this information to the BCA before commencing work on the Restricted Building Work in the form required by the BCA. Advise the BCA of any change to an LBP previously advised.

Include the following as applicable

- Site LBP
- Carpenter
- Foundations 1 Concrete foundation walls and concrete slab-on-ground constructor
- Foundations 2 Concrete or timber pile foundations constructor
- Bricklaying and block laying 1 Brick / masonry veneer
- Bricklaying and block laying 2 Structural masonry - Bricklayer / Blocklayer
- Roofing 1 Concrete / clay tile roofer
- Roofing 2 Profiled metal roofer and/or wall cladding installer
- Roofing 3 Metal tile roofer
- Roofing 4 Membrane roofer
- Roofing 5 Torch on membrane roofer
- Roofing 6 Liquid membrane roofer
- Roofing 7 Shingle / slate roofer
- External plastering 1 Solid plasterer
- External plastering 2 Proprietary Plaster Cladding Systems (PPCS) plasterer

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Also provide names and contact details of the following

- Registered drainlayer
- Registered plumber
- Registered gasfitter
- Registered electrician

1.5 RECORD OF WORK

Where Restricted Building Work is carried out by a LBP, on completion provide a Record of Work. Provide copies to both the BCA and the Contract Administrator.

Compliance information

1.6 DOCUMENTATION REQUIRED FOR CODE COMPLIANCE

Information may be required either as a condition of the contract documents or as a condition of the building consent. It may include the following:

- Applicators approval certificate from the manufacturer / supplier
- Manufacturer's / supplier's warranty
- Installer / applicator's warranty
- Producer Statement (PS1) - Design
- Producer Statement (PS3) - Construction from the applicator / installer
- Producer Statement (PS4) - Construction review from an acceptable suitably qualified person

Refer to the general sections for the requirements for compliance information to be provided by the contractor.

Refer to the building consent for the requirements for compliance information to be provided by the contractor.

Obtain required documents from the relevant parties for delivery to the contract administrator after the final inspection has been carried out by the BCA.

1.7 PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the Building Consent Authority and the Contract Administrator. Provide producer statements in the form required by the BCA.

Residential building contract

1.8 CHECKLIST

If requested provide evidence of the prescribed checklist given to the residential client.

1.9 DISCLOSURE STATEMENT

If requested provide evidence of the disclosure statement given to the residential client.

1.10 BUILDING CONTRACT

If requested provide evidence of the written building contract that the residential customer has signed.

1.11 DOCUMENTATION REQUIRED ON COMPLETION

As soon as practicable after completion of the building work, provide in writing the following information and documentation to the client and the relevant territorial authority.

Information and documentation relating to:

- The identity of the building contractor and the subcontractors who carried out the work.
- Maintenance requirements for any products incorporated in the building.

If applicable also provide any guarantee or insurance obtained by the building contractor in relation to the building work.

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Substitutions

1.12 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.13 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified products and systems listed in a section unless specified otherwise. If a product is not available then immediately contact the contract administrator for direction.

1.14 PROPOSED SUBSTITUTIONS

Substitution of products or systems contained within branded work sections is not allowed. The contractor may propose substitutions to products within non branded work sections, when the contractor has determined that the proposed substitution is an alternative to the specified product. The Contract administrator is not bound to accept any substitutions. Submit a draft proposal detailing the substitution to the contract administrator before proceeding with full notification.

1.15 NOTIFICATION OF SUBSTITUTIONS

Notify the contract administrator of proposed substitution of specified products. Notification to include but not be limited to:

- Product identification
- Manufacturer's name, address, telephone number, website and email address
- Detailed comparison between the properties and characteristics of the specified product and the proposed substitution
- Statement of NZBC compliance including durability
- Details of manufacturer warranties

Plus an assessment of:

- Any changes required to the programme including any extension of time required
- Any consequential effects of the proposed substitution
- Any effect the substitution may have on Health & Safety requirements
- Allowance for time and cost for re-design and documentation (if applicable)
- Allowance for time and cost for obtaining an amendment to the Building Consent (if applicable)
- Any change in cost associated with the proposed substitution

and if requested:

- All current manufacturer's literature on the product
- Accreditations and appraisals available
- Reference standards
- Product limitations
- Samples
- List of existing installations in the vicinity of the project

1.16 ACCEPTANCE OF SUBSTITUTIONS

Acceptance of any proposed substitutions will be given in writing by the contract administrator.

Amendments to issued Building Consent

1.17 CONTRACTOR AMENDMENTS TO BUILDING CONSENT

Where the contractor has sought acceptance of a substitution or a variation which is for the contractor's own convenience and the substitution or variation requires an amendment to the Building Consent, the contractor must apply for and obtain the required amendment.

The contractor must:

- Obtain approval for substitutions from the contract administrator.
- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

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1.18 PRINCIPAL AMENDMENTS TO BUILDING CONSENT

Where the principal is proposing a substitution or a variation which requires an amendment to the Building Consent, the contractor must provide to the principal information that the contractor has that is required for the amendment.

The principal will:

- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

Manufacturer's documents

1.19 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

Manufacturer's and supplier's requirements, instructions, specifications or details mean those issued by them for their particular product, material or component and are the latest edition.

1.20 CONTRACTOR TO OBTAIN CURRENT DOCUMENTATION

Where manufacturer’s installation, application and execution requirements are referred to in this specification, the Contractor must ensure they are fully aware of this documentation. Whenever necessary obtain and keep on site the relevant latest version of such documentation and make it available to workers carrying out that part of the work.

1.21 DOCUMENTATION PROVIDED FOR BUILDING CONSENT

Documentation including manufacturer’s installation instructions, specification data sheets, producer statements, BRANZ and similar appraisals may be included in the issued Building Consent. These documents have been provided only to demonstrate compliance with the NZBC.

Branded work sections

1.22 BRANDED PRODUCTS / SYSTEMS

Where branded products and systems are specified, all products and components of the system must be as per the specification.

1.23 CROSS REFERENCED WORK SECTIONS

If any related work is cross referenced to a generic work section, but only the equivalent branded section is included in the specification, use that branded section. Confirm with the contract administrator if there is any doubt.

Care of construction documents

1.24 CONSTRUCTION ISSUE

Take receipt of the plans, specifications and other documents issued “for construction”. Keep at least one copy on site available for use by all on site workers. Keep a record of copies provided to others including subcontractors. Protect the documents as appropriate. Obtain replacement copies for documents that have become damaged.

1.25 REVISIONS TO CONSTRUCTION ISSUE

Where revised plans and other documents are issued ensure that superseded documents are deleted from the working sets. Ensure that subcontractors are provided with amended documents. Delete superseded documents by either:

- removing them from the working copy of the construction issue; or
- marking them as superseded

1.26 RETURN DOCUMENTS ISSUED FOR CONSTRUCTION

On completion of the contract works:

- Keep such copies of the plans, specification and other documents as reasonably required for contractor’s record purposes.
- Retrieve all other copies no longer required by parties.
- Agree method of disposal of such documents with the Contract Administrator.

The Contract Administrator will advise whether such documents shall be:

- delivered to the Contract Administrator/Owner; or

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- disposed of by normal waste disposal methods; or
- disposed of by secure document disposal methods.

Confidentiality of documents

1.27 CONFIDENTIALITY OF DOCUMENTS

Documents shall not be given or copied to others who do not require them for carrying out services required for the construction of the works. Documents are only to be used for the contract. Maintain confidentiality of documents.

2 SELECTIONS

Receipt of construction documents

2.1 INITIAL ISSUE & REVISIONS - HARD COPIES

Initial issue:	None unless requested
Revisions:	None unless requested

2.2 DOCUMENT RECEIPT - ELECTRONIC DOCUMENTS

Electronic documents issued for construction shall be all drawings and specifications. Drawings will be hosted on Dropbox an links will be sent to required parties by email

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1235 SHOP DRAWINGS

1 GENERAL

This general section relates to common requirements for the preparation, submission and review of shop drawings referred to in this specification and in separate specifications/documents relating to this project. Detailed requirements for shop drawings for particular parts of the work are included in the specific work section.

1.1 SCHEDULE SECTION

Refer to 1235S1 SCHEDULE OF SHOP DRAWINGS for work sections contained in this specification that have requirements for shop drawings.

1.2 SHOP DRAWING FORMAT

Prepare shop drawings at appropriate scales to enable good legibility. Unless otherwise specified in a work section, submit shop drawings in the format as listed in SELECTIONS.

1.3 PROGRAMME FOR SHOP DRAWINGS

Allow time in the programme for the preparation, coordination and review of shop drawings. Allow also for such resubmission and further review as may be required prior to fabrication. No extension of time will be allowed for resubmission and further review.

1.4 COMMUNICATION WITH SHOP DRAWING DETAILER

Agree and arrange for such direct contact as is appropriate between detailer, consultant and others whose input may be required in the preparation of the shop drawings. Such direct communication does not relieve the contractor of the need to carry out their own coordination and check of shop drawings.

1.5 CONTRACTOR COORDINATION OF SHOP DRAWINGS

Before submitting the shop drawings for review, carry out coordination to ensure that allowance has been made for all other parts of the work that relate to the work detailed in the shop drawings.

1.6 COORDINATION WITH SITE MEASURE

The contractor is solely responsible for coordination of shop drawing dimensions with site measurements. The reviewer's dimensional review is limited to visual/aesthetic matters only

1.7 SHOP DRAWING REVIEW

Submit shop drawings to the named reviewers for review, in due time to ensure conformance with the contract programme.

- Where no time is stated in a specific section allow 10 working days for review by the reviewer. Where a large number of drawings are involved more time will be necessary.
- Where no person is named as the reviewer, submit the shop drawings to the contract administrator.

Shop drawing review indicates only that the shop drawing interpretation of the design concept has been reviewed without the need for further modification, other than the corrections indicated by the reviewer.
The reviewer may advise that:

- The shop drawings have been reviewed and work may proceed; or
- The shop drawings have been reviewed and work may proceed subject to notes, annotations or comments provided; or
- The shop drawings have been reviewed and work may proceed subject to notes, annotations or comments provided. Resubmitted revised shop drawings shall be provided for the record, or
- Work may not proceed. Revise and resubmit shop drawings

1.8 RESPONSIBILITY

Review of shop drawings does not relieve the contractor of responsibility for the correctness of the shop drawings, site dimensions, the overall design, coordination and performance, or for ensuring the work is carried out in compliance with the contract documents. It does not remove the need for the contractor to comply with the stated requirements, details and specifications of the manufacturers and suppliers of individual components, materials and finishes. Review cannot be construed as authorising departures from the contract documents.

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1.9 RESUBMISSION OF SHOP DRAWINGS

Reviewed drawings which are required to be resubmitted to correct comments or notations indicating where the shop drawings are at variance with the contract documents, are to be modified and resubmitted to the reviewer for re-review. Allow 5 working days for re-review by the reviewer.

1.10 WORK MAY PROCEED

Before proceeding with any fabrication, installation or erection, advice must be obtained from the named reviewers that work may proceed. Where no named reviewer has been nominated advice must be obtained from the contract administrator.

1.11 BIM MODEL

BIM (Building Information Model) is being used for the construction of the works. Refer to SELECTIONS for details of the BIM model and the information required to be included.

2 SELECTIONS

2.1 SHOP DRAWING FORMAT

Submit the shop drawings in the following format

	Format/Size
Hardcopy	Not required
Electronic copy	PDF
CAD file	.dwg

2.2 BIM (BUILDING INFORMATION MODEL) FORMAT

.ifc

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1235S1 SCHEDULE OF SHOP DRAWINGS

1 GENERAL

This schedule section identifies work sections in the specification that have requirements for the preparation, submission and review of shop drawings.

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1235 SHOP DRAWINGS
- Identified Work Sections

Shop drawings

1.2 SHOP DRAWINGS

Refer to the following sections:

3876	Structural Insulated Panel Systems (SIPS)
7673	Split Unit Heat Pump Systems

1.3 SHOP DRAWINGS - ADDITIONAL ITEMS

Refer to separate documentation for shop drawing requirements not contained within this specification.



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1238S1 SCHEDULE OF AS BUILT DOCUMENTATION

1 GENERAL

This schedule section identifies work sections in the specification that have requirements for the submission of as built documentation.

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1238 AS BUILT DOCUMENTATION
- Identified Work Sections

As built documents

1.2 AS BUILT DOCUMENTS

Refer to the following sections:

3876	Structural Insulated Panel Systems (SIPS)
7430	Drainage

1.3 AS BUILT DOCUMENTS - ADDITIONAL ITEMS

Refer to separate documentation for as built documentation requirements not contained within this specification.

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1239S1 SCHEDULE OF OPERATION & MAINTENANCE INFO

1 GENERAL

This schedule section identifies work sections in the specification that have requirements for the submission of:

- Information for operation and maintenance
- Operation and maintenance manuals
- Maintenance contract proposals

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1239 OPERATION & MAINTENANCE
- Identified Work Sections

Information for operation and maintenance

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the following sections:

4239	Soffit Cladding
4285	Slab Edge Finish
4311ME	Metalcraft Espan Roofing
4555	Garage Doors
6700R	Resene Painting General
7411M	Metalcraft Roofing Rainwater Spouting Systems
7673	Split Unit Heat Pump Systems
7687	Zehnder MVHR

Operation and maintenance manuals

1.3 OPERATION AND MAINTENANCE MANUALS

There are no work section requirements.

Maintenance contract proposals

1.4 MAINTENANCE CONTRACT PROPOSALS

Refer to the following sections:

7673	Split Unit Heat Pump Systems

Additional Items

1.5 ADDITIONAL ITEMS

Refer to separate documentation for the submission of operation and maintenance requirements not contained within this specification.

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1240 ESTABLISHMENT

1 GENERAL

This general section relates to site establishment including:

- Notices and approvals
- Inspections
- Site preparation
- Temporary construction

Notices and approvals

1.1 STATUTORY OBLIGATIONS

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

1.2 BUILDING CONSENT AUTHORITY AND NETWORK UTILITY APPROVALS

Attend on building consent authority officers, statutory and network utility inspectors, as necessary to obtain approvals, including those required for the completion of the works.

1.3 NOTIFY NETWORK UTILITY OPERATORS

Notify all network utility operators of proposed works before commencing site operations. Ascertain location of services or confirm that none exist in the vicinity of the works. Take all necessary precautions to avoid damage to existing services.

Site preparation

1.4 SITE ACCESS

Access to the site is limited to: the driveway entrance on the west boundary

1.5 SITE AND SOIL SURVEYS

Carry out all investigations necessary and peruse all information available to determine ground conditions and likely ground performance both on the site and adjacent to it. Also refer to the territorial authority project information memorandum (PIM).

1.6 GROUND CONDITIONS

Refer to the geotechnical / soils report included with this specification.

Temporary construction

1.7 TEMPORARY BUILDINGS

Provide as necessary temporary sheds, offices, lunch rooms, sanitary accommodation and other temporary buildings required for storage, management of the works, for the use of workers while on site and as required by Acts and Regulations.

1.8 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

First aid

1.9 FIRST AID EQUIPMENT

Provide first aid equipment.

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1250 TEMPORARY WORKS & SERVICES

1 GENERAL

This general section relates to temporary works and services required for the construction of the contract works. It includes

- Temporary works and services including temporary fencing and hoardings
- Scaffolding
- General care and protection
- Rubbish removal

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

Maintain alter, adapt and move temporary works and services as necessary. Clear away when no longer required and make good.

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

Take reasonable precautions to prevent unauthorised access, including access outside working hours, to the site, the works and adjoining property. Safeguard the site, the works, materials and plant from damage and theft.

1.4 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

Provide appropriate measures to prevent or minimise sediment generation and silt run off. Comply with territorial and other authority requirements relating to carrying out earthworks.

Prevent silt run off by:

- exposing only as much ground as required at any time
- providing run off channels, contour drains or earth bunds to divert clean water away from the site on to stable sealed or grassed ground
- capture silt by the use of silt fences, vegetation buffer strips, sediment ponds or earth bunds.

Provide sediment control by:

- earth bunds constructed across the slope to control and detain run off
- silt fences constructed using filter fabric stretched between posts at a maximum of 1 metre spacing.

Pump water from trenches and other areas of the site using methods to prevent sediment entering any drain or watercourse. Filter dirty water before discharging into drainage system.

1.5 PROVIDE CONCRETE WASHWATER RUN OFF PROTECTION

Provide appropriate measures to prevent cement/concrete washwater or slurry run off to; drains or waterways, landscaped areas new or remaining and adjoining public or private properties. Comply with territorial and other authority requirements relating to cement/concrete washwater.

Control run off from:

- Cement/concrete based material production, placing and finishing.
- Hosing down and cleaning of, tools and equipment, fresh material, and spilt or surplus material, pumps and mixers etc.
- Wet cutting or grinding.
- Slab watering etc.
- Water cleaning of new concrete elements, fresh used formwork etc.

Small project with relatively large exposed ground areas - prevent run off by:

- directing small amounts of washwater onto the area of ground closest to the work.
- for larger amounts provide run off channels, and small soak pits
- very small amounts of washwater with no aggregate and only a small amount of sand may be spread over existing lawns.

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Large project and those without suitable ground area - prevent run off by:

- plan and implement washwater control measures based on the expected volumes, allow for the timely removal and safe disposal of liquids and solids.
- Limit the volume of water used for washing down to the extent required.
- Control the flow of washwater so that it is directed to proper catchments.
- providing watertight bunds, pits or tanks, filtered washwater is not to be discharged to drains.

Spilt or surplus material:

- if possible allow to set and either use or dispose of as hardfill.
- pre-made concrete items, either use or dispose of as hardfill.

Pump washwater away from drains, waterways and adjoining property.

1.6 EXCAVATION SAFETY

To the Health and Safety at Work Act 2015.

Carry out excavation to WorkSafe, Good Practice Guidelines - Excavation Safety. This may include deep excavation, trenching, and areas behind unfilled retaining walls.
Carry out excavation using plant and equipment suitable for the purpose.

Scaffolding

1.7 SCAFFOLDING

Provide scaffolding for the efficient execution of the works.

Comply with:

- Health and Safety at Work Act 2015
- Health and Safety in Employment Regulations 1995
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
- Worksafe - Scaffolding in New Zealand - Good Practice Guidelines

Temporary services

1.8 WATER

Provide clean, fresh water for the works and make arrangements for distributing about the site.

1.9 ELECTRICITY

To AS/NZS 3012.

Nominate the person to install and be responsible for the complete temporary electrical installation. The name and designation of the person responsible is to be displayed prominently and close to the main switch or circuit breaker.

Inspect and overhaul the installation at such intervals as are prescribed by the network utility operator but not more than three monthly intervals.

Care and protection - Site

1.10 LOCATE AND PROTECT SURVEY MARKS

Review information provided relating to survey marks. Physically locate and protect survey marks. Where required use a licensed cadastral surveyor to reinstate survey marks disturbed during construction.

1.11 LOCATE EXISTING SERVICES

Review information provided relating to underground and above ground services. Physically locate the position of all such services. Arrange with the network utility operator for all necessary exploratory work, location, protection, isolation, off-setting, reinstatement or alterations required. Record any alterations made to such utilities.

1.12 PROTECT EXISTING SERVICES

Protect existing services and parts of service systems, whether indicated or not, that are to remain in place during the execution of the works. Provide temporary caps or covers to prevent the ingress of dust and other contaminants into the systems, ducts, pipes etc. Reinstate where required and repair any damage resulting from carrying out the contract works.

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1.13 PROTECT EXISTING LANDSCAPE ELEMENTS

Protect existing trees, fences, gates, walls, gardens and other designated landscape features which are to remain in position during the execution of the works. Construct a temporary fence at the outer edge of the drip line of trees to be protected. Comply with territorial authority requirements.

1.14 MAKE GOOD - SITE

Make good all damage to existing roads, footpaths, grounds, services, landscape elements and site features caused in carrying out the contract works.

Care and protection - Project

1.15 TEMPORARY PROTECTION

Provide and maintain temporary protection as required to protect products during transport, storage and handling. Provide temporary protection as required to protect the work in progress and the finished work. Refer to 1270 CONSTRUCTION for removal of protection.

1.16 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

Care and protection - miscellaneous

1.17 CONSTRUCTION KEYING AND SECURITY

Provide locksets with temporary keying, or install with the cylinders removed.

1.18 TEMPORARY STORAGE

Provide temporary storage areas and protective covers and screens to meet the requirements of the products to be stored.

Rubbish removal

1.19 PERIODIC RUBBISH REMOVAL

Maintain on site appropriate means for the storage and removal of construction waste material. Where required or appropriate provide for the separate storage of recyclable waste and other materials requiring special disposal.



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1270 CONSTRUCTION

1 GENERAL

This GENERAL section relates to common requirements for construction issues including:

- Quality control and assurance
- Noise and nuisance
- Set-out and tolerances
- Common execution requirements
- Qualifications
- Common product requirements
- Common requirements for samples and prototypes
- Common requirements for spare and maintenance products
- Cleaning during the works
- Removal of protection
- Completion requirements
- Commissioning
- Practical completion submission
- Defects period submissions
- Completion submissions

1.1 SCHEDULE SECTION

Refer to 1270S1 SCHEDULE OF SAMPLES & PROTOTYPES for work sections contained in this specification that have requirements for samples and prototypes.

Refer to 1270S2 SCHEDULE OF SPARES & MAINTENANCE PRODUCTS for work sections contained in this specification that have requirements for spares and maintenance products.

Quality control and assurance

1.2 QUALITY ASSURANCE

Carry out and record regular checks of material quality and accuracy, including:

- Concrete quality and finish.
- Dimensional accuracy of structural column locations (following completion of foundations).
- All perimeter columns and frames for plumb.
- Levels of all floors relative to the site datum.
- Framing timber moisture content.

Where any material, quality or dimension falls outside specified or required tolerances, obtain written direction from the contract administrator. Where building consent approval is affected, confirm remedial action with the Building Consent Authority.

Provide all materials, plant, attendances, supervision, inspections and programming to ensure the required quality standards are met by all project personnel.

1.3 NOTICE

Give notice to the contract administrator and any other nominated person of hold points and notification points. Refer to work sections and 1260 PROJECT MANAGEMENT for hold points and notification points required.

1.4 NOTIFIABLE WORK

Lodge notice of the intention to commence any notifiable work and any work that will at any time include any notifiable work, in accordance with Health and Safety in Employment Regulations 1995.

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Noise and nuisance

1.5 LIMIT CONSTRUCTION NOISE

Minimise the effects of noise generation by including in the planning of the work such factors as placing of plant, programming the sequence of operations and other management functions. Limit construction noise to comply with the requirements of NZS 6803, the requirements of the Resource Management Act sections 326, 327 and 328 and the Health and Safety in Employment Regulations 1995 clause 11.

1.6 ACCEPTABLE NOISE LEVELS

Refer to NZS 6803 Tables 2 and 3 for the upper limits of construction work noise received in residential zones, dwellings in rural areas, industrial areas and commercial areas, note also the allowed adjustments. Do not exceed these limits or any limits imposed by regional councils or territorial authorities.

1.7 PROVIDE INFORMATION TO NEIGHBOURS

Provide information to neighbours of any noise generation from the site liable to constitute a problem. Explain to them the means being used to minimise excessive noise and establish with them the timings most suitable for the noise generating work to be carried on.

Discuss with any complainant the measures being used to minimise noise. Where possible modify these measures to accommodate particular circumstances. Finally, determine the sound level at the location under discussion using methods and observation reporting as laid down in NZS 6803. If the noise level is above the upper limits of NZS 6803, table 2 and table 3, cease the noise generating operation and remedy the problem.

1.8 ROADWAY AND FOOTPATH

Keep the adjacent footpath and road clear at all times. Where work must be carried out in the roadway or footpath, obtain required consents from the territorial authority. Where temporary use is made of the footpath or roadway for deliveries and the like ensure that public safety is protected and the goods and materials moved as soon as practicable. Sweep, wash and otherwise clean the roadway/footpath and restore it to its previous condition.

1.9 VEHICLE CROSSING

Make good damage that has occurred as a result of carrying out the contract works. Where there has been significant damage, contact the territorial authority and obtain instructions for making good. Pay the territorial authority costs associated with making good.

1.10 TRAFFIC SAFETY

The management of traffic safety on-site and related traffic off-site, to WorkSafe Managing Work Site Traffic - Good Practice Guidelines. Movement on- and off-site also to territorial authority and/or NZTA requirements.

1.11 DIRT AND DROPPINGS

Remove dirt and droppings deposited on public or private thoroughfares from vehicles servicing the site to the satisfaction of the appropriate authorities and the contract administrator.

1.12 DAMAGE AND NUISANCE

Take precautions to prevent damage and nuisance from water, fire, smoke, dust, rubbish and all other causes resulting from the construction works.

1.13 SMOKE FREE REQUIREMENTS

In accordance with the Smoke Free Environments Act 1990 smoking is not allowed on site.

1.14 RESTRICTIONS

Do not:

- light rubbish fires on the site.

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Set-out and tolerances

1.15 SURVEY INFORMATION

Locate and verify survey marks and datum points required to set out the works. Where these do not exist or cannot be located advise the contract administrator who will arrange for the required points to be established.

Record and maintain their position. Re-establish and replace disturbed or obliterated marks.

1.16 DATUM

Establish a permanent site datum to confirm the proposed levels and their relationship to all other existing and new levels.

1.17 SET-OUT

Set out the work to conform with the drawings.

1.18 SET-OUT BY LICENSED CADASTRAL SURVEYOR

Before commencing construction provide the contract administrator with a certificate prepared by a licensed cadastral surveyor that the set-out is complete and that the building is accurately placed on the site.

During construction provide the contract administrator with a certificate, prepared by the same licensed cadastral surveyor confirming the set-out of the foundations and grid lines. Necessary adjustments are to be determined and agreed to by the contract administrator before proceeding further.

1.19 CONFIRM HEIGHT IN RELATION TO BOUNDARY

Arrange for the licensed cadastral surveyor to provide a certificate certifying that the building has been constructed within the allowed height in relation to boundary. Obtain details from the principal of the person they have engaged to carry out this certification and advise the surveyor when they can carry out the required survey.

Provide the certificate to the local authority. Provide a copy of the certificate to the contract administrator.

1.20 USE OF SET-OUT INSTRUMENTS

Permit without charge, the use of instruments already on site for checking, setting out and levels.

1.21 CHECK DIMENSIONS

Check all dimensions both on drawings and site, particularly the correlation between components and work in place. Take all dimensions on drawings to be between structural elements before linings or finishes, unless clearly stated otherwise.

1.22 TOLERANCES

All work to be level, plumb, and true to line and face. Unless otherwise specified in specific work sections of this specification, tolerances for structural work shall comply with the following:

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes
Masonry construction:	To NZS 4210 Masonry construction: Materials and workmanship Clause 2.6.5 Tolerances Table 2.2 Maximum tolerances
Structural steelwork:	To NZS 3404.1 Steel structures standard Section 14.4 Tolerances (after fabrication) Section 15.3 Tolerances (erection)
Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

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Refer to work sections for tolerance requirements for finishes.

Execution

1.23 EXAMINE PREVIOUS WORK

Before commencing any part of the work carefully examine the previous work on which it depends, to ensure it is of the required standard.

1.24 REPORT DEFECTIVE PREVIOUS WORK

Refer defects to the contractor to be remedied, if the remedy is outside the scope of the contract documents the contractor shall obtain direction from the contract administrator. Do not carry out work over previous work that is defective and will affect the required standard.

1.25 EXECUTION GENERALLY

Construct the work in accordance with the documents issued for construction including any direction that may have been given by the contract administrator that varies the construction document.

1.26 EXECUTION - NO DETAIL IS PROVIDED

The documents issued for construction will not include all details relating to every material, junction and interface with other materials.

Where the detail provided is of a general nature, or where no detail is provided, refer to the manufacturer's documents for information relating to installation and execution of that part of the work.

Where there is more than one method or detail appropriate to the part of the work in question, refer the options to the Contract Administrator for direction as to which detail or method to use.

1.27 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

Where a NZBC Acceptable Solution is referred to in the specification but not shown on the plans, obtain a copy of that Acceptable Solution and make it available to the workers carrying out that part of the work.

1.28 MINIMISE DELAYS DUE TO WEATHER

Use appropriate techniques and methods to prevent damage and minimise delays due to weather.

Defective or damaged work

1.29 DEFECTIVE OR DAMAGED WORK

Repair defective, damaged and marked elements, or replace them where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Refer to individual work sections for any special requirements.

Hot work - fire safety

1.30 HOT WORK

Generally, to NZS 4781 Code of Practice for Safety in Welding and Cutting, includes but not limited to: Welding; flame cutting; disc cutting; grinding; bitumen blowers; blow lamps; brazing; burning off; soldering; use of hot air guns.

Note - where the standard refers to the use of asbestos, alternative fire-resistant materials are to be used.

1.31 COMBUSTIBLE MATERIAL

Manage fire risk to adjacent combustible materials by isolating hot work at a safe distance away, or store combustible materials away from fire hazards. Additional precautions may be necessary if combustible material cannot be separated from hot work, refer to NZS 4781, 6.1.4.

1.32 HOT WORK PERMIT

A hot work permit, issued by the main contractor, is required when it is not possible to isolate hot work from adjacent fire hazards. Refer to example in NZS 4781, Appendix A.

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1.33 FIRE SYSTEMS

Fire systems should remain operational where possible while welding or cutting work is performed. Where required, shield fire systems to NZS 4781 clause 6.4.

1.34 DURING SUSPENDED WORK

Maintain a fire watch at least 30-minutes after hot works are suspended e.g. during lunch breaks or overnight, to NZS 4781, clause 6.2.7.

For hot works in confined spaces, prevent potential ignition of flammable gases, to NZS 4781 clause 6.5.

Qualifications

1.35 QUALIFICATIONS GENERALLY

The work is to be carried out by workers and / or supervisors who are experienced, competent and familiar with the materials and the techniques specified. Workers must also be familiar with the manufacturers' and suppliers' installation and application instructions and standard details provided by them in relation to the use of the products for this project. If requested provide evidence of qualification / experience.

1.36 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

Where restricted building work (RBW) forms part of the contract works, workers, or supervisors of that work must be licensed building practitioners (LBP) holding current licenses for the particular restricted building work.

For rare instances where non-RBW also requires an LBP refer to individual work sections for details.

1.37 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Where required by a manufacturer or supplier, workers must be specifically trained /approved / accredited / registered / licensed / certified by them. Refer to individual work sections for details.

1.38 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Where workers and / or supervisors of work are required to be licensed, registered or similar under legislation, they must have a current license before they start the work and maintain currency until their part of the work has been completed and all documentation that is required has been provided.

1.39 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Where workers and / or supervisors of work are required to be trained / licensed / certified or similar under industry rules or contractual requirements, they must have a current qualification before they start the work and maintain currency until their part of the work has been completed. Refer to individual work sections for details.

1.40 QUALIFICATIONS – PRODUCER STATEMENTS

Where producer statements are required for parts of the work, ensure that person is suitably qualified and authorized to issue such producer statements.

1.41 REPLACEMENT OF PERSON

Should it be necessary to replace a person, ensure that records of work, producer statements, warranties and the like required for the part of the work they have carried out are obtained.

Ensure that the replacement person takes responsibility for the work they carry out and that they are able to provide such records of work, producer statements, warranties and the like required as a condition of the contract and the building consent.

Products

1.42 NEW PRODUCTS

Products to be new unless stated otherwise, of the specified standard, and complying with all cited documents.

1.43 COMPATIBILITY OF PRODUCTS

Ensure all parts of a construction or finish are compatible and their individual use approved by the manufacturers and suppliers of other parts of the system. Source all parts of a system from a single manufacturer or supplier.

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1.44 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Protect products during transit and delivery on site and / or off site. Reject and replace goods that are defective or damaged or will not provide the required finish.

Handle products carefully to avoid damage and distortion and in accordance with codes of practice and the manufacturer's or supplier's requirements. Avoid any contact with potentially damaging surfaces or conditions.

Store products to avoid visual damage, environmental damage, mechanical damage and distortion. Store in accordance with codes of practice and the product manufacturer's or supplier's requirements. Maintain the proper condition of any protective packaging, wrapping and support.

Refer to individual work sections for any special requirements.

1.45 SUBSTRATE CONDITIONS

Ensure substrate conditions are within the manufacturer's or supplier's stated guidelines both before and during the installation of any material, product or system. Obtain written instructions on the necessary action to rectify unsatisfactory conditions.

1.46 INSTALLING PRODUCTS

Install in accordance with the manufacturer's or supplier's technical literature. Ensure that all installers are familiar with the required substrate conditions and the manufacturer's or supplier's specified preparation, fixing and finishing techniques.

1.47 COMPLY WITH STANDARDS

Comply with the relevant and/or cited Standard for any material or component. Obtain certificates of compliance when requested by the contract administrator.

1.48 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.49 INCOMPATIBLE PRODUCTS

Separate incompatible materials and metals with separation layers, sleeves or gaskets of plastic film, bituminous felt or mastic or paint coatings, installed so that none are visible on exposed surfaces.

Samples

1.50 SAMPLES FOR REVIEW

Where specified in the work sections submit samples and any nominated supporting documentation to the named reviewer and notify the contract administrator of the submission. Where no person is named as the reviewer, submit to the contract administrator.

Samples for review may be described as a portable sample for review, portable control sample, fixed sample for review or fixed control sample. A portable sample refers to a sample that is easily movable, convenient for carrying. A fixed sample refers to a sample that is not portable. If the location of a fixed sample is not defined in the work section, obtain direction from the contract administrator.

For samples that are located on site, or by agreement with the contract administrator are located off site, notify the reviewer and contract administrator of their location and availability for review.

Timing for the provision and review of samples is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for each review. Allow for such resubmission and further review as may be required. No extension of time will be allowed for resubmission and further review.

Obtain written instructions in relation to the samples from the contract administrator. Do not proceed further with related work items until advised to continue.

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Samples may be incorporated in the finished work if confirmed in writing by the contract administrator, otherwise allow to completely remove any fixed samples. Remove from the site any rejected samples.

Refer to SAMPLES clauses in work sections for further detail.

1.51 CONTROL SAMPLES

Samples become control samples if an instruction is given by the contract administrator to that effect. Control samples will be used for comparison purposes throughout the contract. Control samples may be portable or fixed in place, refer to SAMPLES clauses in work sections for further detail.

Control samples that are to remain on site, or otherwise in the care of the contractor, are to be maintained in original condition.

If confirmed by the contract administrator, fixed control samples may be incorporated in the finished work, otherwise allow to remove fixed control samples from site when instructed by the contract administrator.

1.52 OTHER SAMPLE REQUIREMENTS

Where specified in the work sections obtain samples for the purposes described.

Prototypes

1.53 PROTOTYPES - TESTING

Where specified in the work sections provide and test prototypes. Timing for the provision, testing, disassembling, re-assembling, retesting and review of prototypes and test results is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for each review of test results. Submit test results to the named reviewer and to the contract administrator. Where no person is named as the reviewer submit test results to the contract administrator.

Obtain written instructions in relation to the prototype from the contract administrator. Do not proceed further with related work items until advised to continue.

Refer to PROTOTYPES - TESTING clauses in work sections for further detail.

1.54 PROTOTYPES - REVIEW

Where specified in the work sections provide prototypes for review. Timing for the provision, disassembling, re-assembling and review of prototypes is to be included in the contract programme. Where no time is stated in a work section allow 10 working days for review by the named reviewer. Where no person is named as the reviewer notify the contract administrator for direction.

Obtain written instructions in relation to the prototype from the contract administrator. Do not proceed further with related work items until advised to continue.

Refer to PROTOTYPES - REVIEW clauses in work sections for further detail.

1.55 PROTOTYPES - GENERAL

Refer to the PROTOTYPES - TESTING and PROTOTYPES - REVIEW clauses in work section for details on what is to happen after the review and or testing of the prototype is complete. Where no information is provided refer to the contract administrator for direction.

Prototypes may become control samples if an instruction is given by the contract administrator to that effect.

Spares & maintenance products

1.56 SPARES & MAINTENANCE PRODUCTS

Collect, protect, package, label and store safely all spares and maintenance products specified in the work sections. Give the contract administrator an inventory of all spares and maintenance products.

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If no instruction is given within a work section for the location of spares and maintenance products, then deliver to the owner.

If no instruction is given within a work section for timing in relation to the provision of spares and maintenance products, then provide at practical completion.

Refer to SPARES & MAINTENANCE PRODUCTS clauses in work sections for further detail.

Cleaning during the works

1.57 PERIODIC SITE CLEANING

Carry out periodic site cleaning during the contract period. Place waste material in appropriate storage pending removal from the site. Keep food waste separate from construction waste.

1.58 TRADE CLEANING

Keep the work area clean, remove of all debris, unused and temporary materials and elements from the site as work progresses and on completion. Refer to individual work sections for any specific requirements.

Remove protection

1.59 REMOVE PROTECTION

Remove all temporary markings, labels, packaging and coverings to products unless instructed otherwise, or where they are required for protection.

Maintain temporary protection until removal is required by the manufacturer/supplier, the execution of the work or the requirements of individual work sections. Re-establish protection as necessary.

Remove temporary protection and special protection immediately prior to practical completion or before when there is no further risk of damage.

Refer to individual work sections for any special removal requirements.

Completion

1.60 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.61 LEAVE WORK

Leave work to the standard required for the following procedures.

1.62 COMPLETION - TESTS & CERTIFICATION

Carry out tests as detailed in the work sections. If testing identifies a failure to meet performance requirements, notify the contract administrator and any nominated recipient, identify and correct the cause of failure and repeat the test. Submit test results and certification documentation to the contract administrator and any nominated recipient.

1.63 REMOVE CONSTRUCTION WASTE

Remove all debris, unused materials and the like from the site. Arrange for material to be recycled to be collected or delivered to the recycler.

1.64 COMPLETE ALL SERVICES

Ensure all services are complete and operational, with all temporary labelling removed, required labelling fixed and service instructions provided.

1.65 CLEANING BY CONTRACTOR

Clear the contract works of all construction materials, waste, dirt and debris. Clean the contract works including:

- Wipe all surfaces to remove construction dust.
- Clean out service ducts and accessible concealed spaces.
- Clean out all gutters and rainwater heads.
- Wipe dust from both sides of glass. Take particular care when removing paint or cementitious

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materials to not damage the glass. Do not use metal scrappers that may damage the glass.
- Remove adhesive residue left by labels and other temporary protection/markings.
- Clean out the interior of all cabinetry.
- Wash down external concrete including driveways and concrete masonry. Take care when waterblasting to not cause damage to the surface or allow water to enter the building.
- Remove rubbish and building material from the area immediately adjacent to the contract works.

Commissioning

1.66 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.67 MOVING PARTS

Adjust, ease and lubricate all doors, windows, drawers, hardware, appliances, controls and all moving parts to give easy and efficient operation.

1.68 COMMISSIONING - TESTS & CERTIFICATION

Carry out tests as detailed in the work sections. If testing identifies a failure to meet performance requirements, notify the contract administrator and any nominated recipient, identify and correct the cause of failure and repeat the test. Submit test results and certification documentation to the contract administrator and any nominated recipient.

1.69 INSTRUCTION AND DEMONSTRATION

Provide instruction and demonstration to the owner/occupier to the extent that is listed below and as required for them to reasonably occupy and use the building. This is to include at least the following:
- Location and isolation of all services connections.
- Operation of all emergency systems.
- Locking and security arrangements.
- Operation of basic building services including lighting, heating, mechanical ventilation, air conditioning and security.
- Special cleaning requirements and procedures.
- Any other features that the owner/occupier needs to know about.

1.70 SECURITY AT COMPLETION

Remove any temporary lock cylinders and complete final keying prior to handing over keys to the principal on completion of the works. Leave the works secure with all accesses locked. Account for all keys/cards/codes and hand to the principal along with an itemised schedule, retaining a duplicate schedule signed by the principal as a receipt.

Practical completion submission

1.71 ADDITIONAL PRACTICAL COMPLETION INFORMATION

In addition to requirements in the contract and contained elsewhere in the specification provide the following information submissions for practical completion:
- All documents which the contractor has obtained on behalf of the owner/occupier.
- Information required by the owner/occupier to be able to use the building.
- Advice that NUO accounts in the contractor's name have been closed and as appropriate changed to be in the name of the owner/occupier.
- A list of persons to be contacted to carry out any emergency or remedial work including 24 hour/7 day contact details.

Defects period submissions

1.72 DEFECTS REMEDIATION - SUBMISSIONS

Provide the following at periods required by the contract administrator, where no period is stated, provide this information monthly:
- A copy of the contractor's check list identifying remaining defects and omissions to be completed recording progress made in completing and correcting the items.
- A copy of lists issued by the principal/employer identifying omissions and defects recording progress made in completing and correcting the items.
- A copy of lists issued by the contract administrator identifying omissions and minor defects

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recording progress made in completing and correcting the items.

Completion submissions

1.73 FINAL COMPLETION - SUBMISSIONS

In addition to requirements in the contract and contained elsewhere in the specification provide:

- Contractors advice that all defects have been corrected and omissions and deferred work completed.
- All documents which the contractor has obtained on behalf of the owner/occupier.



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1270S1 SCHEDULE OF SAMPLES & PROTOTYPES

1 GENERAL

This schedule section identifies work sections in the specification that have requirements for:

- The submission of samples
- The submission of prototypes for review
- The provision and testing of prototypes

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1270 CONSTRUCTION
- Identified Work Sections

Samples

1.2 SAMPLES

Refer to the following sections:

4272	Stone Cladding
7151	Sanitary fixtures, tapware & accessories

1.3 SAMPLES - ADDITIONAL ITEMS

Refer to separate documentation for sample requirements not contained within this specification.

Prototypes

1.4 PROTOTYPES - REVIEW

Refer to the following sections:

4821	Flashings

1.5 PROTOTYPES - TESTING

There are no work section requirements.

1.6 PROTOTYPES - ADDITIONAL ITEMS

Refer to separate documentation for prototype requirements not contained within this specification.



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1270S2 SCHEDULE OF SPARES & MAINTENANCE PRODUCTS

1 GENERAL

This schedule section identifies work sections in the specification that have requirements for spares and maintenance products.

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1270 CONSTRUCTION
- Identified Work Sections

Spares & maintenance products

1.2 SPARES & MAINTENANCE PRODUCTS

There are no work section requirements.

1.3 SPARES & MAINTENANCE PRODUCTS - ADDITIONAL ITEMS

Refer to separate documentation for sample requirements not contained within this specification.



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1278SR SCHEDULE OF SLIP RESISTANCE TESTING

1 GENERAL

This section relates to the testing of surfaces for slip resistance. It includes:

- test methods and minimum test values required for slip resistance testing.
- general reporting requirements.

This section includes schedules identifying work sections with:

- slip resistant surfaces exempt from testing and slip resistant surfaces that have been tested and comply with NZBC D1/AS1 requirements for testing.
- surfaces that require slip resistance testing.

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- Work sections identified in the schedule(s)

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:

BPN	British Pendulum Number
COF	Coefficient of friction
SDV	Slope design value
SRV	Slip resistance value

Documents

1.3 DOCUMENTS

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

NZBC D1/AS1	Access routes
AS 4586	Slip resistance classification of new pedestrian surface materials

Slip resistance - surfaces not requiring testing

1.4 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces on access routes that do not require testing for slip resistance include surfaces identified in NZBC D1/AS1, Table 2 as acceptable. These surfaces are covered in the following Work sections:

6311 Timber Strip, Block & Plank Flooring

1.5 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

There are no work section requirements.

Slip resistance - surfaces requiring testing

1.6 SLIP RESISTANCE - SURFACES REQUIRING TESTING

There are no work section requirements.

1.7 TEST METHODS & MINIMUM TEST VALUES

Refer to tables below for test methods and minimum test values required for the stated test condition.

Test condition:	Minimum test value required:	Test method:
Level access wet	39 SRV	Wet pendulum test method of AS 4586, Appendix A using the Slider 96 rubber.

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Sloping access wet	Refer to sloping access wet table below, select BPN value for stated slope.	Wet pendulum test method of AS 4586, Appendix A
Stairs wet - with slip resistant nosings	39 SRV	Wet pendulum test method of AS 4586, Appendix A using the Slider 96 rubber.
Stairs wet - without slip resistant nosings	50 BPN	Wet pendulum test method of AS 4586, Appendix A
Wet areas primarily used barefoot	“B” Classification	Obtain classification from the ramp method of AS 4586, Appendix C
Level access dry	0.4 COF	Obtain slip resistance value from the dry floor friction test method of AS 4586, Appendix B
Sloping access dry	Refer to sloping access dry table below, select COF value for stated slope.	Obtain slip resistance value from the dry floor friction test method of AS 4586, Appendix B
Stairs dry - with slip resistant nosings	0.4 COF	Obtain slip resistance value from the dry floor friction test method of AS 4586, Appendix B
Stairs dry - without slip resistant nosings	0.525 COF	Obtain slip resistance value from the dry floor friction test method of AS 4586, Appendix B

Sloping access wet - minimum test values required for a given slope

Minimum test value required (SDV)	Maximum gradient	Maximum slope in degrees
42 BPN	1 in 39	1.5°
43 BPN	1 in 29	2.0°
44 BPN	1 in 23	2.5°
45 BPN	1 in 20	3.0°
45 BPN	1 in 17	3.5°
46 BPN	1 in 15	4.0°
47 BPN	1 in 13	4.5°
48 BPN	1 in 12	5.0°
49 BPN	1 in 11	5.5°
50 BPN	1 in 10	6.0°

Sloping access dry - minimum test values required for a given slope

Minimum test value required (COF)	Maximum gradient	Maximum slope in degrees
0.433	1 in 39	1.5°
0.444	1 in 29	2.0°
0.455	1 in 23	2.5°
0.466	1 in 20	3.0°
0.477	1 in 17	3.5°
0.488	1 in 15	4.0°
0.499	1 in 13	4.5°
0.504	1 in 12	4.76°
0.521	1 in 11	5.5°
0.525	1 in 10	5.7°
0.543	1 in 9	6.5°
0.557	1 in 8	7.125°

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1.8 GENERAL REPORTING REQUIREMENTS

Provide slip resistance test results to the contract administrator, including a statement that the tested surface meets or exceeds the nominated minimum test value. Refer to individual work sections for additional requirements. If no time is nominated for the submission of test results in the work section, then provide test results prior to practical completion.

If testing identifies a failure to meet performance requirements, notify the contract administrator and manufacturer/supplier. Consult with the manufacturer/supplier to identify the cause, then correct the failure and repeat the test.

Slip resistance - additional items

1.9 SLIP RESISTANCE - ADDITIONAL ITEMS

Refer to separate documentation for slip resistance requirements not contained within this specification.



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2210 PREPARATION & GROUNDWORK

1 GENERAL

This section relates to the clearance, excavation and backfilling of the site area in preparation for:

- footings and floor slabs

Documents

1.1 DOCUMENTS

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

NZS 3604	Timber-framed buildings
WorkSafe	Good Practice Guidelines - Excavation Safety

1.2 SITE SAFETY

Provide adequate support for all excavations.

1.3 ARCHAEOLOGICAL DISCOVERY

If fossils, antiquities and other items of value are found refer to the general section 1220 PROJECT for actions to be taken with archaeological discovery.



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2 PRODUCTS

2.1 EXCAVATED CLEAN FILL

Clean, free of contamination, mineral soil from other formations in the excavation which may be selected and approved as suitable for filling by having grading and moisture content properties that will allow recompaction to 95% of maximum density.

2.2 ROCK FILL

Hard material comprising rock, broken stone, hard brick, concrete, run of pit scoria, or other comparable inert material capable of being placed and compacted as specified.

2.3 SAND FILL

Clean sand of such grading in particle size to achieve mechanical compaction to 90% maximum density.

2.4 HARD FILL

Scoria or crushed rock to GAP (General All Passing) 40 grading.

2.5 GRANULAR FILL

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

2.6 DRESSING COURSE

Scoria to GAP 20 grading, or "dirty footpath scoria", or equivalent "all in" graded crushed metal aggregate.

2.7 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.



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3 EXECUTION

3.1 WASHOUT BAY FOR TRUCK

Provide a designated area for trucks to be washed down to avoid mud and dirt being carried off site.

3.2 EXCAVATION GENERALLY

Carry out excavation, using plant suitable for the purpose, to the guidelines set by the WorkSafe, Good Practice Guidelines - Excavation Safety.

3.3 BURNING OF MATERIALS

Burning of materials is not permitted on site.

3.4 PROTECT EXISTING WORK

Protect from damage existing buildings, structures, roads, paving and services nominated on the drawings as being retained.

3.5 EROSION CONTROL

Ensure measures are in place to contain silt dislodged as a result of water infiltration and to prevent it being carried off site with stormwater.

3.6 SURFACE PREPARATION

Comply with NZS 3604, section 3.5, **Site preparation**. Remove all turf, vegetation, trees, topsoil, stumps, uncontrolled fill and rubbish from the area to be built on.

3.7 STOCKPILE TOPSOIL

Stockpile excavated topsoil on site where directed. Keep separate from other excavated materials. Spread and level where directed before completion of the works.

3.8 GENERAL EXCAVATION

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

3.9 ROCK EXCAVATION

If rock is found at any level above the underside of the structural foundations, or above required base levels for site service trenches, immediately notify the owner. Obtain written instructions from the owner on the proposed approach to rock excavation, or consequent alterations to subgrade construction. Confirm any changes with the territorial authority.

3.10 FOUNDATION EXCAVATION

Take foundation excavations to depths shown. Keep trenches plumb and straight, bottoms level and free of soft spots, stepped as detailed and clean and free of water.

3.11 INADEQUATE BEARING

If localised bearing is not to NZS 3604, 3.1.2 **Foundations** and 3.1.3 **Determination of good ground**, then excavate further and backfill with material as follows:

- Below slabs on grade: Hardfill compacted in 150mm layers
- Below footings: 10 MPa concrete

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.
Confirm any changes with the territorial authority.
For inadequate bearing or over excavation of service trenches, use hardfill compacted in 150mm layers.

3.12 STANDARD OF COMPACTION

Place fill in layers of not more than 150mm and compact to achieve 95% of maximum dry density. For granular fill material, the fill shall be compacted to 80% of saturated dry density.

3.13 GRANULAR BASE FOR SLABS

To conform to NZS 3604, section 7.5.3, **Granular base**. Consolidate with a vibrating roller. Blind the surface with 20mm of coarse sand or sand/cement and roll ready to receive a damp-proof membrane.

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3.14 GENERAL BACKFILLING

Obtain written confirmation from the owner before using any excavated material. Compact approved backfilling in 150mm layers with the last 200mm in clean topsoil, lightly compacted and neatly finished off.

3.15 RETAINING WALLS

Backfill behind retaining walls with free draining granular material and compact in 200mm layers. Ensure any tanking membranes, protection sheets, drain coil and damp-proofing are not damaged.

3.16 SURPLUS MATERIAL

Remove surplus and excavated material from the site.

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3101 CONCRETE WORK - BASIC

1 GENERAL

This section relates to formwork, reinforcement, concrete mixes and the placing of concrete.

1.1 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

ACRS	Australian Certification Authority for Reinforcing Steels - An independent certification scheme for reinforcing steel and structural steel, by product and manufacturer/processor. Certifies compliance with Australia/New Zealand Standards.

ACRS web site - www.steelcertification.com

Documents

1.2 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZBC E2/AS3	External moisture provisions for concrete and concrete masonry buildings
AS 1366.3	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NZS 3101.1	Concrete structures standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
CCANZ CP 01	Code of practice for weathertight concrete and concrete masonry construction

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Manufacturer/supplier contact details
Web: https://www.alliedconcrete.co.nz/

Requirements

1.4 QUALIFICATIONS

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

1.5 STEEL REINFORCING COMPLIANCE

Steel reinforcing materials for concrete to AS/NZS 4671. Steel to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel. Confirm compliance and provide evidence if requested.

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2 PRODUCTS

2.1 NORMAL CONCRETE

Normal concrete 17.5 to 50 MPa grade, (refer to SELECTIONS), maximum aggregate size 19mm ready-mixed to NZS 3104. Provide delivery dockets listing mix and despatch details.

2.2 REINFORCEMENT

Bars to AS/NZS 4671. Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to AS/NZS 4671, and 500E mesh to AS/NZS 4671.

2.3 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.4 SPACERS AND CHAIRS

Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

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3 EXECUTION

3.1 HANDLE AND STORE

Handle and store reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.

Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

3.2 FALSEWORK AND FORMWORK

Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss. Do not use tie wires or rods unless approved in writing by the Contract Administrator. Unless detailed otherwise, provide a 19mm chamfer or fillet strip at all interior and exterior angles of beam and column forms. Mitre at intersections.

Water blast to clean formwork. Keep formwork wet before concrete is placed.

Unless detailed otherwise, set up soffit boxing for beams and slabs to provide a camber when forms are stripped, of 3mm rise for every 3 metres of total clear span.

3.3 CUT AND BEND REINFORCEMENT

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109: 3.3 Hooks and bends. Minimum radii of reinforcement bends to NZS 3109, table 3.1, Minimum radii of reinforcement bends. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.

3.4 ADJUSTMENTS

Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.

3.5 TOLERANCES, BENDING

To NZS 3109, 3.9, Tolerances for reinforcement.

3.6 SECURE REINFORCEMENT

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

3.7 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.
Wire mesh laps to NZS 3101.1, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

3.8 EQUIPOTENTIAL BONDING REINFORCING

Co-ordinate with electrician to provide for equipotential bonding of reinforcing as required by AS/NZS 3000, 5.6 Equipotential Bonding, before concrete placement.

3.9 CASTING IN

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

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

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

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

3.10 CONSTRUCTION JOINTS

Locate and construct as shown on the drawings or in accordance with NZS 3109, 5.6, Type B.

3.11 PRE-PLACEMENT INSPECTION

Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the Building Consent Authority.

3.12 SURFACE FINISHES

To NZS 3114, 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.13 EXPOSED CONCRETE

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

3.14 CONCRETE SURFACE TOLERANCES

To NZS 3114, 104, Surface tolerances and NZS 3114, 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

3.15 PUMPING CONCRETE

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109, 7.4, Handling and placing and NZS 3109, 7.6, Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.

3.16 COMPACTION

Use power operated vibrators on foundations, vertical constructions and beams.

3.17 SAW CUTS TO NZS 3604 OR NZS 4229

Cut slabs where indicated on the drawings as required to control shrinkage cracking. Form by saw cutting the slab (blade width approximately 5 mm) to a quarter of the depth of the slab after it has hardened (saw cutting shall take place no later than 24 hours after initial set for average ambient temperatures above 20 ºC, and 48 hours for average ambient temperatures below 20ºC).

3.18 SURFACE DEFECTS

Make good surface defects immediately after forms are stripped. Make good hollows or bony areas with 1:2 mortar or plaster, finished to the same tolerances as the parent concrete. Fill any tie rod holes with 1:2 mortar.

3.19 CURING OF CONCRETE

Keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.

3.20 STRIKE FORMWORK

Strike formwork without damaging or overloading structure. Do not remove formwork before the following minimum periods:

12 hours:	Sides of beams, walls and columns
4 days:	Slabs in beam and slab construction (leave props under slab spans over 2 metres)
10 days:	Props from under slab spans over 2 metres
18 days:	Beams, soffits and slab spans over 5 metres

3.21 REMOVE

Remove all unused materials and all concrete and reinforcing debris from the site.

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4 SELECTIONS

4.1 REINFORCEMENT LAPS

Where reinforcement laps are not shown on the drawings, lap as follows:

Bar diameter	Grade 300E deformed
10mm	400mm
12mm	500mm
16mm	650mm

4.2 NORMAL CONCRETE

Normal concrete:

17.5 MPa: for paving

4.3 SURFACE FINISHES PAVEMENTS AND DRIVEWAYS

Surface finish class to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes.

Finish class	Location
Exposed aggregate - Autumn Gold Standard Crushed Aggregate	As drawn

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3114E EXPOL UNDERSLAB INSULATION

1 GENERAL

This section relates to the supply and installation of Expol insulation foam boards for concrete slabs on ground.

It includes:

- EPS and XPS under slab insulation foam boards
- XPS slab edge insulation foam boards

Documents

1.1 DOCUMENTS

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

NZBC H1/AS1-AS2	Energy efficiency
AS 1366.3	Rigid cellular plastic sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

Expol under slab / slab edge insulation brochures
Expol technical product guide
Expol technical data sheets
Expol ThermaSlab edge installation instructions
Expol BPIR

Company	Expol Ltd
Web:	www.expol.co.nz
Email:	tech@expol.co.nz
Telephone:	09 634 3449 / 0800 863373
Facsimile:	09 634 0756

Requirements

1.3 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

2 PRODUCTS

Materials - under slab insulation

2.1 EXPOL THERMASLAB VH GRADE

Expol ThermaSlab VH grade EPS under slab insulation sheets to AS 1366.3 and AS/NZS 4859.1 for high load applications. Available in a range of sizes and thicknesses. Refer to SELECTIONS.

2.2 EXPOL THERMASLAB H GRADE

Expol ThermaSlab H grade EPS sheets to AS 1366.3 and AS/NZS 4859.1. Available in a range of sizes and thicknesses. Refer to SELECTIONS.

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3 EXECUTION

3.1 EXPOL-X

Expol-X, XPS dense rigid foam insulation board. Available in 2500mm x 600mm and a range of thicknesses. Refer to SELECTIONS.

Conditions

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.3 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.4 PROTECT

Do not subject the polystyrene to prolonged saturation or exposure to sunlight. Do not allow the polystyrene to come into contact with solvents.

3.5 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

Installation/application

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 INSTALLATION - GENERAL

Install under slab insulation to NZBC H1/AS1-AS2 and Expol Ltd installation requirements. Also install to NZS 4246 for all housing and buildings up to 300m².

3.8 INSTALL UNDERSLAB INSULATION

Install the polystyrene sheets once the polythene DPM has been laid. Place the polystyrene sheets on top of the polythene DPM and butt together. Do not place the polystyrene under any footings or slab thickenings. Cut holes in the polystyrene with a sharp knife to accommodate any services. Lay reinforcing steel mesh over the polystyrene on mesh chairs

Installation - concrete slab edge

3.9 INSTALL SLAB EGDE INSULATION

Fix slab edge insulation boards with Expol Styrofix adhesive at an application rate of 1 tube per board. Apply a bead of adhesive to the back of the board in a wave pattern between the top and bottom edges, allowing for small gaps at the bottom of every valley for trapped moisture to escape. Frequency of the wave to be a minimum of 125mm apart along the full length of the board.

Place insulation board against the concrete slab edge and apply firm even pressure. Remove insulation board from the concrete slab edge and allow the adhesive to tack. Place insulation board back on the concrete slab edge, support and brace until the adhesive cures.

Install remaining edge insulation boards around the full perimeter of the concrete slab edge. Cut holes in the boards where necessary with a sharp knife to accommodate any services. Fill and patch insulation board joints with Expol patch kit.

Completion

3.10 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

3.11 EXPOL STYRO-FIX ADHESIVE

Expol single component polyurethane based, moisture curing, fast setting construction adhesive.



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Components

3.12 EXPOL PATCH KIT

Expol water based waterproof resin coating. Available in 4 litre pails.

4 SELECTIONS

For further details on selections go to www.expol.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

4.1 EXPOL THERMASLAB INSULATION S & H GRADES - CONCRETE SLAB

Location:	Under Slab
Brand:	Expol Thermaslab
Size:	As required
Grade:	H
Thickness:	300mm
R value:	8.34

4.2 EXPOL MAXEDGE - HOUSE

Location:	Footings
Brand:	Expol
Size:	As required
Grade:	VH
Type:	T40

4.3 EXPOL MAXEDGE - GARAGE

Location:	Footings
Brand:	Expol
Size:	As required
Grade:	VH
Type:	T105

4.4 EXPOL THICKENING INSULATION

Location:	Footings
Brand:	Expol
Size:	50mm
Grade:	VH

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3820 CARPENTRY

1 GENERAL

This section relates to the supply and erection of timber framing, as a framed structure, or as partitioning. It includes prefabricated timber and engineered wood.

1.1 RELATED WORK

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

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

***A copy of** NZS 3604 **Timber-framed buildings, must be held on site.**

1.3 QUALIFICATIONS

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

1.4 DIMENSIONS

All timber sizes except for battens are actual minimum dried sizes.

2 PRODUCTS

2.1 TIMBER FRAMING, TREATED

Species, grade and in service moisture content to NZS 3602, NZBC B2/AS1 and treatment to NZS 3640, NZBC B2/AS1. Structural grade (SG) to NZS 3604, NZS 3622 with properties to NZS 3603.

2.2 ENGINEERED WOOD

LVL members to AS/NZS 4357.0, to required sizes and lengths and the manufacturer design properties.

Treatment to NZS 3640 and AS/NZS 1604.1.

2.3 TIMBER TRUSSES

To FTMA CoP. Moisture content 16% at supply.

2.4 WALL DWANGS, NOGS AND BLOCKING

If dwangs, nogs or blocking is required for exterior insulated walls, ensure they are not full depth of framing. Install flush with face of wall required, leaving a minimum 20mm or 45mm preferable gap to the other face to NZS 3604, 8.8. Dwangs and nogs if required to be at 1350mm centres maximum to NZS 3604, 8.8.

Components

2.5 NAILS

Type to NZS 3604, section 4, **Durability**, and of the size and number for each particular types of joint as laid down in the nailing schedules of NZS 3604, sections 6-10.

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2.6 SCREWS

Wood screws to the requirements of NZS 3604, 2.4 Fastenings and Fabrication, and section 4, **Durability**, and of the type, number and form required for each screw application to NZS 3604, sections 6 - 10.

2.7 BOLTS AND COACH SCREWS

Bolts and coach screws complete with washers, to the requirements of NZS 3604, clause 2.4.5 Bolts and Coach Screws, and section 4, **Durability**, and of the type, number and form required for each particular junction to NZS 3604, sections 6 - 10.

2.8 NAIL PLATES

Comply with the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6 - 10. Plates to the plate manufacturer's design for the particular locations as shown on the drawings.

2.9 CONNECTORS

Comply with the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10. Connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.

2.10 CORROSION RISKS

For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

2.11 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

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3 EXECUTION

3.1 EXECUTION GENERALLY

To NZS 3604 except as varied in this specification. Execution to include those 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).

3.2 SEPARATION

Separate all timber framing timbers from concrete, masonry and brick by: -

- a full length bituminous damp-proof membrane overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space

3.3 ATTENDANCE

Provide and fix blocks, nogs, openings and other items as required by other trades.

3.4 MOISTURE CONTENT

Maximum allowable equilibrium moisture content (EMC) for non air-conditioned or centrally heated buildings for framing to which linings are attached.

Framing at erection:	24% maximum
Framing at enclosure:	20% maximum
Framing at lining:	16% maximum

3.5 SET-OUT

Set out framing in accordance with the requirements of NZS 3604 and as required to support sheet linings and claddings. When necessary provide framing to suit any required cladding/lining control joints and sheet joints.

3.6 FRAMING WALLS

Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, section 8, **Walls**.

3.7 FRAMING ROOFS

Frame to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 9, **Posts** and 10, **Roof framing**.

3.8 FRAMING CEILINGS

Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to NZS 3604, section 13, **Ceilings**. Trim for openings in ceilings and hatches to NZS 3604 section 13.3, **Openings in ceilings**. Provide blocking for water tanks located in the ceiling space to NZS 3604, section 13.4, **Water tanks in roof space**.

3.9 INSTALLING WALL UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.10 FIT CAVITY BATTENS

Fit and fix 20mm cavity battens over wall underlay or rigid air barrier, fully nail to timber studs to the requirements of the manufacturer or to NZS 3604. Fit and fix related flashings. Make allowance for cladding control joints where required. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc.).

3.11 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.12 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

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4 SELECTIONS

4.1 FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Purlins:	Radiata pine	SG8	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merchantable	H1.2
Sarking:	Radiata pine	Merchantable	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

4.2 INTERIOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Non structural walls:	Radiata pine	SG8	H1.2
Structural and braced walls:	Radiata pine	SG8	H1.2

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3876 STRUCTURAL INSULATED PANEL SYSTEMS (SIPS)

1 GENERAL

This section relates to the supply and fixing of Structural Insulated Panel Systems (SIPS). It includes wall panels, bracing panels, roof panels and floors.

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:

SIPS	Structural Insulated Panel Systems
OSB	Oriented Strand Board

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC C/VM2	Framework for fire safety design
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions

WorkSafe Fact Sheet: Crane Safety for Construction Site Managers/Supervisors
Approved Code of Practice for Cranes

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Newko Sips

Manufacturer/supplier contact details

Company:	Newko SIPs
Email:	ko@newko.co.nz

Requirements

1.4 PREPLANNING

Prior to shop drawing/manufacture of the SIPS panels liaise with the SIPS manufacturer and other relevant parties, to ensure installation/on site requirements are coordinated with the panel production. These should include, but not be limited to;

- construction and erection sequences
- transport and erection processes and equipment required for lifting, handling or stacking
- lifting inserts and other inserts required
- access for cranes and trucks, clearance and obstructions, loads to be applied to the ground or structures by cranes or trucks
- loads to be applied from temporary propping or bracing, suitable foundations or supports for propping and bracing
- temporary loads to be applied from storing or stacking panel elements

1.5 QUALIFICATIONS - FABRICATORS

Fabricators to be experienced, competent trades people familiar with the materials and techniques specified.

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1.6 QUALIFICATIONS - INSTALLERS

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

1.7 NO SUBSTITUTIONS

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

1.8 SHOP DRAWINGS

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Provide shop drawings to show the general arrangement including, but not be limited to:

- All panel type details
- Panel layout with a numbered and detailed key
- Base plate details and fixing
- Jointing and fixing (include air leakage prevention)
- Non-panel component details to complete the work
- Services details (trunking, conduits etc)
- Openings and penetration details
- Special lifting requirements

If requested provide the following additional information:

Submit shop drawings for review

- Complete shop drawing review before commencing fabrication.

1.9 AS BUILT DOCUMENTS

Refer to the general section 1238 AS BUILT DOCUMENTATION for the requirements for submission and review of as built documents and records.

Provide the following as built documents and records:

- Provide draft as built information prior to practical completion.
- Provide final as built information prior to the end of the defects liability period.

Compliance

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's / supplier's warranty
- Installer's / applicator's warranty
- Producer Statement - Construction from the applicator / installer
- Producer Statement - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance - (design by contractor)

1.11 SITE ENVIRONMENT - DURABILITY, WIND, SEISMIC

Design the installation to the manufacturer's requirements and as appropriate for the project site environment parameters stated in the general section 1220 PROJECT.

1.12 SEISMIC, EARTHQUAKE LOADS

Design the system and its anchorages to resist the earthquake loads of the seismic zone in accordance with NZS 1170.5. Refer to SELECTIONS for requirements.

1.13 DESIGN WIND PRESSURES, BY CALCULATION

Design in accordance with AS/NZS 1170.2, using scheduled and/or calculated design wind pressures. Refer to SELECTIONS for requirements.

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Performance - General

1.14 DURABILITY

SIPS panel systems to comply with NZBC B2/AS1 Durability for the exposure zone stated in the general section 1220 PROJECT, when installed in accordance with supplier recommendations.

1.15 SURFACE FIRE PROPERTIES FOR LININGS

Group Number to NZBC C/AS2, Table 4.12.1.1: Maximum permitted Group Number for internal surface finishes. Refer to SELECTIONS.

1.16 SPREAD OF FIRE FOR CLADDING

To NZBC C/AS1, 5.3 **External cladding systems**, NZBC C/AS2, 5.8 **External cladding Systems** or NZBC C/VM2. Refer to SELECTIONS.

1.17 FIRE RESISTANCE RATINGS (FRR)

To NZBC C/AS1, Parts 4 and 5, NZBC C/AS2, 2.3 **Fire Resistance Ratings**, Parts 4 and 5, or NZBC C/VM2. Refer to SELECTIONS.

Quality control and assurance

1.18 NOMINATED MANUFACTURER/SUPPLIER

A manufacturer/supplier should be nominated, who will supply strength and deflection capacities for design purposes, and provide structural design tables outlining capacities for each SIP thickness.

2 PRODUCTS

Materials - SIPS

2.1 STRUCTURAL INSULATED PANELS - WALL

Timber framed sandwich panel consisting of two outer skins of 12mm Oriented Strand Board (OSB) with an internal core of insulation. Panels are cut to the exact shape and size to suit each project.
SIPS wall panels are typically 1200mm wide x 2.4m, 2.7m and 3.0m high.
Typical thicknesses 95mm, 115mm, 165mm. Refer SELECTIONS.

2.2 STRUCTURAL INSULATED PANELS - BRACING

Timber framed sandwich panel consisting of two outer skins of 12mm Oriented Strand Board (OSB) with an internal core of insulation with additional fixings or studs added for bracing. Panels are cut to the exact shape and size to suit each project.
SIPS bracing panels are typically 1200mm wide x 2.4m, 2.7m and 3.0m high.
Typical thicknesses 95mm, 115mm, 165mm. Refer SELECTIONS.

2.3 STRUCTURAL INSULATED PANELS - ROOF

Timber framed sandwich panel consisting of two outer skins of 12mm Oriented Strand Board (OSB) with an internal core of insulation. Panels are cut to the exact shape and size to suit each project.
SIPS roof panels are typically 1200mm wide x 2.4m, 2.7m and 3.0m long.
Typical thickness 215mm, 265mm or to suit span. Refer SELECTIONS.

Components

2.4 SPLICE

70mm - 100mm laminated timber studs min. H1.2. Refer SELECTIONS.

2.5 SIP SPLINE

A narrow short SIP that slots into the main SIP recesses. Refer SELECTIONS.

2.6 BASE PLATE

Min. H1.2 timber baseplate. Size, shape and fixing to suit panel manufacturers requirements. Refer to shop drawings and SELECTIONS.

Accessories

2.7 SIPS NAILS

Ring shanked nails. Refer to shop drawings for sizes and types.

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2.8 SIPS SCREWS

Pancake head screws. Refer to shop drawings for sizes and types.

2.9 HOLD DOWN STRAPS

Proprietary hold down straps. Refer to shop drawings for locations, sizes and types.

2.10 SEALANT

Proprietary sealant and/or foam to suit location and joint design, to manufacturers requirements.

2.11 AIRTIGHTNESS TAPE

Proprietary tape to suit location and joint design, to manufacturers requirements.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

Installation/application

3.3 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements, and shop drawings for specific dimensions and tolerances.

3.4 SETTING OUT

Confirm panel dimensions, set out and site conditions. Also check base plate positions and fixing points.
Confirm that foundations, dead men, and all supports for temporary propping or bracing are up to strength and capable of resisting the applied loads prior to commencing erection of panels.

3.5 TOLERANCES, ON - SITE EXECUTION

Locate SIPS panel items to line and level, and the following tolerances:

Horizontal:	± 3mm maximum, or less if required by manufacturer
Vertical:	± 3mm maximum, or less if required by manufacturer

3.6 FIT BASE PLATE

Fit and fix base plate(s) to manufacturer requirements. Cover with temporary waterproofing until panels are fitted.

3.7 PRE-LIFTING

Prior to lifting any panels from the truck, check and make a record of any damage to the panels, and obtain approval from the Contract Administrator before incorporating a damaged panel into the work.

3.8 LIFTING

Carry out work in accordance with;
WorkSafe Fact Sheet: Crane Safety for Construction Site Managers/Supervisors, and the Approved Code of Practice for Cranes.

Mobile crane positions to be arranged and prepared prior to panel delivery to provide suitable clearances from power lines, trees and any obstructions for all operations including lifting and positioning. Ensure the crane has adequate capacity and is suitable for all aspects of the erection process.
Check that all necessary attachments; strong backs, materials and equipment for rigging, reorienting, propping or bracing and fastening etc, are on site and available prior to delivery of the panels. Where proprietary lifting inserts are being used, ensure that lifting clutches are the correctly sized and from the same supplier.

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Heavy panels are to remain attached to the crane until they are either fully fixed into their final position or adequately secured by temporary means.

3.9 STACKING ON SITE

Ensure panels are fully supported. Stack to suit order of use.

3.10 PROPPING AND BRACING

Provide temporary adjustable props or braces to secure the panel in position until final support is provided. They must be able to withstand the expected wind loads on the panel for the site and position.

3.11 PLACING AND INSTALLATION

Install panels in accordance with the drawings, stated design parameters, reviewed and approved construction drawings and installation details. Check order of installation. Co-ordinate with work of other contractors. Consult and coordinate as necessary with installers of adjoining work, including window and door installations.

Order of installation and installation to be to the manufacturers recommendations.
On positioning of the panel, check that all fixings line up with the appropriate items on the preceding work. Also check fixings will function as intended, in particularly fixings required to accommodate seismic movement. Ensure that there is no damage caused to the panel, surrounding surfaces or fixings during placing. Seal joints with sealant or foam to manufacturers requirements.

3.12 FINAL POSITION

Adjust panels into final position, check alignment, verticality, joint widths etc and fix into place.

3.13 POST PLACING ADJUSTMENTS

After permanent placing check and adjust as necessary;

- all fixings for correct alignment and operation.
- recheck that all props, braces and fastenings are secure and capable of performing as required - not less than 1 day and not more than 7 days after a panel is fixed into position and held by temporary means.
- if panels are subject to, high wind loads, unintended or accidental loads during construction, recheck props braces and fastenings.

3.14 TEMPORARY PROTECT EXPOSED TOPS OF PANELS

During installation use temporary waterproofing to protect tops of panels, plates and sills etc, until they are covered or protected by subsequent construction.

3.15 TAPE JOINTS

Tape joints with airtight tape to manufacturer requirements.

3.16 PENETRATIONS

Form additional penetrations to suit SIPS details.

Completion & Commissioning

3.17 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

3.18 COMPLETION - CERTIFICATION

Refer to 1270 CONSTRUCTION for certification requirements at completion.

4 SELECTIONS

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

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SIP Types

4.1 SIP PANELS

	Size	R Value	Type	
115 Newko	115mm	2.8	Wall	
165 Newko	165mm	4.2	Wall	
210 Newko	210mm	5.1	Roof	
260 Newko	260mm	6.7	Roof	

SIP locations & types as drawn.

Refer to engineering.

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4161PC PRO CLIMA WALL AND ROOF UNDERLAYS, TAPES & ACCESSORIES

1 GENERAL

This section relates to the application of **Pro Clima NZ Limited** external wall and roof underlays, internal floor protection membranes, tapes and accessories.

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:

NZMRM	New Zealand Metal Roofing Manufacturers Association Inc.
MVTR	Moisture vapour transmission resistance
TEEE	Thermoplastic Elastomer-Ether Ester
SIPs	Structural Insulated Panels

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

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F2/AS1	Hazardous building materials
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays - part 1: materials
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
CodeMark™ CMNZ30032 verH	SOLITEX EXTASANA Wall Underlay

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Pro Clima documents relating to work in this section are:

SOLITEX EXTASANA® Installation Guide
SOLITEX EXTASANA ADHERO® Mass Timber Application Guide
SOLITEX® ADHERO FC & SOLITEX EXTASANA ADHERO® Wall Application Guide Version 2.0 dated January 2026
SOLITEX EXTASANA ADHERO® Mass Timber Moisture Protection
SOLITEX MENTO® Application Guide 24.06.2025
BRANZ Appraisal 815 (2024) - TESCON EXTOSEAL Sill Tape
BRANZ Appraisal 838 (2024)- TESCON EXTORA Sealing Tape
BRANZ Appraisal 855 (2025)- SOLITEX MENTO 3000 Roof and Wall Underlay
BRANZ Appraisal 876 (2020) - SOLITEX MENTO 1000 Roofing Underlay
BRANZ Appraisal 953 (2024) - KAFLEX and ROFLEX Grommets
BRANZ Appraisal 989 (2023) - SOLITEX EXTASANA ADHERO® Self-adhesive Underlay - Amendment 1
BRANZ Appraisal 1163 (2021) - SOLITEX EXTASANA® Wall Underlay

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SOLITEX MENTO® 1000 CONNECT Roof Underlay Installation Guide
SOLITEX UM CONNECT Application Instructions
Specification Guidelines 30 January 2026
Early-Close-In with SOLITEX EXTASANA®
SOLITEX EXTASANA® Early Close-In Application Guide for Brick Cladding
SOLITEX EXTASANA® Early Close-In Application Guide for Horizontal Cladding
SOLITEX EXTASANA® Early Close-In Application Guide for Vertical Cladding

Manufacturer/supplier contact details

Company:	**Pro Clima NZ Limited**
Web:	www.proclima.co.nz
Email:	welcome@proclima.co.nz
Telephone:	0800 pro clima (776 254)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For Pro Clima system

- Provide this warranty on the Pro Clima standard form.
- Commence the warranty from the date of purchase of the product from the manufacturer.

Refer to the Pro Clima warranty agreement and the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer warranty:

2 years:	For installation

- Provide this warranty on the installer/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.

Compliance

1.6 COMPLIANCE - CODEMARK CERTIFICATE

SOLITEX EXTASANA Wall Underlay meets the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ30032.

1.7 COMPLIANCE - BRANZ APPRAISAL 815

TESCON EXTOSEAL Sill Tape has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 815.

1.8 COMPLIANCE - BRANZ APPRAISAL 838

TESCON EXTORA Sealing Tape has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 838.

1.9 COMPLIANCE - BRANZ APPRAISAL 876

SOLITEX MENTO 1000 Roofing Underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 876.

1.10 COMPLIANCE - BRANZ APPRAISAL 989

SOLITEX EXTASANA ADHERO® Self-adhesive Underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 989.

1.11 COMPLIANCE - BRANZ APPRAISAL 1163

SOLITEX EXTASANA® Wall Underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1163.

Requirements

1.12 NO SUBSTITUTIONS

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

1.13 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Installers to be experienced in the installation of Pro Clima products and familiar with Pro Clima NZ Limited technical literature and the related documents listed in this design i.e. NZMRM CoP. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

2 PRODUCTS

Wall underlays

2.1 WALL PROTECTION MEMBRANE - MECHANICAL FIX

SOLITEX EXTASANA® wall underlay to NZS 2295, comprised of a non-porous, UV stable, water resistant TEEE film, laminated between two layers of non-woven spun-bonded polypropylene, coloured blue on the top surface and grey on the bottom. Watertight to >10,000mm water column pressure, with low MVTR (vapour open).

Has a flammability Index of ≤ 5, when tested to AS 1530.2 and meets the requirements of NZBC C/AS2, paragraph 4.12.5.2 (b), for suspended flexible fabrics, NZBC B2 Performance B2, 3.1(a), 3.1(b), 3.2, NZBC E2 Performance E2, 3.2 and NZBC F2 Performance F2, 3.1 in accordance with CodeMark™ Certificate CMNZ30032. Refer to BRANZ Appraisal 1163 for details. Supplied in rolls 1.5m x 36.5m long (55m²), 1.5m x 50m long (75m²) and 2.74m wide x 36.5m long (100m²). SOLITEX EXTASANA® must be covered and protected against weather or ultraviolet light within 180 days.

2.2 WALL PROTECTION MEMBRANE - PEEL AND STICK

SOLITEX EXTASANA® ADHERO wall underlay to NZS 2295, comprised of a non-porous, UV stable, water resistant TEEE film, laminated between two layers of non-woven spun-bonded polypropylene, coloured blue on the top surface and grey on the bottom. Pressure sensitive solid acrylic adhesive layer on underside. PE release paper. Watertight to >10,000mm water column pressure, with very low MVTR (diffusion open).

Has a Flammability Index of ≤ 5, when tested to AS 1530.2 and meets the requirements of NZBC C/AS2, paragraph 4.12.5.2 (b), for suspended flexible fabrics, NZBC B2 Performance B2, 3.1(a), 3.1(b), 3.2, NZBC E2 Performance E2, 3.2 and NZBC F2 Performance F2. Supplied in rolls 1.5m x 30m long (45m²)²) and 0.5m x 30m long (15m²) for internal and external corners. SOLITEX EXTASANA® ADHERO must be covered and protected against weather or ultraviolet light within 180 days.

Roofing underlays

2.3 ROOF UNDERLAY - LIGHT WEIGHT, TYPE R4, HIGH EXPOSURE (30 DAYS)

SOLITEX MENTO® 1000, consists of a waterproof, non-porous diffusion open membrane laminated to two layers of polypropylene fleece. Has a flammability Index of ≤ 5, when tested to AS 1530.2. Refer to BRANZ Appraisal 876 for details. Supplied in rolls 1.5m or 3m wide x 50m long. Self-supporting to 1200mm.

SOLITEX MENTO® 1000 must be covered and protected against weather or ultraviolet light within 30 days.

Components

2.4 WEATHERTIGHT SEALING TAPE

TESCON EXTORA® weathertight sealing tape, a multi-purpose, UV stable, pressure-sensitive, self-adhering tape comprised of a PP fleece protection layer, solid acrylic glue and siliconized release backing paper. Suitable for jambs and heads of framed openings only. Supplied in rolls 60mm, 100mm, 150mm and 200mm wide x 30m long.

Note: TESCON EXTORA® can be exposed to weather or ultraviolet light for a period of up to 180 days.

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2.5 SILL TAPE

TESCON EXTOSEAL® Sill Tape, a butyl rubber, pressure-sensitive, self-adhering, one-piece stretchable, self-sealing, non-bitumen sill tape with a siliconized release backing paper. Workable in cold temperatures, down to - 20°C. Does not melt in the heat and can be applied to damp surfaces. Complies with NZBC E2/AS1, paragraph 9.1.4.1(b). Refer to BRANZ Appraisal 815 for details. Supplied in rolls 150mm, 200mm or 300mm wide x 20m long. TESCON EXTOSEAL® can be exposed to weather or ultraviolet light for a period of up to 180 days.

2.6 WEATHERTIGHT JOINERY SEALING TAPE

TESCON EXTORA® PROFIL weathertight joinery sealing tape, UV stable, pressure-sensitive, self-adhering tape comprised of a PP fleece protection layer, solid acrylic glue and a split, siliconized release backing paper. Applied to perimeter of joinery extrusion and joined to wall underlay. Supplied in rolls 60mm wide x 30m long.

2.7 NAIL & SCREW SEALING TAPE

TESCON® NAIDECK double-sided butyl rubber self-sealing tape, water resistant, reinforced, non-bitumen, used on the underside of a purlin / batten on roofs and behind façade clip and mounts on walls, to form a seal around nail or screw penetrations. Supplied in rolls 50mm wide x 20m long.

2.8 WINDOW AND DOOR WEATHERTIGHT CONNECTION STRIP

CONTEGA® EXO exterior window and door connection tape for SOLITEX EXTASANA® wall underlay comprised of PP microfibre fleeces, used for weathertight connection to window and door frames to the wall underlay or other weathertightness layer. Supplied in rolls 85mm and 120mm wide x 30m long for different framing widths.

2.9 DOUBLE-SIDED TAPE

DUPLEX Double-sided tape comprised of siliconized release paper, used for bonding the overlaps of roof underlay SOLITEX MENTO® membranes and fixing of membranes to steel frame structures. Supplied in rolls 25mm wide x 80m long.

2.10 MULTI-PURPOSE ADHESIVE

ORCON® Classic multi-purpose adhesive, for bonding Pro Clima membranes to rough adjoining structural components or mineral surfaces. Supplied in a 310ml cartridge or 600ml sausage.

Tapes

Accessories

2.11 WIRE NETTING

75mm galvanized hexagonal wire netting to AS/NZS 4534.

2.12 SAFETY MESH

Safety mesh**,** 2mm x 150 x 300mm galvanized or PVC coated safety mesh to AS/NZS 4389.

2.13 GUTTER AND UNDER FLASHINGS

SOLITEX MENTO® range roof underlay to NZS 2295, cut to width for use under valley, apron flashing and internal gutters.

2.14 CAVITY CLOSERS, EAVES FLASHINGS, RIDGE VENT FLASHINGS

Fix cavity closers, eaves and ridge vent flashings and finishing accessories to complete the Pro Clima Roof Ventilation system in accordance with SOLITEX MENTO® Roof Underlay Installation Guide and to Pro Clima Construction details.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 GENERAL REQUIREMENTS

Design application and installation of Pro Clima NZ Limited products to NZBC E2/AS1, BRANZ Appraisals, Pro Clima Technical Literature and Industry Codes of Practice.

3.4 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.

Preparation

3.5 PREPARATION

Before starting work, ensure all surfaces are stable, dry, smooth, and free from dust, dirt, silicone and grease. Remove all unwanted material from the surface with a vacuum cleaner or cloth if necessary. Remove flaking and loose materials such as peeling paintwork, building papers and labels. Adhesion to frozen surfaces not possible, if in doubt carry out adhesion tests.

Application - wall underlay

3.6 SCOPE LIMITATIONS - WALL PROTECTION MEMBRANE OVER RIGID WALL UNDERLAYS

SOLITEX EXTASANA® Wall Protection Membrane is to be used as a flexible wall underlay over rigid wall underlays on timber and steel framed buildings within the following scope limitations:

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

3.7 METAL CLADDING ON TIMBER CAVITY BATTENS

Fix strip of generic DPC as a separator between timber and metal cladding.

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 SAFETY MESH

Lay safety mesh over exposed roof areas fixed in accordance with AS/NZS 4389 and NZMRM CoP.

3.10 FIX ROOF UNDERLAY - USING STANDARD METHOD

Fix roof underlay in accordance with SOLITEX MENTO® Roof Underlay Installation Guide and as follows:

- Fix roof underlay at maximum 150mm centres to all framing with large-head clouts 20mm long, 8mm-12mm stainless steel staples, self-drilling screws or proprietary underlay fixings.
- Pull membrane taut over framing before fixing.
- Run underlay vertically or horizontally at roof pitches greater than 8°, horizontally with roof pitches less than 8°.
- Underlay must extend from the ridge and overhang the fascia board by 20mm - 25mm. Vertical laps must be no less than 150mm wide. Horizontal laps must be no less than 150mm wide, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150mm wide.
- Repair damaged areas such as tears, holes or gaps around service penetrations by covering with new material lapping the damaged area by at least 150mm and taping with TESCON EXTORA® Sealing Tape.

3.11 GUTTER AND UNDER FLASHINGS

Install SOLITEX MENTO® range roof underlay for use as an underlay to valley, apron flashings, and internal gutters. Lap under flashings with adjoining underlays. Fix SOLITEX MENTO® range soffit liner from top plate down 150mm past ribbon plate.

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Application - tape systems

3.12 APPLY TESCON TAPE SYSTEMS

Apply TESCON tape systems in accordance with Pro Clima TESCON Installation Guides.

Note: Tapes can be specified for all joins in SOLITEX membranes to prevent wind-wash of insulation and resulting degradation of insulation performance.

Completion

3.13 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go to www.proclima.co.nz.
Substitutions are not permitted to the following.

Materials

4.1 PRO CLIMA SOLITEX EXTASANA® MEMBRANE - MECHANICAL FIX

Manufacturer:	Pro Clima NZ Limited
Type:	SOLITEX EXTASANA® Wall Protection Membrane
Sealing tape:	TESCON EXTORA® weathertight sealing tape & TESCON EXTOSEAL® sill tape
Adhesive:	ORCON® Classic multi-purpose adhesive

4.2 PRO CLIMA SOLITEX MENTO 1000 ROOF UNDERLAY

Manufacturer:	Pro Clima NZ Limited
Type:	SOLITEX MENTO® 1000 three layer underlay
Jointing tape:	TESCON EXTORA® weathertight sealing tape or use Solitex Mento 1000 Connect
Sealing tape:	TESCON EXTORA® weathertight sealing tape
Adhesive:	ORCON® Classic multi-purpose adhesive

Accessories

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4161PI PRO CLIMA INTERNAL AIRTIGHTNESS SYSTEM

1 GENERAL

This section relates to the application of **Pro Clima NZ Limited** internal air tightness and moisture control system (IAS).
It includes:

- INTELLO® PLUS vapour check membrane
- AEROSANA® VISCONN range of spray and brush applied sealant/membranes
- DASATOP® vapour check membrane for refurbishment
- associated sealing tapes, adhesives and accessories

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:

IAS	Intelligent Airtightness System
ACH	Air Changes per Hour
MVTR	Moisture Vapour Transmission Rate
PET	Polyethylene terephthalate
PP	Polypropylene

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Pro Clima documents relating to work in this section are:

INTELLO® PLUS Technical Brochure
INTELLO® PLUS Installation Instructions
TESCON VANA Application Guide
INTELLO® ConneX Connection Strip Data Sheet
AEROSANA® VISCONN Technical Brochure
DASATOP® Technical Brochure

Manufacturer/supplier contact details

Company:	**Pro Clima NZ Limited**
Web:	www.proclima.co.nz
Email:	info@proclima.co.nz
Telephone:	0800 PRO CLIMA (776 254)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For pro clima system

- Provide this warranty on the pro clima standard form.
- Commence the warranty from the date of purchase of the product from the manufacturer.

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Refer to the pro clima warranty agreement and the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer warranty:

2 years: For installation

- Provide this warranty on the installer/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

1.6 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 pro clima products and familiar with Pro Clima NZ Limited technical literature and the related documents listed in this design.

Performance - airtightness

1.8 QUALITY PERFORMANCE

Confirm in SELECTIONS the airtightness level required for this project based on a pressure difference of 50 pascals.

2 PRODUCTS

Intelligent airtightness system (IAS)

2.1 INTELLIGENT AIRTIGHTNESS SYSTEM (IAS)

Intelligent Airtightness System (IAS), an airtightness and moisture control system, comprised of the following:

- Humidity-variable vapour control and airtightness membrane INTELLO® PLUS
- Sprayable airtightness sealant / membrane AEROSANA® VISCONN
- Humidity-variable fibre-reinforced brush-on sealant AEROSANA® VISCONN FIBRE
- Humidity-variable refurbishment vapour control layer DASATOP®
- Multi-purpose adhesive tape TESCON VANA
- Adhesive tape TESCON PROFIL for joinery connection
- Multi-purpose liquid adhesive ORCON
- Airtightness grommets KAFLEX and ROFLEX for cable and pipe penetrations
- Airtightness box for power points and light switches INSTAABOX.

Materials

2.2 HIGH PERFORMANCE VAPOUR CONTROL LAYER CONNECTION STRIP

INTELLO® ConneX is a specially formulated UV-stabilised humidity-variable strip, designed to ensure the continuity of the INTELLO® and INTELLO® PLUS Intelligent Air Barrier (IAB) systems at difficult junctions.

Use at intermediate floor junctions and internal to external wall junctions. It allows up to 90 days of UV exposure prior to being covered by internal linings or external cladding.
Supplied in rolls 300mm wide for Internal/External wall junctions, and 900mm wide for midfloor junctions.

2.3 HIGH PERFORMANCE REINFORCED VAPOUR CONTROL LAYER

INTELLO® PLUS High performance reinforced vapour control layer, comprised of PP microfibre fleeces with PP reinforcement and polyethylene copolymer membrane. Used as a vapour control and airtightness membrane for all externally diffusion-open constructions. Supplied in rolls 1.5m wide x 20m and 50m long, and 3m wide x 50m long.

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Components

2.4 MULTI-PURPOSE ADHESIVE TAPE

TESCON VANA multi-purpose adhesive tape comprised of special fleece made from PP and solid acrylic adhesive with siliconized release paper. Used to secure and provide permanent airtight seal of overlaps between INTELLO® PLUS membranes, joints between membranes and smooth, non-mineral surfaces. Supplied in rolls 60mm wide x 30m long.

2.5 CORNER SEALING TAPE

TESCON® PROFIL corner sealing tape comprised of special fleece made from PP and solid acrylic adhesive with siliconized release paper in individual strips 12 / 23 / 25mm. Supplied in rolls 60mm wide x 30m long.

2.6 WINDOW AND DOOR SEALING TAPE

CONTEGA® IQ window and door connection strip comprised of PP microfibre fleeces, used for airtight or weathertight connection to window and door frames to the air tightness layer, wall underlay or other weathertightness layer. Supplied in rolls 90mm wide x 30m long.

1 self-adhesive strip used for masonry construction and 2 self-adhesive strip used for timber construction.

2.7 PLASTERED CONNECTIONS SEALING TAPE

CONTEGA® PV fleece tape for interior airtight plaster connections, comprised of PET fleece with functional membrane and plaster reinforcement. Used for connections between INTELLO® PLUS membrane or wood-based panels and surfaces that will be plastered (brickwork or concrete). Supplied in rolls 200mm wide x 15m long.

2.8 DOUBLE SIDED TAPE

DUPLEX Double sided tape comprised of siliconized release paper, used for bonding the overlaps of membranes and fixing of membranes to steel frame structures. Supplied in rolls 25mm wide x 20m long.

2.9 MULTI-PURPOSE ADHESIVE

ORCON® Classic multi-purpose adhesive, for bonding pro clima membranes to rough adjoining structural components or mineral surfaces. Supplied in a 310ml cartridge or 600ml sausage.

Quality control

2.10 VERIFICATION OF INSTALLATION OF INTELLIGENT AIRTIGHTNESS SYSTEM (IAS)

pro clima WINCON system used to test air leakage at the time of installation, by depressurizing the building. System consists of the following:

- WINCON Installation verification fan
- WINCON Transport box
- WINCON Tape
- Draegar smoke stick kit CH 216

WINCON fan can be hired from PCNZ. Used before lining to ensure the application has been complete and free from any defects (air leakages).

2.11 MEASUREMENT OF BUILDING AIRTIGHTNESS PERFORMANCE

BlowerDoor verification device, used to measure infiltration rates in existing buildings by both pressurizing and depressurizing buildings.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

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3.3 GENERAL REQUIREMENTS

Design application and installation to Pro Clima NZ Limited product literature.

3.4 TIMBER FRAMING REQUIREMENTS

Timber framing to be in accordance with the requirements of the relevant timber framing section.

Timber framing species, grade and in service moisture content to NZS 3602, NZBC B2/AS1 and treatment to NZS 3640, NZBC B2/AS1. Structural grade (SG) to NZS 3604, NZS 3622 with properties to NZS 3603.

3.5 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.

3.6 PROTECT

INTELLO® PLUS membrane must be protected from lengthy exposure to sunlight and UV radiation, from both direct, external exposure or through glazing, and reflected light. Protection must be complete, temporary discontinuous or perforated coverings are unsuitable.

3.7 INSPECTION

Before starting work, check that the building construction phase will allow work of the required standard. Carry out remedial work identified before installing vapour control layer.

Preparation

3.8 PREPARATION

Before starting work, ensure all surfaces are stable, dry, smooth, and free from dust, dirt, silicone and grease. Sweep or vacuum clean and wipe all surfaces.

Application

3.9 FIX HIGH PERFORMANCE VAPOUR CONTROL LAYER CONNECTION STRIP

Fix INTELLO® ConneX connection strip to junction of external and internal walls and uppermost ceiling framing, and at midfloor junctions on multilevel buildings, in accordance with INTELLO® ConneX Installation Instructions and as follows:

Note: This element is to be installed during framing stage and is left in place until insulation and services are in place and the remainder of the IAS (INTELLLO®) PLUS is ready to be installed.

- Prior to erecting internal wall, fix the INTELLO® ConneX connection strip to the junction where the internal wall meets the external wall using staples at 200mm centres. Apply pro clima ORCON adhesive to connect the INTELLO® ConneX connection strip to the floor.
- Erect the internal wall allowing an even overhang of the connection strip either side of the internal wall.
- Once all of membrane is installed apply TESCON VANA adhesive tape to the overlap between INTELLO® PLUS membrane and the INTELLO® ConneX connection strip to form a continuous airtightness layer.

3.10 FIX HIGH PERFORMANCE REINFORCED VAPOUR CONTROL LAYER

Fix INTELLO® PLUS High performance reinforced vapour control layer to external wall and upper most ceiling framing in accordance with INTELLO® PLUS Installation Instructions and as follows:

- Mark external studs using a vivid marker and rigid measure at a distance of 1.48m from the floor to indicate where the upper edge of the INTELLO® PLUS is to be aligned.
- Unroll INTELLO® PLUS for whole wall section allowing sufficient material for "relaxed" corners, returns onto intersecting wall studs and fixing to joinery. Cut wall sections after stapling main sections. Ensure membrane is fixed on wall with writing facing into the room.
- Staple along the entire upper edge of membrane to every stud first, then on a middle stud run a hand down toward the floor to tighten the membrane, ensure there is a 20mm return for fixing to floor. Apply the staples, starting from the bottom at 100mm to 150mm centres.
- Using the printed markings as a guide overlap the upper sheet by 150mm and staple both sheets along the entire length first. As above run a hand down the middle stud toward the floor to tighten the membrane and staple. Ensure junctions between walls and ceilings are "relaxed". Avoid joining INTELLO® PLUS membranes in corners.
- Tape INTELLO® PLUS with TESCON VANA adhesive tape so that is free of any tension or

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stress. Position the tape centrally and press firmly to secure using PRESSFIX. Cut a slit in any folds in the overlapping part of the membrane and re-tape.
- Lay INTELLO® PLUS so that it completely covers the walls and ceiling and tape it with TESCON VANA, ensuring that an airtight seal is formed.
- Apply ORCON Classic adhesive, forming a continuous bead approximately 5mm thick on floor and lay the membrane in the adhesive bed, leaving an expansion joint. Do not press the adhesive completely flat.
- When installing an electrical flush box cut a hole in INTELLO® PLUS the same size as an INSTAABOX. Make the required number of holes and feed the cables through, then align the INSTAABOX and tape it to the INTELLO® PLUS with TESCON VANA, ensuring that an airtight seal is formed.

Note: Internal framing to be installed (along with associated connection strip) after lining of external framing has been completed.

Application - tape systems

3.11 APPLY TESCON TAPE SYSTEMS

Apply TESCON tape systems in accordance with pro clima TESCON Installation Guides.

Quality control

3.12 VERIFICATION OF INSTALLATION OF INTELLIGENT AIRTIGHTNESS SYSTEM (IAS)

Carry out air leakage test using the pro clima WINCON system at the time of completing the installation. Identify leak points by feel or smoke pen, and fix leak immediately using either ORCON adhesive or TESCON VANA jointing tape in accordance with pro clima installation requirements.

3.13 MEASURING BUILDING PERFORMANCE

To confirm infiltration rates use the Minneapolis BlowerDoor.

BlowerDoor verification device used to measure infliltration rates in existing buildings by both pressurizing and depressurizing buildings.

Building Performance requirements to be met are as follows:

	Unit of air leakage measurement (@50Pa pressure diff)	
Building type or performance standard being met	Design Air Permeability (DAP or AP50) of the envelope surface area ($m^3/hr/m^2$)	Air Change Rate (ACH or N50) of the envelope volume ($m^3/hr/m^3$)
Certified Passive House		≤ 0.6
Passive House - low energy		≤ 1
Passive House retrofit (EnerPHit)		≤ 1
Airtight construction with balanced MHRV system	≤ 1.5	
BRANZ recommendation for new apartments	3	
NZGBC Homestar V5: 8 star	≤ 3	
NZGBC Homestar V5: 9 star	≤ 2	
NZGBC Homestar V5: 10 star	≤ 1	
Typical new house built to NZBC minimum standards	5-8	

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Completion

3.14 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go to www.proclima.co.nz.
Substitutions are not permitted to the following.

Performance - airtightness

4.1 QUALITY ASSURANCE

Airtightness level: < 1

Materials

4.2 PRO CLIMA WINDOWS

Manufacturer:	Pro Clima NZ Limited
Jointing tape:	TESCON® VANA or EXTORA multipurpose adhesive tape
Adhesive:	ORCON® Classic multi-purpose adhesive

4.3 PRO CLIMA AIRTIGHTNESS

Manufacturer:	Pro Clima NZ Limited
Jointing tape:	TESCON® VANA or EXTORA multipurpose adhesive tape
Joinery tape:	TESCON® VANA or EXTORA multipurpose adhesive tape
Adhesive:	ORCON® Classic multi-purpose adhesive

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4171HR JAMES HARDIE® RIGID AIR BARRIERS

1 GENERAL

This section relates to the supply and fixing of James Hardie® rigid air barrier products;

- RAB™ Board - 6mm and 9mm

1.1 RELATED WORK

Refer to 4272 Stone Veneer for stone cladding finish.

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:

FRR	Fire resistance rating
SED	Specific engineering design

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	Protection from fire
NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
AS/NZS 3837	Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®
Bracing Design Manual by James Hardie®
Fire and Acoustic Design Manual by James Hardie®
CodeMark™ Certificate GM-CM30130 RevA HomeRAB™ Pre-Cladding and RAB™ Board by James Hardie®
BRANZ Appraisal 611 - James Hardie® HomeRAB™ Pre-Cladding and RAB™ Board
BRANZ Appraisal 775 - 3M All Weather Flashing Tape 8067
BRANZ Appraisal 846 - SUPER-STICK Flexible Flashing Tape

Manufacturer/supplier contact details

Company:	James Hardie New Zealand Limited
Web:	www.jameshardie.co.nz
Email:	info@jameshardie.co.nz
Telephone:	Ask James Hardie™ on 0800 808 868.

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For HomeRAB™ Pre-Cladding and RAB™ Board (refer to James Hardie® product warranty)
15 years:	For accessories supplied by James Hardie® (refer to James Hardie® product warranty)
From:	Date of purchase

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

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

1.7 SAFE WORKING

To James Hardie® requirements for safe working practices with James Hardie® products, particularly with regards to cutting and drilling.

1.8 NO SUBSTITUTIONS

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

Performance - Wind

1.9 PERFORMANCE, WIND

The design wind pressures are to NZS 3604, up to and including Very High Wind Zone. This is within the scope of the manufacturer's literature and details.

1.10 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

To NZBC C/AS1, 5.3 External cladding systems or NZBC C/AS2, 5.8 External Cladding Systems, where external walls are located at a distance greater than or equal to 1.0m from a relevant boundary and a building height less than 10m.

Performance - Acoustic

1.11 ACOUSTIC REQUIREMENTS

Refer to James Hardie Acoustic Systems for details.

2 PRODUCTS

Materials

2.1 RAB BOARD

Hardie™ RAB™ Board, 6mm or 9mm thick, manufactured from treated cellulose fibre, Portland cement, sand and water, cured by high pressure autoclaving manufactured to AS/NZS 2908.2, face and edge sealed.

Components

2.2 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to NZS 3604, section 4 Durability, for requirements for fixing's material to be used in relation to the exposure conditions.

Refer to NZBC E2/AS1, Table 20, Material selection, and NZBC E2/AS1, Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Zone	Fixings Material
Zone D, Zone E	Grade 316 Stainless
Zone B, Zone C	Hot-dipped galvanized or Grade 316 Stainless

2.3 GALVANIZED NAILS

Hot-dip galvanized nails to James Hardie® requirements. Refer to SELECTIONS.

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Accessories

2.4 SEALING TAPE - VERTICAL JOINTS/CORNER JOINTS

SUPER-STICK Building Tape® (75mm wide) or 3M™ All Weather Flashing Tape 8067 (75 mm wide) or Thermakraft™ Premium Jointing Tape.

2.5 FLASHING TAPE / WINDOW FLASHING TAPE

SUPER-STICK Building Tape® or 3M™ All Weather Flashing Tape 8067 or Thermaflash Flashing Tape.

3 EXECUTION

Conditions

3.1 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.

3.2 HANDLING

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.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

3.4 FRAMING - RAB™ BOARD

Provide framing plumb, level, in true alignment and in accordance with NZS 3604 or SED requirements. Stud and nog spacing must not exceed James Hardie® requirements. Moisture content of timber framing must not exceed the requirements specified by NZS 3602 to minimise shrinkage and movement after sheets are fixed.

Application - generally

3.5 PENETRATIONS AND FLASHINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- Openings formed in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie® .
- Materials lapped in a way that water tracks down to the exterior face of the Rigid Air Barrier.
- Underlay / tapes to openings finished and dressed off ready for the installation of window and door frames and other penetrations.
- Required holes in cladding accurately formed and cut to James Hardie® requirements, ensure (if required) services penetration grommets/sleeves/seals/tapes are in place prior to cladding installation.

3.6 CUT EDGES

Cut edges where exposed (not covered by uPVC flashing, flashing or sealing tape) must be primed prior to installation. Refer to SELECTIONS for primer.

Install Rigid Air Barriers

3.7 SHEET LAYOUT

Refer to the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie® for sheet layouts to suit general installations.

3.8 VERTICAL JOINTS

Join sheets to the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®.

3.9 HORIZONTAL JOINTS

Join sheets to the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®.

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3.10 EXTERNAL AND INTERNAL CORNERS

Form in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®, using a 75mm minimum wide sealing tape.

3.11 FIXING SHEETS

Fix in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie® with the sealed face towards the external cladding and unsealed face towards the framing. Fix sheets to suit installation requirements for general fixing, bracing and fire rating requirements. Refer to SELECTIONS for fixing type. Use hand-driven nailing for fixing bracing sheets.

3.12 PENETRATIONS

Form in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®.

3.13 OPENINGS

Form in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®. Exposed timber framing around window, door, meter box and other penetrations must be covered with a 150mm wide minimum flashing tape or sealing tape. Flashing tapes must be lapped over the HomeRAB™ Pre-Cladding or RAB™ Board by 50mm minimum.

3.14 FLASHINGS AND JUNCTIONS

Form in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®. Install flashing tape over any flashings and at all junctions with other materials or building elements.

3.15 AT SOFFITS

Form in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®.

3.16 BASE CLEARANCES

Form in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual by James Hardie®. Lining is required to extend below the bottom plate / floor joist by 15mm minimum to form a drip edge and must finish a minimum 100mm clear of finished ground. Where base of sheets are cut to suit site requirements seal the bottom edge with primer.

Completion

3.17 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused and temporary materials and elements from the site.

3.18 REPLACE

Replace all damaged or marked elements.

3.19 LEAVE

Leave work to the standard required for following procedures.

3.20 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.jameshardie.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

4.1 RAB™ BOARD - RIGID AIR BARRIER 6MM

Brand/type:	Hardie™ RAB™ Board
Sheet length:	3000mm
Sheet thickness:	6mm
Nails:	50 x 2.8mm galvanized round head gun nails
Finish:	Shell Flintkote min 3no. coats

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4230 WALL CLADDING

1 GENERAL

This section relates to the supply and installation of exterior cladding, including:

- associated flashings
- timber fascias
- timber barges

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:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1491	Finger jointed structural timber
AS/NZS 2269.0	Plywood - Structural - Specification
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3617	Profiles of weatherboards fascia boards and flooring
NZS 3631	New Zealand timber grading rules
BRANZ BU 601	Sealants for cladding joints

1.3 MANUFACTURER'S DOCUMENTS

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

Copies of the above literature are available from

Web:	https://southpacifictimber.co.nz/

Performance

1.4 PERFORMANCE

Accept responsibility for the weathertight performance of the completed cladding system, including all penetrations.



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2 PRODUCTS

2.1 WALL UNDERLAYS

For flexible wall underlays, rigid wall underlays and rigid air barriers, refer to the appropriate separate section(s).

2.2 EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. Treatment to NZBC B2/AS1 and NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.3 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated uPVC, aluminium or stainless steel trays with upstands. Upstand one side 10mm and the other 75mm. Length and width to suit cavity.

2.4 TIMBER WEATHERBOARD

Dressing grade to NZS 3631, to NZS 3617 for profile and treated to NZS 3602, table 2, reference 2.A1, Requirements for wood-based building components to achieve a 15-year durability performance.

2.5 TIMBER FASCIAS AND BARGE BOARDS

Dressing grade to NZS 3631 and treated to NZS 3602, table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance. Finger jointed timber to AS/NZS 1491.

2.6 NAILS, SCREWS AND FASTENINGS

Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4, Durability.

2.7 FLASHINGS

To NZBC E2/AS1, 4.0 Flashings. Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

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3 EXECUTION

3.1 MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602 for:
Equilibrium moisture content (EMC)

- Framing: 20% at closing in
- Weatherboards: 14% at time of fixing
- Exterior joinery and trim: 14%

3.2 EXECUTION METHODS AND PRACTICES

To NZS 3604 except as varied in this specification. Execution to include those 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 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall underlay/rigid air barrier to openings finished and dressed off with flashing tape ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

3.4 INSTALL DRAINED CAVITY

20mm Minimum thickness drained cavity to NZBC E2/AS1, 9.0 Wall claddings, where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the wall underlay. Seal the top of the cavity. Install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

3.5 PRIME OR SEAL TIMBER WEATHERBOARDS AND TRIM

Prime or seal all front and back faces, edges and end grain before fixing weatherboards and exterior trim, to the finish and quality specified in painting sections.

3.6 INSTALL TIMBER WEATHERBOARDS

Install level, true to line and face, to NZBC E2/AS1, 9.4 Timber weatherboards. Refer to NZS 3604 for fixings durability requirements for specific provisions.

3.7 INSTALL EXTERIOR TIMBER FINISHINGS

Install timber fascias, barge boards, facings, beads, trim and enclosures level, true to line and face, with all end grain sealed and joints mitred.

3.8 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1.

3.9 USE OF SEALANTS

Selection and use of sealants to follow BRANZ BU 601.

3.10 COMPLETE

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

3.11 REPLACE

Replace damaged or marked elements. Remove unused materials from the site.

4 SELECTIONS

4.1 CAVITY BATTENS

Timber species: Pine
Treatment: H3.2
Fixing to SIPs by engineer.

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4.2 CAVITY CLOSER/VERMIN-PROOFING

Brand/type: By contractor
Material: uPVC

4.3 VERTICAL TIMBER WEATHERBOARDS

Location: As drawn
Size/profile: HP55
Species and grade: Vitex
Finish: Oiled with Resene Wood X Oil - Benmore Tint

4.4 HORIZONTAL TIMBER WEATHERBOARDS

Location: As drawn
Size/profile: CP838
Species and grade: Vitex
Finish: Oiled with Resene Wood X Oil - Benmore Tint

4.5 HORIZONTAL TIMBER WEATHERBOARD FASCIA

Location: As drawn
Size/profile: 3 x CP838 Weatherboards
Species and grade: Vitex
Finish: Oiled with Resene Wood X Oil - Benmore Tint

4.6 VERTICAL TIMBER WEATHERBOARD FASCIA

Location: As drawn
Size/profile: 3 x HP55 Weatherboards
Species and grade: Vitex
Finish: Oiled with Resene Wood X Oil - Benmore Tint

4.7 VERTICAL TIMBER BATTENS

Location: As drawn
Size/profile: 45x20mm
Species and grade: Vitex
Finish: Oiled with Resene Wood X Oil - Benmore Tint

4.8 NAILS, SCREWS AND FASTENINGS

Cladding	**Fixing/fastening (metal/finish)**	**Fixing/fastening (type, gauge and length)**	**Centres (general and edge)**
All timber claddings	SS	Jolt Head Screws	Per board, per batten

4.9 FLASHINGS

Location	**Material/ thickness**	**Base metal thickness**	**Finish**
As drawn	As drawn	As drawn	As drawn

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4239 SOFFIT CLADDING

1 GENERAL

This section relates to the supply and fixing of cladding to the underside of exterior soffits, verges and eaves and includes:

- Timber board

Documents

1.1 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 2269.0	Plywood - structural - Specifications
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3617	Profiles of weatherboards, fascia boards and flooring
NZS 4251.1	Solid plastering: Cement plasters for walls, ceilings and soffits

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

https://southpacifictimber.co.nz/

Requirements

1.3 QUALIFICATIONS

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

1.4 HEALTH AND SAFETY

Comply with all manufacturer/supplier and WorkSafe New Zealand requirements for health and safety.

1.5 NO SUBSTITUTIONS

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

1.6 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:

Provide this information prior to practical completion.

2 PRODUCTS

Timber board soffit cladding

2.1 TIMBER BOARD

Timber board in long lengths to profile detailed, with species and grading to the requirements of NZS 3602, table 2, Requirements for wood-based building components to achieve a 15-year durability performance. Select appearance grades to NZS 3631 requirements.

2.2 TONGUE AND GROOVE TIMBER BOARD SARKING

Tongue and groove timber board profile as detailed, in long lengths with species and grading to the requirements of NZS 3602, table 2, Requirements for wood-based building components to achieve a 15-year durability performance. Select appearance grades to NZS 3631 requirements.

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Timber board soffit cladding fasteners

2.3 NAILS - GALVANIZED

Refer to SELECTIONS for size and use; galvanized countersunk or stainless steel to NZS 3604, Table 4.1.

2.4 NAILS - STAINLESS STEEL

Refer to SELECTIONS for size and use; galvanized countersunk or stainless steel to NZS 3604, Table 4.1.

2.5 SCREWS - STAINLESS STEEL

Refer to SELECTIONS for size and use; galvanized countersunk or stainless steel to NZS 3604, Table 4.1.

Timber profiles

2.6 TIMBER TRIM

18 x 18 mm timber trim with 6 mm minimum chamfer to internal corner. Species and grading to the requirements of NZS 3602 , table 2, Requirements for wood-based building components to achieve a 15-year durability performance, treated H3.1 unless durable heartwood. Select appearance grades to NZS 3631 requirements, but with all knots excluded.

3 EXECUTION

Conditions

3.1 HANDLING

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 all product with damaged faces or edges

3.2 SUBSTRATE

Do not commence work until the substrate is of the standard required for the specified finish; 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 soffits are fixed.

3.3 MOISTURE CONTENT TIMBER BOARD

Immediately before starting fixing, test the moisture content of the boards. Use an electrical moisture meter to test 5% of boards, but not less than 10 boards in the centre of the length. Do not start fixing until 90% of the values obtained are within the range in NZS 3602 table 4, Allowable moisture content (%) at time of installation.

3.4 PENETRATIONS

Form small holes to accommodate penetrations through the soffit as per the method detailed in the sheet manufacturer's technical literature.

Install timber board soffit cladding

3.5 FIXING SOFFIT BOARD

Using full length boards only, nail from the centre of the board width (nogs at 480mm centres). Nail the batten with a single fixing through the gap between boards at every fixing point.

3.6 FIXING, PAINT FINISH

Prime all cut ends before fixing. Drill all fixings located within 25mm of board ends. Punch all fixings.

3.7 FIXING, CLEAR FINISH

Coat all cut ends before fixing. Drill all fixings located within 25mm of board ends. Finish fixings flush.

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Install timber profiles

3.8 EXECUTION

To NZS 3604, except as varied in this specification. Execution to include those 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).

3.9 TIMBER TRIM

Using full lengths, scribe internal joints and mitre external and running joints. Fully support all joints and fix securely and true to line and face, fully nailed. For paint finish prime joint edges before fixing, otherwise seal them without runs onto any exposed face.

3.10 NAILING, PAINT FINISH

Punch nails and patch prime external trim being painted, before stopping as specified under painting preparation.

3.11 NAILING, CLEAR FINISH

Punch nails flush with the face of external trim being stained or clear finished.

Completion

3.12 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

Timber Board soffit cladding

4.1 TIMBER SOFFIT 1

Profile:	HP55
Species:	Vitex
Finish:	Resene Wood X Oil - Benmore Tint

4.2 TIMBER SOFFIT 2

Profile:	HP84
Species:	Vitex
Finish:	Resene Wood X Oil - Benmore Tint

Finishes - materials supplied unfinished

4.3 MATERIALS SUPPLIED UNFINISHED FOR ON SITE FINISHING

Soffit:	Refer to appropriate painting section/s for finishes

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4241ME METALCRAFT ESPAN™ CLADDING

1 GENERAL

This section relates to the supply and fixing of **Metalcraft Roofing** espan™340 and espan™470 trough (standing seam) profiled vertical cladding installed on a drained cavity, complete with accessories.

1.1 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
MS	Modified silicone
LBP	Licensed Building Practitioner

Documents

1.2 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	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
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - performance requirements
AS 3566	Self-drilling screws for the building and construction industries
NZS 3602	Timber and wood-based products for use in building
ISO 5660.1	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 1 Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 2 Smoke production rate (dynamic measurement)
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Metalcraft Roofing espan™340 product literature
Metalcraft Roofing espan™470 product literature
Eco Choice Aotearoa Ecolabel certificates

Manufacturer/supplier contact details

Company:	**Metalcraft Roofing**
Web:	www.metalcraftgroup.co.nz
Email:	technical@metalcraftroofing.co.nz
Telephone:	09 274 0408

Requirements

1.4 NO SUBSTITUTIONS

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

1.5 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be authorised espan™ installers by manufacturer / supplier. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

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Compliance information

1.6 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Applicator approval certificate from the manufacturer / importer / distributor
- Manufacturer / supplier warranty
- Installer / applicator warranty
- Producer Statement - Construction from the applicator / installer
- Producer Statement - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance - General

1.7 PERFORMANCE

Install wall cladding materials in accordance with the NZMRM CoP, and Metalcraft espan™340 and espan™470 product literature, to form a weather-tight performance for the completed cladding system, including all penetrations through walls and parapets.

1.8 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 wall cladding. Ensure that all necessary members are positioned so that flashings can be fastened at both edges through the wall profile or cladding to the primary structure.

2 PRODUCTS

Materials

2.1 EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, treated H3.1, minimum 20mm thickness, width and height to match timber framing studs to NZS 3602 table 1, Requirements for wood-based buildings components to achieve a 50-year durability performance, reference 1D.10. Or ventilated uPVC battens with separation strips on wall underlay. Timber framing studs to have an absorbent overlay separation strip.

2.2 EXTERIOR CAVITY WALL BATTENS - WITH DRAINED CAVITY

Proprietary horizontal cavity batten system.

2.3 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated uPVC, or aluminium trays with upstands. Upstand one side 10mm and the other 75mm. Length and width to suit cavity.

2.4 STEEL - TYPE AM COATING (ALUMINIUM/ZINC/MAGNESIUM ALLOY), PREPAINTED

Formability steel sheet G300 for roll forming or G300 for flashings, coated to AS 1397. Prefinished /prepainted to AS/NZS 2728.

Fixings

2.5 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 NZMRM CoP and Metalcraft espan™304 or espan™470 product literature. For fixing patterns refer to Metalcraft product literature for espan™340 or espan™470 profile.

2.6 FIXING CLIPS TO TROUGH SECTION CLADDING - ESPAN™ 470

Galvanized steel (powdercoated for aluminium) to suit the material and the espan™470 profile and location as required by Metacraft Roofing for espan™470.

Fixings to steel are 10mm x 12 gauge galvanized self-drilling fastener. Length to suit minimum steel embedment should be 5 - 6mm beyond the drill point with a minimum of 3 threads beyond the drill point.
Fixings to timber are 12 gauge. Length to suit minimum embedment into structure of 35mm.
For high wind loads refer to Metalcraft for advice.

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2.7 FIXING SCREWS

To AS 3566. Screws appropriate to the cladding material and the supporting structure, as required by Metalcraft and with a Class 4 or 5 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 35mm. Screw fasteners to be head stamped identifying the manufacturer and class. Refer to SELECTIONS.

2.8 RIVETS

Sealed aluminium, minimum diameter 4.0mm. Refer to Metalcraft for requirements.

Components

2.9 FLASHINGS GENERALLY

To NZBC E2/AS1, 4.0, Flashings.

Formable grade 0.55 BMT for Type AM - coated and pre-painted steel and 0.90 BMT for aluminium, to the same standards as the profiled sheets.

2.10 WALL AND PARAPET FLASHINGS

To NZBC E2/AS1, 4.0, Flashings.

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

Accessories

2.11 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.12 PLASTIC CLADDING

Refer to 4242 PROFILED PLASTIC CLADDING.

2.13 SEALANT

Neutral curing MS sealant or polymer sealant as required by Metalcraft and used as directed.

3 EXECUTION

Conditions

3.1 INSPECTION

Inspect the wall framing and supporting structure to ensure that it is complete and fully braced ready for cladding and free from any misalignments or protrusions that could damage the cladding.

3.2 FRAMING TIMBER MOISTURE

When continuous metal cladding etc. Runs along a long continuous timber member and is directly fixed to it, the timbers equilibrium moisture content (EMC) to be 18% or less. For flashings in this situation (sometimes called transverse flashings) the framing EMC to be maximum 16%, and preferably as low as 12%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

3.3 STORAGE

Upon delivery visually inspect sheets for damage and accept packs of undamaged cladding. Reject all damaged material. Store on a level firm base clear of the ground, with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets. If sheet packs become wet, fillet or cross stack to allow air circulation and drying between sheets.

3.4 HANDLING

Avoid distortion and contact with damaging substances, including cement. Do not drag sheets across each other and other materials. Protect edges and surface finishes from damage.

3.5 SEPARATION

Isolate dissimilar materials in close proximity as necessary by painting the surfaces or fitting separator strips of compatible or inert materials. Place isolators between metals and treated timber and cement based materials.

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Application

3.6 FIX INSULATION

Refer to thermal insulation sections.

3.7 SET-OUT FOR VERTICAL CLADDING

Set cladding to vertical plumb lines and maintain verticality. Add 4mm tolerance to cover width when setting out cladding sheets (i.e. 344mm for espan™ 340 or 474mm for espan™ 470). Set all exposed fixings with horizontal string lines. Carefully set out sheets with side laps away from the main line of sight, and with the widths of end sheets the same. Check during fixing to eliminate creep or spread and to keep fastenings in line.

3.8 END LAPS

End laps are not permitted.

3.9 THERMAL MOVEMENT

Fix for Thermal Movement to Metalcraft requirements for thermal movement.

3.10 FIXING GENERALLY

Install and fix in accordance with the NZMRM CoP recommendations, and to Metalcraft required fixing patterns and details for each area of the building roofing. Use only screws as required by Metalcraft. Paint colour matched fixings and accessories before installation.

3.11 FIX UNDERLAYS

To NZBC E2/AS1, 9.1.6 Wall underlay. Fix to framing, with laps and fixing to Metalcraft requirements. Make good any damage before or during fixing of cladding before fixing continues.

3.12 INSTALL DRAINED CAVITY - HORIZONTAL PROPRIETARY SYSTEM

Drained cavity to NZBC E2/AS1, 9.0 Wall claddings, where required. Fix horizontal proprietary cavity battens to wall framing studs in accordance with manufacturer's requirements.

3.13 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

3.14 MARKING AND CUTTING

Use ink pen, chalk line or coloured pencil for marking cladding sheets prior to cutting. Do not use lead pencil for marking Zincalume® and Colorsteel®. Cut by shear only, using nibblers or hand snips.

3.15 FIX SHEETS - CONCEALED CLIP SYSTEM

Fix sheets in place using the clip fixing system required by Metalcraft for espan™340 or espan™470 profile, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet.

3.16 INSTALL FLASHINGS

Flash to penetrations, cap corners and edges to detail. Flashings to be installed on timber framing with moisture content of less than 20%. Where no detail is provided flash to NZMRM CoP recommendations and Metalcraft and NZBC E2/AS1 requirements. Cut accurately and fix using sealant and rivets to detail and to Metalcraft requirements to form a weatherproof cover. For visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.17 SEPARATION

Separate metal sheeting from CCA treated timber with wall underlay or other suitable inert isolation material.

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3.18 USE OF SEALANTS

Select and use sealants only as recommended by Metalcraft. 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 wall. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation, to enable espan™ to expand and contract freely.

Completion

3.20 REPLACE

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

3.21 LEAVE

Leave this work complete with all necessary flashings and capping all properly installed as the work proceeds so the finished cladding is completely weathertight.

3.22 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.metalcraftgroup.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 UNDERLAYS

Brand/weight:	Pro Clima Mento 1000
Flashing tape brand:	Pro Clima

Cladding

4.2 METALCRAFT ESPAN™ 470 TROUGH SECTION CLADDING

Location:	As drawn
Manufacturer:	Metalcraft Roofing
Brand/type:	espan™470 - swaged
Dimensions:	Sheet width 484mm, cover 470mm, rib height 49mm, and roll formed to any length
BMT/material:	0.55
Clips:	espan™ concealed fixing clip - Standard zincalume clip with coreflute cushioning tape
Batten material:	Timber
Colour:	Flaxpod Matte

Accessories

4.3 FLASHINGS - GENERALLY

Profile:	As drawn
BMT/material:	0.55
Coating system:	To match roofing
Paint colour:	To match roofing

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4272 STONE CLADDING

1 GENERAL

This section relates to the supply, laying and fixing of non-load bearing stone;

- as a non-structural decorative veneer
- as dry stacked or pointed stone veneer

1.1 RELATED WORK

Refer to 4271 Natural stone veneer walling for lightweight stone veneer system

Documents

1.2 DOCUMENTS

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

NZBC B1/AS1	Structure
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction, materials and workmanship

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.

Warranties

Requirements

1.3 QUALIFICATIONS

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

2 PRODUCTS

Materials

2.1 NATURAL STONE INDIVIDUAL STONE

Natural stone is natural stone modified by the quarry only for sizing. Refer to SELECTIONS.

2.2 DAMP-PROOF COURSE (DPC)

To NZBC E2/AS1 either:

- 2 coats bitumen-based paint to AS/NZS 2904.
- 1.0 mm min. bituminous sheet or heavy kraft strip laminate (saturated and coated with bitumen) to AS/NZS 2904.
- 1.0 mm min. butyl rubber to ASTM D6134.

2.3 DAMP-PROOF MEMBRANE (DPM)

0.25 mm min. polythene or polyethylene sheet to AS/NZS 2904.

Components - general

2.4 LINTELS

Steel lintel angles over openings to AS/NZS 2699.3.

2.5 WALL TIES

To AS/NZS 2699.1. Metal ties screw fixed to framing.

Accessories

2.6 SAND FOR MORTAR

To NZS 3103. Chloride levels not to exceed 0.04% by dry weight of sand.

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2.7 MORTAR

Composed of Portland cement, sand and water with an admixture to the provisions of NZS 4210: 2.2 Mortar. Obtain written approval of admixture being used. Obtain written approval if intending to use hydrated lime in the mortar.

2.8 MORTAR COLOUR

Add mineral oxide pigment conforming to requirements of NZS 4210, clause 2.2.2.2(f).

2.9 ADMIXTURES

To NZS 4210.

2.10 WATER

Clean, fresh and free from excess alkali, salt, silt and organic materials.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

To NZS 4210 for aggregates, cement, bricks and reinforcement.

Take delivery of materials and goods and store on site and protect from weather or damage.
Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufacturer's requirements.
Reject and replace goods that are damaged or will not provide the required finish.

3.2 PRE-INSTALLATION / APPLICATION REQUIREMENTS - CONCRETE BASE

Check vertical and horizontal alignment. Any discrepancies exceeding the permitted tolerances shall be corrected before units are laid.

3.3 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the brick veneer. Required preparatory work includes the following:

- wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- stone cladding neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

3.4 MEASURE MATERIALS

Measure materials for mortar accurately by weight or volume using suitably calibrated equipment.

3.5 WET WEATHER

Keep stone dry at all times prior to laying. Protect the top row of uncompleted stone walls. Protect freshly laid stonework during interruption through rain and at completion of each day's work. Protect stonework for a minimum of 6 hours

3.6 COLD WEATHER CONSTRUCTION

When air temperature is below 5°C take the precautions required by NZS 4210: 2.18 Cold weather construction.

3.7 HOT WEATHER CONSTRUCTION

When air temperature is above 25°C or there is a drying wind, or lower temperatures, take the precautions required by NZS 4210: 2.19 Hot weather construction.

3.8 KEEP FACE WORK CLEAN

Keep clean during erection and until completion of the contract works. Turn back scaffold boards at night and during heavy rain. Do not rub face work to remove stains.

Installation - general

3.9 STANDARDS AND TOLERANCES

To NZS 4210, table 2.2 Maximum tolerances.

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Refer to the general section CONSTRUCTION for general requirements.

3.10 COLOUR MIXING

Check all stone delivered to site for colour variation, prior to commencing work. Ensure stones are thoroughly blended from several groups to ensure an even colour spread throughout the work.

3.11 UNIFORMITY

Carry up work with no portion more than 1500 mm above another at any time, raking back between levels.

3.12 PROVIDE WEEPHOLES

Provide weepholes at the bottom of cavities and cells and as necessary to drain moisture to the outside air. Provide vent gap at the top of the cladding.

3.13 INSTALL VERMIN PROOFING

Fold and staple one edge of the mesh to the substrate, with the mesh sloping down towards the veneer. Set the other edge into the mortar joint by half the thickness of the veneer or 50 mm, whichever is less.

3.14 CAVITY VENTILATION

Ventilate to outside air with top and bottom openings. Seal cavity off from roof space.

3.15 SEPARATION JOINTS

Provide for wall movements of veneer with control joints to NZS 4210: 2.10 Methods of controlling wall movements. Weatherproof as necessary.

3.16 FORM REVEALS

Form lintels, jambs and sills as detailed complete with flashings and all ready for following work.

3.17 HEAD FLASHINGS

Provide a flexible flashing extending 200 mm beyond ends of the opening and sloping to weepholes over all openings in cavity walls.

3.18 JAMB FLASHINGS

Provide a flexible flashing to jambs of openings in cavity walls, fully lapped with horizontal damp-proof courses at head and sill.

3.19 SILL FLASHINGS

Provide a flexible flashing under jointed sills, turned up at back and ends.

3.20 REBATE DAMP PROOFING

Provide damp-proof course to stepped rebates supporting stone cladding

Installation - stone cladding

3.21 CAVITY WIDTH

No cavity width less than 40 mm or more than 75 mm.

3.22 PLACE WALL TIES

Place wall ties to: -

- engineer's specification

At unsupported edges and at all openings through veneered walls or non-grouted cavity walls, wall ties to be provided:
At the top and bottom of the opening:

- Not more than 300 mm or 2 courses, whichever is the smaller

At the sides of the opening or at an unsupported edge:

- Not more than 300 mm
- Where the veneer wall continues above or is interrupted by a damp-proof course or waterproof membrane, wall ties shall be provided in each of the first two courses above the membrane.

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Substrate

3.23 SUBSTRATE - GENERAL

Confirm the substrate is suitable for the veneer application, installed to the manufacturer's installation requirements, as required by NZBC B1/AS1 and to meet stone cladding manufacturers requirements.

Preparation

3.24 SURFACE PREPARATION

Ensure the substrate is dry and free of all dust, paint or other surface contaminants before commencing the veneer installation.

3.25 WATERPROOFING / SUBSTRATE PRIMER

When a primer or waterproofing membrane is required ensure product is compatible with the chosen adhesive and complies with manufacturer's instructions.

Completion

3.26 PROGRESSIVE CLEANING

Clean off all contaminants from the face work immediately after they occur.

3.27 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

3.28 LEAVE

Leave work to the standard required by following procedures.

3.29 REMOVE

Remove any temporary structures, all debris, unused materials and elements from the site.

4 SELECTIONS

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

Natural stone

4.1 NATURAL STONE INDIVIDUAL STONE CLADDING

Substrate:	RAB board
Brand:	James Hardie
Stone type:	Schist
Size:	Random - varies each piece
Colour:	Poolburn blend
Finish/thickness:	150-200mm
Weight:	450kg/ m²

Accessories

4.2 WALL TIES

Material / type:	316 Stainless Steel
Size:	130mm (150mm veneer), 180mm (200mm veneer)

4.3 LINTELS

Material / type:	Galvanised Mild Steel
Size:	As per structural engineer's drawings

4.4 SHELF ANGLES

Material / type:	Galvanised Mild Steel
Size:	As per structural engineer's drawings

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Primer

4.5 WATERPROOFING/ SUBSTRATE PRIMER

Brand: Shell Flintkote

Mortar & Pointing

4.6 MORTAR NATURAL INDIVIDUAL STONES

Colour Standard Grey

4.7 POINTING NATURAL INDIVIDUAL STONES

Colour Creamy White

Samples

4.8 SAMPLES

Refer to the general section 1270 CONSTRUCTION for details of how samples will be reviewed and how instructions to proceed will be given. Provide the following samples for review:

	Sample A
Sample description:	Typical laying & Pointing
Sample type:	1m x 1m sample panel
Number:	1
Reviewer:	Contract administrator & Client
Time for review:	10 working days
Review criteria:	Colour and style of pointing, laying and finish of bagging

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4285 SLAB EDGE FINISH

1 GENERAL

This section relates to **Stoanz Ltd** exterior **Sto** plastered insulation systems, applied by hand, or pump over **StoTherm** polystyrene panels on;

- concrete block masonry substrates.

Stoanz Ltd products must be installed by an approved applicator.

1.1 RELATED WORK

Refer to 3114E Expol Underslab Insulation

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:

XPS	Extruded Polystyrene
EPS	Expanded Polystyrene
MPNZA	Master Painters New Zealand Association

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 1170	Structural design actions - General principles
AS 1366.3	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 3604	Timber-framed buildings
AS/NZS 4858	Wet area membranes
WorkSafe:	Guidelines for the provision of facilities and general safety in the construction industry
MPNZA	Health and Safety Programme

Health and Safety at Work Act 2015

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.

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Stoanz Ltd documents relating to work in this section are:
Sto Product Manual with specification and CAD details
Sto Technical Data Sheets
BRANZ Appraisal 478 - StoTherm Cavity System
BRANZ Appraisal 604 - StoTherm Masonry Insulation System

BRANZ	Test STO740/3 StoTherm Anchors pull through test
BRANZ	Test DC1525 Gluecoat Adhesion test
BRANZ	Test FH4008.1 heat release test - performance A (unrestricted)
BRANZ	Test No DC1182 Sto Flexyl waterproofing to AS/NZS 4858

BRANZ StoTherm System ULS wind pressure of 2.5kPa

Materials and execution to **Stoanz Ltd** specification except where varied by this specification and supported by architectural detailing.

Copies of the above literature are available from:

Company:	**Stoanz Ltd**

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Web: www.sto.co.nz
Email: info@sto.co.nz
Telephone: 0-4-801 7794

Warranties

1.5 WARRANTY

Warrant this part of the work under normal environmental and use conditions against failure of materials and execution. The **Sto** Applicator must complete the **Sto** quality assurance compliance procedure form and applicator warranty. The **StoThermMasonry Insulation Plaster Systems** is warranted as follows:

Materials: 15 years from date of practical completion
Execution: 5 years from date of practical completion

Requirements

1.6 QUALIFICATIONS

Use only applicators registered to apply the **Sto** Plaster systems.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Sto** Insulation system.

1.8 PROTECTION OF NEW PLASTER

Provide protection systems as required by the manufacturer to protect fresh plaster from adverse weather conditions. Normally required curing procedures can be altered when acrylic-modified plasters (bonding agents) have been specified. Such plasters may only need to be protected from direct sun and strong, drying winds for 16 - 24 hours.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Provide **Sto** Maintenance Schedule instructions before practical completion of the contract for issuing to the building owner.

1.10 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry.

If the elimination or isolation of potential hazards and risks is not possible then minimise hazards and risks in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and risks, and put into place procedures for dealing with emergencies. Obtain from **Stoanz** Ltd the material safety data sheets for each product. Keep sheets on site and comply with the required safety procedures.

1.11 PRODUCER STATEMENT

Provide a producer statement from the approved **Sto** applicator in the form as required by the Building Consent Authority.

1.12 STOTHERM ANCHORS, WIND

Use the number of anchors appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604 and the wind loads on various wall areas as given by AS/NZS 1170. Modify this clause depending on whether NZS 3604 or AS/NZS 1170 is being used as a design basis for the project. Refer to **Stoanz** Ltd technical information for **StoTherm** Anchor centres required for the building wind zone.

1.13 INSPECTIONS

Allow to inspect the whole of the work at each stage. Determine a programme for inspections including notification when each part and stage of the work is ready for inspection prior to the work commencing.

If requested permit representatives of **Stoanz** Ltd to inspect the work in progress and to take samples of their products from site. Refer to **Sto** product manual.

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Compliance information

1.14 DURABILITY

The work covered by this part of the specification has been designed and constructed to meet the NZBC durability requirement for 15 years with a serviceability life in excess of 30 years. Refer to the following:

BRANZ Appraisal 604 - StoTherm Masonry Insulation System

Performance

1.15 PERFORMANCE

Accept responsibility for the structural and weather-tight performance of the exterior render application.

1.16 TESTS

Refer to the following BRANZ Tests:

- STO740/3 StoTherm Anchors pull through test.
- Test DC1525 Gluecoat Adhesion test
- Test FH4008.1 Heat release test - performance A (unrestricted)
- Test No DC1182 Sto Flexyl waterproofing to AS/NZS 4858
- BRANZ StoTherm System ULS wind pressure of 2.5kPa

2 PRODUCTS

Materials

2.1 MULTISCREED PLASTER

Mineral basecoat plaster in a bag. The material contains mineral aggregates water retention agents, adhesive compounds, fibre and other additives to form a solid, basecoat plaster.

2.2 STO MESH

Alkali-resistant, 165g/m² fibreglass mesh in 50 metre rolls, or 360g/m² **Sto Panzer Mesh** for areas requiring extra impact resistance.

2.3 STOARMAT MESHED REINFORCEMENT PLASTER.

Reinforcement plaster in a pail with a calibration grain. A white non cement flexible meshing plaster containing organic fillers and fibres bound in a polymer dispersion to form a malleable crack resistant intermediate plaster with excellent adhesion qualities.

2.4 STOLIT K & MP COLOURED FINISHING RENDERS

Six different coloured finishing renders (as selected) in a pail. Containing organic aggregates and fibres bound in a polymer dispersion with enhancement agents and colouring pigments. Refer to SELECTIONS for texture and colour.

2.5 PROTECTOSIL SC EASY CLEAN

Clear, invisible Silane sealer for ease of cleaning and added protection against staining of coloured sponge finishes (Note: were a clear coating is required contact **Stoanz Ltd**).

Accessories

2.6 STO FLEXYL WATERPROOFING

Waterproof membrane conforming to AS/NZS 4858 for waterproofing balustrades, parapet tops, horizontal ledges and foundation splash zones.

2.7 STO ADHESIVE FOAM

For filling any voids in the foundation insulation.

2.8 SEALANT

BRANZ appraised modified MS sealant.

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3 EXECUTION

Conditions

3.1 DELIVERY

Keep **Sto** bagged plaster products dry in transit. Take delivery of **Sto** plaster products in good condition. Reject all damaged materials and immediately notify supplier in writing.

3.2 STORAGE

Deliver all materials in original unopened packaging with labels intact. Provide dry storage on site, stack carefully, protect from mechanical damage. Keep bagged render dry and off concrete surfaces.

3.3 PLASTERING CONDITIONS

Carry out plastering to **Stoanz** Ltd specification under conditions which will not adversely affect the finished work.

3.4 PROTECT

Before application of plaster, apply masking film and tape to all joinery, pipes, roofs and all areas likely to be marked by the plaster. Use drop cloths and ground covers to keep the working areas clean. Clean off droppings onto finished work immediately.

Application

3.5 FINISHING

Refer to SELECTIONS for type and colour.

The choice of a light colour will help by reducing thermal movement - LRV 25% minimum.

StoTherm Masonry Insulation Plaster System

3.6 MULTISCREED BASECOAT PLASTER

To clean dry foundation apply one straightening coat of Multiscreed basecoat plaster by hawk and trowel at an approximate thickness 4mm using guides and corners as required.

3.7 MESHED REINFORCEMENT PLASTER

Apply one even coat of **StoArmat** reinforcement plaster at approximate thickness 1.5 - 2mm. While plaster is still wet lightly embed **Sto** mesh ensuring adjacent drops of mesh are overlapped by a minimum of 75mm. Float surface to ensure mesh is lightly embedded into the **StoArmat** reinforcement coat. Allow to dry and apply one further coat of **StoArmat** reinforcement plaster at approximately 1mm thick to leave the plane even surface free of voids or deviations. Once dry remove any slight ridging with a **Sto** rasp.

3.8 FINISHING RENDER

Apply selected **Stolit K** or **MP** coloured finishing render applied with a stainless steel trowel gauging to the thickness of the aggregate size and finished with a plastic float to the requisite pattern. Apply **Stolit MP** or **MP Natural** in two coats and finish with a float and judicial use of a damp sponge

3.9 PAINT OR SEALER COAT

Apply one coat of **StoColor Maxicryl** matt facade paint tinted to the selected colour on **Stolit K** render, or **Protectosil SC** easy clean sealer on MP finishes.

Completion

3.10 CLEANING

Remove debris, unused materials and elements from the site relating to plaster system application. Replace damaged, cracked or marked elements. Leave the whole of this work to the required standard.

3.11 FINAL INSPECTION

A final inspection by project assessor of the entire finished plaster system to take place immediately after completion of the application work and any defects or subsequent damage made good immediately.

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4 SELECTIONS

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

4.1 RENDER FINISH

Location:	Edge of house floor slab
Substrate:	**XPS Slab Insulation**
Base coat:	**Multiscreed** basecoat, 4mm thick
Mesh coat:	**StoArmat** meshed reinforcement plaster
Finishing render:	**Stolit K 1.0mm** coloured finishing render
Paint:	StoColor Maxicryl facade paint
Paint coats:	One
Colour:	37307 LRV 68 C1 - Light Grey

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4311ME METALCRAFT ESPAN ROOFING

1 GENERAL

This section relates to the supply and fixing of Metalcraft Roofing Ltd Espan® standing seam profiled roofing complete with accessories.

It includes:

- Espan® 470

1.1 RELATED WORK

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

1.2 ABBREVIATIONS

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

The following abbreviations are used throughout this part of the specification:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
MS	Modified silicone

Documents

1.3 DOCUMENTS

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

BPS	Building Product Specifications
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G12/AS1	Water Supplies
AS/NZS 1170.2:2011	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
AS/NZS 2728	Prefinished/prepainted 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 4256.3	Plastic roof and wall cladding materials, Glass fibre reinforced polyester
ISO 5660.1	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 1 Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 2 Smoke production rate (dynamic measurement)
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Metalcraft Roofing Espan® Product and Installation Guide (January 2023)
Metalcraft Roofing Building Product Information Sheet
COLORSTEEL® Maintenance Recommendations

Manufacturer/supplier contact details

Company:	Metalcraft Roofing Ltd
Web:	www.metalcraftgroup.co.nz
Email:	technical@metalcraftroofing.co.nz
Telephone:	09 274 0408

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Warranties

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years for installation

- Provide this warranty on the install/applicator standard form (if not available then use 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

1.6 QUALIFICATIONS WORKERS – MANUFACTURER/SUPPLIER REQUIREMENTS

Workers to be trained and accredited by Metalcraft Roofing Ltd. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

1.8 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:

- COLORSTEEL® Maintenance Recommendations

Provide this information prior to practical completion.

Compliance information

1.9 COMPLIANCE - PROPOSED ALTERNATIVE SOLUTION

Metalcraft Roofing trough roofing profiles Espan® 340 and Espan® 470 are presented as an alternative solution for:

NZBC Clause E2-External moisture

Performance: E2.3.1 Roofs must shed precipitated moisture.
E2.3.2 Roofs must prevent the penetration of water that could cause undue dampness, damage to building elements, or both.

Proposed alternative solution is supported by:

- Metalcraft Roofing Ltd standard details and installation guidelines
- NZMRM CoP incorporates trough sections up to 550mm widths
- In-service history and previously accepted Alternative Solution for standing seam profiled roofing

Performance

1.10 DESIGN PARAMETERS WIND - NON SPECIFIC DESIGN

The design wind pressures are to NZS 3604, table 5.4.

Refer to general section 1220 PROJECT for details.

1.11 DRINKING WATER

Roofing for collecting potable water to NZBC G12/AS1.

2 PRODUCTS

Materials

2.1 STEEL - TYPE AM COATING (ALUMINIUM/ZINC/MAGNESIUM ALLOY), PREPAINTED

Formability steel sheet G300 for roll forming and flashings, coated to AS 1397. Prefinished /prepainted to AS/NZS 2728.

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Fixings

2.2 FASTENERS GENERALLY

Fixings and fasteners are to be compatible with all materials and have a durability no less than the material being fastened.

2.3 ESPAN FIXING CLIPS - UNPAINTED

Unpainted Zincalume® type AZ coated steel clip with corflute polypropylene cushioning tape. Refer to SELECTIONS.

2.4 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by Metalcraft Roofing and with a durability not less than the material being fixed. Screw fasteners to be head stamped identifying the manufacturer and class. Refer to SELECTIONS.

2.5 RIVETS

Sealed aluminium, minimum diameter 4.0mm.

Components

2.6 FLASHINGS GENERALLY

To NZBC E2/AS1, 4.0, Flashings.

Formable grade 0.55 BMT and 0.75 BMT for steel, and 0.90 BMT for aluminium. Flashings coated to the same standard as the roofing sheets and notched across profile ribs. Refer to SELECTIONS.

2.7 BOOT FLASHINGS

EPDM proprietary boot flashing designed to weatherproof cylindrical penetrations.

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 cure silicone or MS polymer sealant.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

Moisture content timber: 18% maximum

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.



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3.5 SEPARATION

Isolate dissimilar materials (metals and non-metals) in close proximity as necessary by painting the surfaces or fitting separator strips of compatible materials. Place isolators between metals and treated timber and cement based materials.

3.6 SET-OUT

Carefully set out with consideration of the position of side laps to take account of the prevailing wind and line of sight. Add 4mm tolerance to cover width when setting out roofing sheets (i.e. 344mm for Espan® 340 or 474mm for Espan® 470). Ensure all sheets are square and oversailing the gutter true to line. Check during fixing to eliminate creep or spread and string lines along purlin centres to keep fastenings in line.

3.7 END LAPS

End laps are not permitted.

3.8 THERMAL MOVEMENT

Provide for thermal expansion to NZMRM CoP.

3.9 FIXING GENERALLY

Install and fix in accordance with E2/AS1, NZMRM CoP and Metalcraft Roofing required fixing patterns and details for each area of the roof. Paint colour matched fixings and accessories before installation.

3.10 MARKING AND CUTTING

Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use lead pencil for marking type AZ or type AM coated steel. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof.

3.11 FIX SHEETS - CONCEALED CLIP SYSTEM - TIMBER PURLINS

Screw fix concealed clip to purlins, minimum 35mm embedment, as required by Metalcraft Roofing, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet. Clip fit roofing sheets over concealed clip.

3.12 FIX SHEETS - CONCEALED CLIP SYSTEM - STEEL PURLINS

Screw fix concealed clip to purlins, minimum 3 threads beyond drill point, as required by Metalcraft Roofing, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet. Clip fit roofing sheets over concealed clip.

3.13 STOP ENDS AND DOWNTURNS

With purpose made tools, form minimum 30mm high stop-ends at the upper end of sheets. Fold 40mm hem along lower end of sheets and install grab flashing with a 5mm expansion gap in accordance with Metalcraft Roofing installation details.

3.14 INSTALL FLASHINGS

Flash roof to parapets, walls and penetrations to detail. Where no detail is provided flash to NZBC E2/AS1, NZMRM CoP and Metalcraft Roofing details. Cut accurately and fix using sealant and rivets to detail and to Metalcraft Roofing requirements to form a weatherproof cover. For visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.15 USE OF SEALANTS

Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces. Secure joint with rivets at 50mm centres.

3.16 FLASHING PENETRATIONS

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

Roof pitches 10° or greater:	Boot flashing is permitted to be direct fixed and sealed to Espan® sheet
Roof pitches less than 10°:	Boot flashing to be fixed and sealed over a soaker flashing

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Completion & Commissioning

3.17 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go to www.metalcraftgroup.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Roofing

4.1 METALCRAFT ESPAN 470 TROUGH SECTION ROOFING - STEEL

Location:	House Roof
Manufacturer/supplier:	Metalcraft Roofing Ltd
Brand/type:	Espan® 470
Roof pitch:	As drawn
BMT/material:	0.55mm steel
Coating system:	Colorcote ZinaCore
Coating colour:	Flaxpod Matte
Fixing clips:	Zincalume® fixing clip - unpainted

Accessories

4.2 FLASHINGS - GENERALLY

Profile:	As drawn
BMT/material:	0.55
Coating system:	To match roofing
Paint colour:	To match roofing

4.3 FLASHINGS - VALLEY

Profile:	As drawn
BMT/material:	0.55 - Stainless Steel
Paint colour:	To match roofing

Valley flashing as drawn in central gable valley.

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4337E ECOPLY® ROOFING & DECKING

1 GENERAL

This section relates to the use of Carter Holt Harvey Plywood Ltd Ecoply® plywood sheets for:

- membrane roofs
- membrane decks
- membrane gutters
- substrate for roofing

1.1 RELATED WORK

Refer to 3827E ECOPLY PLYWOOD BRACING SYSTEMS for plywood used as bracing

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:

COC	Chain of Custody
EPD	Environmental Product Declaration
FSC®	Forest Stewardship Council®

Documents

1.3 DOCUMENTS

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

NZBC B1/AS1	Structure
NZBC E2/AS1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1604.3:2012	Preservative-treated wood-based products - Part 3: Plywood
AS/NZS 2269.0	Plywood - Structural - Specifications
NZS 3604	Timber-framed buildings
EN 15804+A2	Sustainability of construction works - Environmental product declarations - Core rules for product category of construction products
ISO 14025	Environmental labels and declarations - Type III environmental declarations - Principles and procedures

1.4 MANUFACTURER'S DOCUMENTS

Carter Holt Harvey Plywood Limited documents relating to work in this section are:

Ecoply® Specification and installation guide December 2023
CHH Ply - Plywood Environmental Product Declaration, EPD Registration S-P-05512
Declare Label CHH-0002 Ecoply® Untreated structural plywood, Carter Holt Harvey Plywood Ltd
Forest Stewardship Council (FSC®) certification. Available Forest Stewardship Council (FSC®) certified (FSC® C012019) upon request

Manufacturer/supplier contact details

Company:	Carter Holt Harvey Plywood Limited
Web:	chhply.co.nz
Email:	info@ecoply.co.nz
Telephone:	0800 326 759

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Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Environmental

1.7 ENVIRONMENTAL PRODUCT DECLARATION

Carter Holt Harvey Plywood has a third party verified Environmental Product Declaration (EPD) in accordance to ISO 14025 and EN 15804+A2. The EPD is based on a cradle to gate Life Cycle Assessment with end of life options, with modules A1-A3, C1-C4 & D. The EPD is registered with EPD Australasia, EPD Program Operator. Refer to CHH PLY-Plywood Environmental Product Declaration April 2023, EPD Registration Number S-P-05513, valid until 12.04.2028.

1.8 DECLARE LABEL

Carter Holt Harvey Plywood Limited, Ecoply® Untreated Structural Plywood has a Living Building Challenge (LBC), Declare Label and achieves a LBC Red List Free status. Refer to Declare Label CHH-0002.

2 PRODUCTS

Materials

2.1 ECOPLY® STRUCTURAL (SQUARE EDGE) F8/F5 GRADE

Radiata pine veneer ply manufactured to AS/NZS 2269.0, face sanded, grade as scheduled and H3.2 CCA treated to AS/NZS 1604.3, if required. Available as FSC® certified (FSC® C012019) upon request.

Components

2.2 SCREWS IN TIMBER

Stainless steel, counter-sunk. Refer to Ecoply® Specification and Installation Guide requirements for size and use.

General:

7 - 9mm plywood:	No. 8 x 30mm
12 -15mm plywood:	No. 8 x 40mm
17mm plywood:	No. 10 x 40mm
19 - 21mm plywood:	No. 10 x 45mm
25mm plywood:	No. 10 x 50mm

Under membranes:

17 - 25mm plywood:	No. 10 x 50mm (to E2/AS1, 8.5.5.1)

2.3 ADHESIVE

Refer to SELECTIONS.

2.4 BRUSH ON TREATMENT

Soudal Metalex Ready to Use or Soudal Metalex Concentrated Timber Preservative. Clear or Green colour product.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

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3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

Ensure support framing is completed to Ecoply® Specification and Installation Guide stated requirements as a minimum. Always refer to the roofing and decking system supplier for installation, plywood selection and surface preparation requirements for specific roofing and decking products or to specific design requirement.

Ensure all Ecoply® square edge sheet edges and joints will be fully supported with framing width of minimum 45mm at each Ecoply® sheet joint.

Ensure moisture content is:

Timber:	20% maximum

Application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 FIXINGS

150mm centres along edges, minimum 7mm, maximum 15mm from the edge and, 300mm maximum centres on intermediate supports, or 200mm centres under membranes

3.6 FIXING ECOPLY® PLYWOOD SHEETS

Fix sheets to Ecoply® Specification and Installation Guide (or specific design) stated requirements. Lay sheets in a staggered layout, face-grain of sheet at right-angles to support and with sheets in square, true alignment and plane with a 3mm expansion gap for square edge sheets. Nail or screw fix to Ecoply® Specification and Installation Guide requirements unless specified differently.

3.7 UNDER MEMBRANE ROOFING

To NZBC E2/AS1, 8.5 Membrane roofs and decks. Screw and adhesive fix sheets with stainless steel screws for membrane type roofing to Ecoply® Specification and Installation Guide and membrane manufacturers' requirements. CD grade plywood with the C face up (or better). Provide a 5mm radius chamfer to external edges where the membrane is to be wrapped over. Fix internal corner fillets.

Provide whichever is the greater falls:

- as shown on the drawings
- to the membrane manufacturer's requirements
- minimum to NZBC E2/AS1, 8.5.1, - 1:30 for roofs, 1:40 for decks and 1:100 for gutters

3.8 TREAT

Treat cuts and holes in sheets with a brush on timber preservative treatment - Soudal Metalex Ready to Use or Soudal Metalex Concentrated Timber Preservative.

Completion

3.9 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go to chhply.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

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4.1 ECOPLY® STRUCTURAL (SQUARE EDGE)

Location:	Flat membrane roofs as drawn.
Manufacturer:	Carter Holt Harvey Plywood Ltd
Brand/grade:	Ecoply® Structural / CD
Stress grade:	F8/F5
Thickness:	19mm
Treatment:	H3.2 CCA
Fixings:	Screws stainless steel

4.2 SCREWS

Type/size/material:	10g x 50mm stainless steel screws

4.3 ADHESIVE

Type:	Soudal ® Gorilla Grip

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4422ST SEALCO ECOTUFF® TPO WARMSEAL & GREENSEAL MEMBRANE ROOFING

1 GENERAL

This section relates to **Sealco Ltd** EcoTUFF TPO waterproof membrane roofing system. It includes:

- EcoTUFF TPO single layer adhesive fixed membrane with heat welded laps
- WarmSEAL components including polyiso insulation for warm roof installations
- GreenSEAL components for green roof installations
- All required overlays, components and accessories to complete installation

1.1 RELATED WORK

Refer to 4337 PLYWOOD ROOFING AND DECKING for plywood substrate.

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:

TPO	Thermoplastic Polyolefin (reinforced thermo plastic sheet)
PIR	Polyisocyanurate (polyiso)

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS1366.2	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polyisocyanurate (RC/PIR)
AS/NZS 2269.0	Plywood - Structural - Specifications

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Sealco Ltd EcoTUFF Brochure
Sealco Ltd EcoTUFF Manual
Sealco Ltd EcoTUFF Material Safety Data Sheets
Sealco standard detailed drawings
BRANZ Appraisal 792 - EcoTUFF TPO Roof and Deck Membrane

Manufacturer/supplier contact details

Company:	**Sealco Ltd**
Web:	www.sealco.co.nz
Email:	admin@sealco.co.nz
Telephone:	03 366 9495 (head office) or 0508 SEALCO 027 5445532

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty

20 years:	for materials (EcoTUFF TPO waterproof membrane roofing system)
20 years:	for materials (WarmSEAL warm roof and GreenSEAL green or ballasted roof systems)

- Provide this warranty on Sealco Ltd standard form.

- Commence the warranty from the date of completion of application.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Installer's warranty for the system under normal environmental and use conditions against failure.

5 years: for execution

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Roofing work to be carried out by Licensed Building Practitioners who are licensed applicators approved by Sealco Ltd. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

1.9 PROJECT REGISTRATION

Contact Sealco Ltd to confirm that the project has been registered.

Web: www.sealco.co.nz/register
Telephone: 03 366 9495 or 0508 SEALCO or 027 5445532

If project has not been registered, telephone and provide all required details.

1.10 PRE-INSTALLATION MEETING

Convene a meeting between the applicator, contractor, all associated consultants and Sealco Ltd to ensure all parties know what is required for effective performance of the system.

1.11 SPECIAL DETAILS

Where a standard detail does not exist, or if a standard detail cannot be applied, an approved alternative must be obtained from Sealco Ltd before proceeding with the installation.

Compliance information

1.12 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's / suppliers warranty
- Installer's / applicator's warranty
- Producer Statement - Construction (PS3) from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.13 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets. All penetrations to comply with NZBC E2/AS1 and Sealco Ltd recommendations.

Quality control and assurance

1.14 TEST - FLOOD TESTING

Flood test horizontal applications with a minimum 50mm depth of water for 24 hours. Make good any lack of water tightness when the surface is completely dry.

1.15 QUALITY ASSURANCE

Maintain quality necessary to assure that work is performed in accordance with this specification and the qualifying requirements of Sealco Ltd.

Ensure that Sealco Ltd Quality Control sheets are completed fully and faithfully for each installation area including Pre-start Substrate Inspection Form, and Final Inspection Form.

2 PRODUCTS

Materials - ecoTUFF TPO waterproof membrane

2.1 ECOTUFF TPO SHEET

Single ply EcoTUFF TPO 1.14mm or 1.52mm thick, reinforced waterproof membrane bearing the manufacturer's mark. Available in 3m or 3.6m wide x 30.4m long rolls. Refer to SELECTIONS for type and thickness.

Materials - WarmSEAL warm roof

2.2 VAPOUR BARRIER

LexShield™ Peel & Stick vapour barrier, a cross-laminated, high density polyethylene film backed with a proprietary high tack adhesive backing. Installed over the substrate under the insulation layer.

2.3 INSULATION PANEL

Lexcor Isolex™, a closed cell, polyisocyanurate (PIR) rigid thermal insulating panel. Available in panel sizes 1220mm wide x 1220mm and 1220mm wide x 2440mm long, with thicknesses ranging from 25mm to 140mm, including a range of R-values. Fixed to substrate with Adphalt adhesive or mechanically fixed with insulation screws and washers. Refer to SELECTIONS for options.

Components - EcoTUFF TPO waterproof membrane

2.4 ECOTUFF TPO ADHESIVE

SEALCO TPO contact adhesive system including Ultrastick spray adhesive

2.5 ECOTUFF TPO SEALANT

SEALCO TPO sealant for general purpose flashings.

2.6 ECOTUFF TPO CUT EDGE SEALANT

SEALCO specially formulated TPO edge sealer for EcoTUFF TPO cut edge finishes

2.7 ECOTUFF TPO FLASHING

SEALCO unreinforced TPO flashing for use in corners and other details, heat welded to EcoTUFF TPO. Unreinforced T joint covers used to seal T joint sections in EcoTUFF TPO sheet.

Components - WarmSEAL warm roof

2.8 ADPHALT FOAM INSULATION ADHESIVE

Adphalt, quick setting flexible polyurethane insulation foam adhesive used for bonding Lexcor Isolex insulating panels to either Lexshield vapour barrier or to further sheets of Lexcor Isolex or for bonding Lexboard Recovery Cover Board sheets,

Accessories

2.9 EDGE TRIM

Aluminium TPO coated drip edge trim 3m and 5m lengths Sealco Ltd details to suit the specific location.

2.10 PIPE BOOTS

SEALCO FlashRITE moulded unreinforced pipe boots as supplied and required by Sealco Ltd. Designed to fit 20mm-150mm penetrations. Pipe boots are welded to substrate and mechanically clamped and sealed around pipes.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Take delivery of Sealco Ltd EcoTUFF TPO branded rolls, PIR insulation and other materials and components undamaged and allow for site handling facilities where required. Store membranes and accessory materials in cool dry conditions that ensure no deterioration or damage. Do not leave out on roofs or other areas exposed to sunlight. Ensure all tapes and adhesives are within their expiry dates.
Note: Some of the EcoTUFF system materials are Class 2 or 3 flammable goods.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

Confirm the moisture content of substrates:

Concrete substrate:	Relative humidity of 75% maximum
Plywood/ timber:	Moisture Content of 20% maximum
Strandsarking:	Moisture Content of 18% maximum

For concrete substrates, check relative humidity using a hygrometer.

3.4 CONFIRM LAYOUT

Confirm layout as detailed on drawings. If not detailed on the drawings, confirm the layout to suit site conditions, and Sealco Ltd specification.

3.5 WEATHER

Apply EcoTUFF TPO membrane system in dry atmospheric conditions and only when the air or substrate temperature is 6ºC and above.

3.6 INSTALLATION SEQUENCE

Install Sealco WarmSEAL components, vapour barrier, insulation sheets and if required coverboard, complete with EcoTUFF TPO membrane in sections to produce a weather-tight section each day complete with all joint seams, edge flashings and terminations. Cover off exposed edge at the end of each workday or of rain is imminent to ensure complete system remains dry.

Application - general / preparation

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 PRELIMINARY WORK

Ensure that preliminary work, including formation of falls, flashing rebates, grooves, ducts, provision of battens and fixing of vents and outlets to levels, is complete and properly constructed to enable the system to work as intended. No fillets are required for EcoTUFF TPO membrane. This work and the substrate to be smooth, clean and dry.

3.9 ACCEPTANCE OF SUBSTRATE

Confirm that the substrate complies with the NZBC E2/AS1 for the relevant substrates and Sealco Ltd documents including sumps, outlets and projections, and ensure work is of the required standard. Ensure the fall complies with NZBC E2/AS1 including correct fall to rainwater outlets to avoid ponding,

- Lay roofs to a minimum fall of 1:30 (2°) to NZBC E2/AS1, 8.5.1 a.
- Lay decks to a minimum of 1:40 (1.5°) to NZBC E2/AS1, 8.5.1 b.

- Lay gutters to a minimum fall of 1:100 (0.57°) to NZBC E2/AS1, 8.5.1 c.

3.10 PLYWOOD SUBSTRATE

Ensure plywood substrate is a minimum 17.5mm thick square-edged sheets and complying with AS/NZS 2269.0, minimum CD structural grade with the sanded C side upwards. Treated H3 with waterborne CCA treatment and kiln dried after treatment.

Lay with staggered joints (brick bond) with all edges of the sheets fully supported. Chamfer all external edges with a minimum radius of 5mm. Internal corner angle fillets are not required as the TPO will form up a pencil turn at the internal angle. Allow 5mm clearance between plywood and abutments or any other elements protruding through the roof.

Fix with glue and 10 gauge x 50mm stainless steel countersunk head screws, with all sheets tight butted. Fix screws at 150mm centres on edges and 200mm in the body of the sheets. Plywood and the timber substructure to have maximum moisture content of 20% when the membrane is installed. Plywood must not be LOSP treated.

For cold roof applications, tape plywood joints using a polyethylene bond-breaker 36mm tape.

3.11 TURN DOWNS

Where selected vapour barrier or waterproof membrane is to be turned down at an external corner, chamfer the corner to provide a minimum 5mm radius.

3.12 PENETRATIONS AND JUNCTIONS

Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof.

Required work includes the following:

- roofing installation neatly finished to all sides of openings and to all wall and parapet junctions.
- installation of flashing (those required to be installed prior to installation of penetrating elements and/or wall linings).

Application - WarmSEAL warm roof

3.13 INSTALL VAPOUR BARRIER

Install Lexshield Peel & Stick vapour barrier over the prepared substrate and under the insulation in accordance with manufacturer's instructions. Apply from the low to high point so that the laps will shed water, with minimum 50mm laps between rolls and at patches. Extend vapour barrier up above insulation layer art all upstands and ensure the vapour barrier is well sealed at all roof penetrations.

If adhesion to trapezoidal tray decking is found to be an issue or in high wind zones, Sealco recommends priming steel tray with Multigrip primer.

3.14 INSTALL POLYISO INSULATION - ADHESIVE ADHERED

Ensure vapour barrier top is completely dry. Apply a minimum of 5 rows of Adphalt, adhesive foam for the 1.2m wide panel, then place panel into the wet foam (within 2 minutes) and leave to cure. Lay polyiso sheets tightly butted in brick-bond pattern and ensure insulation is neatly fitted to all roof perimeters, penetrations and abutments. Weight down polyiso panels or install temporary screws into polyiso panels to ensure minimal movement while curing.

Where insulation over 100mm thickness is required, it is recommended to install 2 sheets of polyiso of similar thicknesses, instead of one single panel. Lay top layer of insulation to ensure panel joins are staggered in both directions to eliminate points where sheet joints are vertically concurrent. Adhesive fix insulation in same manner as first layer.

Application - laying EcoTUFF TPO

3.15 ECOTUFF TPO MEMBRANE SET-OUT

Neatly set out rolls starting at the lowest point of the roof and run perpendicular to the roof pitch. Allow for 40mm side laps and end laps. Pre-plan the work to keep the number of membrane laps to a minimum. EcoTUFF TPO rolls to be relaxed for 20 minutes prior to installation.

3.16 INSTALL ECOTUFF TPO MEMBRANE - ADHESIVE FIXED

Apply EcoTUFF Ultrastick TPO adhesive to the substrate at a rate of 3m² per litre by sprayer, brush or roller ensuring good even coverage and leave to tack dry before bonding the two surfaces together. Lay TPO into adhesive ensuring TPO is laid flat with no lumps or bubbles. Roll the top of the entire membrane after installation.

3.17 BONDING LAPS

Clean laps where required with weathered lap cleaner, form all laps at 40mm cover. Using the Leister heat welder carefully heat both mating surfaces at the back of the lap evenly at the same time whilst firmly rolling the on top of the sheet with the hand roller. Using the Leister heat welder make your final run by placing the nozzle between the sheets at the front lap area, heat both surfaces (to the point of melting the mating surfaces) and creating a bonded lap of 40mm. Firmly roll the lap with a lap roller immediately and test the lap joint on completion with a lap probe.

3.18 MINOR MOVEMENT JOINTS

Lay membrane across joint but leave unbonded underneath EcoTUFF TPO on both sides of the joint. Refer to Sealco Ltd technical support for a specially designed movement joint detail.

3.19 INSPECT

Inspect and test lap joints on completion with lap probe ensuring the lap is fully bonded. Any seams found to be insufficiently welded must be repaired.

3.20 PENETRATIONS

Use a heat gun (Leister) to form and finish upstands, downturns, penetrations, sumps and vents to conform to the EcoTUFF Product Manual and NZBC E2/AS1. Use the gun to form and heat weld flashing patches to the exterior of the EcoTUFF membrane. If required, install Sealco flashRite pipe boots to Sealco Ltd installation details.

3.21 INSTALL ROOF DRAINAGE ACCESORIES

Install all required SEALCO roof drainage accessories, to Sealco Ltd installation details.

Completion

3.22 PROTECTION

Protect completed areas of roof. Keep foot traffic to a minimum during and after laying. Lay temporary protection / access boards as required for later operations and remove when no longer needed. Protect and maintain roofing until completion of the contract works. DO NOT position heavy items on top of the insulation.

3.23 SUBSEQUENT WORK

Make good any damage by other trades by welding an EcoTUFF patch to the installed membrane neatly to maintain the appearance of the covering as originally laid.

3.24 ACCEPTANCE

Sign off acceptance of completed areas using Sealco Ltd Quality Control sheets.

3.25 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

3.26 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

Carry out selected flood or electronic leak detection testing at the completion of membrane installation prior to installation of overlays.

4 SELECTIONS

For further details on selections go to www.sealco.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Materials - EcoTuff TPO membrane Roofing

4.1 SEALCO ECOTUFF TPO ROOFING MEMBRANE

Location:	As drawn.
Supplier:	Sealco Ltd
Substrate:	Polyiso Insulation
Primer:	None
Adhesive:	EcoTUFF Ultrastick TPO adhesive
Membrane::	EcoTUFF TPO
Thickness:	1.14mm
Colour:	Grey Friars

4.2 TPO VENTS

Location:	As drawn.
Supplier:	Sealco Ltd
Type:	Aeratori Per Ventilazione Roof Vents

4511 EXTERIOR TIMBER WINDOWS & DOORS

1 GENERAL

This section relates to the supply and installation of:

- exterior timber windows
- exterior door frames and doors

1.1 RELATED WORK

Refer to glazing sections for glazing

Refer to painting sections for finishes

Documents

1.2 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/AS1-AS2	Energy efficiency
NZBC H1/VM1-VM2	Energy efficiency
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames

1.3 MANUFACTURER'S DOCUMENTS

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

Copies of the above literature are available from

Web:	https://windowsbertrand.com/
Email:	olaf.bertrand@bertrand.pl

1.4 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state

Warranties

1.5 WARRANTY

Provide warranty for:

5 years for materials
Warrantor: Manufacturer

Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.

Refer to the general section 1237 WARRANTIES for additional requirements.

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Performance

1.6 PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS

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

1.7 PERFORMANCE - THERMAL, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix E, Table E1.1.1 Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

Performance - Wind (design by contractor)

1.8 WIND - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, table 5.4.

Refer to SELECTIONS for wind zone.

2 PRODUCTS

Materials - general

2.1 EXTERIOR TIMBER

Solid timber to NZS 3602 to profiles detailed. Moisture content 16% ex factory.

2.2 SASHES

Solid/finger jointed timber to profiles detailed and complete with weather-seals and weather hoods as necessary.

2.3 EXTERIOR FACINGS AND SCRIBERS

Treated H3.1 unless durable heart wood, to profiles detailed/scheduled.

2.4 GLASS

Refer to glazing sections for glass type and thickness. To NZS 4223.3.

2.5 PANELS

Refer to SELECTIONS for type.

2.6 INTERIOR TIMBER

To NZS 3602. Moisture content 10-14%.

2.7 STANDARD DOORS

Frames to profile as detailed and dimensioned.

Materials - doorsets

2.8 STANDARD DOORSETS, SIDE HUNG DOOR

Frames to profile as detailed and dimensioned.

2.9 STANDARD DOORSETS, SLIDING

Frames to profile as detailed and dimensioned.

Components

2.10 FLASHINGS GENERALLY

Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

2.11 WINDOW AND DOOR FURNITURE

Refer to 5521 HARDWARE for type.

2.12 METAL FASTENINGS

Galvanized steel or non-corrodible metal.



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2.13 SCREWS

Stainless steel or non-corrodible metal. Length sufficient to penetrate into the background support up to the shank. Screws for fixing hinges, hardware or furniture to match the item being attached.

2.14 NAILS

Length sufficient to penetrate into the background support at least half the nail length, except if into radiata pine then three-fifths their length.

2.15 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Table 2, Acceptable opening sizes for barriers.

2.16 HINGES

Size and gauge to carry door size and weight. Refer to SELECTIONS for type, size and material.

3 EXECUTION

Conditions

3.1 GENERALLY

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

3.2 DO NOT DELIVER

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

3.3 HANDLE

Handle, unload and store elements without distortion and avoiding pre-finished surfaces rubbing together, and contact with mud, moisture and other damaging materials.

3.4 PROTECT

Protect all elements against damage to arrises and glazing beads. Store frames and doors flat and away from moisture or direct sunlight.

3.5 FABRICATE DOORSETS

Fabricate doorsets in the factory with doors hung, provision for furniture made, finishes applied and fully operable.

3.6 CHECK ALL OPENINGS

Check all openings on site for size and standard of execution before installing window or door frames.

3.7 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 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 underlay to wall openings.
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).

Assembly

3.8 FABRICATION GENERALLY

Manufacture and fabricate frames, doors and sashes as detailed. Install hinges, stays and running gear as scheduled.

3.9 FABRICATION SASHES

Solid/finger-jointed timber to profiles detailed, complete with weather seals and weather hoods as necessary and as detailed.

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3.10 HINGES

Fit hinges to doors to support the door size and weight

3 hinges	Doors up to 2.2 metres
4 hinges	Doors 2.2 - 2.6 metres
5 hinges	Doors 2.6 - 5.0 metres

Fit minimum 2 hinges per window sash

3.11 FACTORY FINISHING

Before delivery to site:

- Prime assemblies scheduled for paint finish with an alkyd wood primer.
- Prime rebates and concealed faces of beads of assemblies scheduled for clear finish with an alkyd wood primer.
- 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.

Installation - frames

3.12 FIXING FRAMES

Fit flashings to frame and framing as required. Fix and assemble frames rigidly in place, plumb, level and true to line and face without distortion and with all opening sashes fully and easily operating. Fit facings, scribers, draught-stopping and sealants.

3.13 DISTORTION

Do not distort frames when wedging or other packing, or when tightening fixings. If necessary adjust packing and fixings to eliminate binding. Do not cut, plane or sand frames to remedy distortion.

3.14 FIXINGS

Fix frames so that nail heads are covered by applied stops and beads. Punch all nail heads below timber surfaces which will be visible in completed work. Ensure that at least one frame fixing is adjacent to each hanging point.

3.15 EXTERNAL DOOR AND WINDOW FRAMES AND SASHES

Fabricate as detailed. Jamb, head and sill liners as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face, complete with full length sill tray, jamb and cap flashings and with all doors and sashes operating freely. Fit hardware.

3.16 INSTALL FLASHINGS

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

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

Except where window/door frames are recessed, ensure that head flashings over-sail jamb facings by 15mm at each end. Refer to 4821 FLASHINGS section for supply and installation.

3.17 COMPLETE AIR SEAL

To NZBC E2/AS1:9.1.6 Air seals. Form an air-tight seal by means of proprietary expanding foam, compressible foam strips, or sealants used with backing rods. Ensure that in combination with the internal linings a complete air seal is created.

3.18 FIX HARDWARE

Fix all sash hardware and furniture as scheduled.

3.19 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.

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Installation - doorsets

3.20 PROPRIETARY ELEMENTS

Fix in accordance with the door manufacturer's requirements.

3.21 INSTALLATION GENERALLY

Frames finished to match the width of lined walls. Wedge frames into opening and nail through into the studs. Locate all wedges and fixing at hinge positions and opposite, with one fixing in the vicinity of the lock. Fixings concealed behind planted stops.

Hang doors on hinges, sliding or bi-fold gear as specified and to operate freely. Fit all hardware and door furniture.

Installation - standard doorsets

3.22 SIP WALLS - TIMBER FRAMES

Wedge into opening and nail through into the studs. All wedges and fixing to be at hinge positions and opposite, with one fixing in the vicinity of the lock.

3.23 BOTTOM CLEARANCE

With inward opening doors, ensure clearance over internal floor coverings by set of sill.

3.24 REMOVE DOORS

Remove doors from the frames if necessary to protect them, or for re-finishing, store safely and near completion refit them, all without any damage.

3.25 INSTALL PANELS

Prime rebates and beads; install sealant backing strips or silicone. Install dry beading to outside of panels as selected. Do not mitre corners of beads.

3.26 MANIFESTATIONS

To NZS 4223.3, 2.2 Manifestation (making glass visible).

3.27 INSTALL FURNITURE

Install latches, locks and door furniture as scheduled.

3.28 CHECK

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

Completion

3.29 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.30 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

4 SELECTIONS

Performance - thermal

4.1 THERMAL PERFORMANCE - VERTICAL WINDOWS & DOORS

Window Type:	Construction R-value (typical window size):
Timber Aluminium Windows & sliding doors	R1.2
Entrance doors	R0.9

Performance - Wind (design by contractor)

4.2 WIND - NON SPECIFIC DESIGN

Building wind zone: H (refer to NZS 3604, table 5.4)

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Performance - air infiltration

4.3 AIR INFILTRATION

For NZS 4211, table 3 **Air infiltration**.

Air conditioned zones: <0.6 ACH

Joinery frames

4.4 TIMBER-ALUMINIUM WINDOWS

Location:	Refer to window and door schedule
Brand:	Bertrand
Frame:	Timber
Exterior Profile:	Aluminium
Finish:	Water based Coating
Colour:	RAL to match Flaxpod Matte Black

4.5 PIVOT DOOR

Location:	Refer to window and door schedule
Brand:	Bertrand
Timber Species:	Timber
Exterior Profile:	Aluminium
Finish:	Water based Coating

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4521 ALUMINIUM WINDOWS AND DOORS

1 GENERAL

This section relates to the manufacture, supply, and installation of:

- aluminium windows
- aluminium doors and frames
- hardware and furniture
- flashings

1.1 RELATED WORK

Refer to glazing sections for glass types

1.2 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WGANZ	Window & Glass Association NZ
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 provisions for timber-framed buildings up to 10 m in height
NZBC F4/AS1	Safety from falling
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
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 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
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.
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness

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ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames
BRANZ BU 636	Protecting Glass From Damage

Window & Glass Association NZ (WGANZ) documents:

Window Installation Guide	Guide to Window Installation as described in E2/AS1
PQAS	Powder Coating Quality Assurance System
SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)

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'S DOCUMENTS

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

Copies of the above literature are available from

Web:	https://www.ropowindows.com/
Email:	helen@chinaropo.com

Warranties

1.5 WARRANTY - MANUFACTURER / SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years: For fabrication

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

1.6 WARRANTY - INSTALLER / APPLICATOR

Provide an installer/applicator warranty:

2 years: For installation

- Provide this warranty in the installer/applicator standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS

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

1.8 COMPLIANCE

Windows and doors to be manufactured and installed to NZBC E2/AS1.

1.9 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

1.10 PERFORMANCE - WINDOWS AND DOORS

To NZS 4211, including:

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

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strength of sashes, marking.
Refer to SELECTIONS.

1.11 PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS

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

1.12 THERMAL PERFORMANCE - WINDOWS & GLAZED DOORS, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix D, Table D1.1.1: Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

1.13 THERMAL PERFORMANCE - WINDOWS & DOORS

Thermal performance of windows & doors to NZBC H1/AS1 or NZBC H1/AS2 & NZBC H1/VM1 or NZBC H1/VM2. The construction R-value of windows & doors determined in accordance with NZBC H1/VM1 or NZBC H1/VM2, Appendix D, D1 Vertical windows and doors:

- Thermal transmittance of window & doors in accordance with ISO 10077-1.
- Thermal transmittance of framing in accordance with ISO 10077-2.
- Thermal transmittance of glazing using BS EN 673.

Refer to SELECTIONS for construction R-values.

Performance - Wind (design by contractor)

1.14 WIND - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, table 5.4.

Refer to SELECTIONS for wind zone.

2 PRODUCTS

Materials

2.1 WINDOWS

Refer to SELECTIONS for type and finish.

2.2 DOORS

Refer to SELECTIONS for type and finish.

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.

2.7 REVEALS - TIMBER PAINTED

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

2.8 FLASHINGS GENERALLY

To NZBC E2/AS1, 9.1.9 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.

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Components - for cavity systems

2.9 STANDARD CAVITY CLOSER

A perforated device constructed from either aluminium or PVC to close the cavity above the window or door unit, between the cladding and head flashing, to provide ventilation in accordance with NZBC E2/AS1 to the spaces above the window or door.

2.10 SUPPORT BAR

WGANZ extruded aluminium support bar with built in drainage and ventilation to NZBC E2/AS1, to provide continuous support to the window unit. Size to suit cladding type.

Components

2.11 GLAZING GASKETS

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

2.12 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.

2.13 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Section 2.0, **Opening windows**.

Sealants

2.14 STRUCTURAL SEALANT

Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a ± 40% movement factor complying with US Federal Specification TT-S-001543A.

2.15 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-001543A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus (± 25% movement) to US Federal Specification TT-S-00230C.

2.16 FOAM TAPE

Foam tape to NZBC E2/AS1, paragraph 9.1.9.9.

Finishes

2.17 ANODISED ALUMINIUM

To WGANZ 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

Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.

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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 636 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/m² complying with AS/NZS 4680.

3.9 INSTALLATION FIXING

To NZBC E2/AS1, paragraph 9.1.9.10. 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 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.

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 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.

3.15 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 underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to NZBC E2/AS1, 9.1.4 Wall underlays to wall openings.
- Full height 20mm jamb battens to NZBC E2/AS1, Figure 9.1.9.4: General window and door



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opening for direct fixed (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).

3.16 INSTALLATION

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

3.17 INSTALLATION CAVITY CONSTRUCTION

Install to WGANZ Window Installation Guide details and drawings including WGANZ sill support bars.

For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to NZBC E2/AS1, Figure 8.5.6.1D: Junctions with walls for membrane.

3.18 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 minimum plus any jamb scriber width at each end.

3.19 COMPLETE AIR SEAL

To NZBC E2/AS1, 9.1.5 Air seals. Form an air-tight seal by means of a proprietary expanding foam or sealants used with 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.

3.20 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.21 SEAL FRAMES ON SITE

Seal frames to each other and to adjoining structure and finishes, all as required by the window 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.

3.22 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.

3.23 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.

3.24 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

3.25 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.

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3.26 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

3.27 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.

3.28 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.

3.29 REMOVE

At the appropriate stage of the project, remove safety indicators and protective coverings and wipe down all joinery thoroughly.

3.30 REPLACE

Replace damaged, cracked or marked elements.

4 SELECTIONS

Performance

4.1 THERMAL PERFORMANCE - VERTICAL WINDOWS & DOORS

Window /Door Number:	Construction R-value:
As drawn - refer to window schedule.	0.8

Performance - Wind (design by contractor)

4.2 WIND - NON SPECIFIC DESIGN

Building wind zone H (refer to NZS 3604, table 5.4)

Window and door system

4.3 ALUMINIUM WINDOWS

Manufacturer: Ropo Windows
Type / location: As shown in window schedule

4.4 ALUMINIUM DOORS

Manufacturer: Ropo Windows
Type / location: As shown in window schedule

4.5 FLASHINGS

Material/type: 0.55BMT
Pattern: Formed to suit details provided

4.6 WEATHERING SEALANT

Brand/type: MS Sealant
Colour: To match cladding

Finishes - Powder Coating

4.7 ANODISED ALUMINIUM FINISH

Colour/finish: To match Colorsteel Matte Black

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4555 GARAGE DOORS

1 GENERAL

This section relates to the manufacture, supply and installation of garage door systems including required opening/operating systems.

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1170	Structural design actions
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3604	Timber-framed buildings
AS/NZS 4505	Garage doors and other large access doors

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:

Copies of the above literature are available from

Web:	https://www.custommade.co.nz/

Requirements

1.3 INFORMATION FOR OPERATION AND MAINTENANCE

Provide operating instructions for the garage doors and associated opening equipment. Provide a list of all components requiring regular maintenance.

Performance

1.4 DESIGN PARAMETERS WIND

Design the installation to the manufacturers requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

1.5 LOADS - NON - SPECIFIC DESIGN - DOORS UP TO 3.0M HIGH

Garage doors complete with hinges, roller assemblies and fasteners to comply with wind performance requirements to NZS 3604.

1.6 RESPONSIBILITY FOR PERFORMANCE

Accept responsibility for the structural and weathertight performance of the completed garage door installation.

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2 PRODUCTS

2.1 GARAGE DOOR

Manufacture to AS/NZS 4505 complete with a compliance label.

2.2 MOTORISED DOOR OPENER

As noted.

3 EXECUTION

3.1 PREPARATION FOR INSTALLATION

Check that the trimmed and lined openings are formed and constructed to suit the required door units. Do not proceed until openings are properly formed.

3.2 MANUFACTURER'S REQUIREMENT FOR INSTALLATION

Install door, track and operating equipment complete with all specified and necessary accessories and hardware to the manufacturer's requirements.

3.3 START UP

Carry out start up procedures and verify proper performance of the doors.

3.4 ADJUSTMENT

Lubricate bearings and sliding parts and adjust doors to operate easily, free of warp, twist or distortion with a weathertight fit round the entire perimeter.

3.5 DEMONSTRATION

Carry out start up procedures and verify proper performance of the door. Demonstrate the operation of the door to the principal/principal's representative. Set security features to principal's requirements. Reset security features at practical completion of the contract works.

Completion

3.6 ENSURE

Ensure all elements are free of marks or blemishes, with all moving parts working fully and freely.

3.7 REPLACE

Replace damaged, cracked or marked elements.

3.8 LEAVE

Leave work to the standard required by following procedures.

3.9 REMOVE

Remove all debris, unused materials and elements from the site.

4 SELECTIONS

4.1 GARAGE DOOR - SECTIONAL OVERHEAD DOOR

Location:	As drawn.
Brand:	Custom made Doors
Type:	Garage Door Frame - Either Metal Tray or Horizontal Timber Cladding (as drawn).

4.2 GARAGE DOOR CONTROLLERS

Brand:	Custom made doors.
Number of remotes:	4 per door.
Location of internal control buttons:	As drawn
Number of internal control buttons:	2 per door

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4710P PINK® BATTS® THERMAL & ACOUSTIC INSULATION

1 GENERAL

This section relates to Comfortech Building Performance Solutions™ Pink® Batts® thermal and acoustic insulation materials for walls, floors, ceilings and roofs.

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting, wall underlays and roofing underlays

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:

IIC	Impact Insulation Class
STC	Sound Transmission Class

Documents

1.3 DOCUMENTS

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

NZBC H1/AS1-AS2	Energy efficiency
NZBC G6/AS1	Airborne and impact sound
NZBC G6/VM1	Airborne and impact sound
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS/NZS 3000	Electrical installations (Known as the Australian/ New Zealand Wiring Rules)
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings

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.

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Comfortech H1. Done - Insulation Guide
Comfortech Pink® Batts® Insulation - Safety Data Sheet.
Comfortech Pink® Batts® Thermal Solutions - Product Guide
Comfortech Pink® Superbatts® Thermal Solutions - Installation Guide
Comfortech Pink® Batts® - Product Data Sheets
Comfortech Pink® Batts® - Installation Instructions
BRANZ Appraisal 238 (2023) - Pink® Batts® Insulation - Amendment 12 August 2024
BRANZ Appraisal 632 - Pink® Batts® SnugFloor® Insulation
BRANZ Appraisal 767 - Pink® Batts® Skillion Roof Insulation

Manufacturer/supplier contact details

Company:	Tasman Insulation NZ Ltd
Trading as:	Comfortech Building Performance Solutions™
Web:	www.pinkbatts.co.nz
Telephone:	0800 746 522

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

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50 years	For Pink® Batts® thermal insulation products

- Provide this warranty on the manufacturer/ supplier standard form (if not available then use 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.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For Pink® Batts® insulation products

- Provide this warranty on the installer/applicator standard form (if not available then use 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

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

Compliance information

1.9 BRANZ APPRAISAL

Pink® Batts® Insulation meets the requirements of the NZBC when used in accordance with the conditions and limitations listed in the following Branz Appraisal:

BRANZ Appraisal 238 - Pink® Batts® Insulation
BRANZ Appraisal 632 - Pink® Batts® SnugFloor® Insulation
BRANZ Appraisal 767 - Pink® Batts® Skillion Roof Insulation

Performance - Fire

1.10 FIRE PROPERTIES - NON COMBUSTIBLE

Pink® Batts® insulation products, with the exception of Pink® Batts® R2.6 Wall Insulation and Pink® Batts® R2.8 Wall Insulation products, are classified as non-combustible when tested to NZS/AS 1530.1 and achieve a Group Number of 1-S.

1.11 FIRE HAZARD TESTING

Pink® Batts® insulation products withstand the 30s Needle Flame test in accordance with AS/NZS 60695.11.5, that is required for insulation abutting or covering recessed downlights intended to be in contact with IC, CA 80, CA 135 luminaires.

Performance - Acoustic

1.12 SOUND CONTROL SITE TEST

Site testing of each sound rated element (wall, ceiling etc), where required, will be carried out by the element system provider, to NZBC G6/VM1, using a nominated acoustic consultant. Coordinate with element provider to rectify any element that does not meet the specified Rw/STC/IIC figure due to insulation issues.
Refer to the appropriate wall/ ceiling system sections that require sound ratings.

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2 PRODUCTS

Materials - thermal insulation

2.1 PINK® BATTS® WALL INSULATION

Pink® Batts® Wall Insulation (Pink® Batts® Classic, Pink® Batts® Narrow, Pink® Batts® Ultra®, Pink® Batts® Ultra® 140mm Wall, Pink® Batts® Ultra® 140mm Narrow Wall) rectangular bio-soluble fibrous glass wool slabs manufactured from up to 80% recycled window glass and bonded with thermosetting resin. Coloured Pink for identification. Available in different R-values, sizes and thicknesses. Refer to SELECTIONS.

2.2 PINK® BATTS® SECONDARY WALL INSULATION LAYER

Pink® Batts® Ultra Interior Wall Insulation 1220mm x 530mm and 35mm/ 45mm thick bio-soluble fibrous glass wool slab manufactured from up to 80% recycled window glass and bonded with thermosetting resin. 530mm width fits between 70mm wide non structural battens at 600mm centres. Coloured Pink for identification. Available with R-value 1.0 and R-value 1.3. Refer to SELECTIONS.

2.3 PINK® BATTS® SKILLION ROOF INSULATION

Pink® Batts® Skillion Roof Insulation (Pink® Batts® Skillion Roof and Pink® Superbatts®) rectangular bio-soluble fibrous glass wool slabs manufactured from up to 80% recycled window glass and bonded with thermosetting resin. Coloured Pink for identification. Available in different R-values, sizes and thicknesses. Refer to SELECTIONS.

Materials - acoustic insulation

2.4 PINK® BATTS® SILENCER® WALL INSULATION

Pink® Batts® Silencer® Wall Insulation 1140mm x 560mm and 75mm/ 100mm thick bio-soluble fibrous glass wool slab manufactured from up to 80% recycled window glass and bonded with thermosetting resin. Coloured Grey for identification. Available in different R-values, sizes and thicknesses. Refer to SELECTIONS.

Components

2.5 FASTENERS

Insulation anchors complete with retaining washer.

2.6 WIRE NETTING

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting used to support the insulation.

2.7 PLASTIC STRAPPING TAPES

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

2.8 ADHESIVE TAPE

Pressure sensitive adhesive tape.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

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3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Check that framing is free from moisture. Check cavities are not interconnected. Check required wire netting, roof/ underlays are in place and are dry, clean and homogeneous before installing insulation. Ensure main power is isolated and tagged prior to installation.

3.4 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Refer to Pink® Batts® Insulation - Safety Data Sheet.

Installation - general

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 INSULATION CLEARANCES

Install Pink® Batts® insulation with clearances to mechanical and electrical services and equipment, including ducts, chimneys and other heat sensitive materials in accordance with tables below based on NZS 4246, or to equipment manufacturers requirements if they require larger clearances. Installed clearances not to be more than 50mm larger than the required clearance. Smaller clearances that are required by manufacturer can be used for equipment specifically manufactured with heat shielding or similar (excludes light fittings).

The following installation clearances tables are subject to:

- Requirements of NZS 4246
- 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.
- Clearances 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.
- Clearances 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 require fixed barriers to NZS 4246 to maintain clearances.

(1) CLEARANCES TO LIGHT FITTINGS :

Type of fitting	Minimum insulation clearance	Comments
Recessed, marked NON-IC, or unmarked	100mm (increase if over 100W)	NON-IC fittings and new or old unmarked & unknown fittings, and/or insulation. Secure insulation.
Recessed, CA 80, CA 90 or CA 135	Abut fittings	Do NOT cover the fittings
Recessed, IC, IC-F or IC-4	Abut & cover fittings	Ensure insulation complies
Recessed, marked Do-Not-Cover	Manufacturer clearances	Do not cover the fittings
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.

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(2) CLEARANCES TO RECESSED HOT APPLIANCES:

Appliance	Minimum insulation clearance	Comments
Electrical heaters	100mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Gas appliance exposed flame	200mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Excludes uncommon appliances, refer NZS 4246.
Gas appliance flues	75mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation. Excludes uncommon appliances refer NZS 4246.
Oil-fired appliances and flues	230mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Open fireplace opening	200mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Brick masonry chimneys	50mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Metal chimneys & flues	75mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Solid fuel appliance	600mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Solid fuel appliance flue	600mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.

(3) CLEARANCES TO 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

3.7 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to AS/NZS 3000, 4.5.2.3.5;

- Existing fittings or retrofit situations, fittings maybe unmarked
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F & IC-4

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Refer to clause INSULATION CLEARANCES for clearances.

3.8 LAY PLASTIC STRAPPING TAPE

Lay at right angles across the framing at a minimum of 300mm centres, staple tape to each framing member with stainless steel staples.

3.9 PREPARATION

Before installation, gently agitate the insulation by gentle shaking or bouncing to assist recovery to the nominal thickness stated on the product label. Ensure the product is installed dry.

Installation - thermal insulation

3.10 INSTALL THERMAL INSULATION - GENERALLY

Install Pink® Batts® insulation in a dry protected environment. Lay, fit and fix insulation without gaps, tucks, folds and over compaction to NZBC H1/AS1-AS2 and Pink® Batts® installation requirements. For all housing and buildings up to 300m², install in accordance to NZS 4246 sections 5 Walls, 6 Ceilings & Roofs, 7 Underfloor - Suspended Framed Floors and 10 Concrete Slab-on-Ground Insulation, for residential light timber or steel framed buildings. Insulate around vents (not over them) to allow unhindered ventilation. Confirm with fireplace manufacturer for clearances; Pink® Batts® insulation is non-combustible and need not be separated except if used in conjunction with, or attached to other heat sensitive materials. Lift up electrical wires, lighting transformers/ controllers and lay the insulation underneath.

3.11 INSTALL PINK® BATTS® SECONDARY WALL INSULATION LAYER

Friction fit Pink® Batts® Ultra Interior Wall Insulation slabs between 70mm wide non structural ceiling battens placed horizontally at 600mm centres over primary wall structure. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Fill gaps around windows and doors with off-cuts. Insulate around vents (not over them) to allow unhindered ventilation. Fit insulation slabs over electrical wiring and plumbing. Ensure there are no gaps, folds or undesirable compression at edges.

Installation - acoustic insulation

3.12 INSTALL ACOUSTIC INSULATION - GENERALLY

Install Pink® Batts® insulation in a dry protected environment. Lay, fit and fix insulation without gaps, tucks, folds and over compaction to NZBC G6/AS1 and Pink® Batts® installation requirements. Fit insulation around vents (not over them) to allow unhindered ventilation. Confirm with fireplace manufacturer for clearances; Pink® Batts® insulation is non-combustible and need not be separated except if used in conjunction with, or attached to other heat sensitive materials. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

3.13 INSTALL PINK® BATTS® SILENCER® WALL INSULATION

Friction fit Pink® Batts® Silencer® Wall Insulation slabs between framing when lining on one side is installed. If cutting is required, cut oversize by 5-10mm to ensure a friction fit to completely fill the whole of the cavities. Fill gaps around with off-cuts. Fit insulation slabs behind electrical wiring and plumbing. Ensure there are no gaps, folds or undesirable compression at edges. Maintain full thickness of the insulating panels over the whole of the installation.

Completion

3.14 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go to www.pinkbatts.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

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Materials - thermal insulation

4.1 PINK® BATTS® SERVICE CAVITY INSULATION

Location:	45mm Services Cavity
Brand/ Type:	Pink® Batts® Masonry
R-value:	1.2
Nominal stabilised thickness:	50mm

Materials - acoustic insulation

4.2 PINK® BATTS® SILENCER® WALL INSULATION

Location:	Internal Walls
Brand/ Type:	Pink® Batts® Silencer® 100mm wall insulation
System STC:	43 (Testing with 10mm GIB® standard plasterboard on either side)
Nominal stabilised thickness:	100mm

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4821 FLASHINGS

1 GENERAL

This section relates to the fabrication and installation of flashing systems not forming part of a proprietary system.

1.1 RELATED WORK

Refer to 4311D Dimond Profile Metal Roofing for roofing.

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries - General requirements and mechanical properties
NZS 3604	Timber-framed buildings
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

Requirements

1.3 QUALIFICATIONS

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

1.4 VERIFY DIMENSIONS

Verify dimensions against site measurements prior to fabrication.

Standards of performance

1.5 DURABILITY REQUIREMENTS

Design and install the flashings appropriate for the durability applications in accordance with NZBC B2/AS1. The Building Code B2, 3.2 requires that all hidden elements have at least the same durability as that of the element that covers it. Refer to NZBC B2/AS1 Table 1: Durability Requirements of Nominated Building Elements and NZBC E2/AS1 Table 20 Material selection.

1.6 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with NZBC E2/AS1 Table 20 to minimise corrosion. Refer to either NZS 3604 Clause 4.2 or AS/NZS 2728 for the relevant exposure conditions. For compatibility of materials in contact and subject to run-off, refer to NZBC E2/AS1 table 21 and NZBC E2/AS1 table 22.

1.7 PROTOTYPES - REVIEW

Refer to the general section 1270 CONSTRUCTION for details of how prototypes will be reviewed and how instructions to proceed will be given. For flashings where there are no specific details or drawings, provide full size prototypes of the flashings to integrate components into the weathertight system. Co-ordinate with the trades affected by the installation. Provide the prototype flashings to the contract administrator for review.

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2 PRODUCTS

2.1 FLASHING MATERIALS

Acceptable materials for flashings are described in NZBC E2/AS1, 4.0. Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the building and cladding materials and their fixings.

2.2 FLASHING FABRICATION

Fabricate flashings generally to NZBC E2/AS1, 4.0, from a ductile grade of metal designed for lateral strength by folding, stiffening or ribbing on external edges, having a maximum un-stiffened width of 300mm. Provide all hooks, hems, kick outs, bird's beaks, stop ends, soft edges and turn downs etc. to NZBC E2/AS1, 4.0, or as shown on the drawings.

2.3 FIXINGS

Rivets, screws, nails and cleats to be compatible with the materials being fastened. Fasteners complying with the corrosion requirements of AS 3566 are suitable for use with ZINCALUME® steel products. Use only low carbon non-conductive sealing washers.

2.4 JOINTS - SEALANTS

Neutral Curing silicone or MS polymer sealant as required, with low resistance to compression and be-able to withstand large temperature variations. MS polymer sealant to be used where the sealant is exposed and the surrounding surfaces are to be subsequently painted or coated.

3 EXECUTION

Conditions

3.1 DELIVERY

Keep flashings dry in transit. Take delivery of flashings in an undamaged condition. Reject all damaged materials.

3.2 STORAGE

Store materials and accessories on a level, firm base, in dry conditions, well ventilated, out of direct sunlight and completely protected from weather and damage. Ensure storage areas are away from current work areas. Cover to keep dry until fixed.

3.3 HANDLING

Avoid distortion and contact with potentially damaging surfaces/substances. Do not drag flashings across each other, or across other surfaces. Protect edges, corners and surfaces from damage.

3.4 SUBSTRATE

Do not commence work until the substrate is of the standard required by the installer for the specified flashings, level and in true alignment.

3.5 PROTECT

Protect surfaces, window and door joinery, and finishes already in place, from the possibility of damage during the installation process.

3.6 CONFIRM LAYOUT

Before commencing work confirm the proposed installation of the flashings and expansion joints and other visual considerations of the finished work.

3.7 CO-ORDINATE INSTALLATION

Co-ordinate installation of flashings with associated trades.

Application

3.8 INSTALLATION

Install flashings in accordance with NZMRM CoP and in compliance with NZBC E2/AS1, 4.0 Flashings. For very high wind zones and where the pitch of the roof is below 15° the flashing joint laps shall be sealed with sealant at each end of the lap to prevent the ingress of water.

Refer to NZBC E2/AS1 Table 7 for general dimensions of flashings.

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3.9 FIXINGS

Fix flashings with fasteners appropriate to the situation. For fixing flashings with proprietary brackets or clips ensure they are aligned to allow for movement and are compatible with the flashing material.

Fix screws with the shank perpendicular to the surface of the flashing with the washer fitted firmly against the flashing. Screws to be compatible with the flashing material.

Rivets 'blind' or 'pop' are to be sealed when used. Aluminium rivets are compatible with zinc or AZ coated steel. Monel and stainless steel rivets can be used to fix galvanized steel flashings. Minimum diameter of rivet to be used is 4.0mm. Drill hole 1mm larger than the rivet size. Seal head of rivet with neutral cured silicone.

3.10 JOINTING - SEALANTS

Clean surfaces to be lapped using a solvent ensuring all traces of the solvent are removed with a clean rag. Apply sealant by gun in a continuous bead of approximately 5mm diameter. Width of sealant when compressed should not exceed 25mm. Sealant joints shall be mechanically fixed for strength. Refer to NZMRM CoP for details.

3.11 FINAL INSPECTION

A final inspection by the installer to take place after completion of the flashing work. Any defects or subsequent damage to be made good.

Completion

3.12 PROTECT

Protect new work from damage.

3.13 REPLACE

Replace all damaged or marked elements.

3.14 LEAVE

Leave work to the standard required for following procedures.

3.15 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 FLASHINGS

Type	Material and finish/colour
General flashings:	0.55mm Colorcote Zinacore / Colour to match roof / wall cladding
Cladding:	
- External corner:	0.55mm Colorcote Zinacore / Colour to match roof / wall cladding
- Internal corner:	0.55mm Colorcote Zinacore / Colour to match roof / wall cladding
Soffit:	0.55mm Colorcote Zinacore / Colour to match roof / wall cladding
Wall/roof junctions:	0.55mm Colorcote Zinacore / Colour to match roof / wall cladding
Apron:	0.55mm Colorcote Zinacore / Colour to match roof / wall cladding
Gutter apron:	0.55mm Colorcote Zinacore / Colour to match roof / wall cladding
Roof penetrations:	0.55mm Colorcote Zinacore / Colour to match roof / wall cladding

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4910 METALWORK

1 GENERAL

This section relates to the fabrication, delivery, specialist coating and installation of interior and exterior metal items:
It includes:

- exterior wall and door cladding systems, structural items, column and beam cladding, screens, grilles, louvres, fins and other external features, stairs, handrails, balustrades, ladders, canopies, signs and signage, street furniture, flues and cowlings, decorative and specialised sheet finishes, wire mesh and expanded metal sheet finishes and associated fasteners and hardware.

1.1 DOCUMENTS

Documents referred to in this section are:

NZS/BS 1387	Screwed and socketed steel tubes and tubulars and for plain end steel tubes suitable for welding or screwing to BS 21 pipe threads
AS/NZS 1554.1	Structural steel welding - Welding of steel structures
AS/NZS 1554.6	Structural steel welding: Welding stainless steel for structural purposes
AS 1566	Copper and copper alloys - Rolled flat products
AS/NZS 1567	Copper and copper alloys - Wrought rods, bars and sections
AS 1572	Copper and copper alloys - Seamless tubes for engineering purposes
AS/NZS 1594	Hot-rolled steel flat products
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Abrasive blast cleaning
AS/NZS 1665	Welding of aluminium structures
AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1865	Aluminium and aluminium alloys - Drawn wire, rod, bar and strip
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
AS/NZS 1867	Aluminium and aluminium alloys - Drawn tubes
AS/NZS 2312:2002	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
AS/NZS 3679.1	Structural steel - Hot rolled bars and sections
AS/NZS 3750.9	Paints for steel structures - Organic zinc-rich primer
AS/NZS 3750.15	Paints for steel structures - Inorganic zinc silicate paint
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS/NZS 4792	Hot-dip galvanized (zinc) coatings on ferrous hollow sections, applied by a continuous or a specialized process
BS 6497	Powder organic coatings for application and stoving to hot-dip galvanized hot-rolled steel sections and pre-formed steel sheet
BS EN 1011.3	Welding. Recommendations for welding of metallic materials. Arc welding of stainless steel
GANZ:	Galvanizing Association of New Zealand - After-Fabrication Hot Dip Galvanizing. A practical reference for designers, specifiers, engineers, consultants, manufacturers and users

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.

Requirements

1.2 QUALIFICATIONS

Metalworkers to be experienced, competent trades people familiar with the materials and techniques specified.

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1.3 HOT WORK - FIRE SAFETY
Refer to section 1270 CONSTRUCTION

2 PRODUCTS

Fabricated items

2.1 ITEMS
Refer to SELECTIONS.

Materials

2.2 STEEL COIL, SHEET, PLATE, BARS, ANGLES CHANNELS AND TUBE
To comply with the following:

- Hot-rolled steel bars and sections to AS/NZS 3679.1.
- Hot -rolled sheet/coil to AS/NZS 1594.
- Medium gauge black steel pipe to NZS/BS 1387, with plain ends.
- Medium gauge galvanized steel pipe to NZS/BS 1387 with plain ends, complete with galvanized and bolted couplings.

2.3 ALUMINIUM COIL, SHEET, PLATE, BARS, ANGLES, CHANNELS, RODS AND TUBE
To comply with the following:

- Anodised/plain finish sheet/coil to AS/NZS 1734.
- Drawn wire, rod, bar and strip to AS/NZS 1865.
- Extruded rod, bar, solid and hollow products to AS/NZS 1866.
- Aluminium drawn tube to AS/NZS 1867.

Finishes

2.4 EXTERNAL ORGANIC COATING
Polyester exterior grade coating to BS 6497.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING
Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

Take delivery of materials and goods and store on site and protect from damage.
Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufacturer's requirements.
Reject and replace goods that are damaged or will not provide the required finish.

3.2 PRE-INSTALLATION REQUIREMENTS
Check work previously carried out and confirm it is of the required standard for this part of the work.

3.3 PRE-COATING/FINISHING REQUIREMENTS
Check work previously carried out and confirm it is of the required standard for specified finish.
Carry out such additional preparatory work as required to bring the substrate to suitable condition.

Fabrication - general

3.4 CORNERS
Unless specified or detailed otherwise, mitre junctions of identical sections.

3.5 HOLES
Form without distortion of surrounding metal.

3.6 CLEANING
Remove all burrs and sharp arrises which would be visible after fixing, or a hazard to the user.

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3.7 BONDING

Prepare surfaces of metals to receive adhesives by degreasing and abrading mechanically or chemically. Use adhesives in accordance with the manufacturer's requirements. Form bond under pressure.

3.8 RIVETED JOINTS

Draw riveted joints tightly together, with rivets closed to completely fill holes.

3.9 MECHANICAL JOINTS

Ensure mechanical joints are tight with no visible gaps.

3.10 MECHANICAL JOINTS, ELEMENTS

Bed in mastic all mechanical joints of elements which will be located externally, including all mating surfaces, cleats and other fixings.

3.11 MECHANICAL JOINTS, CLEATS

Unless specified otherwise connect cleats to frames with countersunk screws where they will be visible after the component has been fixed and where raised heads would interfere with any moving part.

Fabrication - welding

3.12 PREPARATION FOR WELDING

Remove grease, dirt, moisture and oxide from edges to be welded. Remove scale and residue from arc and power cutting by machining or hand grinding. Ensure accurate fit using clamps and jigs where practical. Use tack welds for temporary attachment where jigging is not practical.

3.13 WELD QUALITY

Make joints with parent and weld metal fully fused throughout with no inclusions, holes, porosity or cracks. Prevent weld spatter falling on surfaces of materials which will be self finished and visible in completed work. Ensure complete removal of flux residues and slag. Butt welds which will be visible in completed work to be ground smooth and flush with adjacent surfaces.

3.14 WELDING STEEL

By one of the following methods:

- gas welding
- metal-arc welding to AS/NZS 1554.1 for mild steel
- seam welding
- other methods subject to approval.

3.15 WELDING ALUMINIUM

Grind flush visible welds.

Fabrication - sheet products

3.16 FABRICATE SHEET PRODUCTS

Fabricate and assemble in a workshop wherever practicable.

3.17 MARK OUT

Mark out the work accurately, square and true to line allowing for correct radius folds and laps to give the dimensions required for neat, close fits when in place. Use marking methods that do not damage, deface or cause future corrosive attack to the sheet metal being worked.

3.18 CUT SHEETS

Cut sheets by mechanical methods leaving edges true to line, square, smooth and free from all burrs.

3.19 FORMING

Use mechanical methods wherever possible and form and fold sheets square and true to line and face free of all deformation and defects. Minimise cold-working and stress build-up and their effects by limiting the amount of working and avoiding sharp radius bends (minimum 1 x sheet thickness).

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3.20 PRE-ASSEMBLE

Pre-assemble in the workshop and match mark elements being assembled or erected on site. Do not strain, twist, bend or open such elements to force them into the correct position while assembling or erecting.

3.21 JOINING ALUMINIUM SHEET

Use self-secured seams, aluminium pop rivets, bolts and welding as best suits the form and location of the work.

Separation

3.22 SEPARATION

Isolate copper, brass and bronze from all other metals. Isolate dissimilar materials (metal and non-metal) in close proximity as necessary by painting the surfaces or fitting separator strips. Place isolators between metals and treated timber and cement-based materials.

Polishing and coating

3.23 PREPARATION FOR COATINGS

Before applying coatings remove welding slag, weld spatter, anti-splatter compounds, paints, grease, flux, rust, burrs and sharp arrises. Make good defects which would show after application of coating. Remove burrs and sharp arrises which would be visible after fixing, or which could be a hazard to the user. Finish surfaces smooth.

Handling

3.24 HANDLING

Avoid distortion of elements during transit, storage and handling. Prevent pre-finished surfaces rubbing together, and any contact with mud, plaster or cement. Keep protective coverings dry.

3.25 SUBSTRATE

Ensure location and substrate is ready to receive the fabricated metalwork elements.

Installation

3.26 INSTALL ITEMS

Locate fixings accurately and use in accordance with the metalwork manufacturer's requirements. Fix to comply with the specified standards and installation details, including bedding compounds and sealants, and with work plumb, level and true to line.

3.27 MOVING PARTS

When assembled, moving parts to move freely and without binding.

3.28 EARTHING OR EQUIPOTENTIAL BONDING METALWORK

If it is a project electrical requirement, ensure that any electrically at-risk metalwork, is earthed or equipotential bonded (or at least conductor cable attached) before enclosure.

Completion

3.29 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.30 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

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4 SELECTIONS

Fabricated items

4.1 ALUMINIUM SHROUD

Location/item:	Shroud over bedroom windows by engineer.
Finish:	Powdercoated to match roof & Flashings
Thickness:	8mm

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5113G GIB® PLASTERBOARD LININGS

1 GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber and steel framed walls and ceilings to form:

- standard systems
- wet area systems
- GIBFix® Framing systems
- Barrierline system
- Noise Control system

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:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
AS/NZS 4600:2005	Cold-formed steel structures
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)
NASH	Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section:

GIB® Site Guide (September 2018)
GIB® Wet Area Systems (April 2021)
GIB Rondo® Metal Batten System (August 2012)
GIB-Cove®
GIB RocTape®
GIB® Goldline™ Platinum Tape-on Trims
GIB® UltraFlex high impact corner mould
BRANZ Appraisal 289 GIB® Fire Rated Systems
BRANZ Appraisal 394 GIB® Noise Control Systems
BRANZ Appraisal 427 GIB® Wet Area Systems
BRANZ Appraisal 928 GIB EzyBrace® Systems
BRANZ Appraisal 940 GIB® Intertenancy Barrier Systems for Terrace Homes

GreenTag Certification WWL:G102:2021:GR - GreenTag™ GreenRate Level A for:
GIB® Standard (10mm & 13mm)

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GIB Braceline® (10mm & 13mm)

GreenTag Certification WWL:G103:2021:GR - GreenTag™ GreenRate Level C for:
GIB Ultraline® (10mm & 13mm)

Manufacturer/supplier contact details
Company: Winstone Wallboards
Web: www.gib.co.nz
Telephone: 0800 100 442

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.5 INSTALLER WORK SKILLS AND QUALIFICATIONS

GIB® plasterboard fixers and plasterers to be experienced competent workers, familiar with GIB® plasterboard lining systems installation and finishing techniques. Submit evidence of experience on request. For example:

- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance

1.6 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
- before applying finish coatings or decorative papers,

so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

2 PRODUCTS

Materials

2.1 GIB® PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS/NZS 2588. Refer to SELECTIONS for location, type, thickness and finish.

GIB® Standard plasterboard
GIB Aqualine® wet area plasterboard

Components

2.2 CEILING BATTENS

GIB® Rondo® metal ceiling battens, batten joiners and perimeter channel.

2.3 SCREWS

GIB® Grabber® drywall type screws as follows:

Grabber® type	Used for fixing:
High Thread	GIB Ezybrace® or Standard systems to timber
Self Tapping	Standard systems to light gauge steel or timber
Dual Thread Screws	GIBFix®, GIB Ezybrace®, or Standard systems, to light gauge steel or timber
Wafer Head Needle Tip	Light gauge metal to timber not directly under plasterboard
Pancake Head Drill Tip	Light gauge metal to light gauge metal directly under plasterboard

Refer to GIB® requirements for appropriate details.

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2.4 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

GIB® UltraFlex® high impact corner mould
GIB® Levelline® Tape on Trim

2.5 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.6 CONTROL JOINTS

GIB® Rondo® P35 control joints.

GIB® Goldline™ tape-on trims
GIB® plastic W-profile control joints.

Accessories

2.7 ADHESIVE

Timber frame:

GIBFix® One ultra low VOC water based wallboard adhesive
GIBFix® All-Bond solvent based wallboard adhesive

2.8 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®, GIB Trade Finish® Multi

2.9 JOINTING TAPE

GIB® jointing tape.

2.10 GAP FILLER

GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.

3.4 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.

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"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to **AS/NZS** 2589.

3.5 SUBSTRATE

Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (September 2018).

3.6 TIMBER FRAME MOISTURE CONTENT

Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to NZBC E2/AS1 and GIB® Site Guide (Sept 2018).

3.7 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide (Sept 2018).

Application

3.8 INSTALL CEILING BATTENS

Install to GIB® Rondo® Ceiling Batten Systems requirements.

3.9 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide (September 2018). Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.10 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.11 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.12 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide (September 2018) requirements.

3.13 INSTALL TAPE-ON TRIMS

Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

3.14 FINISHING GENERALLY

To GIB® Site Guide (September 2018) and AS/NZS 2589.

Completion & Commissioning

3.15 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Throughout house and garage unless otherwise specified.	GIB® Standard plasterboard	10mm	4

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4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Ensuites, Guest WC, Mudroom, Laundry, Kitchen, Pantry	GIB Aqualine® plasterboard	10mm	4

4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to A1-07 / A1-08 RCP	GIB® Standard plasterboard	13mm	4

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to A1-07 / A1-08 RCP	GIB Aqualine® plasterboard	13mm	4

Accessories

4.5 GIB® RONDO® CEILING BATTENS

Brand/type: GIB® Rondo® Ceiling battens

4.6 GIB® TAPE ON EDGE OR CORNER TRIMS

Brand/type: By Manufacturer

4.7 GIB® EDGE PROFILES

Brand/type: By Manufacturer

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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, TIMBER VENEER

Doors as scheduled complete with matching 6mm clashing strip to both sides and to the exposed edge of cavity slider doors.

2.4 DOOR HINGES

Size and gauge to carry door. 3 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.

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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.

3.8 DOOR LINERS, EXTENDED

Heads and jambs finished 30mm, rebated for wall linings and extended a minimum of 10mm. 10mm planted door stops. Hang doors on hinges, sliding and bi-fold gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

Completion

3.9 CHECK

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

3.10 TEMPORARY PROTECTION

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

4 SELECTIONS

4.1 HOLLOW CORE DOOR, TIMBER VENEER

Type	Hollow or solid core as noted on window schedule, standard pine.
Hardware:	TBC by client

Accessories

4.2 DOOR HINGES

Interior doors

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

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6221M MAPEI® TILING SOLUTIONS

1 GENERAL

This section relates to floor and wall tiling systems with Mapei® tiling products:

- primers / sealers
- acoustic underlays
- wet area membranes
- adhesives
- grouts
- sealants

1.1 RELATED WORK

Refer to 7553 UNDERFLOOR HEATING MAT SYSTEM for undertile heating.

Documents

1.2 DOCUMENTS

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

NZBC D1/AS1	Access routes
NZBC E2/AS1	External moisture
NZBC E3/AS1	Internal moisture
AS 3740	Waterproofing of wet areas within residential buildings
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
NZS 4121	Design for access and mobility - Buildings and associated facilities
BRANZ	Good practice guide: Tiling

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

MBP (NZ) Ltd. documents relating to this part of the work:

Mapei® catalogue - Products for Ceramics and Stone Products
Mapei® product Technical Data Sheets
BRANZ Appraisal 484 - Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes
BRANZ Appraisal 485 - Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes

Manufacturer/supplier contact details

Company:	MBP (NZ) Ltd.
Web:	www.mbpltd.co.nz
Email:	enquiries@mbpltd.co.nz
Telephone:	09 921 1994

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a tile manufacturer/supplier warranty:

2 years:	For tiling products

- Provide this warranty on the manufacturer/supplier standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a Mapei® products manufacturer/supplier warranty:

15 years:	For Mapelastic AquaDefense, Mapelastic Smart and Mapegum WPS

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10 years For other Mapei® tiling products

- Provide this warranty on the manufacturer/supplier standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years: For workmanship

- Provide this warranty on 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 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved MBP (NZ) Ltd. applicators. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

1.9 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.

Performance

1.10 INTERNAL / EXTERNAL MOISTURE

Wet area membranes under tiled areas to AS 3740, NZBC E2/AS1, NZBC E3/AS1 and to BRANZ Good Tiling Practice.

2 PRODUCTS

Materials - floor covering

2.1 TILES

Refer to SELECTIONS for option.

Levelling compounds

2.2 SELF - LEVELING COMPOUND - TIMBER AND CONCRETE FLOORS

Ultraplan Renovation, a fibre-reinforced ultra-fast hardening self-leveling compound for thicknesses from 3mm to 40mm.

2.3 TROWEL APPLIED LEVELING COMPOUND - SHORT COVERING TIME

Nivorapid, an ultra-fast drying thixotropic trowel applied cementitious leveling mortar for thicknesses from 3mm to 20mm. Interior application only.

2.4 TROWEL APPLIED SMOOTHING & REPAIR COMPOUND - Q

Planitop Smooth & Repair R4, rapid setting fibre reinforced trowel applied levelling mortar for horizontal and vertical, internal and external concrete substrates, for thicknesses from 3mm to 40mm.

2.5 TROWEL APPLIED SMOOTHING AND LEVELING COMPOUND - QUICK SETTING

Planitop Fast 330, quick-setting, fibre-reinforced trowel applied levelling mortar of cementitious binders, aggregate, synthetic resin and additives for thicknesses from 3 to 30mm. For interior and exterior application.

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2.6 SELF - LEVELING ECO COMPOUND

Ultraplan Eco, an ultra-fast hardening self-levelling smoothing compound with very low VOC content for thicknesses from 1mm to 10mm. For installing onto internal concrete substrates only.

2.7 HIGH BUILD LEVELING COMPOUND - HEAVY LOADS

UC Leveller, fast hardening self-levelling compound for thicknesses from 3mm to 70mm. For installing onto internal concrete substrates only.

2.8 SCREED BINDER - 24 HOUR CURE

Mapecem, a fast setting and drying (24 hour cure) hydraulic binder for shrinkage-compensated screeds.

2.9 PRE-BLENDED SCREED - 24 HOUR CURE

Mapecem Pronto, pre-blended ready to use rapid setting shrinkage compensated screed for internal and external applications.

2.10 SCREED - 4 DAY CURE

Topcem, a fast setting and drying (4 day cure) hydraulic binder for shrinkage-compensated screeds.

2.11 CONCRETE/SAND & CEMENT SCREED ADMIXTURE - IMPROVED ADHESION

Planicrete, a synthetic-rubber latex for the improved adhesion of cement mixes and bonding slurries for bonded screeds to concrete substrates for interior and exterior application.

Primers/sealers

2.12 GENERAL PURPOSE PRIMER

Primer 3296, acrylic primer in water dispersion for porous substrate for use in interior and exterior applications.

2.13 LEVELING COMPOUND PRIMER

Eco Prim T Plus, acrylic primer in water dispersion to improve adhesion of leveling compounds on absorbent and non-absorbent substrates, for interior use only.

2.14 NON-POROUS SUBSTRATE PRIMER - SINGLE COMPONENT

ECO Prim Grip Plus, one component acrylic primer of synthetic resin in water dispersion for interior and exterior use.

2.15 MOISTURE BARRIER EPOXY PRIMER & PROTECTIVE COATING

Planiseal MR, two component water based epoxy primer and moisture barrier for positive and negative hydrostatic pressure for interior and exterior use.

Adhesives

2.16 RAPID SETTING ADHESIVE - CERAMIC TILES/NATURAL STONE

Granirapid, a high performance, deformable, fast setting and hydrating two- component cementitious adhesive.

2.17 RAPID SETTING ADHESIVE - CERAMIC TILES/MARBLE/NATURAL STONE

Keraquick Maxi S1, a high performance, deformable, fast setting and hydrating non-slip cementitious adhesive. Suitable for application in layers up to 15mm thick.

2.18 ELASTICITY LATEX ADMIXTURE

Latex Plus is a water dispersion of a flexible polymer. Mix with Keraquick Maxi S1 to improve deformability.

2.19 CEMENT BASED POWDER ADHESIVE AND ADDITIVE

Kerabond Plus, a cement based powder mixed with Isolastic, a latex additive to impart elasticity.

2.20 NON-POROUS SUBSTRATE SPECIAL PURPOSE ADHESIVE

Keralastic T, a high performance, two component, polyurethane adhesive for ceramic tiles and natural stone.

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2.21 MULTI SUBSTRATE CEMENT BASED ADHESIVE

Keraflex Maxi S1, a high performance, deformable cementitious adhesive with extended open time and no vertical slip for ceramic tiles and stone material, with Low Dust Technology.

2.22 CEMENT BASED POWDER ADHESIVE AND ADDITIVE - RAPID SETTING

Keraquick S1 zero, a high performance, deformable, fast setting cementitious adhesive with no vertical slip, mixed with Latex Plus, a latex admixture introducing elasticity to provide improvement of deformability.

2.23 EPOXY ADHESIVE

Kerapoxy Adhesive, a two component epoxy adhesive with no vertical slip for ceramic tiles and natural stone material.

2.24 PREMIXED ADHESIVE

Ultramastic III, a high performance, ready to use paste adhesive with no vertical slip and extended open time, for ceramic tiles.

2.25 CEMENT BASED ADHESIVE – MOSAICS

Adesilex P10, mixed 50/50 Water and Isolastic additive. A high performance white cementitious adhesive with no vertical slip for bonding of glass, ceramic and marble mosaics.

2.26 CEMENTITIOUS DEFORMABLE ADHESIVE - TILES

Ultralite S1 Flex, one component lightweight deformable cement and synthetic resin based adhesive for use in interior and exterior applications.

2.27 CEMENTITIOUS HIGHLY DEFORMABLE ADHESIVE - TILES

Ultralite S2 T Flex, one component lightweight highly deformable, thixotropic cement and synthetic resin based adhesive for use in interior and exterior applications including external facade tiling.

2.28 CEMENTITIOUS HIGHLY DEFORMABLE RAPID SETTING ADHESIVE - TILES

Ultralite S2 Quick, one component lightweight highly deformable rapid setting cement and synthetic resin adhesive for use in interior and exterior applications including external facade tiling.

Grouts

2.29 POLYMER-MODIFIED MULTI-PURPOSE CEMENTITIOUS GROUT

Ultracolor Plus, a fast setting and drying, high performance, polymer-modified, anti-efflorescence, water-repellent grout for joints from 2mm to 10mm, with DropEffect and anti-mould with BioBlock technology.

2.30 EPOXY GROUT

Kerapoxy, a high performance, two-component, acid-resistant epoxy grout for joints of at least 3mm, for ceramic tiles and natural stone material.

2.31 KERAPOXY EASY DESIGN GROUT

Kerapoxy Easy Design Grout is a high performance, two-component, acid-resistant epoxy grout for joints of at least 1mm, for ceramic tiles and natural stone material.

Sealants

2.32 MULTI-PURPOSE SILICON SEALANT

Mapesil AC and Primer FD, a solvent-free, acetic cross-linking mildew-resistant silicon sealant with an associated adhesive enhancing primer.

2.33 NEUTRAL SILICON SEALANT - NATURAL STONE

Mapesil LM, an odourless one-component neutral cross-linking, silicon sealant for natural stone.

2.34 SINGLE COMPONENT POLYURETHANE SEALANT

Mapeflex PU40, a single component, thixotropic, polyurethane based sealant with a low modulus of elasticity.



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Components - waterproofing

2.35 WATERPROOFING TAPE - MAPEBAND SA

Mapeband SA, an alkali resistant butyl self-adhesive waterproof tape.

2.36 WATERPROOFING TAPE - MAPEBAND EASY

Mapeband Easy, an alkali resistant rubber tape with a non-woven fabric face and back.

2.37 WATERPROOFING MEMBRANE SYSTEM - INTERIOR USE

Mapegum WPS, a fast drying, synthetic resin-based liquid elastic membrane for interior waterproofing. To waterproof edges and expansion joints use Mapeband Easy, Mapeband SA

2.38 WATERPROOFING MEMBRANE SYSTEM - INTERIOR USE

Mapelastic AquaDefense, a one component, solvent-free, ready-to-use, quick drying synthetic resin based paste in water dispersion for interior applications. Provides a waterproofing layer to concrete, concrete block, cementitious screeds and render, plasterboard and fibre cement board before laying ceramic, stone and mosaic tiles. To waterproof edges and expansion joints apply Mapeband Easy, Mapeband SA.

2.39 WATERPROOFING MEMBRANE - MULTI PURPOSE USE

Mapelastic Smart, a two component flexible cementitious waterproofing membrane, for interior and exterior ceramic tile and natural stone To reinforce waterproof protection layers and anti-fracture layers use Mapenet 150 waterproof reinforcing mesh or Mapetex Sel. To waterproof edges and expansion joints use Mapeband Easy (do not use Mapeband SA for areas of full immersion).

Components - cleaning

2.40 GROUT & TILE CLEANING AGENT

Keranet, an acid-based general tile cleaner.

2.41 CLEANER

Ultracare Kerapoxy Cleaner, a high performance cleaner for epoxy grout.

2.42 SOLVENT GEL

Pulicol 2000, a solvent based gel for removing old natural and synthetic resin-based adhesives, paint and grouts/grout residue.

Accessories

2.43 UNDERTILE HEATING

Proprietary electric undertile heating system complete with thermostat/controller.

Refer to 7553 UNDERFLOOR HEATING MAT SYSTEM for undertile heating.

2.44 STRIPS AND WEATHERBARS

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

2.45 EXPANSION JOINT, METAL AND RUBBER

Clear anodised aluminium/brass with metal anchor to set into in-situ concrete, cement screed/bed and complete with rubber infill.

2.46 EXPANSION JOINT, METAL AND COMPOUND

Aluminium/brass angles with high density foam rubber insert and jointing compound.

2.47 EXPANSION JOINT, PLASTIC

Rigid stabilised PVC sides with flexible central section.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

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3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Check that maximum variation in the plane of the substrate is no greater than ±4mm in 2 linear metres before commencing tiling.

3.4 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.

3.5 CONFIRM LAYOUT

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

3.6 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.

3.7 PREPARATION OF BACKGROUNDS

Prepare backgrounds in accordance with AS 3958.1, section 4 and in accordance with the Mapei® instructions for the selected substrate.

3.8 FALLS

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

Unless stated otherwise provide minimum fall gradients to BRANZ Good Practice Guide - Tiling, clause 6.6 Falls in floors.

1 : 40 minimum	For tiled decks which also act as a roof
1 : 60 minimum	For paving over ground
1 : 50 minimum	For unenclosed shower bases (to NZBC E3/AS1, 3.3.5)
1 : 60 minimum	For enclosed shower bases
1 : 50 minimum	For shower bases for people with disabilities (to NZS 4121, 10.5.11.3 (b).)
1 : 60 minimum	For commercial kitchens or similar

3.9 WATERPROOFING WET AREAS

Areas to be waterproofed shall be in accordance with NZBC E3/AS1, AS 3740 and BRANZ Good Practice Guide -Tiling Section 7: Waterproofing interior wet areas, as shown on the drawings or stated in SELECTIONS.

3.10 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.

3.11 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.

3.12 SUBSTRATE TEMPERATURE

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



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3.13 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.

Application

3.14 APPLICATION GENERALLY

Prepare backgrounds as described in AS 3958.1, Section 4. Suitably prepare backgrounds and substrates in accordance with 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.

Application of primers/ sealers, undertile membranes, waterproofing, adhesives grouts and sealants to comply with MAPEI® technical data sheets and application details for specific products.

3.15 SUBSTRATE PREPARATION

Refer to 6192 FLOORING SUBSTRATE PREPARATION for preparation of substrates for laying of ceramic tiles and natural stone.

3.16 LEVELLING COMPOUNDS

Prepare for and apply levelling compounds to MAPEI® technical data sheets and application details for specific product.

3.17 PRIMERS/SEALERS

Apply primers to MAPEI® technical data sheets and application details for specific product.

3.18 INSTALL UNDERTILE HEATING

Refer to 7553 UNDERFLOOR HEATING MAT SYSTEM for installation of undertile heating.

3.19 WET AREA MEMBRANE WATERPROOFING

Apply wet area waterproofing systems in accordance with MAPEI® technical data sheets and requirements.

3.20 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.

3.21 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 in accordance with the manufacturer's instructions.

3.22 MOVEMENT JOINTS

Install movement joints with a minimum joint width of four times the expected movement. Provide a 9 to 10mm minimum joint width for exterior joints at 3.6m maximum spacings and a 12mm minimum joint width for 4.8m maximum spacings. Increase joint width by 1.5mm for each 10°C over or below a 35°C temperature range.

Provide movement control joints:

- to coincide with control joints in the substrate / structure.
- where substrate material changes.
- where tiles are restrained by building elements.
- where flexing of the structure will occur.
- to the perimeter of tiles that abut another material.
- where tile surfaces change in plane.
- where tile type changes.
- radiating from an external corner of an L-shaped tiled area

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Provide movement joints at 4.5m spacing to tiled floors exposed to direct sunlight and at 6m maximum spacing for shaded internal tiled floors (reduce these spacings by 15 to 20% for flexible organic adhesives).

Provide movement joints at 3 to 4.5m centres along the length of internal and external walls (reduce these spacings by 15 to 20% for flexible organic adhesives) and at storey heights.

3.23 APPLY ADHESIVE

Apply and float thick or thin bed of cement based adhesive to 6mm maximum and 3mm minimum bed thickness to the tile manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with 3mm grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.

3.24 GROUTING

Apply grout to tiling in accordance with Mapei® technical data sheets and application details for specific product and as described in AS 3958.1, clause 5.7.

3.25 SEALING

Apply sealants to tiling in accordance with Mapei® technical data sheets and application details for specific product.

3.26 CLEAN TILES

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Use Mapei Keranet to clean tiles of cementitious residue as necessary and Mapei Kerapoxy Cleaner to remove residues of epoxy grout from tile surfaces. Finally polish glazed tiles with a clean dry cloth.

Completion & Commissioning

3.27 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

3.28 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

4 SELECTIONS

For further details on selections go to www.mbpltd.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 WALL TILES

Location:	Ensuite, Bathrooms
Manufacturer:	Client Selected
Pattern/number:	Client Selected
Colour:	Client Selected
Edging:	Anodized Aluminium

4.2 FLOOR TILES

Location:	Ensuite, Bathrooms
Manufacturer:	Client Selected
Pattern/number:	Client Selected
Colour:	Client Selected
Edging:	Client Selected

4.3 MAPEI® LEVELLING COMPOUNDS

Location:	Ensuite, Bathrooms
Type:	Mapei® Topcem

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4.4 MAPEI® PRIMERS/SEALERS

Location: Ensuite, Bathrooms
Type: Mapei® Primer S

4.5 MAPEI® ADHESIVES

Location: Ensuite, Bathrooms
Type: Mapei® Adesilex LP

4.6 MAPEI® WATERPROOFING TAPE

Type: Mapeband SA

4.7 MAPEI® WATERPROOFING MEMBRANE REINFORCING MESH

Function: Reinforcing
Type: Mapetex Sel

4.8 MAPEI® GROUT

Type: Mapei® Kerapoxy
Colour: TBC

Components

4.9 MAPEI® - MAPELASTIC AQUADEFENSE WATERPROOFING MEMBRANE SYSTEMS

Membrane: Mapelastic AquaDefense
Waterproof edges: Mapeband SA
Waterproof expansion joints: Mapeband SA

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6311 TIMBER STRIP, BLOCK & PLANK FLOORING

1 GENERAL

This section relates to the supply, laying and finishing of timber flooring as an overlay, including underlays over the existing substrate.
It includes:

- solid timber

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:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC D1/AS1	Access routes
AS/NZS 1859.4	Reconstituted wood-based panels - Specifications - Wet-processed fibreboard
AS/NZS 1860.1	Particleboard flooring - Specifications
AS/NZS 2269.0	Plywood - Structural - Specifications

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

https://southpacifictimber.co.nz/

Manufacturer/supplier contact details

Web:	https://southpacifictimber.co.nz/
Email:	sales@southpacifictimber.co.nz

Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 NO SUBSTITUTIONS

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

Performance

1.6 TESTING MOISTURE CONTENT

Sample and test the substrate to ensure that moisture content is within the limits specified. Provide a written record.

1.7 SURFACE FIRE PERFORMANCE

Flooring to be non-combustible or have a Critical Radiant Flux to NZBC C/AS2, Table 4.12.3.1: Critical radiant flux requirements for flooring (kW/m2). Refer to SELECTIONS.

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Performance - Slip resistance

1.8 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt from testing.

2 PRODUCTS

Materials

2.1 TIMBER STRIP, BLOCK AND PLANK FLOORING

Refer to SELECTIONS for product selection.

2.2 TIMBER TRIM

Skirting, edge strip, reducer strip and nosing as detailed and to match overlay flooring.

Accessories

2.3 CONCRETE SEALER

Two part water based epoxy coating.

2.4 EXPANSION STRIPS

Coloured silicone flexible expansion sealant.

2.5 EXPANSION COVERS

Selected expansion covers as supplied.

2.6 ADHESIVE, DIRECT STICK

As required by the overlay flooring supplier and as not to cause cupping or curling of timber through moisture absorption from the adhesive.

Finishes

2.7 POLYURETHANE

Resin-based, moisture-curing polyurethane to the flooring supplier's requirements.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Accept packs of timber and accessories undamaged and dry. Store on level, dry surfaces in non-traffic, non-work areas that are enclosed and dry. Avoid damage to timber.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Check for moisture content by hygrometer. Do not commence laying flooring until readings for the whole area are within acceptable levels as follows:

Moisture content:	

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	Timber substrate - 8 -12% for air conditioned buildings - 10 -14% for intermittently heated buildings - 12 -16% for unheated buildings
	Concrete substrate 60-70%RH

3.4 BEFORE COMMENCING WORK

Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, and in the case of air-conditioned buildings the air-conditioning operating for 6 weeks, before starting work.

3.5 PREPARATION

Check that the timber supplied is as specified, of a consistent colour and grain and sufficient to complete the work. Reject timber that varies widely in colour or grain. Reject timber that is damaged. Check the moisture content of the timber to ensure it is at the required level for the installation environment.

Check laminated strip and plank flooring to ensure it has been supplied at the moisture content recommended by the suppliers for the proposed location. Do not remove planks from packs until just prior to installation.

3.6 CARRY OUT THE WORK

Carry out the work to conform with this specification and in accordance with the timber floor supplier's technical requirements.

3.7 PROTECTION

Protect adjoining work surfaces and finishes during the installation.

3.8 LAYOUT

Before beginning the installation, confirm the proposed layout of the timber, grain direction, any other visual considerations of the finished work and specified expansion requirements relating to the specified product. Minimise in number with no cut planks less than half width and only at the perimeter of the work.

3.9 SURFACE TOLERANCES, DIRECT STICK

Substrate to have no deviations greater than 3mm over a 3 metre straightedge in any given direction and no abrupt variations greater than 1mm over 250mm.

Application - general

3.10 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - surface preparation - new

3.11 PREPARATION NEW CONCRETE

Clear substrate of debris, then vacuum to remove dust. Refer to allowable surface tolerances. Check for moisture content by hygrometer. Do not commence installation until the hygrometer readings show 60-70%. Apply concrete sealer if required before commencing flooring installation.

Application - installation

3.12 LAYING, DIRECT STICK

Apply adhesive approved by the flooring supplier, at the required spread rate. Follow requirements for open time, taking note of substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using approved techniques. Install the flooring strictly in accordance with the flooring supplier's stated requirements. Ensure the required expansion gap is left at perimeters and around fixed obstacles.

3.13 EXPANSION GAPS, PERIMETERS

Calculate expansion gaps strictly to manufacturer's requirements, to suit the environment, size of the installation and product type.

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3.14 EXPANSION STRIPS

Apply coloured silicone flexible expansion sealant supplied by the flooring manufacturer to match the dimensions of the expansion gap flush with the finished flooring. Apply to flooring manufacturer's directions.

3.15 EXPANSION COVERS

Cover expansion joints using matching expansion joint covers supplied by flooring manufacturer.

Finishing

3.16 POLYURETHANE COATING, UNFINISHED FLOORS

Apply four coats of resin-based, moisture-curing polyurethane to the coating manufacturer's and flooring supplier's requirements. Physically protect the surface from damage or contamination before and after coating.

3.17 CLEAN TIMBER FLOORING

Leave timber flooring surfaces free of adhesive, dirt and debris. Vacuum off, damp mop with a low-foam neutral detergent and allow to dry.

Completion

3.18 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

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

Materials

4.1 TIMBER TONGUE AND GROOVE FLOORING

Location:	As drawn
Brand:	South Pacific Timver
Species:	American Red Oak
Size:	Client selected
Thickness:	19mm

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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 6721RE RESENE ENVIRONMENTAL PAINTING INTERIOR

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

AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 9001	Quality management systems - Requirements
MPNZA	Health and Safety Programme

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)
Resene	Product Data Sheets (hard copy or at 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.



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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 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.

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 Programme.
- 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) the safety data sheet for each product used and comply with the required safety procedures. Keep sheets on site.

Performance

1.12 RESENE INSPECTION

Permit representatives of **Resene** to inspect the work in progress and to take samples of their products from site if requested. **Resene** will take care when inspecting the work, but does not accept any responsibility for the proper completion of the work before or after such inspection.

1.13 INSPECTION OF THE WORK

Inspection of the whole of the work at each of the stages set out in SELECTIONS may be made. Agree on a programme that will facilitate such inspection, including notification when each part and stage of the work is ready for inspection.

2 PRODUCTS

Materials

2.1 MATERIALS GENERALLY

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

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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 for more information or visit 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.

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 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior
For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.
Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior
For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish, seal to manufacturer's requirements.
Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.4 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.

3.5 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.

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3.6 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

3.7 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) listed in the materials systems schedule clauses. Carry out the preparatory work required by them for each of the substrates.

3.8 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.

3.9 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.

3.10 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.

3.11 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.

3.12 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.

3.13 CONCEALED JOINERY SURFACES

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

3.14 CONCEALED METAL SURFACES

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

3.15 EXTERNAL DOORS

Prime or seal and paint bottom edges before hanging.

3.16 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.



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3.17 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

3.18 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.

3.19 MIXING

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

3.20 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.

3.21 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- Back painting and pre-installation painting, then post-installation exposed-face painting
- 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** 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.

3.22 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.

3.23 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..

3.24 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.

3.25 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

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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

3.26 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.

3.27 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.

3.28 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.

3.29 REPLACE

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

3.30 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.
- 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.

3.31 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.

4 SELECTIONS

4.1 SELECTIONS

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

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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.

Related work

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.
Refer to 6711RE RESENE ENVIRONMENTAL 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.

4.1 HARDWARE

Hardware for removal:	Hardware from all doors before painting.

Resene interior paint systems

Plasterboard - new

4.2 RESENE NEW INTERIOR PLASTERBOARD, WALLS - DRY AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1: 1/1
Fire rating:	Group 1-S. Test Report FH4967
1st coat	Resene Broadwall D403, Waterborne Wallboard Sealer
2nd coat:	Resene Zylone Sheen D302, Waterborne Low Sheen
3rd coat:	Resene Zylone Sheen D302, Waterborne Low Sheen
Colour:	Refer to finishes schedule

4.3 RESENE NEW INTERIOR PLASTERBOARD, WALLS - WET AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1A: 1/1
Fire rating:	Group 1-S. Test Report 7-593235-CO
1st coat:	Resene Waterborne Sureseal D42a, Waterborne Pigmented Sealer
2nd coat:	Resene SpaceCote Low Sheen Kitchen & Bathroom D311K Waterborne Enamel
3rd coat:	Resene SpaceCote Low Sheen Kitchen & Bathroom D311K Waterborne Enamel
Colour:	Refer to finishes schedule

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4.4 RESENE NEW INTERIOR PLASTERBOARD, CEILINGS - DRY AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1: 1/1
Fire rating:	Group 1-S, Test Report FH4967
1st coat:	Resene Broadwall D403, Waterborne Wallboard Sealer
2nd coat:	Resene Ceiling Paint D305, Waterborne Flat
3rd coat:	Resene Ceiling Paint D305, Waterborne Flat
Colour:	Client Selected

4.5 RESENE NEW INTERIOR PLASTERBOARD, CEILINGS - WET AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1A: 1/1
Fire rating:	Group 1-S, Test Report 7-593235-CO
1st coat:	Resene Waterborne Sureseal D42a, Waterborne Pigmented Sealer
2nd coat:	Resene SpaceCote Flat Kitchen & Bathroom D314K, Waterborne Enamel
3rd coat:	Resene SpaceCote Flat Kitchen & Bathroom D314K, Waterborne Enamel
Colour:	Refer to finishes schedule

Interior timber - new

4.6 RESENE NEW INTERIOR TIMBER DOORS, JOINERY, SKIRTING - CLEAR COAT

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
Colour:	Refer to finishes schedule

4.7 RESENE NEW INTERIOR TIMBER DOORS, 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, Semi-Gloss Waterborne Enamel
3rd coat:	Resene Lustacryl D310, Semi-Gloss Waterborne Enamel
Colour:	Refer to finishes schedule

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7120 HOT & COLD WATER SYSTEM

1 GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

1.1 RELATED WORK

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

Documents

1.2 DOCUMENTS

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

NZBC G4/AS1	Ventilation
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
NZBC H1/AS1-AS2	Energy Efficiency
AS 1432	Copper tubes for plumbing, gas fittings and drainage applications
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2345	Dezincification resistance of copper alloys
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.1	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) General
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2537.3	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) fitness for purpose of system
AS/NZS 2537.4	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) Guidance for the assessment of conformity.
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation

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AS 3688	Water supply and gas systems - metallic fittings and end connectors
AS/NZS 3879	Solvent cements and priming fluids for PVC (PVC-U and PVC-M and ABS and ASA pipes and fittings
AS 4032.2	Water supply - Valves for the control of heated water supply temperatures - Tempering valves and end-of-line temperature actuated devices
AS/NZS 4129	Fittings for polyethylene (PE) pipes for pressure applications.
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4606.1	Storage water heaters. General requirements
NZS 4606.2	Storage water heaters. Specific requirements for water heaters with single shells
NZS 4606.3	Storage water heaters. Specific requirements for water heaters with composite shells.
NZS 4607	Installation of thermal storage electric water heaters: valve-vented systems
NZS 4617	Tempering (3-port mixing) valves
AS 4809	Copper pipe and fittings. Installation and commissioning
AS 5200 part 053	Plumbing and drainage products, Stainless steel pipes and tubes for pressure applications.
AS/NZS 5601.1	Gas installations - general installations
AS/NZS 60335.2.35	Household and similar electrical appliances. Safety - Pat 2.35 Particular requirements for instantaneous water heaters

Gas (Safety and Measurement) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006
NZ Backflow Testing Standard: NZ Backflow Testing Standard 2019, Field testing of backflow prevention devices and verification of air gaps

Warranties

1.3 WARRANTY

Provide warranty for:

2 years:	For the supply and installation of the plumbing system and fixtures

- 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.

Requirements

1.4 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.5 HOT WATER TEMPERATURES

To NZBC G12/AS1, 6.14

Storage water heaters to store water at not less than 60ºC.

Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed:

- 45ºC - for early child hood centres, schools, elderly facilities, hospitals, psychiatric or disabled institutions.

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- 50ºC - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

Performance

1.6 TESTING - TO NZBC G12/AS1

Test to NZBC G12/AS1, 7.6, Watertightness, for hot and cold water.

- Test to a pressure of1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

2 PRODUCTS

2.1 TESTING - TO AS/NZS 3500

Test to AS/NZS 3500.1 as modified by NZBC G12/AS3, Section 17, Testing and commissioning, for cold water.

- Test reticulation system to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.1, 17.3.1 Hydrostatic test. Test storage tanks to AS/NZS 3500.1, 17.3.2 Storage tanks (except rain water tanks).

and
AS/NZS 3500.4 as modified by NZBC G12/AS3, Section 9, Testing and commissioning, for hot water.

- Test reticulation system (excluding tanks, water heaters, and some fixtures, valves etc) to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.4, 9.3 Testing. Test complete system (including valves, pumps, water heaters etc) under normal working conditions for a minimum of 48 hours, then check visually, to AS/NZS 3500.4, 9.3 Testing.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

Materials

2.2 COPPER PIPE

To NZBC G12/AS1, 2 Materials. Copper pipe to NZS 3501, AS 1432 (type A, B & C) and AS 3688 for fittings.

2.3 POLYBUTYLENE PIPE

To NZBC G12/AS1, 2 Materials. Polybutylene tubing to AS/NZS 2642.1, AS/NZS 2642.2 and AS/NZS 2642.3 complete with fitings and accessories brand-matched . Protect from sunlight.

2.4 POLYETHYLENE PIPE

To NZBC G12/AS1, 2 Materials. Polyethylene pipes to AS/NZS 4130 and fittings to AS/NZS 4129. Except for solid black PE, protect from sunlight. For cold water applications only.

2.5 WATER METER

To the requirements of the network utility operator.

2.6 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1.

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2.7 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to AS/NZS 2845.1 where it is possible for water or contaminants to backflow into the potable water supply. Refer to NZBC G12/AS1, 3.4 Backflow protection & 3.5 Containment Backflow protection and NZBC G12/AS1, table 2, Selection of Backflow Protection and table 2A Containment Backflow Protection

2.8 TEMPERING VALVE

Tempering valve to NZS 4617 or AS 4032.2 to NZBC G12/AS1.

Materials - Hot water heating appliances

2.9 HEAT PUMP WATER HEATER - SPLIT SYSTEM

Heat pump water heating system, with insulated storage cylinder and separate compressor/condenser/evaporator, complete with required fittings. With flow and return pipe work for water between cylinder and heat pump. Insulated exposed flow and return pipe work.

Components

2.10 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZBC H1/AS1-AS2 and AS/NZS 3500.4.

2.11 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.



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3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/AS1 or AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3.

3.2 HANDLE AND STORE

Handle and store pipes, fittings 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 tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

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

3.9 EXCAVATE

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

Application - Jointing

3.10 JOINTING COPPER PIPE

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to NZBC G12/AS1 and AS 4809.

3.11 JOINTING POLYBUTYLENE PIPE

Aluminium clamped, seal ring compression or push fit "O" ring seal jointing to pipe system manufacturer's requirements.

3.12 JOINTING POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to NZBC G12/AS1 and AS/NZS 2033.

Application - Pipework installation

3.13 WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1.



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3.14 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.15 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 9 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and AS/NZS 3500.4 as modified by NZBC G12/AS3 or G12/AS1.

3.16 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) to NZBC G12/AS1, 9.0.

3.17 IN-LINE FILTER

Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

Application - Hot water systems

3.18 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation or NZS 4607 for Valve-vented systems.

3.19 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation or AS/NZS 3500.4, 5.5.4 Seismic restraints.

3.20 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to NZBC H1/AS1-AS2 Energy Efficiency, AS/NZS 3500.4, section 8.2 Thermal insulation, and to the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs.

3.21 INSTALL HEAT PUMP WATER HEATER - SPLIT SYSTEM

Install complete with the necessary fittings and pipe work, to the manufacturer's installation instructions.

3.22 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.23 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

3.24 PENETRATIONS

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



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Installation - Valves

3.25 INSTALLING BELOW GROUND ISOLATING VALVE

Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

3.26 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED

Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

3.27 INSTALLING BACKFLOW PREVENTION DEVICE

Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or NZ Backflow Testing Standard.

Completion

3.28 LABEL

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.29 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.30 REPLACE

Replace damaged or marked elements.

3.31 LEAVE

Leave work to the standard required by following procedures.

3.32 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Water main

4.1 POLYETHYLENE WATER MAIN

Size:	25mm outside diameter (i.e. DN 25 in AS/NZS 4130)

Pipework

4.2 COPPER PIPE

Nominal bore:	By Plumber
Wall thickness:	By Plumber

4.3 POLYBUTYLENE PIPE

Brand:	By Plumber

4.4 EXPOSED PIPES

Type:	Stainless steel hose braid
Nominal bore:	As required
Accessories:	Stainless steel hose braid fitted with stainless steel nuts

4.5 RIGID INSULATION

Brand:	Climaflex XT
Material:	Extruded Polyethylene foam
Wall thickness:	13mm

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Hot water systems

4.6 HEAT PUMP WATER HEATER - SPLIT SYSTEM

Brand:	Haier
Model:	Split System Cylinder
Location cylinder:	Laundry Cupboard
Location heat pump:	Outside laundry door

Valves and accessories

4.7 MAIN ISOLATING VALVE

Location:	By plumber - entry to site
Brand/type:	By plumber

4.8 FLOOR/ZONE ISOLATING VALVES

Location:	At each fixture
Brand/type:	By Plumber

4.9 APPLIANCE ISOLATING VALVES - CONCEALED

Appliance:	Dish Washer, refrigerator
Brand/type:	By Plumber

4.10 APPLIANCE ISOLATING VALVES - EXPOSED

Appliance:	Washing machine
Brand/type:	Refer to tapware selections

4.11 IN-LINE FILTER

Location:	By installer
Brand/type:	By Plumber

4.12 BACKFLOW PREVENTION DEVICE

Location:	TBC
Brand/type:	By plumber

4.13 TEMPERING VALVE

Location:	At HWC
Brand/type:	by Plumber

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7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES

1 GENERAL

This section relates to the supply and installation of sanitary fixtures, tapware and sanitary accessories.

1.1 RELATED WORK

Refer to glazing section/s for frameless shower and bath screens not included in this section.

Refer to the electrical section/s for electrical connection of accessories.
Refer to 7123 HOT AND COLD WATER SYSTEM for hot water cylinders.
Refer to 7421 SANITARY SYSTEMS for the supply and fitting of waste disposal pipework

Documents

1.2 DOCUMENTS

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

NZBC E3/AS1	Internal moisture
NZBC F2/AS1	Hazardous building materials
NZBC G1/AS1	Personal hygiene
NZBC G12/VM1	Water supplies
NZBC G12/AS1	Water supplies
NZBC G13/AS1	Foul water
NZBC G13/AS3	Plumbing and drainage
AS/NZS 1730	Washbasins
AS/NZS 2023	Baths for ablutionary purposes
AS/NZS 3500.1:2003	Plumbing and drainage - water services
AS/NZS 3500.2:2003	Plumbing and drainage - sanitary plumbing and drainage
AS/NZS 3662	Performance of showers for bathing
NZS 4223.3	Glazing in buildings - Human impact safety requirements
Plumbers, Gasfitters and Drainlayers Act 2006	

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.

Requirements

1.3 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a Certifying Plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.4 SAMPLES

Submit samples on request of nominated tapware, along with the relevant manufacturers' technical literature for review.

1.5 SUPPLIER

A specialist in the supply of tapware, and employing experienced architectural representatives available to assist during the course of the installation.

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2 PRODUCTS

2.1 SANITARY FIXTURES

Refer to SELECTIONS for product selection.

2.2 TAPWARE

Refer to SELECTIONS for product selection.

2.3 SANITARY APPLIANCES

Refer to SELECTIONS for product selection.

2.4 ELECTRICAL SANITARY ACCESSORIES

Refer to SELECTIONS for product selection.

3 EXECUTION

Conditions - sanitary fixtures

3.1 DELIVERY

Only deliver to the site fixtures or fittings that can be immediately unloaded into suitable storage or be placed for direct installation.

3.2 STORAGE AND HANDLING

Take delivery of and store components complete with protective casings and coverings in areas that are enclosed, clean and dry and where no work is being done. Remove protection only to the extent that will allow installation.

3.3 QUALITY STANDARDS

Installation work to comply with NZBC G1/AS1, NZBC G12/VM1, NZBC G12/AS1, NZBC G13/AS1 and the fixture manufacturer's requirements.

3.4 SUBSTRATE

Ensure substrate and fixings will allow work of the specified standard.

3.5 CO-ORDINATION

Do not proceed if the points of supply and drainage services do not match the points of the fixtures without force or distortion.

3.6 INSTALLATION REQUIREMENTS

Install to NZBC G1/AS1, NZBC G12/VM1, NZBC G12/AS1, NZBC G13/AS1, NZBC E3/AS1 and to the fixture manufacturer's installation requirements for each component.

3.7 PROVIDE SUPPORT

Confirm fixing points needed for each unit and provide solid blocking at each fixing bracket location.

Conditions - tapware

3.8 RETAIN

Retain tapware in the manufacturer's original packaging and ensure that units are complete with fixings and installation instructions. Label each unit separately with its fitting name and space number.

3.9 STORE

Store tapware packages in a shelved, dry and securely locked area. Provide supervision when the secure area is unlocked and packages and cartons are being distributed; signing off each package from the schedule as released.

Conditions - sanitary accessories

3.10 RETAIN

Retain fixtures, fittings and hardware in the manufacturer's original packaging and ensure that units are complete with associated fixings and installation instructions. Label each unit separately to match the submitted and approved schedule.

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3.11 PACKAGE

Package fixtures, fittings and hardware units required in clear plastic and label each to match the drawings and the submitted schedule. Place packages in cartons selected for 'level', 'location', and/or 'sector' and label the packages and the cartons similarly.

3.12 STORE

Store items in a shelved, dry and securely locked area. Provide supervision when the secure area is unlocked and packages and cartons are being distributed; signing off each package from the schedule as released.

3.13 INSPECTION

Before starting the installation of proprietary items, check relevant spaces and wall and floor finishes for any condition that would not allow the proper installation of any unit. Do not proceed until such conditions have been remedied.

Installation - sanitary fixtures

3.14 INSTALLING VITREOUS CHINA FIXTURES

Install to NZBC G1/AS1: Part 3, G12/AS1, G13/AS1 and AS/NZS 3500.2. Carry out preparatory and assembly work, including connections to supply and drainage services and the application of slurries and sealants in sequence. Fit the toilet pan in position, plumb, level, flush and rigid without stressing the attachment points of the component.

3.15 INSTALLING CISTERNS

Fit firmly in place and connect the specified cisterns from the supply services through the flush pipes to the relative fixtures in the positions as detailed all plumb and level.

Installation - Basins

3.16 INSTALLING WASHBASINS

Install to NZBC G1/AS1, AS/NZS 1730. Set basins firmly to walls or vanities as detailed and to comply with NZBC E3/AS1. Connect through trap to the drainage system.

3.17 INSTALLING VANITIES

Install in accordance with the manufacturer's requirements. Seal top and upstand to wall surface to comply with NZBC E3/AS1.

Installation - Showers

3.18 INSTALLING SHOWER FITTINGS

Shower waste, mixer and rose to be install to NZBC G1/AS1 and to AS/NZS 3662.

Installation - Baths

3.19 INSTALLING BATHS

Install to NZBC G1/AS1. Set firmly in cradle with required points fully supported, level and flush. Connect to supply and drainage services.

3.20 INSTALLING BATH SCREEN / DOOR

Install to NZBC F2/AS1 and NZS 4223.3 and to the product manufacturer's requirements. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Installation - Sinks

3.21 INSTALLING SINK BENCHES

Install in accordance with manufacturer's/supplier's requirements. Connect to supply and drainage services.

3.22 INSTALLING CLEANERS SINKS AND TUB UNITS

Install in accordance with manufacturer's requirements. Connect to supply and drainage services.



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Installation - Miscellaneous

3.23 INSTALLING STAINLESS STEEL FIXTURES

Carry out preparatory work and fit elements in position plumb, level, flush and rigid without stressing the attachment points in sequence. Connect to supply and drainage services.

Application - tapware

3.24 GENERAL

To AS/NZS 3500.1 and in accordance with the manufacturer's requirements. Maintain safe water temperatures to comply with NZBC G12/AS1.

Application - sanitary accessories

3.25 INSTALLING ACCESSORIES

Fit specified fittings firmly in place at required dimensions relative to floor and adjoining sanitaryware fittings, all plumb and level.

3.26 LOCATE

Locate units at heights and/or locations shown on the drawings, or as required to comply with NZBC G1/AS1. For any dimension not shown or known, request direction before proceeding.

3.27 CUTTING AND FITTING

Where cutting and fitting of the substrate is necessary for installing any unit, carry out this work before the painting or finishing of that surface. Remove any hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

3.28 INSTALLING UNITS

Install each unit in accordance with the proprietary fixture manufacturer's requirements, using the templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion

3.29 REPLACE

Replace damaged or marked elements.

3.30 PROTECTIVE COVERINGS

Leave fixtures, fittings and accessories clean and unblemished with stickers and protective coverings removed, with supply and drainage connections and all parts fully operating and working. Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following work.

3.31 REMOVE

Remove debris, unused materials and elements from the site.



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4 SELECTIONS

4.1 TOILET

Location:	All bathrooms unless otherwise specified
Toilet pan:	Refer to finishes Schedule

4.2 HAND BASIN

Location:	All Bathrooms, WC, Ensuite
Basin:	Refer to finishes Schedule
Basin taps/mixer:	Refer to finishes Schedule
Bottle Trap:	Refer to finishes Schedule

4.3 VANITY UNIT

Vanity:	By joiner
On bench basin	Refer to finishes Schedule
Vanity taps/mixer:	Refer to finishes Schedule

4.4 KITCHEN SINK BOWL

Sink bowl model:	By joiner
Mixer:	Refer to finishes Schedule

4.5 LAUNDRY & MUDROOM TUB

Location:	Mudroom
Sink model:	Refer to finishes Schedule

4.6 SHOWER

Location:	Ensuites & Guest Bathroom
Shower Mixer:	Refer to finishes Schedule
Shower Set:	Refer to finishes Schedule

4.7 BATHROOM FIXTURES

Location:	Refer drawings
Toilet Roll Holder:	Refer to finishes Schedule
Heated Towel Rail:	Refer to finishes Schedule

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7411M METALCRAFT ROOFING RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to **Metalcraft Roofing** rainwater disposal systems including gutters fascias and downpipes.

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:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
Gutter	In this section includes spouting

Documents

1.2 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Are available on the website or by contacting Metalcraft Roofing.

For technical assistance contact **Metalcraft Roofing**

Web: www.metalcraftroofing.co.nz

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years:	Failure of coating adhesion (manufacturer's standard warranty)
10 years:	Weatherproofing failure caused by material penetration as a result of corrosion (manufacturer's standard warranty)

- 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.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

3 years	For workmanship

- Provide this warranty on the installer/applicator standard form (if not available then use 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.

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Requirements

1.6 NO SUBSTITUTIONS

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

1.7 QUALIFICATIONS

Installers to be experienced competent gutter installers, familiar with the **MetalcraftRoofing** materials and the techniques specified.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide one copy of all relevant **Metalcraft Roofing** maintenance information on completion of the roofing work.

Performance

1.9 TEST - NZBC E1/AS1

Test the completed rainwater disposal system with water to ensure gutters are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in gutters. Comply with NZBC E1/AS1.

1.10 TEST - AS/NZS 3500.3 & NZBC E1/AS2

Test the completed rainwater disposal system with water to ensure gutters are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in gutters. Comply with AS/NZS 3500.3 as modified by NZBC E1/AS2.

2 PRODUCTS

Materials

2.1 GUTTERS

Complete with matching brackets with fixing screws to suit the gutter / fascia. Refer to SELECTIONS for type.

2.2 DOWNPIPES - METAL

Metalcraft metal downpipes, circular or rectangular. Refer to SELECTIONS.

Components

2.3 DROPPERS

Steel or plastic droppers, sized to fit inside the downpipe.

2.4 DOMES

Wire mesh in round form with legs to clip inside the outlet opening to the downpipe.

2.5 GUTTER MESH

Flexible plastic mesh fitted into the gutter to the mesh manufacturer's requirements.

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store 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. Avoid exposure to sunlight if strippable film is still on the product.

3.2 SUBSTRATE

Check that fascia, 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.

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3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 12 metres in length for steel gutter.

3.4 CORROSION

Separate metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

Check compatibility of metals used for rainwater goods, against the materials being used for roofing and flashings.

Application - metal

3.5 INSTALL METAL GUTTER AND FASCIA

Establish minimum falls necessary (minimum 1:500) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum. In areas where snow fall is possible and or high wind areas, the centres should be reduced to 600mm. Lap spouting joints in direction of flow, a minimum of 40mm to seal between and over the top of joint and seal with silicone sealant and fix with rivets. Ensure the joint is fixed over its full girth. Cut out neatly for and fit the pre-formed downpipe dropper and rivet and seal around the joint. All installation to Metalcraft Roofing details and NZMRM CoP recommendations.

3.6 INSTALL METAL DOWNPIPES

Form downpipes complete with offsets and shoes as needed with all joints lapped and sealed as required. Screw fix with matching pipe clips to rigidly stand plumb to the wall, and discharging into the stormwater gully or pipe inlet. All installation to Metalcraft Roofing details and NZMRM CoP recommendations, section 5.7,Outlets & Downpipes.

3.7 INSTALL RAINWATER HEADS

Install using rivets where required to detail as shown on drawings. Ensure colour matched blind aluminium rivets are used when joining metal surfaces.

3.8 INSTALL OVERFLOWS

Install as close as practical to downpipe locations, at a height allowing water to discharge to the outside and not into the building.

3.9 INSTALL PROTECTION

Fit wire mesh domes to downpipe outlets and plastic mesh to spouting to the spouting manufacturer's requirements.

Completion

3.10 REPLACE

Replace damaged or marked elements.

3.11 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.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.metalcraftroofing.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

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4.1 METALCRAFT ROOFING GUTTER SYSTEMS

Profile:	125 Swageless
Base material:	steel
BMT:	0.55mm
Coating system:	COLORSTEEL® Maxam™
Colour:	Matte Black to match roofing

4.2 METALCRAFT METAL DOWNPIPES

Profile:	Round
Size:	80mm
Material:	Steel
BMT:	0.55mm
Coating system:	COLORSTEEL® Maxam™
Colour:	Matte Black to match roofing.

4.3 RAIN CHAIN DOWNPIPE

Material:	Stainless Steel
Type	Standard chain, unpainted.

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7412AR ALLPROOF ROOF & BALCONY DRAINAGE SYSTEMS

1 GENERAL

This section relates to **Allproof Industries** roof drains and balcony drainage systems suitable for residential and commercial drainage, including multi-level balcony drainage.
It includes;

- Roof Drains - domed, flat & overflow options (Large Diameter Bronze, Small Diameter Bronze, Sureflow, Vinylrite Thick Wall, Vinylrite)
- Balcony Drains - domed, flat, overflow & Multi Level options (Allthrough, Balcony Downpipe Flange, Vinylrite Thick Wall, Vinylrite)
- Scuppers and Parapet Drains
- Rainwater Heads
- Downpipes
- Full Rainwater System, stainless steel (rainwater heads, downpipes, scuppers, pipe shrouds, soffit covers)

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:

NZMRM	New Zealand Metal Roofing Manufacturers Inc
ASA	Acrylonitrile styrene acrylate plastic

Documents

1.2 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
Plumbers, Gasfitters and Drainlayers Act 2006	

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Allproof Industries Roof and Balcony Drainage Systems Brochure
Allproof Industries Technical Details
Allproof Industries Installation Details

Manufacturer/supplier contact details

Company:	**Allproof Industries**
Web:	www.allproof.co.nz
Email:	info@allproof.co.nz
Telephone:	09 481 8020

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years	For Allproof Industries bronze balcony and roof drainage products and components
15 years	For all other Allproof Industries roof and balcony drain products For warranty conditions and details refer to Allproof Industries

- Provide this warranty on Allproof Industries Ltd standard form, obtain from Allproof Industries website .
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS WORKERS - LICENSED UNDER STATUTE

Plumbers, drainlayers / contractors to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer / plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

1.7 SITE CONFIRMATION

Meet with the territorial authority drainage inspector to confirm the drainage layout in relation to site conditions. Confirm changes resulting and seek written site instruction before carrying out any work.

1.8 SITE CONDITIONS

Before starting work check on site the drainage layout, dimensions, levels and invert levels and ensure that line, level, falls and cover are correct.

Performance

1.9 TEST

Test the completed rainwater disposal system with water to ensure balcony drainage systems are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in spoutings / drainage systems.

1.10 DESIGN - NZBC E1/AS1

Layout, falls and capacity of spouting to falls and the size and position of downpipes to comply with NZBC E1/AS1. Refer to NZMRM CoP recommendations, sections 5, Roof Drainage.

1.11 DESIGN - AS/NZS 3500.3 & NZBC E1/AS2

Layout, falls and capacity of spouting to falls and the size and position of downpipes to comply with AS/NZS 3500.3 as modified by NZBC E1/AS2. Refer to NZMRM CoP recommendations, sections 5, Roof Drainage.

2 PRODUCTS

Materials

2.1 SUREFLOW - ROOF DRAIN & OVERFLOW

Allproof Industries Sureflow roof outlets with interchangeable dome and rings. Squat compact base flange, ring and dome UV resistant ASA, various rings/grates including SS. Base manufactured from PVC with 4 x stainless steel self tapping screws. Refer to SELECTIONS for options.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Installation - general

3.2 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

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3.3 GENERAL

All work to comply with NZBC E1/AS1: Surface water, 3.0 Drainage system materials and construction and Allproof Industries Installation Details.

Installation

3.4 INSTALL SUREFLOW ROOF OUTLET

Install Allproof Sureflow roof outlets in accordance with Allproof Industries Roof & Balcony Drainage Systems Installation Details.

Installation - connection

3.5 CONNECT TO SURFACE WATER DRAIN

Connect Allproof roof and balcony drainage system to stormwater drain to the requirements and satisfaction of the network utility operator.

3.6 CLEAN

Clean and flush out the whole installation and remove all silt and debris before handing over.

Completion & Commissioning

3.7 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go t**o** www.allproof.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

Materials - roof drains, overflows, flat roof drains

4.1 ALLPROOF ROOF OUTLETS & OVERFLOWS

Location:	As drawn
Roof Drain	Allproof 80mm Bronze Roof Drain
Drain Overflow	Allproof SS Overflow and Soffit Cover

4.2 ALLPROOF - EXTERNAL DRAIN GRATE

Location:	As drawn - around level thresholds
Type/Brand:	Allproof Storm Series Stormwater Drain Cover

4.3 ALLPROOF - EXTERNAL CHANNEL DRAIN

Location:	As drawn - around level thresholds
Type/Brand:	Allproof Threaded Leg SS External Level Threshold Channel Drain

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7420 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures tapware and accessories.

Refer to 7430 DRAINAGE for underground drains.

1.2 DOCUMENTS

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

NZBC G1/AS1	Personal hygiene
NZBC G12/AS1	Water supplies
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.3 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.

Stainless steel pipe and associated fittings
PVC,PE polyethylene or polypropylene pipe including all associated fittings.

3 EXECUTION

3.1 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2, as modified by NZBC G13/AS3, and complete all tests to AS/NZS 3500.2, section15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

3.2 ELECTROLYTIC ACTION

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

3.3 EQUIPOTENTIAL BONDING METALLIC WASTE PIPES

If it is an electrical requirement, before enclosing, ensure metallic waste pipes connected to metallic drains and attached metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) similar to NZBC G12/AS1, 9.0.

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3.4 INSTALL TRAPS, WASTE AND VENT PIPES - AS/NZS 3500.2

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to AS/NZS 3500.2, as modified by NZBC G13/AS3, and jointing to PVC-U pipes to AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.5 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.6 TEST

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations,as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.7 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

4 SELECTIONS

4.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

Brand/type: By Plumber

4.2 EXPOSED PIPES AND TRAPS

Brand/type: By Plumber

4.3 FLOOR WASTES

Manufacturer: Allproof
Brand/type: TBC
Grate/finish: Tiled

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7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS

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

NZBC B1/AS1	Structure
NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC E1/VM1	Surface water
NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - sanitary plumbing
NZBC G13/AS2	Foul water - drainage
NZBC G13/AS3	Foul water - sanitary plumbing and drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3104	Specification for concrete production
NZS 3111	Method of test for water and aggregate for concrete
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4402 (set)	Method of testing soils for civil engineering purposes
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls
NZTA F2	Specification for pipe subsoil drain construction

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 CONCRETE

17.5 MPa prescribed mix to NZS 3104.

2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

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Components

2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260.

Underground PVC-U pipe to be classified as follows:

Classification:	Use:
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.4 PERFORATED PIPE - SUBSOIL DRAINAGE

Perforated corrugated coil high density polyethylene subsoil drainage pipe to AS 2439.1 with polypropylene filter sock over, for groundwater drainage.

2.5 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to AS/NZS 3500.2, 4.6 Gullies, as modified by NZBC G13/AS3.

2.6 SURFACE WATER SUMP GRATINGS

Cast iron frame with lift-up grating.

2.7 STRIP DRAIN CHANNEL

Proprietary, modular, variable invert, plastic, steel (various types), or polymer concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings.

Foul water

2.8 TRENCH BACKFILLING MATERIAL, FOUL WATER - AS/NZS 3500.2

Bedding and backfilling material to AS/NZS 3500.2, 5.4, Bedding of drains, and for concrete, if required, AS/NZS 3500.2, 5.3 Concrete Support.

Subsoil

2.9 DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Free draining crushed stone, 7 mm to 20 mm in size.

Concrete masonry retaining walls

2.10 DRAINAGE MATERIAL - SIMPLE STANDALONE CONCRETE MASONRY RETAINING WALLS

Free draining imported hardfill to the NZTA F2 specification.

Filter material comprised of clean, durable stone having a crushing resistance of not less than 100 kN when tested in accordance with NZS 3111, or a mixture of such material with clean hard sand. The filter material when tested in accordance with NZS 4402, shall comply with the following gradings:

TEST SIEVE APERTURE	PERCENTAGE PASSING
26.5mm	100
13.2mm	85-100
9.5mm	80-95
4.75mm	65-85
2.36mm	50-70
1.18mm	35-55
600µm	18-40
300µm	3-25
150µm	8 maximum
75µm	0

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Accessories

2.11 FILTER FABRIC

Polymeric fabric formed from a plastic yarn or a long chain synthetic polymer composed of at least 85% by weight of propylene, ethylene, amide, ester or vinylidene chloride. Fibres to be rot proof, chemically stable and have low water absorbency. The filter network, (woven or non-woven) must be dimensionally stable and resistant to delamination.

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3 EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.
Trenches running parallel, below and close to foundations of buildings to NZS 3604 or NZS 4229 to be separated to:

- NZBC E1/AS1, 3.9.7, Proximity of Trench to Building, for stormwater and subsoil drains.
- AS/NZS 3500.3, 6.2.8, Installation near and under buildings, as modified by NZBC E1/AS2.
- NZBC G13/AS2, 5.6, Proximity of Trench to Building, for foul water drains.

3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

3.3 FOUL WATER DRAINAGE GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2 and complete all tests to AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033.

3.4 SURFACE WATER DRAINAGE GENERALLY - E1/AS1

Carry out stormwater drainage work to NZBC E1/AS1, and complete all tests to NZBC E1/VM1, 8.0 Drain Leakage Tests.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032, AS/NZS 2566.1 and AS/NZS 2566.2. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033 and AS/NZS 2566.1.

3.5 LAY FOUL WATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.

3.6 CONSTRUCT GULLY TRAPS - AS/NZS 3500.2

Set in a minimum 100mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to AS/NZS 3500.2, section 4.6, Gullies.

3.7 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the network utility operator's stormwater system.

3.8 INSTALL STRIP DRAIN CHANNEL

Excavate trench and form site concrete base to fall. Set interlocking channel sections, sumps and accessories in place, all in accordance with the channel manufacturer's requirements. Check falls and install gratings and covers.

3.9 INSTALL SURFACE WATER SUMP

To NZBC E1/AS1 or to AS/NZS 3500.3 section 7 as modified by NZBC E1/AS2, complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.

3.10 SOAKHOLES OR TRENCHES

Dispose of stormwater on site as shown on the drawings, by soakage, to suit local geology and soil structure; all as directed by the territorial authority.

3.11 TESTING - FOUL WATER

Confirm timing before carrying out any tests. Supply potable water and apparatus needed.
Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.12 TESTING - SURFACE WATER

Confirm timing before carrying out any tests. Supply potable water and apparatus needed.
Test to NZBC E1/VM1, 8.0 Drain Leakage Tests or AS/NZS 3500.3, section 9, as modified by NZBC E1/AS2 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

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Backfilling and encasement - Foul water and surface water

3.13 CONCRETE ENCASEMENT

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

3.14 TRENCH BACKFILLING GENERALLY - FOUL WATER

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area of 75 ± 25 mm by 75 ± 25 mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

3.15 TRENCH BACKFILLING GENERALLY - SURFACE WATER - NZBC E1/AS1

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

3.16 FOUL WATER TRENCH BACKFILLING - AS/NZS 3500.2

Carry out foul water trench backfilling to AS/NZS 3500.2, 5.1, 5.2 and 5.5 as modified by NZBC G13/AS3.

PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.17 SURFACE WATER TRENCH BACKFILLING - NZBC E1/AS1

Carry out surface water trench backfilling to NZBC E1, 3.9.6 and fig. 13.

PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

Subsoil ground water drainage

3.18 FILTER FABRIC TO DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Where details require drainage material to be encapsulated in filter fabric to prevent fines from blocking the aggregate. Place fabric and carefully hold in place by pinning and/or by controlled use of aggregate as ballast. After drain installation and required backfilling, complete encapsulation with fabric. Ensure filter fabric is correctly placed, sufficiently overlapped and pinned and/or secured.

3.19 LAY PERFORATED PIPING - SUBSOIL DRAINAGE

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. Lay in straight runs to discharge into surface water drainage system. The pipe must not excessively elongate during installation. Carry drainage material up and over the pipes without disturbing them. Extend the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.20 CLEAN OUT SUBSOIL DRAIN INSTALLATION

Clean and flush out the whole subsoil drain installation and remove silt and debris before handing over.

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4 SELECTIONS

4.1 PVC-U PIPES

Brand/type: By drain layer

4.2 STRIP DRAIN

Location: Refer to A1-01
Brand/type: Allproof
Size: As detailed A4-02 & A4-04
Grate: Stainless steel Wedge Wire

4.3 PERFORATED DRAINAGE PIPING - SUBSOIL DRAINAGE

Pipe brand/type: By drain layer
Diameter: 110mm
Sock brand/type: By drain layer

4.4 DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Location: Around subsoil drain
Type: Free draining crushed stone, 7 mm to 20 mm in size

4.5 FILTER FABRIC

Brand: By drain layer
Type: geotextile

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7451AL ALLPROOF LEVEL THRESHOLD DRAINAGE SYSTEMS

1 GENERAL

This section relates to **Allproof Industries** level threshold drainage systems suitable for residential and commercial applications.
It comprises of an in-ground drainage channel complete with a range of grate options and fittings including connection to the network utility operators system.
It includes:

- Allproof Perimeter Drain
- Allproof Cantilever Bracket (CB) level threshold drainage system
- Allproof Cast-In Cantilever Bracket (CCB) level threshold drainage system
- Allproof Threaded Leg (TL) level threshold drainage system

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters

Refer to 7441 GROUNDWATER DRAINAGE for sub-soil drainage
Refer to 7461 FOUL WATER DRAINAGE for waste/foul water drainage

Documents

1.2 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC E2/AS1	External moisture
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Allproof Industries Level Threshold Brochure
Allproof Industries Level Threshold Technical Details
Allproof Industries Level Threshold Installation Details

Manufacturer/supplier contact details

Company:	**Allproof Industries**
Web:	www.allproof.co.nz
Email:	info@allproof.co.nz
Telephone:	09 481 8020

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Allproof Industries Level Threshold Drainage System components. For warranty conditions and details refer to Allproof Industries.

- Provide this warranty on Allproof Industries Ltd 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.

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Requirements

1.5 QUALIFICATIONS

Drainlayers / contractors to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.6 ORDERING REQUIREMENTS

Allow manufacturing / delivery lead time after on-site measurement for the following custom products:

- Allproof Cantilever Bracket (CB) System
- Allproof Cast-In Cantilever Bracket (CCB) System
- Allproof Threaded Leg (TL) level threshold drainage System

1.7 SITE CONFIRMATION

Meet with the territorial authority drainage inspector to confirm the drainage layout in relation to site conditions. Confirm changes resulting and seek written site instruction before carrying out any work.

1.8 SITE CONDITIONS

Before starting work check on site the drainage layout, dimensions, levels and invert levels and ensure that line, level, falls and cover are correct.

1.9 NO SUBSTITUTIONS

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

Performance

1.10 TECHNICAL APPLICATION

Refer to Allproof Industries for technical support on grate performance and engage a hydraulics engineer for hydraulic performance, run layout and scheduling, ponding analysis and information on the chemical resistance of the trench and grate materials.

1.11 COMPLIANCE WITH NZ BUILDING CODE

All work to comply with:

- NZBC E2/AS1: Level Threshold, 7.3.2.1 system materials and construction.
- NZBC E1/AS1: Surface water, 3.0 Drainage system materials and construction.

2 PRODUCTS

Materials - Allproof level threshold drainage systems

2.1 ALLPROOF CAST-IN CANTILEVER BRACKET (CCB) SYSTEM

Cast-In Cantilever Bracket (CCB) level threshold drainage system comprises of the following:

- Cantilever brackets with 5 options of grate.

Refer to SELECTIONS for grate options.

3 EXECUTION

Conditions

3.1 GROUND CONDITIONS

Specific ground conditions or contaminated ground may require an increase in the concrete surround dimensions or the addition of reinforcement.

3.2 TEMPORARY INSTALLATION

Allproof Industries level threshold drainage channels are not trafficable until fully installed. During site work and after the trench run is laid, route site traffic away from the trench. If temporary crossings are required lay base course of minimum 1 metre wide either side of the trench for protection and install temporary protective cover or timber infill for support.

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Installation

3.3 GENERAL

All work to NZBC E2/AS1: Level Threshold, 7.3.2.1 system materials and construction, AS/NZS 3500.3 as modified by NZBC E1/AS2 : and Allproof Industries Installation Details.

3.4 INSTALL ALLPROOF CAST-IN CANTILEVER BRACKET (CCB) SYSTEM - CONCRETE FINISH

Install Allproof Cast-In Cantilever Bracket (CCB) System in accordance with Allproof Industries Level Threshold Technical Details, and as follows:

- Form up base and nib of channel (105mm below finished surface of a 150mm minimum depth channel x 200mm wide) to support cast-in threshold bracket.
- Pour concrete and remove timber boxing to complete nib.
- Adjust leg height on bracket and set into channel to create a level surface with the interior floor finish / joinery.
- Install cast-in cantilever bracket to nib using masonry anchors. Provide a 12mm gap between frame and joinery.
- Pour concrete - finished slab.
- Install grate.

Installation - connection

3.5 CONNECT TO SURFACE WATER DRAIN

Connect Allproof level threshold drainage system to stormwater drain to the requirements and satisfaction of the network utility operator.

3.6 CLEAN

Clean and flush out the whole installation and remove all silt and debris before handing over.

Completion

3.7 REPLACE

Replace damaged or marked elements.

3.8 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.

3.9 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.allproof.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Materials - Allproof level threshold drainage systems

4.1 ALLPROOF CAST-IN CANTILEVER BRACKET (CCB) SYSTEM

Location:	Sliding Door Thresholds & Front Door
Manufacturer:	Allproof Industries
Grate code:	CBWW
Grate type:	Cantilever bracket with wedge wire grate
Grate width:	Variable
Grate finish:	316 stainless steel
Load rating:	A - Pedestrian (330kg nominal wheel load)

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7556E ESCEA WOOD FIRES

1 GENERAL

This section relates to the supply and installation of Escea wood fires.
It includes;

- Indoor Escea wood fires

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:

AAC	Autoclaved Aerated Concrete
NES	Resource Management (National Environmental Standards for Air Quality) Regulations 2004
ECAN	Environment Canterbury
GRC	Glass Reinforced Concrete
LEB	Low Emission Burner(to AS/NZS 4012 & AS/NZS 4013, emissions ≤ 1.5 g/kg, efficiency ≥ 65%)
CM1	ECAN Canterbury Method 1 for testing of ultra-low emission wood burners
NCC	Nelson City Council
SFAIT	Solid Fuel Appliance Installation Technician

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
AS/NZS 2918	Domestic solid fuel burning appliances-Installation
AS/NZS 4012	Domestic solid fuel burning appliances - Method for determination of power output and efficiency
AS/NZS 4013	Domestic solid fuel burning appliances - Method for determination of flue gas emission

Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NES)
ECAN Canterbury Method 1 for testing of ultra-low emission wood burners (CM1)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

- Spartherm Wood Fires product catalogue
- Spartherm Wood Fires technical information
- Spartherm Wood Fires Installation Manual
- Escea TFS650-1000 Installation Manual
- Escea TC950 Installation Manual
- Escea Outdoor Fires product catalogue
- Escea EK Series Installation Manual
- Escea EK Series Timber Cavity/AAC Heat Cell Design Guide
- Escea EK Series Concrete Cavity Design Guide
- Escea EW5000 Installation Manual
- Escea EP1350 Installation Manual

Manufacturer/supplier contact details

Company:	Escea Ltd
Web:	www.escea.com/nz www.sparthermfires.co.nz
Telephone:	0800 173 000 / 03 478 8220

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Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Escea or Spartherm products, or associated products, components or accessories listed in this section.

1.5 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved by supplier. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

Performance

1.6 COMPLIANCE WITH STANDARDS

Solid fuel-burning appliances installed to AS/NZS 2918. Where required by the regulatory authority, the appliance to comply with the requirements of AS/NZS 4012 and AS/NZS 4013 or CM1, and be fitted with a compliance plate marked 'Tested to AS/NZS 4012 and AS/NZS 4013' or 'Tested to CM1'.

1.7 DURABILITY

Solid fuel-burning appliances to be installed to comply with NZBC B2/AS1 Table C.1.1.1.

1.8 FINAL INSPECTION AND TEST

Undertake final tests to show the installation complies with AS/NZS 2918 and AS/NZS 4013, and has been tested for leakage and proved to be fully operational.

Carry out testing at the time of completion of installation. Test and demonstrate the system according to manufacturer's specification.

1.9 PRODUCER STATEMENT - INSTALLATION

Provide a producer statement by the installer in the form as required by the Building Consent Authority. The Producer Statement must verify that the design complies with AS/NZS 2918 Domestic solid fuel burning appliances - Installation, naming the installer and the person responsible for verification of the installation and for the post installation tests.

2 PRODUCTS

Indoor wood fire

2.1 ESCEA INDOOR WOOD FREESTANDING FIRE

Indoor, freestanding, glass fronted wood fire with direct vent flue system. Combustion air is directed to the firebox through double lined flue system from outside the building. Refer to SELECTIONS.

Components

2.2 ESCEA INDOOR WOOD FREESTANDING FLUE KIT CLASSIC

Freestanding twin skin flue kit, minimum length of 4.5m from fireplace to flue exit. A 250mm Ø liner extends from 100mm above the roofline to the flue cowl. Exterior face of flue kit finished in black.

2.3 ESCEA INDOOR WOOD DESIGNER FLUE SHROUD

Cylindrical perforated designer flue shroud. Refer to SELECTIONS.

2.4 ESCEA INDOOR WOOD FLUE EXTENSION

Flue extension, available in 1.2m lengths as double skin or triple skin variants. Refer to SELECTIONS.

2.5 ESCEA INDOOR WOOD FLUE OFFSET

45° flue offset, available as double skin or triple skin variants. Refer to SELECTIONS.

2.6 ESCEA INDOOR WOOD FIRE FREESTANDING BASE / PLINTH

Freestanding base plinth available in GRC or sheet metal. Refer to SELECTIONS.

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3 EXECUTION

Conditions

3.1 GENERALLY

Carry out the whole of this work to the requirements of AS/NZS 2918.

3.2 CO-ORDINATE SERVICES

Co-ordinate and co-operate with other sub-trades to avoid any conflict with the installation.

Application

3.3 HANDLE AND STORE

Handle and store units, fittings 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 according to manufacturer's instructions.

3.4 CORROSION

Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips. Provide regular maintenance of outdoor products to prevent corrosion.

Installation

3.5 SEISMIC RESTRAINT - ESCEA

Escea Wood Fires are to be securely restrained through the base of the appliance into a structural floor or base component using mechanical fixings. Fire to be installed onto a continuous base. Refer to the requisite Escea Installation Manual.

3.6 INSTALL INDOOR FREESTANDING WOOD FIRE – ESCEA

Install indoor freestanding fireplace and non-combustible floor protector with fixings in accordance with Escea installation instructions.

3.7 INSTALL SURROUNDS / FASCIAS

Install surrounds and fascias complete with necessary fittings to manufacturer's installation requirements. Refer to Escea for installation instructions.

3.8 INSTALL ESCEA INDOOR WOOD FLUE

Install indoor wood flue system with fixings and flashings in accordance with Escea installation instructions and AS/NZS 2918.

Completion & Commissioning

3.9 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go to www.escea.com/nz or www.sparthermfires.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

Indoor wood burners

4.1 ESCEA INDOOR WOOD BURNER – TFS850 FREESTANDING (LEB)

Location/type:	Freestanding
Manufacturer:	Escea
Model:	TFS850
Appliance size:	632mm height x 818mm width x 526mm depth
Flue system:	Triple skinned flue - 150mm/200mm/250mm ∅ SS Flue (quantity 2) and GAL liners (quantity 1)
Flue kit:	Escea freestanding wood fire classic flue kit

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Components

4.2 ESCEA INDOOR WOOD FIRE FREESTANDING FLUE KIT

Location/type:	Roof or chimney cap
Manufacturer:	Escea
Model:	Freestanding wood fire classic flue kit
Exhaust flue:	1200mm length x 150mm ∅ stainless steel
Intake flue:	1200mm length x 200mm ∅ black
Flue casing:	1200mm length x 250mm ∅ galvanized steel
Cowl:	325mm ∅ stainless steel anti-downdraught cowl
Casing cover:	915mm length x 150-325mm ∅ stainless steel tapered casing cover
Flue kit length:	4.5m

4.3 ESCEA INDOOR WOOD DESIGNER FLUE SHROUD

Location/type:	Roof or chimney cap
Manufacturer:	Escea
Model:	Wood fire designer flue shroud
Upper shroud:	1365mm length x 325mm ∅
Lower shroud:	1200mm length x 325mm ∅
Flue shroud finish:	Black

4.4 CHIMNEY FLUE FLASHING

Size:	To suit flue material
Material:	Dektite or similar flashing

Accessories

4.5 ESCEA INDOOR WOOD FIRE TRIPLE SKIN FLUE EXTENSION

Location/quantity:	As drawn
Manufacturer:	Escea
Model:	Triple skin flue extension 1.2m
Colour:	Stainless steel/galvanized steel
Size:	1200mm length x 150mm ∅ stainless steel flue 1200mm length x 200mm ∅ black liner 1200mm length x 250mm ∅ galvanised steel liner

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7673 SPLIT UNIT HEAT PUMP SYSTEMS

1 GENERAL

This section relates to heat pump air conditioning systems.

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:

L10 :	Centile Level, sound level that is equalled or exceeded for 10% of the time.
HFC:	Hydro-fluorocarbon
mm Hg:	mm mercury - unit of pressure
NIWA	National Institute of Water and Atmospheric Research
ASHRAE	American Society of Heating and Air Conditioning Engineers
IRHACE	Institute of Refrigeration, Heating and Air Conditioning Engineers

Documents

1.2 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 G4/AS1	Ventilation
AS 1324.2	Air filters for use in general ventilation and air conditioning - methods of test
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1571	Copper - seamless tubes for air conditioning and refrigeration
AS/NZS 2107	Acoustics - Recommended design sound levels and reverberation times for building interiors
AS/NZS 3666.1	Air handling and water systems of buildings - Microbial control - Design, installation and commissioning
AS/NZS 3823.1.1	Performance of electrical appliances - Airconditioners and heat pumps - Part 1.1: Non-ducted airconditioners and heat pumps - Testing and rating for performance
AS/NZS 3823.1.2	Performance of electrical appliances - Airconditioners and heat pumps - Part 1.2: Ducted airconditioners and air-to-air heat pumps - Testing and rating for performance
AS/NZS 3823.2	Performance of electrical appliances - Air conditioners and heat pumps - Energy labelling and minimum energy performance standard (MEPS) requirements
AS 4254.1	Ductwork for air handling systems in buildings - Flexible duct
NZS 4303	Ventilation for acceptable indoor air quality
AIRAH DA9, ASHRAE or Carrier	Manual calculation methods
ACADS-BSG Camel, Carrier E20	Electronic calculation methods

1.3 MANUFACTURER DOCUMENTS

Manufacturer documents relating to work in this section are:

Mitsubishi heat pump installation guides

Copies of the above literature are available from:

Web:	https://www.mitsubishi-electric.co.nz/
Telephone:	(03) 341 2837

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Warranties

1.4 WARRANTY - INSTALLER/APPLICATOR

Installer's warranty for the system under normal environmental and use conditions against failure.

5 years Execution warranty

Provide this warranty on the installer's standard form.

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Manufacturer's warranty for the system under normal environmental and use conditions against failure.

5 years: Warranty

Provide this warranty on the manufacturer's standard form.

Requirements

1.6 CO-ORDINATE WORK

Co-ordinate all items with the main contractor, in particular cutting of penetrations and waterproofing. Exterior penetrations to NZBC E2/AS1 as consistent with the project requirements.

1.7 DRAWINGS AND BROCHURES

Submit, on request for review drawings and brochures of units, grilles and any other elements that affect the interior finishes.

1.8 QUALIFICATIONS

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

Handling or recovering refrigerant to be carried out by the appropriate Approved Filler and/or Handler, with a test certificate under the HNSO Act.

1.9 AIR CONDITIONING LOAD CALCULATIONS

General: Calculate the cooling and heating loads using one of the following:

- Manual methods: AIRAH DA9, ASHRAE or Carrier.
- Electronic methods: ACADS-BSG Camel, or Carrier E20

1.10 AIR CONDITIONING DESIGN BASIS

General

Outside design conditions: Use outdoor design conditions listed in publications from NIWA, ASHRAE, IRHACE or other reliable sources for weather data, for the location geographically closest and most relevant to the site.

Inside design conditions

Summer: 22°C dry bulb, 50% relative humidity.
Winter: 21°C dry bulb.
Limit the temperature difference in air conditioned spaces served by the same zone or system to ± 1.5°C when measured:

- Between any 2 points in the space from floor level to 1500mm above floor level, > 2000mm from cooking equipment and > 1000mm from any other appliance.
- When outside conditions are in the range specified above.
- After the plant has been operating for one hour.
- In the same 5 minute period.

Divide the systems into temperature controlled zones to meet the specified permissible temperature variation and documented system divisions.
Where ventilation requirements are not met by natural means and do not comply with NZBC G4/AS1, supply fresh air to spaces with air conditioning systems via the air handling system, or separate mechanical ventilation system in accordance with NZS 4303.

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Heating
Reverse cycle.

Building Enclosure
Refer to drawings for construction of windows, walls, floors, roofs and insulation.

External window shading:	Type: A4-04
Internal window shading:	Type: A4-06

Noise
Indoor noise emitted - to AS/NZS 2107, depending on space served, occupancy and activity. Noise received in all habitable rooms shall not exceed that permitted by the applicable Territorial Authority for the time of day or day of the week for the zoning of the site. Not more than L10: 35dbA between 2300 and 0700 hours. This shall apply to both the property in question and the neighbouring properties.

1.11 SHOP DRAWINGS

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Provide shop drawings to show the general arrangement including, but not be limited to:

- general location and layout drawings, and installation details of units, pipes, ducts and grilles.

Submit shop drawings for review to info@architype.co.nz

- 14 working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication.

1.12 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

All units, filters, controls, pumps, traps, drain trays, refrigerant

1.13 MAINTENANCE CONTRACT PROPOSAL

Provide a proposed contract for the ongoing servicing of the heat pump system. Refer to SELECTIONS.

2 PRODUCTS

Material

2.1 REVERSE CYCLE UNITS

Split system heat pumps shall meet the requirements of AS/NZS 3823.1.1 and AS/NZS 3823.1.2 with minimum energy performance standards (MEPS) in accordance with AS/NZS 3823.2.

Provide effective outdoor coil defrost facility that prevents room temperature dropping more than 2°C during defrost.

2.2 CABINETS

Aluminium, powder coated steel or moulded acrylonitrile-butadiene-styrene (ABS) plastic with zinc - coated steel or stainless steel fasteners. Insulate and vapour seal cabinet and drain trays to prevent external condensation under all operating conditions.

2.3 DRAIN TRAYS

Aluminium, stainless steel or plastic to collect all moisture inside indoor and outdoor units.

2.4 FILTERS

Washable panel type.(85% of arrestance when tested to AS 1324.2, Test Dust No.4 or Class EU2 rated.

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2.5 COILS

Copper tube with aluminium plate fins.

2.6 CONTROLS

Provide as a minimum the following functions:

- Temperature control for each zone located to accurately sense zone temperature.
- Fan speed selection for multi and variable speed fans.
- Day/night zone changeover if scheduled.
- Time switch for each system with (6 temperature programs per day, separate programs for each day of the week, manual set point over ride and 'Vacation' or 'Holiday' temperature set back.

2.7 DUCTS

Metallic-coated sheet steel to AS 1397, coating class G2/Z275.

Flexible ducting shall be metallized fabric clamped on formed metal helix with polyester insulation blanket wrapped around duct and covered with an outer vapour barrier.

2.8 REFRIGERATION PIPEWORK KIT

Split system manufacturer's standard pre-charged piping kit.

2.9 REFRIGERATION PIPEWORK CUSTOM

Copper tubing, de-oxidised seamless refrigeration quality, either half hard or soft drawn. Jointing shall be brazed or flared connections to equipment.

2.10 REFRIGERANT

Refrigerant HFC type with no phase out date, such as R410a or R407a, unless approved otherwise.

3 EXECUTION

Conditions

3.1 DELIVERY

Keep materials and equipment dry in transit. Take delivery of materials and equipment in an undamaged condition. Reject all damaged materials.

3.2 STORAGE

Store materials and accessories on a level, firm base, in dry conditions, out of direct sunlight and completely protected from weather and damage. Ensure storage areas are away from current work areas. Cover to keep dry until installed.

3.3 CONFIRM LAYOUT

Before commencing work confirm the proposed location of pipes, ducts and controls.

3.4 CONCEALED PIPING

All refrigeration and condensate piping shall be concealed within the building structure unless stated otherwise.

3.5 CO-ORDINATE SERVICES

Co-ordinate and co-operate with other sub-trades to avoid any conflict with the installation of the system with other subcontractors work.

3.6 PROTECT SURFACES

Protect surfaces, equipment and finishes already in place from the possibility of damage during the installation process.

Application

3.7 INSTALLATION DUCTWORK

Install flexible duct as straight as possible with minimum number of bends. Maximise bend radius. Check for and rectify any crushed flexible duct.

Install and support to AS 4254.1,2.5, limit sag to < 40mm/m.

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Insulate ducts to reduce heat gain and prevent condensation. Provide continuous vapour barrier around ducts carrying conditioned air. Insulate flexible connections on ducts carrying air below ambient temperature.

Clean interior of ductwork progressively during installation.

3.8 INSTALLATION PIPE WORK

Install general pipe work to AS/NZS 1571

Purge the system at all times with dry nitrogen when brazing or heating pipework.

Pipes to be installed to manufacturer's requirements, adequately supported, also arranged and sized to prevent excessive pressure drop and ensure correct circulation of refrigerant and oil.

All refrigeration pipework test to 1800 kPa.

Insulate all refrigerant and drain piping that may sweat with chemically blown closed cell elastomeric insulation. Suction lines are to be insulated over the entire length between connections to indoor and outdoor units. Protect insulation from sunlight and mechanical damage.
Insulation thickness: 13mm for pipes < DN 20, 19mm otherwise.

Provide trapped (DN 20 condensate drains to AS/NZS 3666.1 from each indoor coil and safety tray, to an approved drain point. Provide drains from each reverse cycle outdoor coil unless casing freely drains to a roof or other location where condensate will not cause damage or pond.

3.9 INSTALLATION UNIT

Provide clearance around outdoor units for condenser air flow and maintenance access, to manufacturer's requirements. Ensure discharge air does not short-circuit to condenser intake.

For equipment at ground level, ensure they are mounted on 100mm level concrete plinth or equivalent impervious material.
Provide internal or external flexible duct connections at indoor unit.

For vibration isolation of suspended units, provide (4 metal spring or rubber-in - shear isolation mountings with (25mm static deflection and 98% isolation efficiency. For floor mounted units, provide neoprene waffle pads. Bolt in place.

If leaks or condensation from equipment could cause nuisance or damage to the building or its contents provide a galvanized steel safety tray under the equipment.

3.10 INSTALLATION REFRIGERANT

The completed system including all pipework, to be evacuated to 0.2mm Hg or better with a vacuum pump and maintained at this pressure for 2 hours, then broken with refrigerant.

Completion

3.11 COMMISSIONING

Commission the systems to manufacturer's recommendations using instruments calibrated in the last 12 months. Submit signed commissioning check list on completion.

3.12 CLEANING

Clean filters, outdoor coils, grilles and diffusers.

Remove debris, unused materials and elements from the site. Clean soiled or marked work. Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following procedures.

3.13 PROTECT

Protect new work from damage.

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4 SELECTIONS

4.1 SPLIT UNIT HEAT PUMP MANUFACTURER / MODEL

Manufacturer:	Mitsubishi electric
Indoor Unit Model:	Bulkhead - Ducted system. Or similar - client selected.

4.2 MAINTENANCE CONTRACT PROPOSAL

Contract to commence from:	Practical completion
Contract period:	1 year

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7687 ZEHNDER MVHR

1 GENERAL

This section relates to the supply and installation of Zehnder Mechanical Heat Ventilation Recovery System (MHVR).
It includes:
MHVR unit
Comfowell manifold
Filters
Flexible ducting
Housings & Valves
Condensate drain
Options Box / Comfo Connect

Documents

1.1 DOCUMENTS

Refer to 1226PS Passive House Project - Special Requirements & Criteria Schedule

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

NZBC E2/AS1	External Moisture
NZBC G4/AS1	Ventilation
NZBC G9/VM1	Electricity
AS/NZS 60335.2.80	Household and similar electrical appliances - Safety - Particular requirements for fans

Electricity (Safety) Regulations 2010 (Reprint as at 4 April 2016)

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

Zehnder ComfoAir 350 product brochure
Zehnder ComfoAir 350 PHI Certificate
Zehnder ComfoAir 350 Instruction Manual
Zehnder ComfoAir 350 Product data sheet
Zehnder ComfoAir 350 Mounting Instructions

Manufacturer/supplier contact details

Company:	Zehnder
Web:	http://www.fantechhhv.co.nz
Email:	info@fantech.co.nz
Telephone:	+64 (09) 444-6266

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years	For MHVR unit internal components

- Provide this warranty on the Zehnder 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.

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer warranty:

2 years	For installation

- Provide this warranty on the installer standard form.

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- 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 CO-ORDINATE WORK

Co-ordinate all items with the main contractor, in particular cutting of penetrations and waterproofing. Exterior penetrations to NZBC E2/AS1 as consistent with the project requirements.

1.6 QUALIFICATIONS

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

1.7 NO SUBSTITUTIONS

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

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1234 DOCUMENTATION for provision of the following general operation and maintenance information as electronic PDF format documents:

Operation Manual

Provide this information prior to practical completion.

Performance

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Commissioning Data
- Manufacturer's, importers or distributor's warranty
- Installer's warranty
- Other information required by the BCA in the Building Consent Approval documents.

1.10 ELECTRICAL WORK

Comply with Electricity (Safety) Regulations 2010, NZBC G9/VM1 Electricity, 1.0 Electrical installation, New Zealand Electrical Codes of Practice and AS/NZS 60335.2.80 Household and similar electrical appliances - Safety - Particular requirements for fans.

2 PRODUCTS

2.1 ZEHNDER COMFOAIR UNIT

Zehnder Comfoair Q350

Components

2.2 FILTERS

Zehnder heat recovery core filters

2.3 FLEXIBLE DUCTING

Zehnder Comfotube 90mm flexible HDPE ducting

2.4 LOW PROFILE DUCTING

Zehnder Flat 51 low profile HDPE ducting

2.5 MANIFOLDS

Zehnder ComfoWell manifolds

2.6 DRAIN

HEPvO 40mm Hygienic Self Sealing Waste Valve

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2.7 SYSTEM CONTROLLER

Zehnder ComfoConnect Wifi Controller

2.8 OUTLET VALVES

Zehnder Luna Return / Supply valves

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

Take delivery of MHRV system components and store on site under cover in an enclosed space, on a flat, even and level surface, and protect it from damage and contamination.
Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with HomeTech™ requirements.
Reject and replace goods that are damaged or will not provide the required finish.

3.2 CONFIRM LAYOUT

Before commencing work confirm the proposed location of MHVR unit, housings, valves, ducts, condensate drains and controls.

Installation - General

3.3 PROTECT SURFACES

Protect surfaces, equipment and finishes already in place from the possibility of damage during the installation process.

3.4 CONCEALED DUCTING

Ensure that all ducting is concealed within the thermal envelop unless stated otherwise.

3.5 CO-ORDINATE SERVICES

Co-ordinate and co-operate with other sub-trades to avoid any conflict with the installation of the MVHR system components, associated electrical and plumbing services, with other subcontractors work.

3.6 ELECTRICAL WORK

All electrical wiring to be carried out by a qualified electrician in accordance with Electricity (Safety) Regulations 2010, NZBC G9/VM1 Electricity, 1.0 Electrical installations, New Zealand Electrical Codes of Practice and AS/NZS 60335.2.80 Household and similar electrical appliances - Safety - Particular requirements for fans.

Installation - MHVR system

3.7 INSTALLATION MHVR SYSTEM

Install MHVR system in accordance with Zehnder requirements and specifications, and as follows:

- Install housings as per architectural drawings.
- Ensure MHVR unit is securely fastened to the supporting structure by the hanger kit.
- Install fresh air and exhaust ducts ensure a minimum of 2m separation between fresh air and exhaust cowls.
- Install 90mm diameter flexible ducting between outlets with a minimum of sharp bends.

3.8 BOOST SWITCHES

Locate boost switches as shown on ventilation setout plans.

Completion

3.9 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused and temporary materials and elements from the site.

3.10 CLEANING

Clean filters, grilles and fans.

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Remove debris, unused materials and elements from the site. Clean soiled or marked work. Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following procedures.

3.11 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

Commissioning

3.12 COMMISSIONING

Commission the system to MVHR ventilation requirements & protocal sheet

Testing

3.13 TESTING

Carry out all necessary testing in accordance with Zehnder requirements.

4 SELECTIONS

For further details on selections go to www.fantech.co.nz or www.zehnder.co.uk
Substitutions are not permitted to the following, unless stated otherwise.

4.1 MVHR UNIT

Location:	Refer Architectural drawings A1-10 / A1-11 - One unit per side of the house.
Supplier:	Fantech NZ
Brand:	Zehnder
Model:	ComfoAir Q350
System Controller:	Zehnder App / In-unit control panel

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7701 ELECTRICAL

1 GENERAL

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

- power
- lighting
- electrical automation
- complete with componentry
- electrically-powered fittings

1.1 RELATED WORK

Refer to 7673 SPLIT UNIT HEAT PUMP SYSTEMS for heatpump installation.

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:

CFL	compact fluorescent lamp
ELV	extra low voltage
GLS	general lighting service
IP	international (ingress) protection classification
LCD	liquid crystal display
LED	light emitting diode
MCB	miniature circuit breaker
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
RCBO	residual current-operated circuit breaker with over current protection
RCCB	residual current-operated circuit breakers
RCD	residual current device
SIA	security integration architecture
TPS	tough plastic sheathed
TCF	Telecommunications Carriers' Forum

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 F6/AS1	Visibility in escape routes
NZBC F7/AS1	Warning systems
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)

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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 3100	Approval and test specification-general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
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 4514	Interconnected smoke alarms for houses
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60598.2.2:2001	Luminaires - Particular requirements - Recessed luminaires
IEC 61643	Components for low voltage surge protection devices

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

Warranties

1.4 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:	Warranty period

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 COMPLY

Comply with the Electricity (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 QUALIFICATIONS - SECURITY SYSTEM

Installation by an installer licensed under the Private Investigators and Security Guards Act. Installation of all security equipment to comply with AS/NZS 2201.1 Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance.

1.8 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.

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1.9 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.

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2 PRODUCTS

2.1 MAINS SUPPLY, SINGLE PHASE

Tough plastic sheathed neutral screened cable to AS/NZS 4961 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 1.0mm², 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 MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm² on 16 amp MCBs
Power circuits:	2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm² on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm² on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that 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 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 RCCBs' meet Type A and comply with AS/NZS 3190. MCBs to 4.5kA or 6kA rated.

2.6 WALL BOXES

Standard grid size or equivalent to be manufactured from plastic or metal, with 2 or more gang size to be metal with steel inserts for accessory securing screws. Screw fixed.

2.7 SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 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 and 2 way units.

2.8 HOT WATER SYSTEM SWITCH

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

2.9 SWITCHED SOCKET UNITS

10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to AS/NZS 3100, AS/NZS 3112 and AS/NZS 3113, single or multi gang as detailed.

2.10 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.

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2.11 SURGE PROTECTION

Protection for the homes appliances with IEC 61643 Class ll surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class lll surge protection to switched socket outlets.

2.12 CEILING ROSES

White plastic mounting base with screwed cover, manufactured to AS/NZS 3113. Terminal type. Cylindrical section TPS for suspended fittings.

2.13 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.14 DOOR BELL SYSTEM

Complete with transformer for mounting on distribution board.

2.15 LIGHT FITTINGS

Fluorescent and High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 230v rated, bayonet cap; Fluorescent triphosphor 2700K; CFL; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.

2.16 HEATED TOWEL RAILS

Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with AS/NZS 3350.1, scratch resistant powdercoated or chrome finish.

2.17 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.

Security system

2.18 CONTROL PANEL

Control panel system with a minimum of one installer code, one master code, 6 zones minimum and 6 user codes. The installer to select codes to suit installation.

2.19 DETECTORS

There are two main types of detectors:

- Standard passive infrared sensors: Install in stable environments with no wind flow and no direct bright sunlight.
- Passive infrared/ microwave sensors: Install in area where environmental stability is an issue.

2.20 AUDIBLE DEVICES

Internal sirens can be either a 12V Piezo Siren or a Horn speaker with a sound pressure level of no less than 95dB.

External siren can be either a stainless steel design or have hardened plastic casing. Both designs to be fully weatherproof but not limited to IP66 Rating. The siren box to contain a strobe diffuser in either blue or red. The siren shall contain a horn speaker, 12v speaker or an electronic siren. The external siren box to have both a cover and rear wall tamper mechanism.

2.21 CABLING

Security alarm wiring to NZS/AS 1125 for cables.

Security alarm wiring to be multi stranded and not single stranded, minimum 0.5mm².

2.22 PERIPHERALS

Fit anti-tamper devices to detectors, control panels and equipment housings, programmed to give a tamper indication when the system is unset and a tamper alarm when the system is set.

Standard keypad manufactured of moulded hardened plastic with either a LED or LCD screen, to match the style of the wiring accessories in diameter, colour and aesthetics.

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2.23 COMMUNICATIONS

Digital dialler to be built into the PCB of all control panels, with the options for both monitoring and remote dial in windows based software. Digital dialler to comply with all the industry standard communication formats including contact I.D and SIA, and NZ Telepermit certification.

Remote software able to upload / download programming changes and or history events and change status of the security alarm with the ability to be turned off if required.

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3 EXECUTION

3.1 MAIN SUPPLY

Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.

3.2 METER BOX

Fit to meter box manufacturer's and Electricity Retailer's requirements. Recess into external wall in sheltered area and flash to weatherproof to NZBC E2/AS1 fig 69. Arrange for meter installation and connection.

3.3 DISTRIBUTION BOARD

Fit to AS/NZS 3000 and board manufacturer's requirements. 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 and server rack, to AS/NZS 3000, the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.

3.6 MAIN EARTH

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

3.7 EARTH LEAKAGE PROTECTION

Install RCD protection to AS/NZS 3000.

3.8 RCD - 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 RCD - SPECIFIC INSTALLATIONS

Install 30mA RCDs at the distribution board.
Install fixed wired RCD protected outlets (SRCD) in the following areas:

- 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. work-shops, garages.

3.10 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. 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. 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

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Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw 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, all sockets to the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units:	1000mm above finished floor
Socket Units:	Refer to Architect's Electrical Layout Drawings

Mount light switches and switch socket outlets vertically and socket units horizontally. Label all switch units that control electrical equipment or special lighting circuits by colour filled engraving on the switch. Use proprietary engraved switch mechanisms where applicable.

3.15 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

3.16 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.

3.17 EXTRA LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer's requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

3.18 ELECTRIC HOT WATER SYSTEM

Wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

3.19 SMOKE ALARMS

Install Type 1 domestic smoke alarm system to NZBC F7/AS1 3.0 **Domestic smoke alarms**, NZS 4514 and to the alarm manufacturer's requirements. Fit neatly and without damage to the surrounding finish.

3.20 SURGE PROTECTION

Install surge protection devices to manufacturer's requirements and in accordance with AS/NZS 3000 and AS/NZS 1768. When fitting IEC 61643 Class ll protection at the switchboard, protect the device by a dedicated MCB.

3.21 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.

3.22 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturers requirements and installed in accordance with AS/NZS 3000 and the NZBC G9/AS1
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.

3.23 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer's recommendations:

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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 manufacturer's 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.

3.24 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

Security system

3.25 SECURITY SYSTEM

Install to the system manufacturer's requirements, control panel, detectors and associated equipment fitted neatly and without damage to surrounding finishes. Installation of security equipment to AS/NZS 2201.1 Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance. All 230v mains power connections to the security panel are to be in accordance with AS/NZS 3000. The 230V power is to be switched using a dedicated single gang Isolator switch or similar.

Completion

3.26 COMPLETION

Leave installation operating correctly, with equipment clean and operational.

4 SELECTIONS

Materials

4.1 SELECTIONS - FITTINGS AND HARDWARE

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

4.2 DISTRIBUTION BOARD

Location:	Refer A1-05
Brand / type:	Client selected
MCB:	Client selected
RCCB:	Client selected
Client selected	Client selected
Surge protectors:	Client selected
Modular contactors:	Client selected
Main switch:	Client selected

4.3 SECURITY SYSTEM

Location	Brand / type	Detector
TBC	TBC	

Outlets - fittings

4.4 INTERIOR OUTLETS

or Item	Brand / type
Switch / socket outlets:	Refer to finishes schedule
Coverplate colour:	Refer to finishes schedule
Switch module colour:	Refer to finishes schedule

Item - RCD	Brand / type
Socket outlet:	Refer to finishes schedule

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4.5 SMOKE ALARMS

Location:	Refer A1-05
Brand / type:	Cavius wired interlinked or Client selected

4.6 EXTERIOR SWITCHES AND SOCKETS

Item	**Brand / type**
Weatherproof socket outlets:	Refer to finishes schedule

4.7 EXTERNAL LIGHT FITTINGS

Fitting	**Brand / type**
Recessed lights:	Refer to finishes schedule
Wall mounted:	Refer to finishes schedule

4.8 FEATURE LIGHT FITTING

Item	**Brand/ Type**
Dining	Refer to finishes schedule
Kitchen	Refer to finishes schedule

4.9 ELECTRICAL APPLIANCES

Item	**Brand / type**
Wall oven:	Client supplied
Cooker top/hob:	Client supplied
Range hood:	Client supplied
Solar Panels:	Client supplied

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