New Residence

Project Specification

2 Grand Terrace Square, Millfarm, Arrowtown, New Zealand

Project Ref: 6688
Date: 23 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:	Sumich Chaplin Architects
Postal Address:	~
Street Address:	6 Roxburgh Street, Newmarket
City:	Auckland
Telephone:	+ 64 9 522 1286
Email:	info@sumichchaplin.com

1.2 DOCUMENT DETAILS

Project Name:	Crang
Project Number:	6688
File Reference:	~
Client:	Joanne and Vaughan Crang
Client Contact:	~
Version:	~

1.3 REVISION CONTROL

Issue:	Outline / Developed Design / Building Consent / Construction / As Built
Revision:	~
Amendment Details:	~
Issued to:	~
Date of Issue:	~
Reviewed by:	~
Approved by:	~

1.4 AUDIT CONTROL

Date:	~
Author:	~
Approved by:	~

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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

~

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:

~

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 single house with internal garage.
As shown on drawing: A1.01, A1.02, A1.03, A1.04, A1.05

1.8 LEGAL DESCRIPTION

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

1.9 SITE FEATURES

~

Site environment - Durability

1.10 EXPOSURE ZONE

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

The site zone is: B (Low)

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Site environment - Wind

1.11 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	~ (refer to NZS 3604, table 5.4) Very High/1.55kPa 50 m/s

Site environment - Seismic

1.12 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

1.13 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: -
~



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1222 PROJECT PERSONNEL

1 GENERAL

This general section provides a list of the parties who are involved with the project. Communications to these personnel are to be sent to them at the address as listed. Refer to the construction contract for:

- the roles that they have under the contract; and
- address details for notices being given under the contract.

Principal

1.1 PRINCIPAL

Name:	The Crang Family Trust
Postal:	~
Street:	2 Grand Terrace Square, Millbrook
Telephone:	~
Represented by:	Vaughan Crang
Mobile:	021 910411
Email:	Vaughan@crangcivil.co.nz

Contractor

1.2 COMPANY

Name:	~
Postal:	~
Street:	~
Telephone:	~
Represented by:	~
Mobile:	~
Email:	~

1.3 CONTRACT MANAGER

Person:	~
Mobile:	~
Telephone:	~
Email:	~

1.4 SITE FOREMAN

Person:	~
Mobile:	~
Telephone:	~
Email:	~

Consultants

1.5 CONTRACT ADMINISTRATOR

Practice:	~
Postal:	~
Street:	~
Telephone:	~
Represented by:	~
Mobile:	~
Email:	~

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1.6 ARCHITECT

Practice:	Sumich Chaplin Architects
Postal:	~
Street:	6 Roxburgh Street, Newmarket, Auckland
Telephone:	+64 9 520 8037
Represented by:	Yuchung Chang
Mobile:	+64 21 523 533
Email:	yuchung@sumichchaplin.com

1.7 LANDSCAPE DESIGNER

Practice:	Suzanne Turley Landscapes
Postal:	~
Street:	~
Telephone:	+6495213559
Represented by:	Ermanno
Mobile:	+64220287642
E-mail:	Ermanno@suzanneturley.co.nz

1.8 STRUCTURAL ENGINEER

Practice:	Envelope Structural
Postal:	~
Street:	31B Drake Street (inside Victoria Park Market), Auckland Central 1010
Telephone:	
Represented by:	Andrew Thompson
Mobile:	+64 27 234 1107
Email:	andrew.thompson@envelope-eng.co.nz

Territorial Authority

1.9 BUILDING CONSENT AUTHORITY

Name:	~
Postal:	~
Street:	~
Telephone:	~
Mobile:	~
Email:	~

1.10 BUILDING CERTIFIER

Name:	~
Postal:	~
Street:	~
Telephone:	~
Represented by:	~
Mobile:	~
E-mail:	~

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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
1237S1 Schedule of Warranties
1238S1 Schedule of As Built Documentation
1278SR Schedule Of Slip Resistance Testing

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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.

2 SELECTIONS

2.1 SHOP DRAWING FORMAT

Submit the shop drawings in the following format

	Format/Size
Hardcopy	~
Electronic copy	PDF
CAD file	DWG



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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:

3811	Prefabricated Structural Timber Framing
4531	Steel Windows & Doors
4554	Skylights
4911	Steel Metalwork
4933	Aluminium Metalwork
5231	Interior Doors & Windows
7545	Underfloor Heating

1.3 SHOP DRAWINGS - ADDITIONAL ITEMS

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

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1237 WARRANTIES

1 GENERAL

This general section refers to the requirements for warranties/guarantees, referred to within this specification and referred to within separate specifications/documents relating to this project. It includes:

- Warranties for parts of the work required by the principal in a required form
- Installer/applicator warranties for parts of the work in the installer's/applicator's standard form
- Manufacturer/supplier warranties provided with products, appliances and the like in the manufacturer's/supplier's standard form
- Guarantees provided by contractor in the contractor's standard form

These guarantees/warranties are in addition to any warranties, implied warranties, or guarantees that are required by the Building Act, the Building Regulations, or the building consent.

1.1 SCHEDULE SECTION

Refer to 1237S1 SCHEDULE OF WARRANTIES for work sections contained in this specification that have requirements for warranties.

Warranties

1.2 PROVIDE WARRANTIES

Provide executed warranties in favour of the principal in respect of, but not limited to, materials, components, service, application, installation and finishing called for in that specified section of work. The terms and conditions of the warranty in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability under the terms of the warranty called for in that specified section of work.

- Conform to the WARRANTY AGREEMENT form included in the specification/conditions of contract.
- Commence warranties from the date of practical completion of the contract works (unless otherwise stated).
- Maintain their effectiveness for the times stated.
- Provide executed warranties prior to practical completion.

1.3 WARRANTIES - INSTALLER/APPLICATOR

Where installer/applicator warranties are offered covering execution and materials of proprietary products or complete installations, provide such warranties to the contract administrator. These warranties may be provided in lieu of the warranties that are otherwise required provided that these warranties are subject to similar conditions and periods.

Provide warranties in favour of the principal. The terms and conditions of such warranties in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

1.4 WARRANTIES - MANUFACTURER/SUPPLIER

Where warranties are offered covering materials, equipment, appliances or proprietary products, provide all such warranties to the contract administrator.

Provide warranties in favour of the principal. The terms and conditions of such warranties in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

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Submission

1.5 REVIEW BY CONTRACTOR

Obtain the warranties from the installers, applicators, manufacturers and suppliers at the earliest possible date and review to ensure that they are correctly filled out and executed. Where warranties are executed as a deed, ensure that a duplicate copy is provided for execution by the owner/principal. Keep safe and secure until required for submission.

1.6 WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY

Obtain copies of warranties required as a condition of the building consent in the form required for submission to the BCA. Keep safe and secure until required at the time of the BCA final inspection and Code Compliance Certificate.

1.7 WARRANTIES - REQUIRED BY CONTRACT

Obtain copies of warranties listed in the contract documents. Provide all warranties at the same time. If the project has an operations and maintenance documentation provision, present the warranties with the operations and maintenance information. If no operations and maintenance documentation provision exists, present the warranties to the contract administrator in a loose-leaf binder with a contents index suitably labelled and including the project name and details. Provide a title on the binder edge "Warranties for (project name)"

1.8 WARRANTIES - SUBMISSION NZIA SCC CONTRACT

Refer to the contract conditions for any requirement relating to the time for submission for warranties and guarantees. Submit all warranties to the architect no later than the date of the contractor's advice of achieving practical completion.

2 SELECTIONS

Project warranties / guarantees

Guarantees - Contractor - Master Build Services Ltd

2.1 MASTER BUILD SERVICES LTD - 10 YEAR GUARANTEE

Provide a 10 Year Guarantee, include all costs of the building in the contract price. Complete the guarantee application form, obtaining all required signatures (registered master builder and owner/s). Send the completed form to Master Build Services for approval along with a copy of the building contract (include a full scope of work for any addition/alteration work), prior to any work commencing. Obtain written confirmation from Master Build Services and provide this to the owner along with the guarantee document. On completion of the building work complete the notice of practical completion form, obtain all required signatures (registered master builder and owner/s) and send the form to Master Build Services.

Weathertightness and watertightness warranty

2.2 WEATHERTIGHTNESS AND WATERTIGHTNESS WARRANTY

A warranty is required from the contractor for a minimum period of 2 years, covering the weathertightness of the complete building envelope and the watertightness of all liquid supply and disposal systems and fittings. This general warranty is in addition to any specific warranties required.

Provide this warranty in favour of the principal. The terms and conditions of this warranty in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

- Conform to the standard form WARRANTY AGREEMENT included in the contract documents.
- Commence the warranty from the date of Practical Completion.
- Maintain its effectiveness for the time stated.

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1237S1 SCHEDULE OF WARRANTIES

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1237 WARRANTIES
- Identified Work Sections

Warranties

1.2 WARRANTIES

Refer to the following sections:

4121	Liquid Applied Tanking
4121SB	Sika Blackseal Elastic
4131	Sheet Tanking
4131AL	Allco Volclay Tanking
4221CV	RK ITI Vertical Weatherboards
4239JH	James Hardie® Soffits
4271	Natural Stone Veneer Cladding
4282SR	Sto Masonry Plaster Systems
4311	Profiled Metal Roofing
4381	Deck Support System
4422NT	Nuraply TPO Roof & Deck Membrane
4511	Exterior Timber Windows & Doors
4531	Steel Windows & Doors
4554	Skylights
4610	Glazing Residential
4611	Glazing Exterior
4612	Glazing Interior
4711T	Terra Lana Natural Wool Insulation
4811	Sealants
5438H	James Hardie® Fibre Cement Secura™ Flooring
5511	Joinery & Cabinetry Fixtures
6211	Wall Tiling Systems
6221	Floor Tiling Systems
6311	Timber Strip, Block & Plank Flooring
6700	Painting General
6711	Painting Exterior
6721	Painting Interior
7123	Hot & Cold Water System
7150	Sanitary Fixtures, Tapware & Accessories.
7221	Gas Appliances
7352	Type 1 Domestic Smoke Alarm Systems
7411	Rainwater Spouting Systems
7412AR	Allproof Roof & Balcony Drainage Systems
7421AI	Allproof Interior Floor Waste Systems
7545	Underfloor Heating
7552W	Warmup Floor Heating Systems
7556W	Rinnai Warmington Solid Fuel Fires
7701	Electrical Basic
7765	Electric Vehicle (EV) Charging Stations

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1.3 PROJECT WARRANTIES

Refer to section 1237 WARRANTIES for project warranties.

1.4 WARRANTIES - ADDITIONAL ITEMS

Refer to separate documentation for warranties not contained within this specification.



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1238 AS BUILT DOCUMENTATION

1 GENERAL

This general section relates to common requirements for the preparation, submission and review of as built documentation referred to within this specification and referred to within separate specifications/documents relating to this project. Detailed requirements for as built documentation for particular parts of the work may be included in specific work sections.

1.1 SCHEDULE SECTION

Refer to 1238S1 SCHEDULE OF AS BUILT DOCUMENTATION for work sections contained in this specification that have requirements for as built documentation.

1.2 AS BUILT DOCUMENT REQUIREMENTS

Where requirements for the as built documents and records are not stated in a specific section, they shall include:

As built drawings recording:

- The actual positions as constructed of all sewer, stormwater, sanitary plumbing, piped and ducted services, electrical and mechanical services.
- Inverts and locations of services at key points within the building and at the property lines.
- Dimension services in relation to the structure and building grid lines.
- Ductwork, piping, conduit and equipment, including such items provided for future use.
- Depth of various elements of foundations in relationship to the ground floor level
- Field changes of dimensions
- Other significant deviations and changes which are concealed in construction and cannot be identified by visual inspection
- Access doors and panels

Records of:

- Products and materials selected for alternatives specified
- Approved substitutions and accepted alternatives
- Other approved changes and deviations to items specified.

1.3 PROVISIONAL AS BUILT DOCUMENTS

Prior to practical completion provide provisional/draft as built documents in sufficient detail to allow the principal to operate, maintain, adjust and re-assemble the contract works and to allow for review by the reviewer. Where no named reviewer has been nominated, submit the as built documentation to the contract administrator. Submit in hard copy and electronic form.

1.4 AS BUILT DOCUMENT REVIEW

As built document review indicates only that the reviewer is satisfied that the documents are legible. The review is not a check of the accuracy or completeness of the documents, however the reviewer may comment on any aspect of the documentation and require the documents to be revised and resubmitted. Review of as built documents does not relieve the contractor of responsibility for their correctness.

Where no time is stated in a specific section, allow 10 working days for review by the reviewer. Where a large amount of documentation is involved more time will be necessary.

1.5 COMPLETE AS BUILT DOCUMENTS

Prior to the end of the defects notification/liability period, provide complete as built documents reflecting any review requirements, with all Information of good quality and properly titled, numbered, cross-referenced and dated. Provide documents in sufficient detail to allow the principal to operate, maintain, adjust and re-assemble the contract works. Submit in hard copy and electronic form to the contract administrator.

1.6 AS BUILT DOCUMENTS - ELECTRONIC COPY

Provide an electronic copy of the as built documents in the following format:

Drawings:	PDF format (in addition provide DWG files if available)
Other documents:	PDF format

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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:

7421AI	Allproof Interior Floor Waste Systems
7545	Underfloor Heating

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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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:

6141	Ground, Sealed or Polished Concrete
6221	Floor Tiling Systems

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
Contaminated walking surfaces	R~	Obtain classification from the oil-wet inclining platform test method of AS 4586, Appendix D

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°

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0.557	1 in 8	7.125°

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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3811 PREFABRICATED STRUCTURAL TIMBER FRAMING

1 GENERAL

This section relates to the manufacture, supply and erection, of prefabricated:

- timber trusses
- timber frames

1.1 RELATED WORK

Refer to 3821 TIMBER FRAMING for general timber framing and installation of prefabricated timber framing.

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:

FSC	Forest Stewardship Council
FTMA	Frame and Truss Manufacturers Association of New Zealand Inc.
PEFC	Programme for the Endorsement of Forest Certification
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 B1/VM1	Structural design of buildings
NZBC B2/AS1	Durability provisions for building elements
AS/NZS 1170	Structural Design Actions
NZS 1170.5	Structural Design Actions - Earthquake actions - New Zealand
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

~

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

Requirements

1.5 QUALIFICATIONS

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

Fabrication companies to be members of the FTMA and accredited by the connector plate manufacturers.

1.6 DESIGN CRITERIA NON-SPECIFIC DESIGN

Frames and trusses to NZS 3604.

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1.7 DESIGN CRITERIA SED

Frames and trusses to, NZBC B1/VM1, AS/NZS 1170, NZS 1170.5 and NZS 3603.

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:
~

If requested provide the following additional information:
~

Submit shop drawings for review to ~.

- ~ working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication and/or installation.

1.9 SPECIFIC DESIGN

Obtain Manufacturer/Supplier specific design for:
Prefabricated trusses

Specific design documentation including, but not be limited to:
Producer Statement - Design (PS1)
Fabricator Design Statement and supporting drawings

Submit specific design documentation for review to contract administrator ~ prior to ~

1.10 MANUFACTURING STATEMENT - PREFABRICATED TRUSSES

Provide a statement to support the manufacture of the roof trusses, issued by a fabricator after manufacture has occurred and identifying:

- The job/design reference name or number
- The site address/location
- The name and contact details of the accredited fabricator
- The name of the software/nail plate manufacturer that has accredited the fabricator
- That the trusses were manufactured in accordance with the Fabricator Design Statement
- The name and position within the company of the person providing the statement

1.11 IDENTIFICATION OF TRUSSES ON SITE

A selection of trusses in a job lot manufactured by a fabricator shall carry identification labels or markings fitted during manufacture, to NZS 3604, 10.2.2.5, **Truss identification**.

Identification shall be evident on the bottom chords of main rafter or girder trusses on a minimum of 6 trusses in a job lot, or on every truss where there are less than 6 trusses in the job lot.

Identification text shall be a minimum of 10mm high and shall include:

- The fabricator name
- The nail-plate manufacturer name
- The job/design reference name or number

2 PRODUCTS

Materials

2.1 TRUSSES NOT EXPOSED

Structural grade timber to NZS 3602, NZBC B2/AS1, gauged, maximum moisture content of 20%, treated to NZS 3640, NZBC B2/AS1, hazard class H1.2 and identified with its unique identifier.

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2.2 TRUSSES EXPOSED

Timber bandsawn/dry dressed and identified with its unique identifier. Treatment to suit species and location, to NZS 3602, NZBC B2/AS1, refer SELECTIONS.

2.3 FRAMES NOT EXPOSED

Structural grade timber to NZS 3602, NZBC B2/AS1, gauged, maximum moisture content of 20%, treated to NZS 3640, NZBC B2/AS1, hazard class H1.2 and identified with its unique identifier.

2.4 FRAMES EXPOSED

Timber bandsawn/dry dressed and identified with its unique identifier. Treatment to suit species and location, to NZS 3602, NZBC B2/AS1, refer SELECTIONS.

Accessories

2.5 STEEL CONNECTOR PLATES

0.8mm to 2.0mm thick steel sheet, hot-dip galvanized to NZS 3604, table 4.2, **Galvanizing of steel components other than nails and screws** and punched to form a toothed connector or nail on connector.

2.6 GALVANIZED STRUCTURAL BRACKETS

>3mm thick steel plate brackets, hot-dip galvanized to NZS 3604, table 4.2, **Galvanizing of steel components other than nails and screws** with hot-dip galvanised bolts/screws and washers.

2.7 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).

3 EXECUTION

Conditions

3.1 COMPLY

Comply with current standards, code requirements and the FTMA CoP in the design and fabrication of trusses and frames.

3.2 DELIVER, HANDLE AND STORE TRUSSES AND FRAMES

Deliver, handle and store frames and trusses so no structural damage occurs, corners and edges are not damaged, or surfaces marked or stained. Follow manufacturer's requirements. Handle all frames and trusses with nylon strops or similar to prevent damage. Store under cover and clear of the ground, to keep dry prior to installation.

Fabrication

3.3 DIMENSIONS, NOT EXPOSED ELEMENTS

Each member calculated length ±3mm. Width and thickness to gauging tolerances. Each overall joint within ±3mm of correct outside profile (including camber allowance).

3.4 DIMENSIONS, EXPOSED ELEMENTS

Each member calculated length ±1mm width and thickness to gauging tolerances. Each overall joint within ±3mm of correct outside profile (including camber allowance). Joint thickness and width difference between members 1mm maximum. Plate location within half of the manufacturer's tolerances plus a rotation of no more than 1mm in 100mm off reference line.

3.5 INSPECTION

Request inspection when timber for exposed trusses and frames is ready for cutting prior to fabrication.

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3.6 FABRICATION

Factory fabricate to FTMA CoP. Build camber into all elements to accommodate normal deflection under load. Lay up members accurately with all joints tight fitting. Mechanically press plates to manufacturer's tolerances, fully and flat over their whole area into the members forming the joint.

3.7 TRUSS AND FRAME FIXINGS

Factory fit truss and frame fixings to comply with the required loading capacity for that particular joint and in accordance with the fixing type and capacity in NZS 3604, Section 10, **Roof framing**, the manufacturer's requirements or to engineering specific design. Ensure all elements are correctly located, plumb and true to line and face.

Site installation

3.8 TRUSS ERECTION

Lift, place and fix trusses without overstressing or deformation. Use temporary supports as needed without causing damage. Fix trusses to wall plates and beams to manufacturer's requirements, but no less than NZS 3604, section 10, **Roof framing** and in particular section 10.2.2, **Roof trusses**. Fit and fix bracing as detailed and to NZS 3604: section 10.2.2, **Roof trusses** and section 10.3, **Systems to resist horizontal loads**. Ensure all trusses are correctly located, plumb and true to line and face.

3.9 FRAME ERECTION

Lift, place and fix frames without overstressing or deformation. Use temporary bracing and supports as needed without causing damage. Fix frames to floor or base plates and other walls or columns to manufacturer's requirements, but no less than NZS 3604, section 8, **Walls** and in particular section 8.7, **Plates**. Fit and fix bracing as detailed and to NZS 3604: section 5, **Bracing design** and section 8.3, **Systems to resist horizontal loads**. When necessary provide framing to suit any required cladding/lining control joints. Ensure all frames are correctly located, plumb and true to line and face.

3.10 FIT CONNECTORS AND FIXINGS - TRUSS

Fit connectors and fixings to obtain full bearing over all contact surfaces and ensure the required loading capacity for the truss and frame roof is maintained. Fix each roof framing member in accordance with NZS 3604, Section 10, **Roof framing.** Ensure the size, number and location of nails to be used in roof framing comply with requirements of Table 10.8, **Nailing schedule for hand-driven and power-driven nails**, the manufacturer's requirements or to engineering specific design. Ensure all elements are correctly located, plumb and true to line and face.

3.11 FIT CONNECTORS AND FIXINGS - FRAMES

Fit connectors and fixings to obtain full bearing over all contact surfaces and ensure the required loading capacity for the frame is maintained. Fix each framing member in accordance with NZS 3604, Section 8, **Walls.** Ensure the size, number and location of nails to be used in framing comply with requirements of Table 8.19, **Nailing schedule for hand-driven and power-driven nails**, the manufacturer's requirements or to engineering specific design. Ensure all elements are correctly located, plumb and true to line and face.

3.12 ROOF BRACING

Refer to 3821 TIMBER FRAMING for roof bracing of trussed roofs.

3.13 WALL BRACING

Refer to 3821 TIMBER FRAMING for wall bracing.

3.14 DPC TO TIMBER

Lay DPC between all timber frames and concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier. For LOSP treated timber use only a DPC specifically suitable with LOSP treatment.

3.15 TIGHTEN BOLTS

Check and tighten all fixing bolts after erection is completed.

Completion

3.16 REPLACE

Replace or repair damaged elements.

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3.17 REMOVE

Remove debris, unused materials and elements from the site.

3.18 LEAVE

Leave work to the standard required by following procedures.

4 SELECTIONS

4.1 PREFABRICATED TIMBER TRUSSES, EXPOSED

Location:	~
Fabricator/brand:	~
Species/grade:	~
Moisture content:	20% maximum
Treatment:	~
Connectors:	~

4.2 PREFABRICATED TIMBER FLOOR TRUSSES

Location:	~
Fabricator/brand:	~
Species/grade:	~
Moisture content:	20% maximum
Treatment:	~
Connectors:	~

4.3 PREFABRICATED TIMBER FRAMES, EXPOSED

Location:	~
Fabricator/brand:	~
Species/grade:	~
Moisture content:	20% maximum
Treatment:	~
Connectors:	~

4.4 PREFABRICATED TIMBER FRAMES, NOT EXPOSED

Location:	~
Fabricator/brand:	~
Species/grade:	~
Moisture content:	20% maximum
Treatment:	~
Connectors:	~

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3821 TIMBER FRAMING

1 GENERAL

This section relates to the supply and erection of timber framing, as a framed structure, or as part of a partitioning system.

1.1 RELATED WORK

Refer to ~ for ~.

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC®	Forest Stewardship Council®
COC	Chain of Custody
PEFC	Programme for the Endorsement of Forest Certification

The following definitions apply specifically to this section:

SG Structural grade	to NZS 3604, 1.3 Definitions

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 provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2904	Damp-proof courses and flashings
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 3631	New Zealand timber grading rules
NZS 3640	Chemical preservation of round and sawn timber
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry.
BRANZ BU 673	Cavity battens

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

~

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

1.5 DIMENSIONS

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

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Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

2 PRODUCTS

Materials

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 APPEARANCE TIMBERS

Graded to NZS 3631, treated where required by NZBC B2/AS1, NZS 3602, table 1, and treatment to NZS 3640.

2.3 STRAPPING

Treated to NZBC B2/AS1, NZS 3602, table 1 and to NZS 3640, clause 6.3.1.

Species:	Radiata pine
Grade:	SG6
Size:	70mm x 45mm, 45mm x 45mm or 45mm x 19mm

2.4 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

To NZBC E2/AS1. H3.1 Radiata pine battens, 20mm thick, 45mm minimum width, and height to match timber framing studs. To NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.5 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Components

2.6 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.

2.7 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.

2.8 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.

2.9 THREADED RODS

Use stainless steel threaded rods of the required length, with washers and nuts at both ends, when stainless steel bolts of the required length are not available.

2.10 TIMBER CONNECTORS AND FIXINGS

Supply for each particular joint the connectors and fixings as noted on the drawings. Comply with the requirements of the manufacturer, NZS 3604, section 4, Durability, and of the number and form required for each particular junction to NZS 3604, sections 6-10.

2.11 BRACING STRAPS

Nail-on type to the requirements of NZS 3604, section 4, Durability, and of the number and form required for each particular application to NZS 3604, sections 6-10.

2.12 POWDER ACTUATED FASTENERS

To type, size and charge required by the powder actuated tool manufacturer for each particular member and the substrate.

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2.13 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).

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.

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

Moisture content:

At erection	24% EMC maximum
At enclosure	20% EMC maximum
At lining	16% EMC maximum

3.4 PROTECT TIMBER

Protect all timber against damage and from inclement weather. Ensure that any variation in moisture content is kept to a minimum, before and after erection and before enclosure.

Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Timber framing tolerances shall be in accordance with NZS 3604 Table 2.1 Timber framing tolerances.

3.6 SEPARATION

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

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

3.7 EXECUTION

Execution to comply with 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).

3.8 SET-OUT

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

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3.9 SET TIMBERS

Set timbers true to required lines and levels with mitres, butt joints, laps and housings cut accurately to provide full and even contact over the whole of the bearing surface.

3.10 TIMBER CUTTING

Select and cut spanning members to minimise allowable defects and avoiding knots and short grain on edges in the middle third, and shakes, splits and checks at mid-span and close to ends.

3.11 STRAIGHTENING STUDS

Cutting for straightening to comply with NZS 3604, 8.5.3, Straightening studs.

3.12 TIMBER PLATES AND FURRING

Fix to steelwork with bolts and washers or approved proprietary fastenings at 1 metre maximum spacing and not less than 2 fixings to each member, or to engineering specific design.

3.13 HOLES AND NOTCHES

Limit holes and notches, checks and half-housing for the structure to those allowable in NZS 3604. Neatly form holes and notches for services without lessening the structural integrity of the member.

3.14 EXPOSED TIMBER CONNECTORS AND FIXINGS

Do not use steel timber connectors and fixings on any structural framing exposed to view unless detailed on the drawings.

3.15 POWDER-ACTUATED FASTENING TOOLS

Comply with the requirements of WorkSafe and the Health and Safety at Work Act 2015. Powder-actuated fastening tool operators to have the appropriate current Certificate and/or Licence and tools to have the appropriate certificate of fitness if necessary.

3.16 ADDITIONAL FRAMING

Position and fix all necessary members for the fixing of all services, fittings, fixtures, edges of linings or claddings, and to provide lateral support to load carrying framing.

3.17 FORM NAILED JOINTS

Fully drive nails in all structural joints with the number and location for each particular joint, to the requirements of the nailing schedules of NZS 3604. Where splitting could occur, pre-drill to 80% of nail diameter.

3.18 FORM BOLTED JOINTS

Drill for and set bolts to ensure full bearing and development of the joint strength, with tension to just set the washers into timber or to engineering specific design.

3.19 FIT CONNECTORS AND FIXINGS

Fit connectors and fixings to obtain full bearing over all contact surfaces and full development of the required loading capacity for that particular joint and in accordance with the manufacturer's requirements or to engineering specific design.

3.20 FIT CAVITY BATTENS

Fit and fix 20mm cavity battens over wall underlay or rigid air barrier. Temporary fix battens before being permanently fixed into the framing with the cladding fixings, to the requirements of the manufacturer or to NZBC E2/AS1 and BRANZ BU 673. Make allowances for cladding control joints where required. Fit and fix related flashings. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc). Use cavity spacers set to 5° fall where fixing is required between cavity battens.

3.21 FIT BRACING

Fit and fix subfloor, wall and roof bracing elements to the requirements of the manufacturer or to NZS 3604, to develop the full number of bracing units required.

3.22 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.23 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section



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Completion

3.24 COMPLETION MATTERS

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



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4 SELECTIONS

4.1 SUB-FLOOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Bearers:	Radiata pine	SG8	H1.2
Ground floor joists:	Radiata pine	SG8	H1.2

4.2 SUB-FLOOR FRAMING - DOUGLAS FIR

Member	Species	Grade	Treatment
Bearers:	Douglas fir	Structural	H1.2
Ground floor joists:	Douglas fir	Structural	H1.2

4.3 FLOOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Mid floor joists:	Radiata pine	SG8	H1.2
Boundary joists:	Radiata pine	SG8	H1.2

4.4 FLOOR FRAMING - DOUGLAS FIR

Member	Species	Grade	Treatment
Mid floor joists:	Douglas fir	Structural	H1.2
Boundary joists:	Douglas fir	Structural	H1.2

4.5 EXTERIOR WALL FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Exterior walls:	Radiata pine	SG8	H1.2
Parapets:	Radiata pine	SG8	H1.2
Enclosed decks and balconies:	Radiata pine	SG8	H1.2
Cantilevered joists enclosed decks and balconies:	Radiata pine	SG8	H3.2
Nogs	Radiata pine	SG8	H1.2
Wall battens (not cavity):	Radiata pine	Merch	H1.2
Jamb battens	Radiata pine	Merch	H3.1

4.6 EXTERIOR WALL FRAMING - DOUGLAS FIR

Member	Species	Grade	Treatment
Exterior walls:	Douglas fir	SG8	H1.2
Parapets:	Douglas fir	SG8	H1.2
Enclosed decks and balconies:	Douglas fir	SG8	H1.2
Cantilevered joists enclosed decks and balconies:	Douglas fir	SG8	H3.2
Nogs	Douglas fir	SG8	H1.2
Wall battens (not cavity):	Douglas fir	Merch	H1.2
Jamb battens	Douglas fir	Merch	H3.1

4.7 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Rafters:	Radiata pine	SG8	H1.2
Trusses:	Radiata pine	SG8	H1.2
Purlins:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merch	H1.2
Sarking:	Radiata pine	Merch	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

4.8 ROOF FRAMING - DOUGLAS FIR

Member	Species	Grade	Treatment

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Rafters:	Douglas fir	SG8	H1.2
Trusses:	Douglas fir	SG8	H1.2
Purlins:	Douglas fir	SG8	H1.2
Valley boards:	Douglas fir	Merch	H1.2
Sarking:	Douglas fir	Merch	H1.2
Skillion roof framing:	Douglas fir	SG8	H1.2
Enclosed flat roof framing:	Douglas fir	SG8	H1.2

4.9 INTERIOR WALL FRAMING - RADIATA PINE

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

4.10 INTERIOR WALL FRAMING - DOUGLAS FIR

Member	Species	Grade	Treatment
Non structural walls:	Douglas fir	SG8	H1.2
Structural and braced walls:	Douglas fir	SG8	H1.2

4.11 CEILING FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Ceiling joists:	Radiata pine	SG8	H1.2
Timber ceiling battens:	Radiata pine	SG8	H1.2
Proprietary ceiling battens:	Manufacturer ~	Type ~	Reference ~

4.12 CEILING FRAMING - DOUGLAS FIR

Member	Species	Grade	Treatment
Ceiling joists:	Douglas fir	SG8	H1.2
Timber ceiling battens:	Douglas fir	SG8	H1.2
Proprietary ceiling battens:	Manufacturer ~	Type ~	Reference ~

4.13 EXTERIOR EXPOSED TIMBER

Member	Species	Grade	Treatment
Posts:	Radiata pine	SG8	H3.2 CCA
Joists:	Radiata pine	SG8	H3.2 CCA
Exterior stairs and steps:	Radiata pine	SG8	H3.2 CCA
Pergola:	Radiata pine	SG8	H3.2 CCA
Ground contact members	Radiata pine	SG8	H5 CCA

Note: All CCA preservative code 01 or 02

4.14 CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Structural	Radiata pine	Merch	H3.2
Timber - Non Structural	Radiata pine	Merch	H3.1
Proprietary - non structural:	Manufacturer ~	Type ~	Reference ~
Cavity closer:	Manufacturer ~	Type ~	Reference ~

4.15 SPECIAL FRAMING ELEMENTS

Member	Species	Grade	Treatment
~	~	~	~

4.16 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

4.17 NAILS

Location	Type	Material	Finish
~			

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4.18 SCREWS

Location	Type	Material	Finish
~			

4.19 BOLTS AND COACH SCREWS

Location	Type	Material	Finish
~			

4.20 NAIL PLATES

Location	Type	Material	Finish
~			

4.21 CONNECTORS

Location	Type	Material	Finish
~			

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4121 LIQUID APPLIED TANKING

1 GENERAL

This section relates to the application liquid applied, below grade membranes for basement wall tanking and damp proofing.

1.1 RELATED WORK

Refer to 2241 EXCAVATION and 2242 BACKFILLING for excavation and fill for basement walls.

Refer to 7441 GROUNDWATER DRAINAGE for subsoil drainage to basement walls.

1.2 ABBREVIATIONS

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

EPS	Expanded polystyrene
SBR	Styrene butadiene rubber
WMAI	Waterproofing Membrane Association (NZ) Inc.
XPS	Extruded polystyrene

Documents

1.3 DOCUMENTS

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

WMAI	Code of Practice for Below-Grade Tanking Membranes

1.4 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:
Available by contacting the manufacturer/supplier

Copies of the above literature are available from the manufacturer/supplier

Web:	~
Email:	~
Telephone:	~

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	For the membrane and membrane system failure under normal environmental conditions

- 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:

5 years	For membrane system installation failure under normal environmental conditions

- 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

1.7 QUALIFICATIONS WORKERS - INDUSTRY QUALIFICATION REQUIREMENTS

Workers to be trained & certified by the tanking membrane supplier, as required by the WMAI Code of Practice. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 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.

1.9 NO SUBSTITUTIONS

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

Compliance information

1.10 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 PS3 - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

1.11 INSPECTIONS

~ ~

2 PRODUCTS

Materials

2.1 WATER-BORNE, POLYMER MODIFIED BITUMEN TANKING

Single component, water-borne, thixotropic elastomeric modified bituminous coating.

2.2 NON-WOVEN POLYESTER REINFORCING

Non-woven polyester to the tanking manufacturer's requirements, for reinforcing water-borne polymer modified bitumen membranes.

2.3 EMULSION FIBREGLASS REINFORCING

Emulsion fibreglass to the tanking manufacturer's requirements, for reinforcing water-borne polymer modified bitumen membranes.

2.4 TWO COMPONENT, WATER-BORNE, POLYMER MODIFIED BITUMEN TANKING

Fast-curing, two component liquid, comprising of an emulsion and a catalyst.

2.5 TWO COMPONENT, POLYMER MODIFIED, CEMENTITIOUS TANKING

Two component, comprising of a liquid emulsion, generally acrylic, modified acrylic or SBR and a dry cement mix.

2.6 POLYURETHANE / POLYUREA TANKING

Single or two component polyurethane, polyurea or polyurethane/polyurea hybrid, thixotropic, elastomeric tanking with high-solids.

2.7 POLYURETHANE, BITUMEN MODIFIED TANKING

Two component elastomeric bitumen modified urethane.

Components

2.8 PROFILED PLASTIC PROTECTION SHEET

Profiled polypropylene or thermoplastic protection sheet, that allows for drainage.

2.9 REINFORCED DETAIL STRIP / BANDAGE

Reinforced, waterproofing detail strip / bandage to the tanking manufacturer's requirements.



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2.10 BOND BREAKER TAPE

PVC self-adhesive bond breaker tape, for use over movement joints.

2.11 FILLETS

Proprietary fillets for internal corners / junctions to the tanking manufacturer's requirements.

Accessories

2.12 SEALANT

Sealant to the tanking manufacturer's requirements.

2.13 ADHESIVE

Adhesive for cold application to the tanking manufacturer's requirements.

2.14 CONCRETE REPAIR MORTAR

Concrete repair mortar for filling any ties holes in concrete.

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. Inspect substrate surface and notify Contractor of any faults or damage. Remedial work to be completed before work commences.

Allow concrete and masonry to dry to the tanking manufacturer's requirements before applying tanking. Minimum curing of new concrete to be 28 days.

Ensure moisture content is:
Concrete ~% maximum

3.4 WEATHER CONDITIONS

Apply tanking only in fair weather with air temperature and relative humidity in accordance with tanking manufacturer's requirements.

3.5 DE-WATERING

Maintain water level at not less than 300mm below the level of the base concrete during the progress of the tanking work and until tanking installation is complete, fully cured, watertight and protected

Installation/application

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 INSTALLATION GENERALLY

Install tanking membrane in accordance with drawings, manufacturer's requirements and WMAI Code of Practice. Liquid applied tanking to be installed to the substrate face in contact with incoming water.

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Application - preparation

3.8 REMOVE FORMWORK

Ensure that formwork has been removed or partially removed from the other face(s) to the membrane face, to the extent that it allows moisture to escape from the concrete to ensure no vapour pressure develops beneath the membrane.

3.9 PREPARE SUBSTRATE

Remove any projections, steps, sharp protrusions, form oils, release agents and curing compounds with a wire brush or by grinding. Remove debris to leave the surface dust free and suitable for the application of primers/tanking. Fill tie holes flush and smooth with mortar.

3.10 MASONRY JOINTS

Check that masonry joints are struck off flush and left for minimum 48 hours before tanking is applied.

3.11 CORNERS & EDGES

External corners and edges to be chamfered and internal corners to have fillet installed to manufacturer's requirements.

Application - generally

3.12 PRIMING

Apply primer in accordance to manufacturer's requirements. Only prime area that can be covered with tanking membrane within that working day.

3.13 EXPANSION / MOVEMENT JOINTS

Install backing rod and sealant to expansion / movement joints, allow to cure. Apply bond breaker tape over joint and, if required by tanking manufacturer, install flexible reinforced bandage membrane over prior to tanking installation.

3.14 CONSTRUCTION JOINTS / CHANGE OF DIRECTION

Install flexible reinforced bandage membrane minimum 100mm wide, over construction joints and changes of direction, prior to tanking installation.

As detailed, under-slab sheet tanking or damp proof membrane to be turned up around wall footings, install flexible reinforced bandage membrane, minimum 100mm wide prior to application of liquid applied membrane around footing.

3.15 PENETRATIONS

Seal around pipes and penetrations, using compatible sealant. If required by membrane manufacturer, install flexible reinforced bandage membrane, minimum 100mm wide around penetration.

3.16 INSTALL LIQUID APPLIED TANKING MEMBRANE

Apply specified number of coats of selected tanking membrane in accordance with manufacturer's requirements. Ensure manufacturer's coverage rates are followed and membrane wet film thickness is checked regularly using manufacturer's approved method.

3.17 CURING / TEMPORARY PROTECTION

Allow tanking membrane to fully cure. Temporarily protect membrane until installation of protection sheet and backfilling.

Application - Protection

3.18 INSPECTION

The Main Contractor and Applicator to visually inspect tanking membrane installation prior to installation of protection sheets and back filling. Visual inspection to include checking for any uneven thickness, evidence of damage, breaks or bubbles in membrane especially around junctions, changes in angle. For larger projects this may be carried out in sections, as areas are completed.

If any damage is identified, repair in accordance with manufacturer's requirements.



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3.19 PROFILED PLASTIC PROTECTION SHEET

Neatly scribe and fit sheet to fully protect the whole of the tanking as backfill is placed. Install in accordance with protection sheet and tanking manufacturer's requirements.

3.20 UV PROTECTION

Protect any exposed areas of tanking with compatible protective paint coating, capping membrane strip or over flashing.

Completion

3.21 COMPLETION MATTERS

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

4 SELECTIONS

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4121SB SIKA® BLACKSEAL® ELASTIC

1 GENERAL

This section relates to the supply and application of the Sika® Blackseal® Elastic system, applied as a below ground flexible bitumen damp-proof membrane behind masonry and concrete walls. It is applied in liquid form.

1.1 RELATED WORK

Refer to ~ for ~

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:

BRANZ	Building Research Association New Zealand

Documents

1.3 DOCUMENTS

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

ISO 9001	Quality management systems
ISO 11600	Building construction - jointing products

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Sika® Product Data Sheets and Safety Data Sheets:
Sika® Blackseal® Elastic
Sika® SealTape B
Sikalastic®-152
SikaSeal®-173
Sika® Primer -3 N
Sikaflex® PRO-3 Purform®
Sikaflex® AT Façade
Sika BlackSeal® Protection Sheet

BRANZ Appraisal 770 (2023) - Sika Blackseal Elastic Damp Proof Membrane - Amended 9 January 2025

Manufacturer/supplier contact details

Company:	Sika (NZ) Ltd
Web:	https://nzl.sika.com/
Email:	info@nz.sika.com
	perrett.jeff@nz.sika.com
Telephone:	0800 745 269
Facsimile:	0800 745 232

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For products listed in this section

- Refer to Sika for full terms of Warranty
- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

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Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS - MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved by Sika (NZ) Ltd. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 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.

1.8 NO SUBSTITUTIONS

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

Compliance information

1.9 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.

Quality control and assurance

1.10 INSPECTIONS

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2 PRODUCTS

Materials

2.1 SIKA® BLACKSEAL® ELASTIC

A polymer modified, water based, one component, brush applied, bitumen emulsion formulated for use as a damp-proofing membrane behind concrete and masonry retaining walls. Manufactured under ISO 9001. Refer BRANZ Appraisal 770.

Components

2.2 SIKA MONOTOP® REPAIR MORTARS

A range of patching and reprofiling mortars for use on concrete and masonry substrates. Contact Sika for further advice and information.

2.3 SIKA® SEALTAPE B

A self-adhesive, flexible waterproofing tape, with a textured top surface that will allow liquid membranes to adhere to it.

2.4 SIKALASTIC® -152

A cementitious, flexible, fibre-reinforced, brush applied waterproofing membrane, which can be applied as part of the sealing system for Sika® membranes, where they terminate on the exterior wall at ground level.

2.5 SIKASEAL®-173

A one component, bitumen based construction sealant used for sealing substrates that are bitumen based, or will be in contact with bitumen. E.g. Bitumen roofing and tanking membranes.

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2.6 SIKA® PRIMER -3 N

A one component solvent based primer for porous substrates, applied before the application of Sikaflex sealants and adhesives.

2.7 SIKAFLEX® PRO-3 PURFORM®

A one component moisture curing polyurethane joint sealant with a movement capacity of +/-35%, with good chemical and mechanical resistance. Conforms to ISO 11600 Type F, Class 25HM.

2.8 SIKAFLEX® AT FACADE

A one component, moisture-curing, low-modulus elastic sealant for porous and non-porous substrates, with a movement capacity of +/-25%. Conforms to ISO 11600 Type F, Class 25HM.

2.9 SIKA BLACKSEAL® PROTECTION SHEET

A rot proof, profiled, thermoplastic sheet to protect below ground waterproofing systems from damage during backfilling and compaction / settlement of backfill.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

Store in a dry place below 35°C and away from frost.

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.

3.4 WEATHER CONDITIONS

Apply only in fair weather with ambient and substrate temperature above 10°C and below 30°C. Protect from rain and water until fully dry.

Application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Preparation

3.6 PREPARATION - CONCRETE & MASONRY WALLS

Determine the ground level termination point for the Sika® Blackseal® Elastic and mark on the wall.

Thoroughly clean the masonry or concrete surface to be coated by removing all dirt, dust, grease, release agent and curing compound residues, by water blasting, grit blasting, or mechanical brushing.
Grind back and make smooth any dags, rough patches, sharp edges, or ridges.
Fill any surface irregularities e.g. holes, gaps and honeycombing, with appropriate patching and repair mortars from the Sika Monotop® range to make it smooth.

Grind back or fill any surface irregularities or overhangs at the connection between the wall and the footing, to make a flush, smooth and continuous vertical surface between the two.
Finish Concrete Surfaces to F4 finish, and firmly point masonry blockwork to give a flush finish.

3.7 PREPARATION – HORIZONTAL SURFACES

Re-profile all horizontal surfaces / toes protruding at the base of the wall / footing with Sika Monotop® 352 N mortar, to create a fall of not less than 1.5 degrees, to ensure that water will not pond on top of the finished membrane, and will fall away from the wall into the drainage system.

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3.8 PREPARATION – EXTERNAL AND INTERNAL CORNERS

Grind back external corners to form a radius with a minimum diameter of 10mm, cove internal corners with a 10mm minimum bead of SikaSeal®-173 sealant.

3.9 PREPARATION - CONTROL JOINTS UP TO GROUND LEVEL

Before Sika® Blackseal® Elastic is applied over any control / movement joints within the masonry / concrete wall, clean, prepare and prime the joints with Sika® Primer -3 N. Fill the joints with Sikaflex® PRO-3 Purform® or Sikaflex® AT Facade in accordance with the relevant product data sheet.

After the Sikaflex® has cured apply barrier tape Sika® SealTape B centrally over the joint to act as a separation layer between the sealant and the membrane. Run the tape to the top of the membrane and terminate at the pre-defined ground level.

3.10 PREPARATION - PIPE PENETRATIONS

Before applying Sika® Blackseal® Elastic around pipes and other penetrations through the concrete / masonry wall, ensure there is an even 10mm gap between the circumference of the pipe and the substrate. Clean, prepare and fill the gap with SikaSeal®-173, in accordance with the product technical data sheet.

3.11 PREPARATION – MEMBRANE TERMINATION POINT AT GROUND LEVEL

Determine the finished ground-level termination contour and mark it on the wall before commencing membrane application.

Brush apply a 300mm wide band of Sikalastic®-152 on to the wall in two layers, centred along the termination line, to achieve a finished thickness of approximately 3mm.

Application of Membrane

3.12 SUBSTRATE PRIMING

Apply a primer coat of 1-part clean potable water to 1-part Sika® Blackseal® Elastic to the clean and dry substrate, with a good quality, soft bristled, brush or roller, at a uniform rate of approximately 4m² / litre.

3.13 APPLICATION OF TOPCOATS

After the primer has fully dried, apply two undiluted coats of Sika® Blackseal® Elastic, using a good quality, soft bristled, brush or roller, at a rate of 2m²/litre/coat.

Appy the first coat and lay off in a horizontal direction, and once cured, apply the second coat and lay off in a vertical direction.
Allow a minimum of 4 hours curing between the first and second coats. Ensure that the first coat is fully dry before proceeding with the second coat. Full cure of the coats will be weather dependent. Protect each coat from rain or water until the completed system has fully cured.

3.14 MEMBRANE CONNECTION TO UNDERFLOOR DPM

Apply a 100mm wide strip of Sika® SealTape B along the top face of the DPM, with an equal overlap onto the DPM and the clean, dry concrete, using a pressure roller to remove any trapped air.

Apply two coats of Sika® Blackseal® Elastic over the tape to provide a continuous connection between the wall membrane and under footing DPM.

3.15 WALL MEMBRANE TERMINATION AT GROUND LEVEL

Apply two coats of Sika® Blackseal® Elastic up to a level 150mm below the top edge of the pre-applied Sikalastic -152 termination membrane (i.e. up to the ground level termination line). This will enable the membrane to be hidden and protected from UV exposure once the ground level is established.

Any Sika® Blackseal® Elastic that remains permanently exposed above ground level after completion must be suitably UV protected.

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Application - Backfilling against membrane

3.16 MEMBRANE INSPECTION BEFORE BACKFILLING

Inspect the entire surface of the completed membrane system and repair any damage or defects using appropriate Sika components before proceeding with the installation of the protection sheet and backfilling.

Sika® Blackseal® Elastic is not UV resistant and should not be left exposed to sunlight.

3.17 WALL PROTECTION, DRAINAGE AND BACKFILLING

Protect Sika® Blackseal® Elastic immediately after full curing with the installation of Sika BlackSeal® Protection Sheet to the entire surface area of the membrane.

Use SikaSeal®-173 as an adhesive to hold the sheets temporarily in place against the membrane before backfilling.
Allow a one row overlap at each sheet interface to provide continuity between the sheets and stop backfill from getting behind the sheets. Face the dimple side of the sheet towards the structure, and the flat side towards the backfill material.

Commence backfilling and compacting in accordance with the designer / engineer's instructions and avoid damaging or moving the protection sheet during the process.

Completion & Commissioning

3.18 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 SIKA® BLACKSEAL® ELASTIC SYSTEM - VERTICAL SURFACES

Location:	~
Substrate:	~
Supplier:	Sika (NZ) Ltd
Membrane type/brand:	Sika® Blackseal® Elastic
Components:	SikaSeal®-173 Sika MonoTop® Sika® Primer -3 N Sikaflex® PRO-3 Purform® Sikaflex® AT Façade Sika® SealTape B Sikalastic®-152 Sika BlackSeal® Protection Sheet

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4131 SHEET TANKING

1 GENERAL

This section relates to the application of sheet membranes for basement tanking and damp-proof membranes.

1.1 RELATED WORK

Refer to 2241 EXCAVATION and 2242 BACKFILLING for excavation, hardfill and sand blinding

Refer to 7441 GROUNDWATER DRAINAGE for subsoil drainage to basement walls.

1.2 ABBREVIATIONS

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

APAO	Amorphous poly-alpha-olefins
APP	Atactic polypropylene
DPM	Damp proof membrane
HDPE	High density polyethylene
SBS	Styrene butadiene styrene
WMAI	Waterproofing Membrane Association (NZ) Inc.

Documents

1.3 DOCUMENTS

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

WMAI	Code of Practice for Below-Grade Tanking Membranes

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:	~
Email:	~
Telephone:	~

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	For the tanking membrane and tanking membrane system failure under normal environmental conditions

- 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:

5 years	For tanking membrane system installation failure under normal environmental conditions

- 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

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Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS WORKERS - INDUSTRY QUALIFICATION REQUIREMENTS

Workers to be trained & certified by the tanking membrane supplier, as required by the WMAI Code of Practice. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 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.

1.9 NO SUBSTITUTIONS

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

1.10 PRE-INSTALLATION MEETING

Arrange a meeting involving the tanking installer, contractor, all related consultants and tanking manufacturer to allow all parties to understand the essential elements required for effective performance of the system and site specific requirements.

1.11 PRESSURE RATING

Obtain a written assurance from the manufacturer that the waterproofing system, comprising membrane and jointing methods, is capable of sustaining the designated water pressure head. Refer to SELECTIONS for the designated water pressure head.

Compliance information

1.12 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 PS3 - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Quality control and assurance

1.13 QUALITY CONTROL CHECKLIST

Complete tanking manufacturer's quality control checklists for each installation area. Provide Copies to the contract administrator on request.

1.14 INSPECTIONS

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2 PRODUCTS

Materials

2.1 TORCH APPLIED TANKING, MODIFIED BITUMINOUS

Modified bitumen SBS, APP or APAO tanking membrane, incorporating a polyester or polyester composite reinforcing fabric. Tanking membrane has a sacrificial thermo-fusible film to the bottom surface and an upper surface of either a thin film, talc, sand, granules or fleece. Available in single or two layer systems. Refer to SELECTIONS.

2.2 SELF-ADHESIVE APPLIED TANKING - BITUMEN

Non-internally reinforced, bitumen tanking membrane formed from pliable SBS bitumen with pressure-sensitive self-adhesive under side and HDPE top surface. Refer to SELECTIONS.

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2.3 SELF-ADHESIVE APPLIED TANKING - BITUMEN FACE-REINFORCED

SBS-modified bitumen tanking membrane incorporating a polyester reinforcement with pressure-sensitive self-adhesive under side and an upper surface of either fleece, woven fabric, granule, sand or talc. Refer to SELECTIONS.

2.4 SELF-ADHESIVE APPLIED TANKING - BITUMEN INTERNALLY REINFORCED

SBS-modified bitumen tanking membrane incorporating a polyester reinforcement with pressure-sensitive self-adhesive under side and an upper surface of either fleece, woven fabric, granule, sand or talc. Refer to SELECTIONS.

2.5 TANKING - NEEDLE PUNCHED BENTONITE

Needle punched bentonite tanking membrane consisting of bentonite granules or powder encapsulated between needle-punched geotextile fabric outer layers. Refer to SELECTIONS.

2.6 TANKING - THERMOPLASTIC

Thermoplastic tanking membrane, available either as a pre-applied chemically treated, cementitious hybrid or fleece-backed sheet or as a non-bonded draped sheet. Refer to SELECTIONS.

Components

2.7 PRIMER

Substrate primer to the tanking manufacturer's requirements.

2.8 BITUMINOUS TANKING - PATCHES & TAPES

Proprietary self-adhesive / torch-on tapes and patches to the tanking manufacturer's requirements. Used as under or over flashings at joints, detailing and penetrations.

2.9 BITUMINOUS LIQUID APPLIED MEMBRANE

Bituminous liquid applied membrane to the tanking manufacturer's requirements.

2.10 THERMOPLASTIC TANKING - TAPES & PATCHES

Proprietary self-adhesive tapes and patches to the tanking manufacturer's requirements and relevant adhesive cleaner / primer as required.

2.11 THERMOPLASTIC TANKING - EPOXY RESIN

Proprietary epoxy resin to the tanking manufacturer's requirements.

2.12 BENTONITE TANKING - PASTE / MASTIC

Trowel grade bentonite paste / mastic to the tanking manufacturer's requirements.

2.13 FILLETS

Proprietary fillets for internal corners / junctions to the tanking manufacturer's requirements.

2.14 PRESSURE BAR

Proprietary mechanically fixed pressure bar/termination bar.

2.15 PIPE CLAMP

Proprietary stainless steel pipe clamp, to clamp around end of membrane at pipe penetrations.

2.16 FIBRE CEMENT PROTECTION SHEET

Treated cellulose fibre in a matrix of cement and sand autoclaved sheet complete with compatible adhesive and tape, as required.

2.17 POLYSTYRENE PROTECTION SHEET

Polystyrene, protection sheet, complete with compatible adhesive and tape, as required.

2.18 PROFILED PLASTIC PROTECTION SHEET

Profiled polypropylene or thermoplastic protection sheet, that allows for drainage, complete with compatible adhesive and tape, as required.

Accessories

2.19 SEALANT

Sealant to the tanking manufacturer's requirements.



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2.20 CONCRETE REPAIR MORTAR

Concrete repair mortar for filling any ties holes or voids in concrete.

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.

Allow concrete to dry to the tanking manufacturer's requirements before applying tanking.

Moisture content: concrete ~% maximum

3.4 PRE-INSTALLATION REQUIREMENTS - FOR PRE-APPLIED TANKING

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

3.5 WEATHER CONDITIONS

Apply tanking only in fair weather with air temperature and relative humidity in accordance with tanking manufacturer's requirements.

3.6 DE-WATERING

Maintain water level at not less than 300mm below the level of the base concrete during the progress of the tanking work until tanking installation is complete, fully cured, watertight and protected

3.7 PLAN LAYOUT

Plan installation so that joints in tanking membrane are minimised and occur in suitable locations.

3.8 SUITABLE FOOTWEAR

During installation of horizontal tanking membrane, installer to wear suitable footwear that will not damage the membrane.

Installation/application

3.9 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.10 INSTALLATION GENERALLY

Install tanking membrane in accordance with manufacturer's requirements and WMAI Code of Practice.

Application - Preparation

3.11 REMOVE OTHER FORMWORK

Ensure that formwork has been removed or partially removed from the other face(s) to the membrane face, to the extent that it allows moisture to escape from the concrete to ensure no vapour pressure develops beneath the membrane.

3.12 PREPARE SUBSTRATE - CONCRETE & MASONRY

Remove any projections, steps, sharp protrusions, form oils, release agents and curing compounds with a wire brush or by grinding. Remove debris to leave the surface dust free and suitable for the application of primers/tanking. Fill voids and tie holes flush and smooth with mortar.

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3.13 MASONRY JOINTS

Check that masonry joints are struck off flush and left for minimum 48 hours before tanking is applied.

3.14 DRESS OFF HARDFILL SURFACE

Remove loose aggregate or other sharp protrusions from the surface of the hardfill. Dress off surface of hardfill with a layer of clean compacted sand. Refer to 2210 PREPARATION & GROUNDWORK for details

3.15 CONCRETE TIDY SLAB

Grind off any steps or sharp protrusions. Clean surface with a broom or compressed air to remove loose particles and material that could compromise the tanking membrane once the slab is poured.

3.16 RIGID INSULATION

Clean surface with a soft broom to remove loose particles and material that could compromise the tanking membrane.

3.17 FORMWORK SUBSTRATE

Check formwork is to be close butted, smooth and stable. Clean surface with broom to remove loose particles and material that could compromise the tanking membrane once the concrete is poured.

3.18 VERTICAL SITE CUT

Check the site cut face is stable, sound and free from loose aggregate or other sharp protrusions. Fill small voids with cementitious repair mortar.

3.19 CORNERS & EDGES

External corners and edges to be chamfered and internal corners to have fillet installed to manufacturer's requirements.

Application - Torch Applied Tanking

3.20 PRIMING

Apply primer to substrate in accordance with manufacturer's requirements. Only prime area that can be covered with tanking membrane within that working day. Allow primer to dry before tanking membrane application commences.

3.21 PENETRATIONS

Seal around pipes and other penetrations, using compatible sealant. Install a membrane strip/patch under or over flashing, around penetration and use a stainless steel hose clamp to secure to pipe.

If required by manufacturer, prime tanking membrane prior to installation of any self-adhesive over flashing tapes or patches.

3.22 EXPANSION / MOVEMENT JOINTS

Install backing rod and sealant to expansion / movement joints, allow to cure. Expansion / movement joints to be in accordance with manufacturer's requirements.

3.23 CONSTRUCTION JOINTS / CHANGE OF DIRECTION - SINGLE LAYER SYSTEM

Install a strip of membrane under flashing over construction joints, changes of direction and prior to main tanking installation in accordance with manufacturer's requirements.

3.24 INSTALL TORCH-ON MEMBRANE - SINGLE LAYER SYSTEM

Check under flashings are clean and dry before applying main tanking membrane.

Unroll and cut membrane to length. Allow membrane to relax before installation. Commence installation at the wall base over the turn-up of under-slab tanking or DPM. Install sheets vertically with overlapping joints to the manufacturer's requirements. Fully weld with a gas torch. Finish membrane minimum 150mm above finished ground level.



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3.25 INSTALL TORCH-ON MEMBRANE - DOUBLE LAYER SYSTEM

Unroll and cut membrane to length. Allow sheet to relax before installation. Commence installation at the wall base, over the turn-up of under-slab tanking or DPM. Install sheets vertically with overlapping joints to the manufacturer's requirements. Fully weld with a gas torch. Finish membrane minimum 150mm above finished ground level.

Check first layer of tanking is clean and dry before applying the second layer in the same direction as the first with the centre of the second layer over the lap joins of the first layer so all side and end laps are staggered. Install as per first layer.

3.26 INSTALL SELF ADHESIVE / TORCH-ON MEMBRANE - DOUBLE LAYER SYSTEM

Unroll and cut membrane to length. Allow sheet to relax before installation. Commence installation of self-adhesive membrane at the wall base, over the turn-up of under-slab tanking or DPM. Install sheets vertically with overlapping joints to the manufacturer's requirements. Finish membrane minimum 150mm above finished ground level. Firmly roll the membrane to achieve full adhesion to primed substrate without air entrapment or any fish mouths in the overlaps.

Check first layer of tanking is clean and dry before applying the second layer in the same direction as the first with the centre of the second layer over the lap joins of the first layer so all side and end laps are staggered. Install second layer and fully weld with a gas torch.

3.27 INSTALL TORCH-ON MEMBRANE - PRE-APPLIED LOOSE-LAID SINGLE LAYER

Unroll and cut membrane to length. Allow sheet to relax before installation. Loose lay membrane over substrate with overlapping joints to the manufacturer's requirements and the chip or fabric layer facing towards the concrete pour. Torch sheet laps and roll with a rubber roller if hand welding.

All penetrations to be in accordance with manufacturer's requirements. If required by manufacturer, prime tanking membrane prior to installation of any self-adhesive over flashing tapes or patches.

For concrete slab applications, allow adequate length of membrane to return around slab edge footing and to extend up walls in accordance with details and manufacturer's requirements

3.28 INSTALL TORCH-ON MEMBRANE - PRE-APPLIED LOOSE-LAID DOUBLE LAYER

Unroll and cut membrane to length. Allow sheet to relax before installation. Loose lay membrane over substrate with overlapping joints to the manufacturer's requirements and the correct side of membrane facing towards the concrete pour. Torch sheet laps and roll with a rubber roller if hand welding.

Check first layer of tanking is clean and dry before applying the second layer in the same direction as the first with the centre of the second sheet over the lap joins of the first sheet so all side and end laps are staggered. Install second layer with the chip or fabric layer facing upwards towards the concrete pour and fully weld with a gas torch.

All penetrations to be in accordance with manufacturer's requirements. If required by manufacturer, prime tanking membrane prior to installation of any self-adhesive over flashing tapes or patches.

For concrete slab applications, allow adequate length of membrane to return around slab edge footing and to extend up walls in accordance with details and manufacturer's requirements.

3.29 TOP EDGE - TERMINATION BAR

Install a termination bar and compatible sealant to the top edge of the membrane in accordance with manufacturer's requirements.

3.30 TOP EDGE - FLASHING

Install an over-flashing and compatible sealant to flash the top edge of the membrane in accordance with manufacturer's requirements.

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Application - Self-Adhesive Tanking

3.31 PRIMING

Apply primer to substrate in accordance with manufacturer's requirements. Only prime area that can be covered with tanking membrane within that working day. Allow primer to dry before membrane application commences.

Clean and prime membrane, as required, for installation of tapes & patches.

3.32 PENETRATIONS

Seal around pipes and other penetrations, using compatible sealant. Install a membrane strip/patch under or over flashing, around penetration and use a stainless steel hose clamp to secure to pipe in accordance with manufacturer's requirements.

3.33 EXPANSION / MOVEMENT JOINTS

Install backing rod and sealant to expansion / movement joints, allow to cure. Expansion / movement joints to be in accordance with manufacturer's requirements.

3.34 CONSTRUCTION JOINTS / CHANGE OF DIRECTION

Install a strip of membrane under flashing over construction joints and changes of direction, prior to main tanking installation in accordance with details or manufacturer's requirements.

3.35 INSTALL SELF-ADHESIVE TANKING MEMBRANE

Unroll and cut membrane to length. Allow sheet to relax before installation. Commence installation of membrane at the wall base, over the turn-up of under-slab tanking or DPM. Install sheets with overlapping joints to the manufacturer's requirements. Finish membrane minimum 150mm above finished ground level. Firmly roll the membrane to achieve full adhesion to primed substrate without air entrapment or any fish mouths in the overlaps.

3.36 TORCH WORK TO BITUMEN REINFORCED SELF-ADHESIVE MEMBRANE

Use torch work in accordance with manufacturer's requirements to:

- Aid shaping & adhesion of membrane
- Bond laps
- Bond the top 100mm width of membrane to the substrate

3.37 TOP EDGE - TERMINATION BAR

Install a termination bar and compatible sealant to the top edge of the membrane in accordance with manufacturer's requirements.

3.38 TOP EDGE - FLASHING

Install an over-flashing and compatible sealant to flash the top edge of the membrane in accordance with manufacturer's requirements.

Application - Needle Punched Bentonite Tanking

3.39 PREVENT PREMATURE HYDRATION

When precipitation is imminent, protect installed Bentonite products not already contained by concrete or backfill with plastic sheeting. After precipitation, immediately pump off standing water.

3.40 EXPANSION / MOVEMENT JOINTS

Expansion / movement joints to be in accordance with manufacturer's requirements

3.41 INSTALL NEEDLE PUNCH BENTONITE TANKING - PRE-APPLIED UNDER SLAB

Loose lay membrane with correct face towards the concrete pour. Install with overlaps, run in a uniform direction, in accordance with manufacturer's requirements. Install without wrinkles or folds.

Allow adequate length of membrane extensions at perimeter of concrete work. Detailing at concrete perimeter, footings, construction joints, junctions and penetrations to be in accordance with manufacturer's requirements.

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3.42 INSTALL NEEDLE PUNCH BENTONITE TANKING - PRE-APPLIED FOR INSITU WALLS

Loose-lay membrane with correct face towards the concrete pour. Install with overlaps, run in a uniform direction, and fix to the wall formwork using light nails or staples in accordance with manufacturer's requirements. Install without wrinkles or folds.

Detailing at footings, construction joints, junctions and penetrations to be in accordance with manufacturer's requirements.

3.43 INSTALL NEEDLE PUNCH BENTONITE TANKING - PRE-APPLIED FOR PRE-CAST WALLS

Pre-apply bentonite tanking to concrete panels at the precast yard. Loose-lay membrane with correct face towards the concrete pour. Install with overlaps, run in a uniform direction, in accordance with manufacturer's requirements. Install without wrinkles or folds.

Allow adequate length of membrane extensions at edges of concrete work in accordance with details and manufacturer's requirements. Detailing at footings, construction joints, junctions and penetrations to be in accordance with manufacturer's requirements.

3.44 TOP EDGE - TERMINATION BAR

Install a termination bar and compatible sealant to the top edge of the membrane in accordance with manufacturer's requirements.

3.45 TOP EDGE - FLASHING

Install an over-flashing and compatible sealant to flash the top edge of the membrane in accordance with manufacturer's requirements.

3.46 CONCRETE PLACEMENT

Place concrete in the direction of tanking overlapping without displacing tanking laps

Application - Thermoplastic Tanking

3.47 EXPANSION / MOVEMENT JOINTS

Expansion / movement joints to be in accordance with manufacturer's requirements.

3.48 INSTALL THERMOPLASTIC TANKING - PRE-APPLIED UNDER SLAB

Loose lay membrane with correct face towards the concrete pour. Install with required overlaps and with end laps staggered, join overlaps with self-adhesive sheet selvedge, tape or weld, or a combination of both in accordance with manufacturer's requirements.

Allow adequate length of membrane extensions at perimeter of concrete work. Detailing at concrete perimeter, footings, pile heads, construction joints, junctions and penetrations to be in accordance with manufacturer's requirements. Clean and prime membrane, as required, prior to installation of self-adhesive tapes and patches.

Ensure a continuous bond to all overlaps and joints, without wrinkles or creases. Firmly rolls joins, if required by manufacturer.

3.49 INSTALL THERMOPLASTIC TANKING - PRE-APPLIED FOR INSITU CONCRETE

Loose lay / drape membrane with correct face towards the concrete pour. Install with required overlaps and with end laps staggered, join overlaps with self-adhesive sheet selvedge, tape or weld, or a combination of both in accordance with manufacturer's requirements.

Where required by manufacturer, tack top edge in place to formwork with nails. If installing over vertical cut face, support top edge of membrane using placement of site concrete.

Detailing at footings, construction joints, junctions and penetrations to be in accordance with manufacturer's requirements. Clean and prime membrane, as required, prior to installation of self-adhesive tapes and patches.

Ensure a continuous bond to all overlaps and joints, without wrinkles or creases. Firmly rolls joins, if required by manufacturer.

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3.50 NAIL PENETRATIONS

Cover all nail penetrations with approved self-adhesive tape or patch.

3.51 TOP EDGE - TERMINATION BAR

Install a termination bar and compatible sealant to the top edge of the membrane in accordance with manufacturer's requirements.

3.52 TOP EDGE - FLASHING

Install an over-flashing and compatible sealant to flash the top edge of the membrane in accordance with manufacturer's requirements.

Application - finishing

3.53 PROTECT VERTICAL SURFACES

Protect the vertical tanking from damage before covering with protective sheets.

3.54 PROTECT HORIZONTAL SURFACES

Do not allow access onto the tanking except for inspection purposes, placement of reinforcing steel and the concrete placement. Allow only foot traffic with suitable footwear that will not damage the membrane.

3.55 INSPECTION - FOR PRE-APPLIED TANKING

The Main Contractor and tanking installer to visually inspect tanking membrane installation prior to placement of reinforcing and again prior to concrete placement. Visual inspection to check for damage including breaks and wrinkles and uneven thickness. For larger projects this may be carried out in sections, as areas are completed.

Repair any damage in accordance with manufacturer's requirements.

3.56 CLEAN MEMBRANE PRIOR TO CONCRETE PLACEMENT - FOR PRE-APPLIED TANKING

Thoroughly clean pre-applied membrane once the placement of reinforcement steel is completed and before the concrete is poured, to remove all contaminants and any debris.

3.57 INSPECTION - PRIOR TO BACKFILLING

The Main Contractor and tanking installer to visually inspect tanking membrane installation prior to installation of protection sheets and back filling. Visual inspection to check for damage including breaks and wrinkles and uneven thickness. For larger projects this may be carried out in sections, as areas are completed.

Repair any damage in accordance with manufacturer's requirements.

3.58 INSTALL CELLULOSE FIBRE PROTECTION SHEETS

Neatly scribe and fit sheets, spot fixing them with adhesive and taped over joints, all to the tanking manufacturer's requirements for this work, to fully protect the whole of the tanking as backfill is placed.

3.59 INSTALL POLYSTYRENE PROTECTION SHEETS

Neatly scribe and fit sheets, spot fixing them with adhesive and taped over joints, all to the tanking manufacturer's requirements for this work, to fully protect the whole of the tanking as backfill is placed.

3.60 UV PROTECTION

Protect any exposed areas of tanking.

Completion

3.61 COMPLETION MATTERS

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



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4 SELECTIONS

4.1 PRESSURE RATING

Designated water pressure head: ~ metres

4.2 TORCH APPLIED TANKING - SINGLE LAYER SYSTEM

Location: ~
Substrate: ~
Manufacturer: ~
Primer: ~
Membrane: ~
Thickness: ~
Components: ~
Accessories: ~

4.3 TORCH APPLIED TANKING - DOUBLE LAYER SYSTEM

Location: ~
Substrate: ~
Manufacturer: ~
Primer: ~
Base sheet: ~
Thickness: ~
Second sheet: ~
Thickness: ~
Components: ~
Accessories: ~

4.4 SELF-ADHESIVE APPLIED TANKING

Location: ~
Substrate: ~
Manufacturer: ~
Primer: ~
Membrane: ~
Thickness: ~
Components: ~
Accessories: ~

4.5 TANKING - NEEDLE PUNCHED BENTONITE MEMBRANE

Location: ~
Substrate: ~
Manufacturer: ~
Membrane: ~
Thickness: ~
Components: ~
Accessories: ~

4.6 TANKING - THERMOPLASTIC MEMBRANE

Location: ~
Substrate: ~
Manufacturer: ~
Membrane: ~
Thickness: ~
Components: ~
Accessories: ~



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4131AL ALLCO VOLCLAY® TANKING

1 GENERAL

This section relates to the application of Allco Waterproofing Solutions Limited Volclay® bentonite based tanking systems.
It includes:

- Sodium bentonite waterproofing membranes
- Components and accessories to complete installation

1.1 RELATED WORK

Refer to 2242 BACKFILLING for back filling after installation of the tanking system.

Refer to 7441 GROUNDWATER DRAINAGE for subsoil drainage to basement walls.

Documents

1.2 DOCUMENTS

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

ASTM D 5993	Standard Test Method for Measuring Mass per Unit Area of Geosynthetic Clay Liners
EN 14196	Geosynthetics - Test methods for measuring mass per unit area of clay geosynthetic barriers
CodeMark™ CMNZ70182 ver1	Volclay® Waterproofing System

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Allco	Volclay Backfill and Protection
Allco	Allsheet DPM Technical Data Sheet
Allco	Substrate Checklist
Allco Volclay®	Swelltite® Technical Data Sheet
Allco Volclay®	Voltex® Technical Data Sheet
Cetco® Volclay®	Waterstop-RX® Technical Data Sheet
Cetco® Volclay®	Cetseal Sealant/Adhesive Technical Data Sheet
Cetco® Volclay®	Aquadrain® 15X Technical Data Sheet
Cetco® Volclay®	Technical Drawings
Allco Volclay®	Tanking Details and Install Guide V3, July 2024
BRANZ Appraisal 507	[2024] - Volclay® Waterproofing System

Manufacturer/supplier contact details;

Company:	Allco Waterproofing Solutions Limited
Web:	www.allco.co.nz
Email:	info@allco.co.nz
Telephone:	09 448 1185

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide warranty for:

20 years: Product Warranty

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

An Allco System Warranty is available on request. Refer to www.allco.co.nz/warranty-technical-support for Allco System Warranty request forms, terms and conditions.

Refer to the general section 1237 WARRANTIES for additional requirements.

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Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Allco Waterproofing Solutions Limited system, or associated components and products.

1.6 QUALIFICATIONS

Applicators to be experienced in the application of bentonite based tanking membranes and approved by Allco Waterproofing Solutions Limited If requested provide evidence of experience prior to commencing work.

1.7 PRE-INSTALLATION REVIEW

Convene a pre-installation meeting if required by Allco Waterproofing Solutions Ltd to establish procedures to maintain required working conditions and to co-ordinate this work with related and adjacent work. Verify final waterproofing and waterstop details comply with Allco Waterproofing Solutions Limited current installation requirements and recommendations. Refer to the Pre-installation check list.

Meeting attendees to include:

- Contractor
- Waterproofing installer
- Mechanical contractor where work extensively penetrates the waterproofing
- Project manager (optional)
- Allco Waterproofing Solutions Limited

1.8 INSTALLATION REPORT

Allco approved applicators are required to complete an installation report via an approved digital platform. Provide reports and digital photographs documenting each installation. Allco Waterproofing Solutions Limited may also carry out inspections to monitor waterproofing material installation compliance with the project contract documents, manufacturer's published literature and site-specific details. Refer to the Site Observation form. Inspections shall include, but not be limited to, substrate examination, beginning of waterproofing installation, periodic intervals and final inspection prior to concrete or backfill placement against the waterproofing.

The above information may also be recorded by an Allco representative in the onsite Allco Volclay – Technical Support Manual. This manual must remain onsite until completion of the section of works, it will then be removed, copied and made available for distribution on request.

1.9 ALLCO TECHNICAL SUPPORT

Contact Allco Waterproofing Solutions Ltd if technical support is required.

Compliance information

1.10 COMPLIANCE - CODEMARK CERTIFICATE

The Volclay® tanking system meets the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ70182.

1.11 COMPLIANCE - BRANZ APPRAISAL

The Volclay® tanking system has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 507.

Performance

1.12 PRESSURE RATING

Volclay® has been BRANZ Appraised for use as an external tanking membrane subject to pressures up to 2 bar (20 metres). Refer to SELECTIONS for the designated water pressure head.

1.13 VAPOUR FLOW RESISTANCE

The membrane system to have a vapour flow resistance of not less than 90 MN s/g.

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2 PRODUCTS

Materials

2.1 VOLTEX WATERPROOFING MEMBRANE

Cetco® Volclay® Voltex® sheet membrane manufactured from two geotextile membranes, one woven (dark grey) and one non-woven (white), needle punched together encapsulating 4.8kg/m² minimum of granular sodium bentonite to EN 14196. Supplied in 1.1m wide x 5m long and 1.6m wide x 40m long rolls. Refer to SELECTIONS.

2.2 SWELLTITE COMPOSITE WATERPROOFING MEMBRANE

Cetco® Volclay® Swelltite® 2mm thick composite sheet membrane of sodium bentonite compound integrally bonded to geomembrane liner on one face and a water soluble film on the other face. Supplied 1m wide x 10.4m long.

Water stop products

2.3 DELAYED HYDRATION WATERSTOP - WATERSTOP-RX 101DH

25mm x 20mm x 5m rolls of trapezoidal flexible strip of bentonite and butyl rubber compound with a reinforcing poly scrim for use in concrete construction joints.

2.4 DELAYED HYDRATION WATERSTOP - WATERSTOP-RX 102DH

19mm x 9mm x 6m rolls of half circle flexible strip of bentonite and butyl rubber compound with a reinforcing poly scrim for use in concrete construction joints.

2.5 WATERSTOP-RX 102

19mm x 9mm x 10m rolls of half circle flexible strip of bentonite and butyl rubber compound for use in concrete construction joints.

Adhesive

2.6 CETCO® VOLCLAY CETSEAL

CETSEAL, a multipurpose, single component polyether moisture cure sealant/adhesive with a low VOC, 100% solids, non-shrinking and with a high UV resistance. Used as a grade termination sealant, membrane lap sealant and waterstop adhesive to secure all Volclay® Waterstop-RX products to concrete, metal and PVC horizontal and vertical surfaces.

Accessories

2.7 CETCO® VOLCLAY BENTOSEAL®

Trowel grade sodium bentonite compound used as a detailing mastic around penetrations, corner transitions and grade terminations.

2.8 CETCO® VOLCLAY CETCOAT®

Cement based crystalline waterproofing system.

2.9 CETCO® VOLCLAY WATERSTOPPAGE®

Granular Volclay® sodium bentonite.

2.10 ALLCO SEAMTAPE®

Butyl rubber sealant tape 80mm wide x 20m roll .

2.11 ALLCO CLOTH TAPE

Polyethylene coated rayon fabric cloth tape with rubber resin adhesive.

2.12 ALLCO TERMINATION BAR

35mm wide x 2.0mm thick extruded aluminium bar fixed tight to the membrane at 300mm centres. Fasteners to suit project substrate.

2.13 SUB-SURFACE DRAINAGE COMPOSITE

Aquadrain drainage composite by CETCO® to manufacturer's recommendations.



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2.14 ALLSHEET DPM

Allco Allsheet DPM 300 and 500 micron recycled polyethylene damp proof membrane used in conjunction with Volclay® membranes. Refer to SELECTIONS.

2.15 ALLCO TERMINATION BAR

35mm wide x 2.0mm thick extruded aluminium profiled bar.

Protection sheet

2.16 CETCO® AQUADRAIN 15X DRAINAGE COMPOSITE

Aquadrain® 15X, a drainage composite, two-part pre-fabricated sheet drain consisting of a three dimensional polypropylene formed dimple core covered with a non-woven polypropylene filter fabric on one side. Polypropylene core resists chemical attack and degradation in soil.

2.17 PROTECTION BOARD

4mm Allco Allguard Board.

3 EXECUTION

Conditions

3.1 COMPLY

Comply with Allco Waterproofing Solutions Limited requirements and instructions. Unless otherwise detailed, install in accordance with Volclay® waterproofing details.

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 DE-WATERING

Maintain water level at not less than 300mm below the level of the base concrete during the progress of the entire tanking work. Run pumps continuously when required. Refer to Allco if unsure of requirements.

3.5 CHECK SUBSTRATE

Approved Allco applicator to verify that the substrate is smooth and without sharp deflections or pockets to achieve work of the required standard. Complete any remedial work identified before commencing any work.

3.6 REMOVE OTHER FORMWORK

Ensure that formwork has been removed or partially removed from the other face(s) to the membrane face, to the extent that it allows moisture to escape from the concrete to ensure no vapour pressure develops beneath the membrane.

Application - general

3.7 INSTALLATION

Install Volclay tanking system in accordance with Allco Volclay Tanking Details and Install Guide. Where required, request specific details prior to proceeding with installation.

3.8 SEALANT/ADHESIVE - WALL / MEMBRANE JUNCTIONS

Apply Cetseal sealant/adhesive as a grade termination sealant, membrane lap sealant and waterstop adhesive to secure Volclay® Waterstop-RX products to concrete, metal and PVC horizontal and vertical surfaces, all in accordance with Allco Waterproofing Solutions Limited requirements and instructions.

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3.9 PREVENT PREMATURE HYDRATION

Cover Swelltite membrane installations with Allguard Protection board immediately, to protect the membrane. After any precipitation, standing water should be pumped off Voltex under slab waterproofing as soon as possible. Do not allow Swelltite to sit in ponded water. Do not walk on membrane if it becomes hydrated.

3.10 COVER EXPANSION JOINTS

Cover expansion joint material placed during substrate preparation. Trowel 3mm thick, 150mm wide layer of Bentoseal® centred over expansion joint. Install 300mm wide strip of Voltex® centred over the expansion joint, then install the main course of Voltex®.

Application - under slab installation

3.11 INSTALL VOLTEX MEMBRANE

Place Voltex® directly on properly prepared substrate compacted to a minimum of 85% Proctor density (25 - 30 kPa) with dark grey woven geotextile side up facing installer with adjoining edges overlapped a minimum of 100mm. Stagger sheet end seams a minimum of 300mm. Mechanically fasten or staple Voltex® as required to prevent movement from construction operations or concrete placement. When the slab is poured in sections, extend Voltex® a minimum of 300mm beyond the slab edge to enable proper overlapping.

3.12 INSTALL ALLCO ALLSHEET DPM

Lay Allco Allsheet DPM under concrete floor substrate over sand blinding, in a single layer to provide a damp proof vapour barrier. Overlap panels a minimum of 150mm when joining films using Allco Cloth tape.

3.13 INSTALL VOLTEX MEMBRANE OVER UNDERSLAB INSULATION

Install Voltex® membrane over monolithic layer of insulation to have full bond to concrete slab.

3.14 INSTALL AROUND LIFT, ESCALATOR AND SERVICE PITS

Install Voltex® under all footings, elevator pits and grade beams when hydrostatic conditions exists or are anticipated per the historical high ground water elevation reported in the project's geotechnical documents.

Application to concrete masonry unit block walls and Precast panels - Swelltite

3.15 FORM FILLET BEADS

Pour 18mm thick, continuous Waterstoppage® fillet at all inside wall corner transitions. Trowel Bentoseal® form-tie pocket/patches and any slightly irregular honeycomb areas.

3.16 INSTALL SWELLTITE MEMBRANE TO BASE OF WALL

Start at the base of the wall and install Swelltite® sheet horizontally, dampen the backing with a spray bottle of water, place dark side membrane against the wall. Attach Swelltite ® using washer-headed mechanical fasteners centred 600mm around the sheet edge. Overlap all adjacent sheet edges a minimum 50mm. Stagger all vertical overlap seams a minimum of 300mm. Refer to details in Volclay® Architectural Specifications and Drawings for heel type foot, and flush footing.

For hydrostatic conditions, refer to Allco Waterproofing Solutions Ltd for specific detailing.

3.17 INSTALL SWELLTITE MEMBRANE TO REMAINDER OF WALL

Install Swelltite® either vertically or horizontally. Continue up wall to finish grade elevation, staggering sheet roll ends of adjacent courses a minimum 300mm. Tape all 50mm laps with Allco seam tape and terminate at grade with Allco termination bar fixed at 300mm centres to Allco typical termination details.

3.18 TRIM AROUND PENETRATIONS

Cut Swelltite® to fit snugly around penetrations. Detail around all penetrations with 18mm cant/fillet of Bentoseal® 6mm thick over substrate a minimum radius of 40mm and onto penetration.

3.19 TERMINATION AT GRADE

Refer to Allco typical termination details.

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3.20 INSPECT BEFORE BACKFILLING

Inspect finished Swelltite® installation and repair any damaged material prior to placement of protection board and backfill. Ensure Swelltite® and protection board is not displaced during backfilling or soil compaction. Do not leave exposed. Backfill within 1-2 days or when precipitation is imminent.

Application - plaza podium decks, roof gardens and earth covered roofs

3.21 INSPECTION OF SUBSTRATE

Installer to confirm condition of substrate is satisfactory to achieve work of the required standard. Installer to notify contractor in writing of unacceptable conditions and to correct all unacceptable work for compliance with manufacturer's warranty requirements prior to commencing work. Deck should be sloped to drains, minimum slope 1 in 100.

3.22 SURFACE PREPARATION FOR CONCRETE SUBSTRATES

Concrete substrates to be of sound structural grade with smooth finish, free from debris, oil, grease, dirt, dust and other foreign matter that may impair the performance of the waterproofing and drainage system and which do not comply with the manufacturer's warranty requirements. Fins, ridges and other protrusions to be levelled and smoothly finished. Fill all honeycomb, aggregate pockets, holes and other voids with non-shrink cementitious grout. Level and smoothly finish to match concrete surface. Ensure horizontal deck or split-slab roof concrete surfaces are sloped for proper drainage.

Concrete surfaces should be in place 7 days minimum, water-cured and thoroughly dry prior to application of Volclay® Swelltite® Membrane.

3.23 SURFACE PREPARATION FOR MASONRY WALL SUBSTRATES

Masonry block cells should be filled with cementitious grout or concrete. All mortar joints should be completely grouted and struck flush with face of block.

3.24 INSTALLATION - GENERAL

Proceed only after all penetrations and expansion joints have received proper compression seals, backer stock and sealant, as required by others. Proceed only after drain has been installed and anchored correctly by others with applicable compression seals or sealant. Clean drain area of debris and dirt.

3.25 INSTALL DECK CORNERS AND TRANSITIONS

Install 30mm continuous fillet of Bentoseal or Waterstoppage to internal corners, with optional Cetcoat laid to concrete substrates.

3.26 INSTALL DECK DRAINS

Install drainage outlet and trowel 2.5mm minimum thick layer of Maxbit liquid flashing around penetration and into drainage base clamp. Extending liquid flashing 150mm outwards around drain. Overlap liquid flashing with Swelltite into the clamped area of the outlet before fixing clamp ring / drainage grate.

3.27 INSTALL SWELLTITE® MEMBRANE FOR PODIUM

Install Swelltite® membrane with sodium bentonite compound directly against the concrete substrate from the low point to the high point across the fall line to create a shingle-style application. Overlap all membrane edges 50mm minimum. Stagger roll end seams a minimum 300mm. Cut membrane to closely contour penetrations, drains and elevation changes. Seal all membrane overlap seams with Allco Seamtape®. Turn up Swelltite membrane 50mm to perimeter upstands and terminate membrane system with Allco termination bar fixed at 300mm centres. Apply Cetseal to the top edge of the termination bar to seal the top of edge of the membrane.

3.28 PREVENT PREMATURE HYDRATION

When threat of rain is imminent, installed bentonite products not already contained by overburden or backfill should have all seams sealed with Allco Seamtape.

3.29 COVER EXPANSION JOINTS

Cover expansion joint material placed during substrate preparation. Cover, trowel 3mm thick, 150mm wide layer of Bentoseal® centred over expansion joint. Install 600mm wide strip of Swelltite® centred over the expansion joint. Then install the main course of Swelltite®.

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3.30 INSTALL SUB-SURFACE DRAINAGE FOR COMPOSITE DECK INSTALLATION

Commencing at the lowest level of the deck, usually around the drains, install the drainage sheet horizontally orientated with the filter fabric facing up. Face the flanged core edge away from the drain. Install over the waterproofing membrane or over the protection board applied over waterproofing membrane to manufacturer's recommendations. Attachment methods include construction adhesive and two-sided tape.

Connect adjacent drainage panels by pulling the filter fabric back to expose two rows of core dimples and then interlocking the core dimples with the installed panel. With the next course, place the flangeless panel edge over the top flange edge of the panel below and butt dimple to dimple. All connections to be completed in shingle fashion to allow water to flow with the overlap toward the deck drain or discharge pipe. Install duct tape as required over core overlap joint to prevent wet concrete or soil intrusion into the drain core. Overlap fabric in direction of water flow and secure with construction adhesive or duct tape.

For inside and outside corners, cut plastic core of drainage composite at the corner. Do not cut filter fabric. Cut drainage composite to fit and wrap extra filter fabric around open edge of core protrusions to prevent soil intrusion into core. Wrap all drainage panel terminations edges with the filter fabric flap by tucking fabric behind the core.

3.31 TOPPING COVER

Provide topping cover over horizontal deck/tunnel installation. Refer to SELECTIONS.

Protection

3.32 PROTECT ALL MEMBRANE SURFACES

Protect entire exposed surface of membrane from damage with Allco Allguard protection board prior to backfilling.

3.33 INSTALL DRAINAGE COMPOSITE

Install Aquadrain® 15X drainage composite in accordance with Allco Waterproofing Solutions Limited requirements & instructions and Allco Backfill and Protection document. Install first course at the base of the structure. Cut as required to fit around penetrations and other details. Ensure open core edges and penetrations are sealed with filter fabric flap.

Extend Aquadrain® 15X to 150mm below finished grade line. Wrap excess filter fabric flap behind the core edge at the top of the wall to prevent soil intrusion. Backfill with compacted soil directly against the filter fabric.

At boundary retaining walls place Aquadrain® 15X with the filter fabric side facing outward against the retaining wall. Install drain composite as above. Place waterproofing and pour structural concrete directly against the drain core.

Do not install Aquadrain 15X if hydrostatic conditions are present. Consult with Allco Waterproofing solutions Ltd if unsure.

3.34 INSTALL PROTECTION BOARDS

Neatly scribe and fit sheets of Allco AllGuard Board, spot fixing them with adhesive and taped over joints.

Backfilling

3.35 GENERAL

This section should be read in conjunction with current Allco Volclay Backfill and Protection document. Installation of the backfill material is the responsibility of the contractor. Refer to Allco Waterproofing Solutions Ltd or approved applicator for further guidance or clarification on backfilling.

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3.36 MONITOR BACKFILLING

When backfilling to Volclay tanking membranes, there must be no voids in the backfill, regardless of the type of material being used for backfill. The top 500mm must be compacted with a walk behind vibratory compactor or some other mechanical soil compaction device to the extent that foot traffic on the lift does not leave indentations greater than 12mm. Ensure that the compactor does not touch the waterproofing membrane.

Refer Allco Volclay Backfill and Protection document for available options for backfill and protection to Allco Volclay Membranes.

For hydrostatic conditions (contact Allco Waterproofing Solutions if unsure) special requirements are:

- Protect membrane with 4mm Allco AllGuard Board or 6mm fibre cement board only (Aquadrain® 15X is not suitable for use in hydrostatic conditions)
- Backfill with a good compactable aggregate such as GAP40 with fines
- Compact backfill at maximum 300mm lifts
- Allco WP and approved applicators are not responsible for installation of the backfill material.

Completion & Commissioning

3.37 COMPLETION MATTERS

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

4 SELECTIONS

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

Performance

4.1 PRESSURE RATING

Designated water pressure head: ~ metres

Tanking

4.2 VOLTEX GEOTEXTILE WATERPROOFING MEMBRANE

Location:	~
Supplier:	Allco Waterproofing Solutions Limited
Brand:	~
Dimensions:	~

4.3 SWELLTITE COMPOSITE WATERPROOFING MEMBRANE

Location:	~
Supplier:	Allco Waterproofing Solutions Limited
Brand:	Cetco® Volclay® Swelltite®
Dimensions:	1m wide x 10.4m long rolls

4.4 WATERSTOP RX

Location:	~
Supplier:	Allco Waterproofing Solutions Limited
Brand/type:	Cetco® Volclay® WATERSTOP-RX 102
Dimensions:	19mm x 9.5mm x 10.2m roll

4.5 WATERSTOP-RX DH

Location:	~
Supplier:	Allco Waterproofing Solutions Limited
Brand/type:	~
Dimensions:	~

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Podium system

4.6 PODIUM

Location: ~
System: Cetco® Volclay® Swelltite® composite waterproofing membrane

4.7 PODIUM TOPPING COVER

Minimum topping cover

Compacted earth backfill cover: 450mm
Concrete coverage thickness: 75mm minimum reinforced concrete slab
Paver with grout bed system: 97 kg/m²

Protection sheets

4.8 AQUADRAIN® 15X DRAINAGE COMPOSITE

Location: ~
Manufacturer: Allco Waterproofing Solutions Limited
Brand/type: Cetco® Aquadrain® 15X
Thickness: 11mm (1.2m x 15.8m roll)

4.9 PROTECTION BOARD

Location: ~
Manufacturer: Allco Waterproofing Solutions Limited
Brand/type: Allco AllGuard
Thickness: 4.0mm (2300mm x 1140mm sheet)

Accessories

4.10 ALLSHEET DPM

Location: ~
Supplier: Allco Waterproofing Solutions Limited
Brand: Allco Allsheet DPM
Dimensions: ~



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4161 UNDERLAYS, FOIL AND DPC

1 GENERAL

This section relates to the application of:

- DPC/DPM
- wall underlays includes Kraft based and synthetic wall underlays
- roofing underlays includes kraft based and synthetic roof underlays
- foils
- vapour barriers
- accessories

1.1 RELATED WORK

Refer to ~ for ~

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

NZMRM	New Zealand Metal Roofing Manufacturers Inc.
W2	Wall underlay Kraft/bituminous based Heavy grade
W3	Wall underlay Synthetic based non-absorbent
W4	Wall underlay Synthetic based absorbent
R1	Roof underlay Kraft/bituminous based Heavy grade
R2	Roof underlay Kraft/bituminous based Self-supporting
R3	Roof underlay Synthetic based Heavy grade
R4	Roof underlay Synthetic based Self-supporting

The following definitions apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZS/AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays
AS/NZS 4347.0	Damp-proof courses and flashings - Methods of test - General introduction, list of methods and test specimen requirements
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the manufacturer/supplier.

Manufacturer/supplier contact details

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Company: ~
Web: ~
E-mail: ~
Telephone: ~

Requirements

1.5 INSTALLATION SKILL LEVELS

Installers to be familiar with the manufacturer's technical literature and the NZMRM CoP NZ Metal Roof and Wall Cladding Code of Practice.

2 PRODUCTS

Materials

DPC

2.1 POLYETHYLENE DPC

Polyethylene film to AS/NZS 2904 and to the appropriate test methods set out in AS/NZS 4347.0. Thickness 500 microns minimum, manufactured for use as a damp-proof course and concealed flashings to doors and windows.

DPM

2.2 DAMP PROOF MEMBRANE - CONCRETE FLOOR

Polyethylene sheet with minimum thickness of 0.25mm to NZS 3604, 7.5.6, **Polyethelene (polythene) sheet damp-proof membranes**.

Water-Resistive Barrier Wall Membrane

2.3 WATER RESISTIVE BARRIER WALL MEMBRANE SYSTEM

Self-adhered, water resistive, vapour permeable, flexible air barrier membrane for installation over a Rigid Air Barrier. Complete with all required tapes and accessories.

Rigid Wall Underlays

2.4 RIGID WALL UNDERLAYS

Plywood or fibre cement sheet over-fixed with flexible wall underlay to NZBC E2/AS1, paragraphs 9.1.6.2 - 9.1.6.4. Refer to the appropriate section.

Roofing Underlay

2.5 SYNTHETIC NON-WOVEN ROOFING UNDERLAY (R3)

A non-woven roofing underlay, consisting of two spun-bonded polyolefin fabric layers bonded to a micro porous inner layer, designed for use as a water absorbent, breathable, water resistant roofing underlay for sloped roofs; with flammability index tested to NZS/AS 1530.2, AS/NZS 2295

Commercial Roofing Foils

2.6 FIRE RETARDANT MEDIUM WEIGHT ALUMINIUM FOIL

Two layers of aluminium foil and paper laminates, bonded with flame retardant adhesive and reinforced with fibreglass yarn in a tri-directional pattern tested to AS/NZS 4200.1 and NZS/AS 1530.2. Refer to NZMRM CoP for recommendations.

2.7 FIRE RETARDANT LIGHT WEIGHT ALUMINIUM FOIL

Two layers of aluminium foil laminated to a central core of Kraft paper with flame retardant adhesive and reinforced with fibreglass yarn in a tri-directional pattern tested to AS/NZS 4200.1 and NZS/AS 1530.2. Refer to NZMRM CoP for recommendations.

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2.8 FIRE RETARDANT MEDIUM WEIGHT LIGHT DIFFUSER

Medium weight reflective underlay consisting of aluminium foil and Kraft paper laminate, bonded to a white polymeric film with flame retardant adhesive and reinforced with fibreglass yarn in a unidirectional pattern tested to AS/NZS 4200.1 and NZS/AS 1530.2.

Vapour Barriers

2.9 MOISTURE VAPOUR BARRIER

Moisture vapour barrier film to AS/NZS 4200.1, complete with adhesive pressure-sensitive tape required by the film manufacturer, used for the prevention of moisture damage.

Accessories

2.10 WINDOW DOOR SEALING SYSTEM

Proprietary window and door flashing tape and accessories to NZBC E2/AS1, 4.2.12 Flexible flashing tape, and 9.1.4 Wall underlays to wall openings.

2.11 GUTTER AND UNDER FLASHINGS

Bituminous breather type underlay cut to width by manufacturer for use under valley, apron flashing and internal gutters. Soffit liner cut to width from bituminous breather type underlay.

2.12 ADHESIVE TAPE

Adhesive tapes to compliment the underlay. Pressure sensitive tapes for joining foil insulation and vapour barriers.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZBC E2/AS1, Table C.2.1.1 Properties of roof underlays and wall underlays, and manufacturers technical literature.

Note: Care should be taken not to expose the underlay to continuous wet and windy conditions.

3.2 STORAGE

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

3.3 INSPECTION

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

Application - DPC

3.4 POLYETHYLENE DPC TO TIMBER

Lay polyethylene DPC under treated and untreated timber, including LOSP treated timber, of all timber framed walls on concrete and concrete masonry, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

3.5 DPC TO MASONRY AND BRICK VENEER

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

3.6 DPC BETWEEN DISSIMILAR MATERIALS

Lay DPC between dissimilar materials where required.

Application - DPM

3.7 DPM TO CONCRETE FLOOR

Lay DPM under concrete floor substrate over sand binding, in a single layer with 150mm overlaps at joints to provide a waterproof barrier.

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Application - Water-Resistive Barrier Wall Membrane

3.8 INSTALL WATER-RESISTIVE BARRIER WALL MEMBRANE

Ensure substrate is dry, clean and free from contaminants. Install self- adhered, water-resistive barrier wall membrane over substrate in accordance with manufacturer's requirements with required minimum overlaps, with lower courses lapped under upper courses to allow for the shedding of water. If required, install joint tape in accordance with manufacturer's requirements. Installation to all penetrations including and windows and doors shall be completed in accordance with manufacturers requirements using compatible flashing tapes and sealants.

Application - Roofing Underlay

3.9 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixing clips. Lay underlay to avoid excessive dishing between purlins. When used vertically limit individual runs to 10 metres for bituminous based roofing underlays, 7 metres for fire retardant underlays and 20 metres for synthetic roofing underlays. Do not lay vertically on roof pitches under 10°.

Lay horizontally across the rafter/trusses starting at the gutter line with succeeding sheets in true alignment and lapping 150mm. Scribe around and fit neatly to all penetrations. Avoid prolong exposure by installing the roof immediately. UV exposure to manufacturers requirements, maximum 7 days.

3.10 GUTTER AND UNDER FLASHINGS

Lay bituminous breather type underlay cut to width by manufacturer for use as an underlay to valley, apron flashings, internal gutters and soffit liner. Lap under flashings with adjoining underlays. Fix soffit liner from top plate down 150mm past ribbon plate.

Application - Commercial Roofing Foils

3.11 FOIL ROOF UNDERLAY

Lay vertically over purlins with a 150mm side lap. Fix securely to purlins with galvanized fixing clips. Lay underlay to avoid excessive dishing between purlins.

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

3.12 FOIL ROOF/WALL UNDERLAY AS LIGHT DIFFUSER (WHITE FACED FOIL)

Lay horizontally or vertically on safety mesh for roof application. Lay vertically for wall application. Start at the gutter and work towards the ridge with a minimum lap of 150mm. Tape joints with appropriate fire retardant white tape 48mm wide to manufactures specifications.

3.13 ROOF/WALL UNDERLAY INSTALLATION (DOUBLE SIDED FOIL)

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

Application - Vapour Barrier

3.14 FIX VAPOUR BARRIER

Fit and fix between insulation and lining with joints lapped and sealed with pressure-sensitive tape.

3.15 FOIL ROOF UNDERLAY AS VAPOUR BARRIER

Lay horizontally or vertically on 75mm galvanized wire netting. Start at the gutter and work towards the ridge with a minimum lap of 150mm. Tape joints using foil reinforced tape x 50mm.

Completion

3.16 CLEAN UP

Clean up as the work proceeds.



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3.17 LEAVE

Leave work to the standard required by following procedures.

3.18 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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4171E ECOPLY® BARRIER RIGID AIR BARRIER SYSTEM

1 GENERAL

This section relates to the supply and installation of Carter Holt Harvey Plywood Limited Ecoply® Barrier plywood as a rigid wall underlay and air barrier behind cavity wall cladding systems.

1.1 RELATED WORK

Refer to ~ for ~

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:

CCA	Copper chrome arsenate
PF	Phenol formaldehyde
uPVC	Unplasticized polyvinyl chloride

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 for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other that risk group SH
AS/NZS 1604.3:2012	Preservative-treated wood-based products - Plywood
AS/NZS 2269.0	Plywood - structural - specifications
NZS 3604	Timber-framed buildings

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Ecoply® Structural Rigid Air Barrier - Barrier Specification & Installation Guide (June 2026)
Ecoply® Barrier Plywood Product Technical Statement and Building Product Information Sheet
Ecoply® Barrier Safety Data Sheet
Ecoply® Barrier sITe App
Ecoply® Barrier CAD drawings
BRANZ Appraisal 827 (2025) - Ecoply® Barrier Rigid Air Barrier

Manufacturer/supplier contact details

Company:	Carter Holt Harvey Plywood Limited
Web:	www.chhply.co.nz
Email:	info@ecoply.co.nz
Telephone:	0800 326 759

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Compliance information

1.7 COMPLIANCE - BRANZ APPRAISAL

Ecoply® Barrier Rigid Air Barrier has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 827.

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Performance

1.8 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

To NZBC C/AS1, 5.3 External Cladding Systems or NZBC C/AS2, 5.5 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.

2 PRODUCTS

Materials

2.1 ECOPLY BARRIER PLYWOOD

7mm thick, square edge, synthetic phenolic (PF) resin Type A bonded timber veneer plywood sheets, manufactured to AS/NZS 2269. H3.2 CCA treated to AS/NZS 1604.3:2012. Stress grade F8/F8. Appearance grade DD with water-resistant beige polyester powder coated on front face and four edges. Sheets marked Ecoply® Barrier. Sheets 1197mm wide. Available in 2440mm and 2745mm lengths. Refer to SELECTIONS.

2.2 GIB STANDARD PLASTERBOARD

Refer to 5113G GIB PLASTERBOARD LININGS for GIB® standard plasterboard.

Components

2.3 NAILS

Refer to SELECTIONS.

2.4 ECOPLY BARRIER SILL TAPE

Flexible weathertight tape with butyl rubber and polyethylene film carrier paper, siliconized foil release paper. 20m long roll. Available in 150mm and 200mm widths to suit application. Black colour.

2.5 ECOPLY BARRIER SEALING TAPE

Water-resistant tape with polypropylene fleece carrier paper and siliconized release paper. 25m long roll. Available in 60mm, 150mm, and 200mm widths to suit application. Grey colour.

2.6 GIB HANDIBRAC HOLD-DOWN BRACKET

Galvanized steel bracket by MiTek New Zealand Limited, supplied with 5 Tek screws and 2 BOWMAC screw bolts.

2.7 TIMBER PRESERVATIVE TREATMENT

Soudal Metalex Concentrated Timber Preservative treatment, in clear or green colour. Refer to SELECTIONS.

Accessories

2.8 PRO CLIMA KAFLEX CABLE SEALING GROMMET

EPDM backed, siliconized water-resistant self-adhesive grommet.

2.9 PRO CLIMA ROFLEX SEALING GROMMET

EPDM watertight grommet, size to suit penetration.

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 - TIMBER FRAMING

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

Timber substrate: 18% maximum moisture content

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with Ecoply® Structural Rigid Air Barrier - Barrier Specification & Installation Guide.

3.6 BOTTOM PLATE FIXING - BRACING SYSTEM

Fix GIB® HandiBrac® hold-down brackets at each end of bracing element with supplied fasteners. Within the length the bracing element, fix bottom plates to the requirements of NZS 3604.

3.7 TREAT CUTS

Brush timber preservative onto cut edges and penetration cut outs.

3.8 FIT ECOPLY BARRIER SHEETS

Fit Ecoply® Barrier sheets with long edge oriented vertically, beige polyester powder coated face outwards, and cut sheet ends oriented upward. Sheets to overhang the bottom plate, joist or bearer by a minimum of 25mm. Allow 2mm expansion gap between sheets.

3.9 FIX GIB STANDARD PLASTERBOARD - BRACING SYSTEM

Refer to 5113G GIB PLASTERBOARD LININGS for GIB® standard plasterboard.

3.10 FASTENERS - STANDARD NAILING PATTERN

Nail fix to framing to the standard Ecoply nail pattern. Maintain clearances to sheet edges to Ecoply requirements. Finish fastener heads flush with the panel surface.

3.11 FASTENERS - NAILING PATTERN FOR BRACING SYSTEM

Nail fix to framing to the specific Ecoply nail pattern for the brace element. Maintain clearances to sheet edges to Ecoply requirements. Finish fastener heads flush with the panel surface. Refer to Ecoply® Structural Rigid Air Barrier - Barrier Specification & Installation Guide.

3.12 FIXING TO RESIST UPLIFT

Nail fix the top of the sheet directly to the centre of the top plate using the specific Ecoply nail pattern for a 4.7kN fixing of the top plate to the studs. Fix the remainder of the sheet to standard nailing pattern. Horizontal sheet joints are not permitted within 300mm of top plate. Maintain clearances to sheet edges to Ecoply requirements. Finish fastener heads flush with the panel surface.

3.13 LINTEL CONNECTION FOR UPLIFT

Nail framing and Ecoply® Barrier sheets to Ecoply lintel connection detail for uplifts not exceeding 7.5kN.

3.14 TAPE - GENERAL

Remove dust from sheets before adhering tape. Apply pressure to seal the tapes with minimal wrinkles.

3.15 VERTICAL ECOPLY BARRIER SHEET JOINTS - WALL PLANE

Centre Ecoply® Barrier Sealing Tape over vertical sheet joints.

3.16 VERTICAL ECOPLY BARRIER SHEET JOINTS - CORNERS

Centre Ecoply® Barrier Sealing Tape over sheet joints at external and internal wall corners.

3.17 HORIZONTAL SHEET JOINT - TAPE Z FLASHING

Apply Ecoply® Barrier Sealing Tape over lower sheet with 60mm overlap to sheet and 80mm upstand to form a Z flashing. Fit upper Ecoply® Barrier sheet over tape upstand with a 15mm expansion gap between upper sheet edge and taped-over lower sheet edge.



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3.18 TAPE SPLICES & JOINTS

Where tape splices occur at a junction, create an overlapping splice of at least 50mm. Take special care to remove any wrinkles or voids at splice areas.

3.19 WINDOW & DOOR OPENINGS

Apply Ecoply® Barrier Sill Tape to cover the bottom of the opening and Ecoply® Barrier Sealing Tape to the vertical trimmer stud and lintel, reinforce corners at each end of the lintel with 100m strip of 150mm wide Ecoply® Barrier Sealing Tape.

3.20 PENETRATIONS - ECOPLY BARRIER SILL TAPE

Apply Ecoply® Barrier Sill Tape to flash to Ecoply® Barrier sheet, provide 100mm minimum cover to sheet. Bandage around pipes with Ecoply® Barrier Sealing Tape with 25mm minimum width of cover to pipe.

3.21 PENETRATIONS - PRO CLIMA KAFLEX CABLE SEALING GROMMET

Apply self-adhesive Pro Clima Kaflex Cable Sealing Grommet over cable penetration to Pro Clima installation instructions.

3.22 PENETRATIONS - PRO CLIMA ROFLEX SEALING GROMMET

Apply Pro Clima Roflex Grommet over penetration and seal grommet flange to Ecoply® Barrier sheets with Ecoply Barrier Sealing Tape to Pro Clima installation instructions.

3.23 FLASHINGS

Apply Ecoply® Barrier Sealing Tape over horizontal flashings as required.

Completion

3.24 COMPLETION MATTERS

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

4 SELECTIONS

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

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4221CV RK ITI VERTICAL WEATHERBOARDS

1 GENERAL

This section relates to the supply and fixing of RK ITI Vertical weatherboard cladding systems.

It includes:

- Vertical shiplap weatherboards
- Vertical board & batten cladding
- Horizontal cavity battens
- Fascia, corner profiles, boxed corner cover boards, mouldings and scribers
- Flashings
- Fixings
- Factory and site applied finishes

1.1 RELATED WORK

Refer to ~ for ~

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
DF	Dressed Face
DFS	Dressed Face Sanded
FSC®	Forest Stewardship Council®
MCA	Micronized Copper Azole
PC	Premium Clears
PEFC	Programme for the Endorsement of Forest Certification
PP-U	Profile Paint Finish - Undercoated
WGANZ	Window & Glass Association NZ

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 provisions for building elements
NZBC B2/VM1	Structural design of buildings
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
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	NZ Timber Grading Rules
NZS 4211	Specification for performance of windows
AS/NZS 4284	Testing of building facades
ISO 2811-1	Paints and varnishes - Determination of density - Part 1: Pycnometer method
BRANZ BU 411	Recommended timber cladding profiles

CodeMark Certificate CMNZ70080 ver3 - RK Board & Batten
CodeMark Certificate CMNZ70082 ver3 - RK Vertical 45mm
CodeMark Certificate CMNZ70083 ver3 - RK Vertical 20mm

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1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

RK VERTICAL 20mm - Vertical Shiplap Weatherboards V5, October 2020
RK VERTICAL 45mm - Vertical Shiplap Weatherboards V5, October 2020
RK Board & Batten Weatherboards V1.0, November 2020
Vertical Shiplap Weatherboard - 20 mm Cavity on Flexible Underlay - Drawing Set 12 October 2020
Vertical Shiplap Weatherboard - 20 mm Cavity on Rigid Underlay - Drawing Set 12 October 2020
Vertical Shiplap Weatherboard - 45 mm Cavity on Flexible Underlay - Drawing Set 12 October 2020
Vertical Shiplap Weatherboard - 45 mm Cavity on Rigid Underlay - Drawing Set 12 October 2020
Board & Batten Weatherboard - Direct Fixed on Flexible Underlay - Drawing Set 12 October 2020
Board & Batten Weatherboard - 20mm Cavity on Flexible Underlay - Drawing Set 12 October 2020
RK Timbers Factory Oil Maintenance Guide
Dryden WoodOil Cleaning and Maintenance Guides
Sika Methodology - RK Timbers powder coated flashing to cedar bonding

Manufacturer/supplier contact details

Company:	ITI NZ Ltd
Trading as:	RK Timbers
Web:	www.rktimbers.co.nz
Email:	specifications@iti.net.nz
Telephone:	0800 484 695

Warranties

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years For installation of Vertical weatherboard cladding systems

- 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

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier.

1.8 NO SUBSTITUTIONS

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

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:

- ~

Provide this information prior to practical completion.

Compliance information

1.10 COMPLIANCE - CODEMARK CERTIFICATE

RK Board & Batten cladding system meets the requirements of the NZBC when used within the Conditions and Limitations of their Certificates CMNZ70080.

1.11 COMPLIANCE - CODEMARK CERTIFICATE

RK Vertical 45mm Weatherboard cladding systems meet the requirements of the NZBC when used within the Conditions and Limitations of their Certificates CMNZ70082.

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1.12 COMPLIANCE - CODEMARK CERTIFICATE

RK Vertical 20mm Weatherboard cladding systems meet the requirements of the NZBC when used within the Conditions and Limitations of their Certificates CMNZ70083.

1.13 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Installer / applicator warranty
- Producer Statement - Construction (PS3) from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.14 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

To NZBC C/AS1, 5.3 External cladding systems or NZBC C/AS2, 5.5 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.

1.15 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations.

2 PRODUCTS

Materials

2.1 TIMBER SPECIES - WESTERN RED CEDAR

Canadian Western Red Cedar (Thuja Pilcata).

2.2 THERMALLY MODIFIED LOW DENSITY HARDWOOD -TRUWOOD®

Thermally modified, clear grade, low density hardwood (Ayous - Triplochiton Scleroxylon).

2.3 RK TIMBERS VERTICAL WEATHERBOARDS

Timber weatherboards to RK Timbers Standard and Architectural profiles. General design to NZS 3617 and BRANZ BU 411. Refer to SELECTIONS.

Components

2.4 RK TIMBERS FASCIA BOARDS

Timber fascia boards to RK Timbers profiles. Refer to SELECTIONS.

2.5 RK TIMBERS TIMBER CORNER PROFILES

Timber external & internal corners to RK Timbers profiles. Refer to SELECTIONS.

2.6 RK TIMBERS EAVES MOULDINGS

Timber eaves mouldings to RK Timbers profiles. Refer to SELECTIONS.

2.7 RK TIMBERS ALUMINIUM FLASHINGS

Extruded aluminium profiles, mill finish or powder coated. Refer to SELECTIONS.

2.8 RK TIMBERS 20mm CAVITY BATTENS

Radiata Pine battens, finger jointed, H3.2 MCA treated RK-H 20 (20mm x 45mm) castellated horizontal batten with 18 degree slope top and bottom edge, 25mm x 6mm castellation rebates with radiused internal corners. Radiata Pine battens, finger-jointed, H3.2 MCA treated RK-V 20 (18mm x 45mm and 18mm x 65mm) vertical battens.

2.9 RK TIMBERS CAVITY CLOSER/VERMIN-PROOFING

Extruded aluminium profiles, powder coated. Refer to SELECTIONS.

2.10 WALL UNDERLAYS

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

2.11 RK TIMBERS CLADDING FIXINGS - SILICON BRONZE NAILS

Silicon bronze nails. Flat, Rose or Pentagon head, annular grooved. Refer to SELECTIONS.

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2.12 RK TIMBERS CLADDING FIXINGS - STAINLESS STEEL SCREWS

ASSY A2 60mm x 12g stainless steel self drilling screws. Refer to SELECTIONS.

Accessories

2.13 SIKA PRIMER-3N

Transparent solvent based reactive epoxy resin compound, density 0,98 kg/l to ISO 2811-1.

2.14 SIKA ACTIVATOR-205

Transparent alkyl titanate in an alcohol solution, density 0,80 kg/l to ISO 2811-1.

2.15 SIKAFLEX-11FC

Polyurethane elastomer adhesive & sealing compound. To ASTM C920 Type S, Grade NS, Class 12.5 for internal and external applications.

Finishes

2.16 OIL FINISH

Dryden WoodOil timber finish, applied onto all faces of the timber weatherboards, fascia, timber corners, boxed corner cover boards, mouldings and scribers. Refer to SELECTIONS.

2.17 STAIN FINISH

Sansin PrecisionCoat timber finish, applied onto all faces of the timber weatherboards, fascia, timber corners, boxed corner cover boards, mouldings and scribers. Refer to SELECTIONS.

2.18 PAINT FINISH

Paint coatings applied onto all faces of the timber weatherboards, fascia, timber corners, boxed corner cover boards, mouldings and scribers. Refer to SELECTIONS.

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.

Application - general

3.3 GENERALLY

Execution to RK Timbers installation instructions, construction details and in accordance with Conditions and Limitations of the CodeMark certificates.

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 PRE-INSTALLATION REQUIREMENTS

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

Moisture content: 18% maximum

Application - factory-applied finish coats

3.6 FACTORY COATING - OIL FINISH

Dryden WoodOil timber finish, factory spray-applied onto all faces of the timber weatherboards, fascia, timber corners, boxed corner cover boards, mouldings and scribers.

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3.7 FACTORY COATING - STAIN FINISH

Sansin PrecisionCoat timber finish, spray-applied onto all faces of the timber weatherboards, fascia, timber corners, boxed corner cover boards, mouldings and scribers.

3.8 FACTORY COATING - PAINT FINISH

Primer and undercoat paint coatings factory spray-applied onto all faces of the timber weatherboards, fascia, timber corners, boxed corner cover boards, mouldings and scribers.

Application - cavity battens

3.9 INSTALL CAVITY CLOSER/VERMIN-PROOFING

Fix RK Timbers cavity closer/vermin-proofing at base of walls, open horizontal and raking junctions and over windows, doors and meters. Use stainless steel fixings only.

3.10 INSTALL 20mm CAVITY BATTENS

Tack fix RK-V 20 vertical battens at window jambs and full height to internal and external corners with a 10mm gap between battens at external corners. Tack fix RK-H 20 castellated battens horizontally at 400mm vertical centres over wall underlay and nogs with batten edge sloping towards the cladding and a 10mm gap to vertical battens. Tack fix RK-V 20 battens horizontally to top plate to seal top of cavity.

Application - flashings

3.11 INSTALL BACK FLASHINGS

Fix back flashings full height to internal and external corners and vertical joints. Use stainless steel fixings only.

3.12 INSTALL JAMB FLASHING

Fix J-mould jamb flashing full height of door/window penetration, finish tight under the head flashing and in line with the door/window jamb and level with the sill. Use stainless steel fixings only.

3.13 INSTALL SOFFIT FLASHING

Fix J-mould soffit flashing full length of soffit. Use stainless steel fixings only.

Application - vertical shiplap weatherboards

3.14 INSTALL WEATHERBOARDS - 20mm CAVITY BATTENS

Seal all cut edges prior to installation. Start fixing vertical shiplap weatherboards from an internal or external corner with leading board lap (top lap) pointing in the same direction as the prevailing wind. Weatherboards to be full storey height, full width and continuous in length at jamb to head and sill junctions with minimum 50mm overhang of bottom plate and finish a minimum 100mm above paved surfaces and 175mm above unfinished surfaces. Position board laps so weathergrooves align to form 6mm x 6mm weathergroove. Boards to be single nailed 35mm to 40mm beyond the leading lap edge through cavity battens with a minimum 35mm penetration into framing.

Application - internal corners - vertical shiplap

3.15 INSTALL TIMBER INTERNAL CORNER PROFILES

Brush apply a thin coat of Sika Primer-3N to the timber bond line. Lint-free rag apply Sika Activator-205 to aluminium back flashing and immediately wipe off with separate lint-free rag. Apply an 8mm wide x 10mm high triangular bead of Sikaflex-11 FC to timber corner and fix to back flashing applying pressure to compress adhesive to 3mm thick bond line.

Application - external corners - vertical shiplap

3.16 INSTALL TIMBER EXTERNAL CORNER PROFILES

Brush apply a thin coat of Sika Primer-3N to the timber bond line. Lint-free rag apply Sika Activator-205 to aluminium back flashing and immediately wipe off with separate lint-free rag. Apply an 8mm wide x 10mm high triangular bead of Sikaflex-11 FC to timber corner and fix to back flashing applying pressure to compress adhesive to 3mm thick bond line.

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Application - eaves mouldings

3.17 INSTALL EAVES MOULDINGS

Nail fix eaves mouldings.

Application - fascia boards

3.18 INSTALL FASCIA BOARDS

To NZBC E2/AS1. Fix timber fascia boards level and plumb onto ends of trusses or rafters to form eaves fascias. Fix as barge boards plumb onto ends of purlins or outriggers to form gable verges, on rake to match roof pitch.

Application - cladding fixings

3.19 FIXING PENTAGON HEAD CLADDING NAILS

Pre-drill pilot hole and finish heads of nails flush onto board surface.

Application - site-applied finish coats

3.20 SITE COATING - OIL FINISH

30-90 days after factory coating, apply one topcoat of Dryden WoodOil using a PAL Speedbrush to manufacturer's instructions.

3.21 SITE COATING - STAIN FINISH

Apply one (min.) topcoat of Sansin stain using a nylon paint brush to manufacturer's instructions.

3.22 SITE COATING - PAINT FINISH

Spot prime nail areas with a single coat, fill all nail holes flush and sand. Apply undercoat to nail areas. Apply two (min.) topcoats of exterior acrylic paint using a paint brush to manufacturer's instructions.

Application - Ancillary

3.23 ALUMINIUM WINDOWS

Installation to comply with NZS 4211 and NZBC E2/AS1. Window profiles to achieve 10mm minimum cover to cladding.

3.24 PENETRATIONS

To NZBC E2/AS1.

3.25 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1. Material compatibility to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact.

3.26 WEATHERPROOF JAMBS

Weather proof jambs with a foam bond breaker & continuous protective sealant bead along the jamb line.

Completion

3.27 COMPLETION MATTERS

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

4 SELECTIONS

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

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4239JH JAMES HARDIE® SOFFITS

1 GENERAL

This section relates to the supply and fixing of James Hardie® soffit and eave linings.
It includes:

- James Hardie® Eclipsa™ Eaves Lining
- James Hardie® Hardie™ Flex Eaves Lining
- James Hardie® Hardie™ Groove Soffit Lining
- James Hardie® Villaboard™ Soffit Lining

Documents

1.1 ABBREVIATIONS AND DEFINITIONS

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

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 provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3604	Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Eaves and Soffits Installation Manual by James Hardie® (Feb 2025)
Fire and Acoustic Design Manual by James Hardie, May 2025
James Hardie® Eclipsa™ Eaves Lining Product Technical Statement
James Hardie® Hardie™ Groove Lining Product Technical Statement
James Hardie® Villaboard™ Lining Product Technical Statement
James Hardie® Eaves and Soffit Care and Maintenance
BRANZ Appraisal 1285 (2025) - James Hardie Fire And Acoustic Wall Systems - Amended 16 June 2026

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For lining product and accessories

- 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 purchase

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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1.6 NO SUBSTITUTIONS

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

1.7 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:

James Hardie® Eaves and Soffit Care and Maintenance

Performance

1.8 PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

The design wind speeds/zones are to NZS 3604, up to and including Very High Wind Zone. Eaves and Soffits Installation Manual by James Hardie® requirements are suitable for these conditions.

2 PRODUCTS

Materials

2.1 VILLABOARD™ SOFFIT LINING

James Hardie® Villaboard™ Soffit Lining, 6mm and 9mm thick cellulose fibre reinforced cement sheet. Manufactured to AS/NZS 2908.2 from Portland cement, ground sand, cellulose fibre and water.

Components

2.2 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to NZBC E2/AS1, Table C.1.1.1A: Material selection, for fixing material, and NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Exposure	Fixing	Fixing Material	Zone
Sheltered	Nail	Hot-dip galvanized steel	B
Sheltered	Nail	Stainless steel	B, C, D, E
Sheltered	Screw	Stainless steel	B, C, D, E

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

Components - Villaboard™ Soffit Lining

2.3 CAPPING & SCOTIA MOULDS

Extruded uPVC capping and scotia mould.

2.4 CONTROL JOINT

Refer to SELECTIONS.

2.5 HARDIE™ DRIVE SCREW

Hardie™ Drive Screw, 316 stainless steel, 30mm x 7g

2.6 VILLADRIVE SCREW

Villadrive Screw, 30mm x 6g, Class 3

2.7 FIBREZIP® SCREW

FibreZip® Screw, self drilling rib head screw, Class 3

2.8 HARDIE™ FLEX NAILS

Hardie™ Flex Nail, 40 x 2.8mm stainless steel or galvanized nail, Refer to SELECTIONS.

2.9 SEALER

Multiplast resin by Plaster systems

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2.10 BASE COMPOUND
Hardie™ Base Coat for flush finishing over recessed screw heads.

2.11 JOINT REINFORCING TAPE
52mm wide perforated paper tape.

2.12 BEDDING COMPOUND
Hardie™ Base Coat compound powder.

2.13 FINISHING COMPOUND
Hardie™ Top Coat topping compound premixed.

Components - General

2.14 FLEXIBLE JOINT SEALANT
Refer to SELECTIONS.

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 framing: 18% maximum

3.4 STANDARDS AND TOLERANCES
Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - general

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

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

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

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

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

3.10 INSTALL VILLABOARD™ SOFFIT LINING
Install in accordance with James Hardie® installation manual requirements. Refer to SELECTIONS for fixing and jointing methods.

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3.11 SEAL EDGES

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

3.12 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.13 FASTENER - SIZE AND LAYOUT

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

3.14 SEALANTS

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

3.15 FINISHING OVER DRIVEN FASTENERS

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

3.16 VILLABOARD™ JOINT FINISHING - LEVEL 3 FINISH

Set joints with Hardie™ jointing compounds reinforced with perforated paper tape. Jointing and finishing to requirements of James Hardie installation manual to achieve a level 3 finish.

3.17 VILLABOARD™ JOINT FINISHING - LEVEL 4 FINISH

Set joints with Hardie™ jointing compounds reinforced with perforated paper tape. Jointing and finishing to requirements of James Hardie® installation manual to achieve a level 4 finish.

3.18 VILLABOARD™ JOINT FINISHING - LEVEL 5 FINISH

Set joints with Hardie™ jointing compounds reinforced with perforated paper tape. Jointing and finishing to requirements of James Hardie® installation manual to achieve a level 5 finish.

3.19 PAINTING

Refer to painting section/s for protective coating system.

Completion

3.20 COMPLETION MATTERS

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

4 SELECTIONS

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



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4271 NATURAL STONE VENEER CLADDING

1 GENERAL

This section relates to the installation of natural stone as a mechanically anchored masonry veneer cladding.

1.1 RELATED WORK

Refer to ~ for ~

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:

kPa	Kilopascal
MPa	Megapascal

The following definitions apply specifically to this section:

Masonry	To NZS 4210, any construction in units of stone laid to a bond in, and joined together with, mortar
Pointing	To NZS 4210, finishing of previously raked joints of masonry with mortar
Veneer	To NZS 4210, a single skin of non-loadbearing masonry which is attached to and laterally supported by a structural element
Wall tie	To NZS 4210, a tie, together with its fixings or anchorages, used to transfer face loads from a veneer to a structural wall, or between skins of a cavity wall, while being capable of accommodating differential inplane horizontal and vertical deflections between the attached elements

Documents

1.3 DOCUMENTS

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

AS/NZS 2699.1	Built-in components for masonry construction - Wall ties
AS/NZS 2699.3	Built-in components for masonry construction - Lintels and shelf angles (durability requirements)
NZS 3404.1-2	Steel structures standard
NZS 4210	Masonry construction - Materials and workmanship
AS/NZS 4456	Masonry units, segmental pavers and flags - Methods of test
AS/NZS 4600	Cold-formed steel structures

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Available by contacting the manufacturer/supplier.

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

1.5 SPECIFIC DESIGN DOCUMENTS

Specific design documents relating to this part of the work:

Documents:	~
Note:	Refer to ~

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Warranties

1.6 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years For ~

- 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.

1.7 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

~ years For ~

- 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

1.8 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.9 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.

1.10 NO SUBSTITUTIONS

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

1.11 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator~	Contract administrator~	Contract administrator~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

1.12 TEST MASONRY

Test masonry in accordance with NZS 4210 for the following and at frequencies required by the engineer. Keep test records and make available to the contract administrator on request.

- 28 day compressive strength of mortar
- 7 day masonry-to-mortar bond strength

1.13 KEEP RECORDS

Keep the following records and make available to the contract administrator on request:

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- Proportions of mortar used, including admixtures
- Supplier of mortar sand

1.14 INFORMATION FOR INSTALLATION

Contractor to obtain manufacturer / supplier instructions and requirements for the installation of the natural stone product. Keep and maintain on site the relevant latest version of such documents and make available to workers carrying out that part of the work.

1.15 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.

Compliance information

1.16 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Producer Statement - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Quality control and assurance

1.17 INSPECTIONS

~ ~

2 PRODUCTS

Materials - cavity

2.1 BACKING BOARD

Moisture resistant rigid backing board material and associated components such as board fixings, joint sealant and joint tape. Refer to SELECTIONS.

Materials - veneer

2.2 NATURAL STONE

Quarried stone worked to size, shape and face finish to form veneer cladding and decorative stone work, such as string courses, quoins, sill and cap stones. Salt attack resistance tested to AS/NZS 4456 to comply with NZS 4210. Refer to SELECTIONS.

2.3 MORTAR

To NZS 4210, bedding and jointing mortar composed of Portland cement, sand, admixture or hydrated lime and clean, fresh water free from excess alkali, salt, silt and organic materials. Mortar for pointing and for use with sill and cap stones to include waterproofing agents. Coloured mortar to be coloured by use of mineral oxide pigments or coloured cement. Refer to SELECTIONS.

2.4 CEMENT SLURRY

Pourable liquid cement slurry mixture for sill and cap stone laying, composed of Portland cement, admixture and clean, fresh water free from excess alkali, salt, silt and organic materials.

2.5 WALL TIES

Wall ties and associated fixings of the specified type. Durability classification, marking and structural performance to AS/NZS 2699.1. Refer to SELECTIONS.

2.6 STEEL LINTELS

Steel lintel durability classification and marking to AS/NZS 2699.3, structural performance to NZS 3404.1-2 or AS/NZS 4600. Refer to SELECTIONS.

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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 STORAGE & HANDLING OF AGGREGATES

Store and handle aggregates to prevent segregation and contamination by foreign materials and intermixing of aggregate sizes.

3.3 STORAGE & HANDLING OF CEMENT & MORTAR

Store and handle cement and mortar to protect it against deterioration and contamination. Store accessible for inspection.

3.4 STORAGE & HANDLING OF NATURAL STONE

Store natural stone to protect from weather so that stone is in an air-dry state at installation. In hot dry weather dampen stone as per the manufacturer / supplier instructions. Check stone is of required thickness, size, shape and finish, and without defects. Carry out such additional work to bring stone to the required condition.

3.5 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.

3.6 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work, including (but not limited to):

- Vertical and horizontal alignment of the concrete base
- Installation of damp proofing material to walls and concrete base
- Installation of flashings required to be installed prior to veneer cladding installation (i.e. joinery flashings)
- Installation of windows and doors

Installation/application - generally

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements. Tolerances to NZS 4210, Maximum tolerances.

3.8 COLD & HOT WEATHER CONSTRUCTION

In air temperatures below 5°C and above 25°C or in drying winds, install natural stone veneer cladding to the precaution requirements of NZS 4210 for cold and hot weather construction.

3.9 BLENDING OF NATURAL STONE

Blend natural stone to achieve a consistent colour and size spread throughout the work.

3.10 CLEANING OUT

To NZS 4210, Cleaning Out. Clean out drained cavities and remove mortar from ties, mortar protruding into cells and cavities at joints, mortar droppings and other loose material.

3.11 FACE WORK

Keep natural stone face work clean during erection and until completion of the contract works. Remove occurring stains as per the natural stone manufacturer / supplier instructions and requirements for cleaning.

3.12 PROTECTION OF UNFINISHED WORK

Protect freshly laid stone work and the top course of uncompleted walls during interruption through rain and at completion of each day's work.

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3.13 PROTECTION OF CAVITY

Install temporary protection where required to protect the cavity from wet mortar entering. Only remove when mortar has cured.

Installation - cavity

3.14 INSTALLATION BACKING BOARDS

Install backing boards to cavity battens, and where specified seal and tape joints, to the manufacturer's requirements and instructions.

Installation - veneer

3.15 PREPARATION MORTAR

Mix materials for mortar to composition and proportion required by, and to the instructions of, the manufacturer and NZS 4210. Measure materials in calibrated devices, thoroughly mix to an even consistency in a mechanical batch mixer or with a hand-mixer for quantities of mortar not exceeding 0.03m³.

3.16 PREPARATION CEMENT SLURRY

Mix materials for cement slurry to composition and proportion required by, and to the instructions of, the cement manufacturer. Measure materials in calibrated devices, thoroughly mix to an even consistency.

3.17 LAYING OF VENEER STONES

Ensure stone is clean, sound and free of defects. Start at corners / wall ends and work horizontally towards the centre, lay stone to the required bond, true to line, plumb and level in 10mm thick (±3 mm tolerance) soft plastic mortar bed, up to 20mm thickness is acceptable for bottom course where required to accommodate variations in the foundation. Lay stone from sedimentary geological formation with its natural bed horizontal. Tool mortar joints to the specified type.

3.18 LAYING OF CAP AND SILL STONES

Ensure stone is clean, sound and free of defects. Apply neat cement slurry to surface where stone is to be placed. Let slurry dry slightly (until it has lost its shine but is still sticky), apply mortar bed over and place stone in mortar bed. Tool mortar joints to the required type.

3.19 INSTALLATION WALL TIES

Install wall ties as the work proceeds to the specified embedment, spacing and fixing and to the instructions of the manufacturer. Install at a 5° downward angle away from the exterior wall and contained within the veneer's mortar bed over its full contact length. When fixing through membranes pre-fill fixing holes with silicone sealant.

3.20 INSTALLATION STEEL LINTELS

Install steel lintels above openings to NZS 4210, Openings and in accordance with construction drawings and specific design documents.

3.21 INSTALLATION CONTROL JOINTS

Install and weatherproof control joints to NZS 4210, Methods of Controlling Wall Movements and in accordance with construction drawings and specific design documents.

3.22 INSTALLATION WEEP HOLES

Install 75mm high x maximum 10mm wide weep holes at maximum 800mm centres to mortar joints at the bottom of the natural stone veneer cladding and at any other location shown on construction drawings and stated in the specific design documentation. Where 75mm height cannot be achieved reduce weep hole spacing to provide at least 1000mm² opening area per lineal meter.

3.23 INSTALLATION VENTILATION

Provide ventilation to the top of the veneer to the requirements of NZS 4210 and in accordance with construction drawings and specific design documents.

Completion & Commissioning

3.24 COMPLETION MATTERS

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



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4 SELECTIONS

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

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4282 EXTERIOR SOLID PLASTER

1 GENERAL

This section relates to coatings of cement plasters, applied by hand or pump to external solid substrates.
Backgrounds include:

- brick
- concrete block masonry
- concrete
- AAC panels
- AAC blocks

Related work

1.1 RELATED WORK

Refer to 5181 INTERIOR SOLID PLASTER for interior solid plaster work.

1.2 ABBREVIATIONS AND DEFINITIONS

The following abbreviations are used in this specification.

AAC	Autoclaved aerated concrete
Background	The solid substrate to which the bond coat is applied
Solid substrate	Concrete, lightweight concrete, concrete masonry, lightweight concrete masonry or brick wall and concrete soffits

Documents

1.3 DOCUMENTS

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

AS 1478.1	Chemical admixtures for concrete, mortar and grout - Admixtures for concrete
AS 1672.1	Limes and limestones - Limes for building
NZS 3103	Sands for mortars and plasters
NZS 3121	Water and aggregate for concrete
NZS 3122	Portland and blended cements (General and special purpose)
NZS 4251.1	Solid plastering: Cement plasters for walls, ceilings and soffits

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the manufacturer/supplier.

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

Requirements

1.5 QUALIFICATIONS

Plasterers to be experienced, competent trades people familiar with the materials and techniques specified. If requested provide evidence of qualification / experience prior to commencing.

Qualifications to be:

- Recognised national certificate in solid plastering (National Certificate in Solid Plastering Level 4 or similar)
- LBP solid plastering (when supervising restricted building work)

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1.6 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

Health and Safety

1.7 HEALTH AND SAFETY REQUIREMENTS

Refer to the requirements of the Health and Safety at Work Act 2015. Comply with:

- Relevant New Zealand safety legislation
- WorkSafe publications including; Guidelines for the provision of facilities and general safety in the construction industry
- Relevant codes of practice, guides, guidelines and standards

2 PRODUCTS

Materials

2.1 BONDING AGENT

Use to form gauging liquid with water:

Bond coat: 1:1, or to manufacturers requirements
Flanking and finish coats: 1:2, or to manufacturers requirements

Use in accordance with the bonding agent manufacturer's requirements, maintaining the approved dosage throughout the work.

2.2 ADMIXTURES

To AS 1478.1. Use in accordance with the admixture manufacturer's requirements, maintaining the approved dosage throughout the work.

2.3 PIGMENT

To NZS 3122. Use in accordance with the manufacturers requirements, maintaining the required dosage throughout the work.

2.4 SAND

To NZS 3103, the grading limits of NZS 4251.1 clause 2.2.2.4 Sand, and suitable for the nominated plaster mix. Obtain from a single source, uniform in composition and colour. Chloride levels to not exceed 0.04% by dry weight of sand.

Submit service records of sands proposed in accordance with NZS 3103, clause 8.1 and confirm that they comply. Prevent contamination or segregation of sand in storage. Do not allow it to become more than slightly damp.

2.5 CEMENT

Portland Cement to NZS 4251.1 clause 2.2.2.3 Cement.

2.6 WATER

To NZS 3121, or local town supply.

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2.7 LIME PUTTY
To AS 1672.

Accessories

2.8 TRIM GENERALLY
Formed from steel, galvanized to 320 g/m².

2.9 CONTROL JOINTS
0.55mm thick steel galvanized to 320 g/m².

2.10 ARCHITRAVE BEAD
0.55mm thick steel galvanized to 320 g/m².

2.11 CASING BEAD
0.55mm thick steel galvanized to 320 g/m², slit, formed and expanded.

2.12 CORNER SECTION
0.55mm thick steel galvanized to 320 g/m², slit, formed and expanded.

2.13 SCREED SECTION
0.55mm thick steel galvanized to 320 g/m², slit, formed and expanded.

2.14 TIE WIRE
Mild drawn or annealed galvanized wire not less than 1.2mm diameter.

Proprietary plaster finishing system

2.15 POLYMER MODIFIED RENDER SYSTEM
Polymer-modified cement-based plaster render comprised of:

- Basecoat render, a proprietary polymer modified cemintitious render supplied as a complete plastering system
- Finish coats consisting of proprietary trowelled on coloured and textured polymer modified finish coats

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 STORE MATERIALS
Store materials in appropriate conditions ensuring adequate protection from contamination or deterioration.

3.2 PLASTERING CONDITIONS
To NZS 4251.1 clause 2.1.7 Air temperature. Carry out plastering under conditions (not too sunny, windy or freezing) which will not adversely affect the finished work. Complete in sufficient time to enable subsequent finishes to be applied under the proper conditions.

Under cold conditions:

- no plastering shall be carried out in air temperatures below 5°C or if the temperature is likely to drop below 5°C in the 24-hour period following the application of plasterwork

Under hot conditions:

- all necessary precautions shall be taken to protect plaster work against the effects of drying winds, direct sunlight, rain and water run-off for at least 24 hours after application.

3.3 DO NOT BEGIN
Do not begin laying up until:

- Linings have been fitted and fixed
- Required openings, chases or other apertures, have been cut
- Pipes, fixtures, fixing pads, and plugs, have been fixed
- Other preparation is complete
- Work that could damage the plaster is complete.

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3.4 SOURCE OF MATERIALS

Supply materials from the same source.

3.5 PROTECT

Protect existing and adjoining work and surrounds, with boards and dust sheets. Clean off immediately droppings and mortar splashes on finished work.

3.6 PROTECT CONCRETE

Protect concrete surfaces from contamination.

3.7 PLANT AND TOOLS

Clean plant and tools to ensure they are free of previous mixes.

3.8 PROPRIETARY PLASTERS

Conform with the various manufacturer's requirements for proprietary and special purpose plasters.

3.9 WORKING TIME

Do not use mixes after initial set has occurred. Do not retemper mixes.

3.10 JOINING UP

If joining up is unavoidable in large areas of work, make junctions so that they are concealed in the finished work.

3.11 SURFACE TOLERANCES

Gradual undulations over the surface and measured between rise and hollow as follows:

Trowelled wall surfaces:	Not exceeding 3mm over a 1200mm straight edge
Textured wall surfaces:	Not exceeding 3mm over a 900mm straight edge

No abrupt deviations permitted.
Take particular care where the surface has light hitting it at an acute angle.

3.12 ALIGNMENT

Finish surfaces evenly to line or level, with angles and corners correct and walls and reveals plumb and square.

Conditions - background

3.13 CHECK BACKGROUND

Ensure that backgrounds and adjoining surfaces are, after the preparation called for in this section, of the required standard.

3.14 PREPARE SURFACE

Before plastering is commenced, eliminate surface contaminants, remove dust and debris and make good any defects in the background which may adversely affect the quality of the plaster coating.

3.15 IRREGULARITIES

Hack off excessive projections. Fill voids, hollows and honeycomb with a mix not stronger than the background or weaker than the first coat.

3.16 ACCEPTANCE OF BACKGROUNDS

Do not commence work until the background is of the required standard.

Application - preparing the surface

3.17 CLEAN SURFACE

Remove oils, greases, retarders and loose material and leave the surface dust free and clean. Remove paint from already painted surfaces.

3.18 COVER CHASES

Cover chases and conduits in the background with 100mm wide lath bedded in the base coat, pressed down flat and trowelled in.

3.19 EMBEDDED ITEMS

Sheath or wrap water pipes and wastes passing through walls, with strip material, to permit thermal movement.

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3.20 CONTROL SUCTION

Control suction by dampening if necessary but without over-wetting. Allow the surface to dry back to a surface-dry condition before plastering.

Application - joints and junctions

3.21 DISSIMILAR BACKGROUND

Fix specified screed sections centred on the junction between dissimilar backgrounds.

3.22 CONTROL JOINTS

To NZS 4251.1, 2.1.9 **Control Joints**, and as shown on drawings.

Provide movement control joints in the plaster to coincide with movement joints in the background and/or junctions between dissimilar backgrounds in the same plane and/or where shown on the drawings. Galvanized mesh or lath shall not be continuous across control joints. Set out of joints to be agreed with owner prior to commencement of plaster application.

3.23 ACCESSORY CONTROL JOINTS

Fix the specified accessory control joints to backgrounds through slots. Fill the joint with sealant before applying finishing coat.

3.24 SECRET CONTROL JOINTS

Form cut joints 3mm wide through the flanking coat plaster to the background. Fill the cut with sealant, following the sealant manufacturer's requirements for primer and masking, before applying the finish coat to provide a secret joint.

3.25 EXPOSED CONTROL JOINTS

Form neat cut joints in plaster. Rule the cut joint straight and true and cut it right through the full thickness of plaster to the background exactly on the line of the junction.

Application - trim

3.26 FIX CORNER SECTIONS

Fix specified corner sections to external angles, as required by the manufacturer for the appropriate background.

3.27 FIX CASING BEADS

Fix specified casing beads at edge terminations of plaster not covered by other trim, as required by the manufacturer for the appropriate background.

3.28 FORM ARRISES

Where sections or beads are not specified:

- form arrises with 6mm pencil rounds
- soften down severe arrises by rubbing with a wet trowel when finishing

3.29 CHECK FLASHINGS

Ensure that flashings, including flashings to recessed sills are in place before, or are fitted as the coating proceeds so the completed work is completely watertight.

3.30 KEYING

Press plaster through the apertures of metal lath, wings of casing beads and corner sections.

Application - plaster systems

3.31 PROPORTION AND MIXES

Refer to SELECTIONS for plaster thickness and finish.

3.32 WATERPROOF RENDERING

Include waterproofing admixture as specified and as required by the manufacturer. Do not plug or puncture the waterproof render.

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Application - curing

3.33 CURING

Confirm the curing and protection systems to be applied to fresh plaster coats. Plastering not to begin until systems are confirmed.

3.34 PROTECT ADJOINING WORK

Protect existing and adjoining work from damage during plastering. Mask adjacent windows and provide temporary covering if necessary. Remove droppings and mortar splashes as the work proceeds.

3.35 MOIST CURING, CEMENT BASED WORK

Cure by preventing rapid or uneven drying out for a suitable period to NZS 4251.1 clause 2.5 Application and curing of plaster coats, and appendix D Plaster on curing.

Bond Coat:	Minimum 48 hours moist curing and 24 hours drying
Flanking Coat:	Minimum 48 hours moist curing and 72 hours drying
Finish Coat:	Minimum 72 hours moist curing depending on ambient temperatures

Do not alter the above curing times.

Completion

3.36 PROTECT FINISHED WORK

Protect finished work from sun, wind, frost, rain and hail and from damage by building operations or other causes. Provide temporary coverings if necessary.

3.37 REINSTATE

Reinstate damaged or marked areas.

3.38 LEAVE

Leave adjacent materials, fittings and finishes clean and to the standard required by following procedures.

3.39 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS



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4282SR STO MASONRY PLASTER SYSTEMS

1 GENERAL

This section relates to the supply and installation of Stoanz Ltd Sto plaster rendering systems over a solid substrate.

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
EPS	Expanded Polystyrene Sheet
ICF	Insulating Concrete Formwork

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 provisions for timber-framed buildings up to 10 m in height
AS/NZS 3837	Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter
AS/NZS 4858	Wet area membranes
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Stoanz Ltd.	StoArmat Miral Render System Specifications
Stoanz Ltd.	StoMiral Render System Specifications
Stoanz Ltd.	Sto Product Technical Data Sheets
Stoanz Ltd.	StoArmat Warranty
Stoanz Ltd.	StoService Assurance Maintenance Guide
BRANZ Appraisal 515 (2024)	StoArmat Miral Render Systems

Manufacturer/supplier contact details

Company:	Stoanz Ltd
Web:	www.sto.co.nz
Email:	info@sto.co.nz
Telephone:	04 801 7794

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years	For StoArmat Render System
15 years	For StoMiral Render System

- 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.

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1.5 WARRANTY - INSTALLER/APPLICATOR

Provide a material manufacturer/supplier warranty:

5 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.

Requirements

1.6 QUALIFICATIONS WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be registered by manufacturer/supplier. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

1.8 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

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:

- Stoanz Ltd. StoService Assurance Maintenance Guide

Provide this information prior to practical completion.

1.10 QUALITY CONTROL SYSTEM - MANUFACTURER/SUPPLIER REQUIREMENTS

Installer/applicator to maintain quality control system to manufacturer/supplier requirements, including but not limited to:

- Complete a StoQuality Assurance Schedule

Make available quality control records if requested by the contract administrator or consenting authority.

1.11 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Producer Statement - Construction (PS3) from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

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Compliance information

1.12 COMPLIANCE - BRANZ APPRAISAL

StoArmat Miral Render System and StoMiral Render System have been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 515.

Performance

1.13 EXTERNAL FIRE SPREAD - CLADDING MATERIAL, CLASSIFICATION

StoArmat Miral Render System and StoMiral Render System has been tested to ISO 5660.1, AS/NZS 3837, and to specific requirements of BPS, 8.4.1 Cladding materials, achieving: Type A classification (peak heat release rate ≤ 100 kW/m², total heat release rate ≤ 25 MJ/m²).

2 PRODUCTS

Materials

2.1 STOLEVELL NOVO RENDER

Lightweight, cement-based, mineral basecoat render supplied in 15kg bags. The material contains mineral aggregates, lightweight fillers, water retention agents, adhesive compounds, fine EPS beads and other additives to form a solid levelling/straitening, basecoat plaster.

2.2 LEVELLITE RENDER

Lightweight, cement-based, mineral basecoat render supplied in 20kg bags. The material contains mineral aggregates, water retention agents, adhesive compounds, EPS beads and other additives to form a solid levelling/straitening, basecoat plaster.

2.3 STO GLASS MESH

Alkali-resistant 165g/m² fibreglass mesh in 50 metre rolls.

2.4 STO STOPLEX W PRIMER OR S-PROTECT WS205 SEALER

Aqueous acrylate universal consolidating sealer with siloxane additive.

2.5 STO FLEXYL MESHED WATERPROOFING

Aqueous copolymer dispersion binder in a pail that when mixed with Portland cement forms a waterproofing plaster mortar that is applied with mesh. The material contains a copolymer synthetic binder, mineral fillers, fibre and enhancement additives.

2.6 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.

2.7 STOLIT K / MP / MILANO 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.

2.8 STOCOLOR MAXICRYL FACADE PAINT

Matt coloured pure acrylate facade paint. Brush, roller or spray applied. Refer to SELECTIONS for colour.

2.9 STOCOLOR DRYONIC S FACADE PAINT

Matt, acrylic facade paint with biometric principles for dry facades. Brush, roller or spray applied. Use temperature regulating X-black for dark colours. Refer to SELECTIONS for colour.

2.10 S-PROTECT 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).

2.11 STOPROTECT TRANSPARENT

Satin, clear, acrylic coating, natural looking (no darkening) sealer with excellent resistance to weathering as a clear coating for honed (architectural) concrete blocks.

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2.12 INTERIOR STOLEVELL CALCE PLASTER

Lime based plaster in a bag applied by hand or pump for finishing interior masonry surfaces to a straight even plane, with properties to regulate ambient climate.

Accessories

2.13 FLASHINGS

Head jamb sill and any other required flashings made from powder coated aluminium, stainless steel or uPVC supplied by main contractor for timber, aluminium and uPVC joinery to NZBC E2/AS1 and masonry construction requirements.

2.14 STO FLASHINGS AND COMPONENTRY

Sto uPVC flashings are to be used for weatherproofing the exterior plaster at transitions, junctions, terminations and for forming corners and drip edges.

2.15 STO CONTROL JOINTS

Sto uPVC 8mm or 12mm uPVC control joint.

2.16 STO JOINT SEAL TAPE

An expanding polyurethane foam impregnated Inseal tape for weatherproofing joints.

2.17 SEALANT

BRANZ appraised modified silicone (MS) 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-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.

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install render system in accordance with StoArmat Miral Render System specification.

3.6 CONFIRM LAYOUT

Before commencing work confirm the layout of expansion joints and other visual detailing of the finished work.

3.7 INSTALL UPVC FLASHINGS

Install all **Sto** uPVC flashings to joinery and terminations as required. Glue into position with construction adhesive prior to plaster application commencing or install in mesh coat application.

3.8 IRREGULARITIES

Before commencing fill voids or damage in masonry surfaces with **LevelLite** plaster to reinstate substrate. On EPS / ICF blocks rasp off any degraded poly surfaces and foam fill any gaps or holes and allow to set before rasping level.

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3.9 PENETRATIONS

All penetrations such as waste pipes, electrical wiring in uPVC conduits and metal plumbing piping install with a minimum 5° downward slope, through the **Sto** plaster system, to be sealed using a double application of MS sealant.

3.10 CONTROL JOINTS

Provide control joints in the plaster system to coincide with control joints in the substrate and/or junctions between dissimilar materials or where shown on the drawings and to **Stoanz Ltd** requirements. Insert **Sto** flexible uPVC 8mm or 12mm control joints in the **StoArmat** mesh coat ensuring the mesh coat does not overlay the V joint. Either coat the V joint in the paint system for a negative detail or fill with MS sealant, concave tooled.

3.11 SEALANT INSTALLATION

All junctions between joinery / adjacent surfaces / dissimilar materials sections and the plaster mesh coat, and around penetrations shall be sealed with MS sealant. Allow to cure before applying finishing plaster.

StoArmat Miral Plaster System for Concrete Blocks

3.12 SURFACE PREPARATION

Before the installation of door and window joinery waterproof the masonry recess/rebates with two coats of **StoFlexyl** correctly mixed with Portland cement. The sill is required to be mesh reinforced from the bottom of the rebate out to the edge of the sill and turned up the jambs by 40mm.

3.13 CONTROL JOINTS

Mark out all control joints that have been installed in the concrete substrate so that Sto uPVC control joints can be installed in the mesh coat.

3.14 BASECOAT PLASTER

Apply one levelling/straightening coat of **StoLevell Novo or LevelLite** basecoat plaster by hawk and trowel or pump at an approximate thickness 5-15mm for StoLevell Novo or 8-20mm for LevelLite using screed guides and stainless steel corners as required. Rule or screed the surface to achieve a level plane ensuring the minimum thickness is achieved.

3.15 BALUSTRADE & PARAPET TOPS / HORIZONTAL LEDGES / FLOOR SLAB TRANSITIONS / FOUNDATION SPLASH ZONES

A minimum slope of 10° is required on all horizontal surfaces. To **StoLevell Novo or LevelLite** base coated surfaces apply **Sto Flexyl** / meshed waterproofing correctly mixed with Portland cement and extend 75mm up and down any adjacent vertical plaster surfaces. Allow to dry and apply the **StoArmat** mesh coat. Sto Flexyl waterproofing must attain a minimum thickness of 1.5mm to meet NZBC E2/AS1 and AS/NZS 4858. For concrete foundation details **Sto Flexyl** is applied extending 200mm above ground to 100mm past the finished plaster system.

3.16 MESHED REINFORCEMENT PLASTER

To dry base coasted surfaces, apply **StoArmat** reinforcement plaster at approximate thickness of 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 embedded onto the **StoArmat** coat, allow to dry then apply one further coat of **StoArmat** 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. Install **Sto** pre meshed uPVC drip edges and corner angles on concrete masonry joinery lintels and edges.

3.17 FINISHING RENDER

Apply selected **Stolit K, MP or Milano** 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**, **MP Natural or Milano** in two coats and finish with a float and judicial use of a damp sponge.

3.18 PAINT OR SEALER COAT

Apply one coat of **StoColor Maxicryl or StoColor Dryonic** matt facade paint tinted to the selected colour on **Stolit K** renders, or **S-Protect SC** easy clean sealer on MP or Milano finishes.

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3.19 INTERIOR PLASTER SYSTEM

Apply **StoLevell Calce System** at 4 - 8mm to achieve a level plane surface free of hollows or an off the trowel adobe finish. Fit galvanized/stainless steel corner profiles set in plaster anchor dabs at corners, doors and other junctions as required, and mesh any stress points. Polish plaster to finish required or alternatively an adobe sponge finish can be achieved by structuring the plaster to the selected finish. Seal with natural wax, clear seal, paint or apply selected finishing render.

StoArmat Miral Plaster System over Autoclaved Aerated Concrete

3.20 SURFACE PREPARATION AND PRE-TREATMENT OF AUTOCLAVED AERATED CONCRETE BLOCKS, BRICKS AND PANELS

All surfaces must be rasped where necessary to remove excess bonding, mortar or nibs on the surface and to ensure that all panel joints are flush and true. Any minor surface damage can be fixed using plaster.

3.21 PRIMER COAT

To clean dry AAC surfaces apply one coat of **S-Protect WS 205** sealer by brush and roller or garden sprayer to seal the surface.

3.22 CONTROL JOINTS

Mark out all control joints that have been installed in the autoclaved aerated concrete substrate so that Sto uPVC control joints can be installed in the mesh coat.

3.23 BASECOAT PLASTER

To clean sealed autoclaved aerated concrete surfaces, apply one levelling/straightening coat of **StoLevell Novo** basecoat render at the required thickness of 5 - 7mm using guides and corner angles as required. Rule or screed the plastered surface to achieve a level plane surface free of hollows and deviations.

3.24 BALUSTRADE AND PARAPET TOPS / BASE DETAIL

A minimum slope of 10° is required on all horizontal surfaces. To base coated surfaces apply **Sto Flexyl** / meshed waterproofing correctly mixed with Portland cement extend 75mm up and down any adjacent vertical plaster surfaces. Allow to dry and apply the **StoArmat** mesh coat. **Sto Flexyl** waterproofing must attain a minimum thickness of 1.5mm to meet NZBC E2/AS1 and AS/NZS 4858. For concrete foundation details **Sto Flexyl** is applied extending 100mm past the finished plaster system.

3.25 MESHED REINFORCEMENT PLASTER

To dry base coated surfaces apply one even coat of **StoArmat** reinforcement plaster at approximate thickness 1.5 / 2mm. While the plaster is still wet, lightly embed **Sto** mesh, ensuring adjacent drops of mesh are overlapped by a minimum of 75mm and the mesh is embedded onto the plaster. Allow to dry and apply one further coat of **StoArmat** at approximate thickness of 1mm. Once dry remove any slight ridging with a **Sto** rasp.

3.26 FINISHING RENDER

Apply selected **Stolit K, MP or Milano** 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, MP Natural or Milano** in two coats and finish with a float or finishing trowel and judicial use of a damp sponge as required.

3.27 PAINT OR SEALER COAT

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

Completion & Commissioning

3.28 COMPLETION MATTERS

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

4 SELECTIONS

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

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4.1 STOARMAT MIRAL PLASTER SYSTEM SS202 OVER CONCRETE BLOCK

Location:	~
Substrate:	~
Levelling coat:	**~** basecoat plaster
Mesh coat:	**StoArmat** meshed reinforcement plaster
Finishing renders:	**Stolit~**
Paint:	~
Sealer:	~
Coats:	~
Colour:	~
Interior plaster:	~

4.2 STOARMAT MIRAL PLASTER SYSTEM ON AUTOCLAVED AERATED CONCRETE

Location:	Autoclaved Aerated Concrete ~
Substrate:	~
Primer coat:	**S-Protect WS 205** silane sealer
Levelling coat:	**StoLevell Novo** basecoat plaster
Mesh coat:	**StoArmat** meshed reinforcement plaster
Finishing render:	**Stolit~**
Paint:	~
Sealer:	~
Coats:	~
Colour:	~



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4311 PROFILED METAL ROOFING

1 GENERAL

This section relates to the supply and fixing of proprietary overlap rigid sheet metal profiled roofing complete with accessories.

1.1 RELATED WORK

Refer to 4312 PROFILED PLASTIC ROOFING for plastic sheeting

Refer to 7411 RAINWATER SPOUTING SYSTEMS for rainwater disposal

1.2 ABBREVIATIONS

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
MS	Modified silyl

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
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 1665	Welding of aluminium structures
AS/NZS 1734	Aluminium and aluminium alloys - flat sheet, coiled sheet and plate
AS/NZS 1554.6	Welding stainless steels for structural purposes
ISO/TS 15510	Stainless steels - Chemical composition
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Warranties

1.5 WARRANTY - INSTALLER/APPLICATOR

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

5 years:	from the date of completion of the roof
Form:	Roofing installers standard form

Include a copy of the roofing manufacturers' maintenance requirements with the warranty.



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Refer to the general section 1237 WARRANTIES - INSTALLER/APPLICATOR for additional requirements.

1.6 WARRANTY - MANUFACTURER/SUPPLIER

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

15 years	For failure of coating adhesion
15 years	For weatherproofing by material penetration
Form:	Roofing manufacturers standard form

Requirements

1.7 QUALIFICATIONS

Carry out work with experienced, competent installers familiar with the products being used and with appropriate qualifications such as the National Certificate in Metal Roofing and Cladding.

Performance

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

1.9 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including penetrations through the roof and junctions with walls and parapets.

1.10 FIXINGS, WIND

Design and use the fixings appropriate for the design loads of this site; refer to general section 1220 PROJECT for details of wind zone. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

Performance - Wind (design by contractor)

1.11 DESIGN PARAMETERS - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, table 5.4.

Refer to general section 1220 PROJECT for details.

2 PRODUCTS

Materials

2.1 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.2 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.3 INSULATION

Refer to appropriate insulation section.

2.4 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL

Formability G550 steel sheet coated to AS 1397.

2.5 STAINLESS STEEL

Stainless steel sheet manufactured to ASTM A240 and ASTM A480. Welding to AS/NZS 1554.6.

2.6 HOT-DIPPED ALUMINIUM/ZINC/MAGNESIUM COATED STEEL, UNPAINTED

Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.

2.7 ALUMINIUM

Aluminium alloy series 5000 temper H16 or H18 to suit application. Aluminium alloy series 5000 temper H34 for welded flashings.

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Components

2.8 ALUMINIUM FLASHINGS - WELDED

Aluminium alloy series 5000 temper H34 minimum thickness 1.6mm BMT to AS/NZS 1734. Aluminium welding to AS/NZS 1665.

2.9 STAINLESS STEEL FLASHINGS - WELDED

Welded stainless steel flashings shall be minimum thickness BMT 1.2mm and grade 304 or 316 stainless steel in accordance with Table 1 of ISO/TS 15510. Welding to AS/NZS 1554.6.

Refer to SELECTIONS for details.

Fixings

2.10 FASTENERS GENERALLY

Minimum Class 4 and durability not less than the roofing material being fixed. Screw fasteners to be head stamped identifying the manufacturer and class.

2.11 FIXING CLIPS

Galvanized steel (powder coated for aluminium) to suit the material and profile of the rigid sheet and location as required by the roofing manufacturer. Fix to steel with 16mm x 10 gauge galvanized wafer head self-drilling screws and to timber with 30mm x 10 gauge galvanized wafer head screws to NZBC E2/AS1, 8.4.7 Fixings: trough profile.

2.12 FIXING SCREWS

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

2.13 RIVETS

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

Accessories

2.14 SEALANT

Neutral Curing silicone or MS polymer sealant as required by the roofing manufacturerand used as directed.

2.15 LAP SEALING TAPE

Closed cell self adhesive nitrile tape.

3 EXECUTION

Conditions

3.1 INSPECTION

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

3.2 FRAMING TIMBER MOISTURE

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

Take delivery of and accept packs of roofing undamaged on delivery. Reject all damaged material. Store on a level firm base 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 movement between sheets.

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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. Use soft, flat soled shoes when fixing and for all other work on the roof.

3.5 SEPARATION

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

Application

3.6 WELDING ALUMINIUM FLASHINGS

Welding to be carried out by a welder qualified under AS/NZS 1665. Preparation and welding to comply with AS/NZS 1665. Finish welds smooth and without abrupt surface changes ready for coatings. Refer to SELECTIONS for BMT and coatings.

3.7 WELDING STAINLESS STEEL FLASHINGS

Weld stainless steel flashings to AS/NZS 1554.6. Preparation and welding to comply with AS/NZS 1554.6. Finish welds smooth and without abrupt surface changes ready for coatings. Refer to SELECTIONS for BMT and coatings.

3.8 FIX INSULATION

Refer to Thermal Insulation sections.

3.9 SET-OUT

Carefully set out with consideration of the position of side laps to take account of the line of sight. Ensure all sheets are square and 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.

3.10 END LAPS

End laps are not permitted, except where specifically detailed.

3.11 MOVEMENT JOINTS

Fixing and jointing to conform with the roofing manufacturer's requirements for thermal movement.

Over timber framing, transverse flashings (those running long continuous framing members) to have expansion joints at maximum 12 centres.

3.12 FIXING GENERALLY

Install and fix in accordance with the NZMRM CoP requirements, and to roofing manufacturer's recommendations. Paint colour matched fixings and accessories before installation.

3.13 MARKING AND CUTTING

Cut only by shearing tools. Do not use black lead pencils for marking aluminium/zinc coated products.

3.14 FIX SHEETS

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

3.15 STOP ENDS AND DOWNTURNS

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

3.16 USE OF SEALANTS

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

3.17 FLASHING PENETRATIONS

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

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3.18 INSTALL RIDGING

Install ridging by fastening to the purlins through the leading edge of the roofing to manufacturer's requirements.

Completion

3.19 REPLACE

Replace damaged or marked elements.

3.20 LEAVE

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

3.21 REMOVE

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

4 SELECTIONS

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4381 DECK SUPPORT SYSTEM

1 GENERAL

This section relates to the supply and installation of proprietary height adjustable support systems for floating decks and paved patios.
It includes:

- support systems for self supporting natural stone/concrete pavers
- support systems for self supporting tiles
- support systems for non self supporting tiles / natural stone on structural underlay
- support systems for timber plank and composite decking systems

Related work

1.1 RELATED SECTIONS

Refer to ~ for ~.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following definitions apply specifically to this section:

Self supporting:	Self supporting tiles/stone/pavers are those individually structurally suitable to span between the deck supports. Sometimes referred to as "structural".
Non-self supporting:	Non-self supporting tiles/stone/pavers are those that cannot individually span between the deck supports and need additional support, which is usually in the form of a structural compressed fibre cement panel underlay cut to the module. Sometimes referred to as "non-structural".

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 provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2908.2	Cellulose cement products - flat sheet

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	For supply of deck pedestal support system

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the

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

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years For installation

- 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.

Requirements

1.7 QUALIFICATIONS

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

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 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer's, importer's or distributors warranty
- Installer's warranty

2 PRODUCTS

Materials

2.1 DECK SUPPORT SYSTEM

Components comprised of high-density UV resistant polypropylene injection moulding, to comply with NZBC B2/AS1. Complete with all required accessories to complete installation. Refer to SELECTIONS for type.

3 EXECUTION

Conditions - general

3.1 DELIVERY, STORAGE AND HANDLING

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 - GENERAL

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

3.3 PEDESTAL LAYOUT

Before commencing work confirm the proposed setting out of pedestals. Confirm maximum load of pedestal to determine whether intermediate pedestals are required Ensure pedestal configurations will not impede critical water flows

For tiling/paving consider pattern of tiles, location of cut tiles and other visual considerations of the finished work. Confirm with pedestal manufacturer the minimum cut tile size that can be supported.

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Conditions - over waterproof membrane substrate

3.4 PRE-INSTALLATION REQUIREMENT - OVER WATERPROOF MEMBRANES

Before commencing work obtain confirmation from project administrator that the installation of the waterproof membrane complies with NZBC E2/AS1. Ensure that the deck support system is not attached to or penetrates the waterproof membrane substrate below.

Installation - general

3.5 INSTALL DECK SUPPORT SYSTEM

Install deck support system and associated decking/paving/tiling in accordance with the manufacturer's requirements.

3.6 PRIOR TO INSTALLATION

Sweep clean waterproof membrane and ensure it is clear of any foreign objects before commencing installation.

Installation - for tiling and paving systems

3.7 SET OUT

Set out for tiling using centre lines in both directions. Commence installation from the centre cross. Confirm whether intermediate pedestals are required.

3.8 INSTALL PEDESTAL JACK & TILES

Install first four pedestal jacks, and intermediate pedestal if required, at the centre cross of set out. Sit the first tile module in place and adjust the height of each pedestal so aligns with datum in both directions. Add the next tile modules by seating one end on the previously laid pedestal and adding new pedestals to opposite end and adjusting height, continue for remainder of tiles until perimeter.

3.9 FIT SIDE EDGE CLIPS

Fit side edge clips to support and space tiles or pavers at wall perimeter where required, in accordance with the manufacturer's requirements.

3.10 INSTALL PERIMETER TILES

Perimeter pedestals may require the spacer/lug to be cut or ground off prior to placing tiles. Maintaining the required manufacturer's perimeter edge gap, cut the perimeter tiles and install.

3.11 FIT WALL SPACERS/LUGS

Fit wall spacers/lugs/clips nominally 50mm from the corner of all perimeter tiles, in accordance with the manufacturer's requirements This locks the tiles together and provides a drainage gap to the substrate below.

3.12 FINAL ADJUSTMENT

Once installation is completed, if further levelling is required, adjust pedestals from above by way of a screw driver or purpose made adjustment key provided by the manufacturer.

Completion

3.13 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.

3.14 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.

3.15 PROTECTION

Provide the following temporary protection of the finished work:

~

4 SELECTIONS

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

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4422NT NURAPLY TPO ROOF & DECK MEMBRANE

1 GENERAL

This section relates to Nuralite Group Limited Nuraply TPO Roof and Deck Membrane installed as a single ply external waterproof covering with associated components & accessories.
It includes;

- Nuratherm, insulated roof system with Nuraply TPO Fleece-Back, mechanically fixed or fully adhered, over Nuratherm insulation installed over concrete, plywood, strandboard (for roofs only), cross laminated timber or metal tray deck substrates.
- Nuraply TPO Smooth or Fleece-Back, mechanically fixed or fully adhered installed directly over concrete, plywood, strandboard (for roofs only), or cross laminated timber substrates.

1.1 RELATED WORK

Refer to 4381NJ NURAJACK DECK SUPPORT SYSTEM for pedestal support systems for floating timber and tile / stone paved decks

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

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 provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS 2122.1	Combustion characteristics of plastics - Determination of flame propagation - Surface ignition of vertically orientated specimens of cellular plastics
AS/NZS 2269.0	Plywood - Structural - Specifications
NZS 3604	Timber-framed buildings
ASTM D6878	Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing

Codemark certificate CMNZ70166 version 0 - Nuraply TPO Waterproofing membrane

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Nuraply TPO Technical information

Manufacturer/supplier contact details

Company:	Nuralite Group Limited
Web:	www.nuralite.co.nz
Email:	info@nuralite.co.nz
Telephone:	09 579 2046 0800 NURALITE (0800 687 254)

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years	For Nuraply TPO membrane
20 years	For Nuraply TPO fleece backed membrane

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the

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standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years	For Nuraply TPO membrane system installation

- Provide this warranty on the Nuraply TPO installer/applicator standard form.
- Commence the warranty from the date of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 NO SUBSTITUTIONS

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

1.8 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be Nuralite Group Limited Authorised Membrane Applicators. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

Compliance Information

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -
- Applicators' approval certificate from the distributor
- Distributor warranty
- Installers' / applicators' warranty
- Producer Statement - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

1.10 COMPLIANCE - CODEMARK CERTIFICATE

Nuraply TPO waterproofing membrane meets the requirements of the NZBC when used within the Conditions and Limitations of certificate CMNZ70166

Performance - general

1.11 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed Nuraply TPO roofing system, including all penetrations through the roof decking and junctions with walls and parapets. In the event that there are issues relating to any aspect of this work, arrange for a meeting to resolve these issues. The following should attend:
- NuraplyTPO roofing applicator
- Nuralite representative
- Contractor
- Principal
- Principal's consultant(s)

1.12 AS APPROVED

"As approved" means that the materials are compatible with Nuraply TPO roofing and are part of the system required by the roofing supplier for each specific location.

Performance - wind

1.13 WIND ZONE DESIGN PARAMETERS – VERY HIGH OR EXTRA HIGH

According to the wind zone parameters of NZS 3604, table 5.4 this project is rated as very high or extra high. Ensure that the installation is adequate for this standard or greater.

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Performance - Nuratherm Insulated roof system

1.14 DURABILITY

Nuratherm insulated roof system complies with NZBC B2/AS1 when maintained to Nuralite requirements.

1.15 ENERGY EFFICIENCY

IKO Nuratherm ALU insulation board has an aged thermal resistance (R Value) of the following:

40mm	R1.80
50mm	R2.25
60mm	R2.70
70mm	R3.15
80mm	R3.60
100mm	R4.55

based on an aged thermal conductivity of 0.022 W/mK.

1.16 FIRE SAFETY

IKO Nuratherm PIR insulation board complies with the flame propagation criteria as specified in AS 2122.1.

2 PRODUCTS

Materials - Nuratherm insulated roof system with Nuraply TPO

2.1 INSULATION BOARD

IKO Nuratherm ALU insulation board, comprised of a core of hard polyisocyanurate foam coated on both sides with tri-ply gas-tight aluminium.

2.2 TAPERED INSULATION BOARDS

Nuralite Nuratherm tapered insulation materials available to provide a 1:60 slope.

2.3 VAPOUR BARRIER

Nuraply ALU, 0.6mm thick self-adhesive modified bitumen sheet membrane with a top side of polyester reinforced aluminium foil. Used as a vapour barrier between the substrate and insulation board when required. Supplied in 1.08m wide x 25m long rolls.

2.4 NURAPLY TPO FLEECE-BACK MEMBRANE

Nuraply TPO Fleece-Back Membrane, a reinforced TPO roofing and waterproofing membrane, with factory applied polyester fleece backing, to ASTM D6878. Refer to SELECTIONS.

Components

2.5 PRIMER - SOLVENT BASED

50/50 mixture of solvent and Nuraply TPO Bonding Adhesive, a solvent based rubberised contact adhesive to bond the membrane.

2.6 NURAPLY TPO MEMBRANE BONDING ADHESIVE - SOLVENT BASED

Nuraply TPO Bonding Adhesive, a solvent based rubberised contact adhesive to bond the membrane.

2.7 NURAPLY TPO SOLVENT

Nuraply TPO Solvent is used to cut back Nuraply TPO Adhesive for use as a primer and for cleaning of equipment.

Components - Nuratherm insulated roof system with Nuraply TPO

2.8 MECHANICAL FIXING - FASTENERS AND PLATES FOR INSULATION PANELS

Nuratherm IKO Fix Screws and Flange system.

Polypropylene telescopic sleeves for fixing insulation panels and TPO membrane. Screws supplied in lengths to suit both the substrate and installed insulation.

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2.9 PRIMER - FOR VAPOUR BARRIER

Nuraflux QD primer for substrate preparation prior to bonding Nuraply ALU vapour barrier to concrete, timber and metal deck substrates.

2.10 NURATHERM ADHESIVE

Nurabond Hi Foaming & Low Foaming PU adhesive, a permanent elastic high-performance moisture-cured single part polyurethane adhesive with high foaming capacity for bonding Nuratherm insulation boards to vapour control layer and with low foaming capacity for bonding Nuratherm insulation boards to each other.

2.11 EXPANDING FOAM

Soudal Gorilla Nailpower fire rated expanding foam for filling gaps in insulation layer.

Accessories

2.12 NURAPLY TPO WALKPAD MEMBRANE

Nuraply TPO Walkpad Membrane provides a safe, stable and maintenance-free walkway for quick and easy access to rooftop equipment in high traffic areas.

2.13 NURAPLY TPO DETAIL MEMBRANE

Nuraply TPO Detail Membrane easily forms flashings around corners and penetrations. Specifically designed for use in areas that cannot be properly detailed with TPO field membrane.

2.14 NURAPLY TPO PRE-FORMED CORNERS

NuraplyTPO pre-formed non-reinforced internal and external corners and T joint patches, used for detailing internal/external and 3-way lap joints.

2.15 NURAPLY TPO SEALANT

Nuraply TPO Sealant is an approved sealant compatible with Nuraply TPO and other accessories.

2.16 NURAPLY TPO MEMBRANE CLEANER

Nuraply Membrane Cleaner is used for lap preparation and removing marks from the membrane surface.

2.17 NURAPLY TPO PVC BOND BREAKER TAPE

Nuraply TPO PVC Bond Breaker Tape is a pressure sensitive, self-adhesive 36mm wide bond breaker tape used as venting grid tape

2.18 NURAPLY TPO DRAIN

Nuraply TPO Drains are a selected range of clamp ring drains in varying size and configurations.

2.19 NURAPLY TPO PRE-LINED SCUPPER

Nuraply TPO Pre-Lined Scupper is designed to be recessed into the substrate. 200mm high x 75mm high x 380mm long.

2.20 NURAPLY TPO SCUPPER OVERFLOW

Nuraply Aluminium Scupper Overflow is designed to be recessed into the substrate. 200mm high x 75mm wide x 300mm long.

2.21 NURAPLY TPO SUMP WITH OVERFLOW

Nuraply Aluminium Sump with Overflow is designed to be recessed into the substrate. 400mm long x 250mm wide x 200mm deep, with 100mm dia overflow.

2.22 NURAPLY TPO PENETRATION POCKET

Nuraply TPO Penetration Pocket is a two-piece moulded TPO pocket with a rigid vertical wall and pre-formed flange, used to seal uneven penetrations. 190mm x 150mm oval.

2.23 NURAPLY TPO POURABLE SEALER

Nuraply TPO Pourable Sealer is a two-part polyurethane sealant used as a penetration pocket filler. 4.26 litre kit.

2.24 NURAPLY TPO PIPE BOOT

Nuraply TPO Pipe Boots are flexible, smooth, non-reinforced TPO cone-shaped boot with a pre-formed flange. 250mm to 152mm diameter

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2.25 NURAPLY TPO DRIP EDGE

Nuraply Aluminium Drip Edge used for the drip edge into external gutters. 50mm x 50mm x 2.5 metres long

2.26 NURAPLY TERMINATION BARS

Nuraply Aluminium Termination Bars are used to terminate the TPO on vertical and horizontal services. Pre-drill holes at 200mm centres. Flat - 28mm wide x 3mm thick x 2.5 metres long. Folded - 45mm wide x 3mm thick x 2.4 meters long.

2.27 NURAPLY DIVERTERS

Nuraply Aluminium Diverters used for diverting water into a gutter at roof/wall intersections. Left and right hand configurations.

2.28 NURAPLY TPO NURATRIM

Nuraply Aluminium Nuratrim is an extruded profile to terminate the TPO on same plain parapets, verges and outer edges. Factory manufactured internal and external corners. Joining plates are used to assemble the lengths and corners together. The Nuratrim comes with pre-punched fixing holes. 100mm high x 78mm wide x 3metre long. Corners 300mm legs. Joining plate 90mm x 100mm.

2.29 MOUNTING PLATE

Nuralite Fixing Plate, provides a universal fixing offering one M10 x 20mm female threaded anchor point for securing most types of rails and bars.

2.30 CABLE DUCT

Nuralite Goose Neck.

2.31 NURAPLY TPO PEEL AND STICK REINFORCED PERIMETER STRIP

Nuraply TPO Peel and Stick Reinforced Perimeter Strip is a reinforced TPO membrane with a factory applied peel and stick adhesive tape on the outer face. 152mm wide x 30.48metres long.

2.32 NURAPLY TPO COVER TAPE

Nuraply TPO Cover Tape is a non-reinforced TPO detailing tape with a peel and stick adhesive backing. 152mm or 250mm wide x 30.48metres long.

2.33 NURAPLY TPO BUTYL TAPE

Nuraply Butyl Tape is 1mm thick, single sided butyl tape with a polypropylene fleece face. Designed to bond permanently to most surfaces including TPO.

2.34 ALUMINIUM TAPE

3M Aluminium tape in 150mmm or 48mm widths.

2.35 DECK SUPPORT SYSTEMS - NURAJACKS & NURAPADS

Refer to 4381NJ NURAJACK DECK SUPPORT SYSTEM for specification.

2.36 ELECTRONIC LEAK DETECTION - CONDUCTIVE TAPE

Nuralite Electronic Leak Test Tape, 50mm wide self-adhesive conductive tape.

2.37 ELECTRONIC LEAK DETECTION - EARTHING PLATE

Nuralite Electronic Leak Test Earthing Plate with earthing cable.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to the general section 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 GENERALLY

Work and materials to Nuralite installation instructions and NZBC E2/AS1.

3.4 WEATHER

Lay Nuraply TPO membrane in fair weather, with ambient air temperature no less than 5°C.

3.5 INSTALLATION SEQUENCE

Install Nuraply TPO membrane systems in sections to produce a weather tight at the end of each work period. Ensure that moisture absorbent substrates and insulation panels are covered with Nuraply TPO membrane on the same day they are laid or ensure that the base is kept covered and dry until Nuraply TPO membrane is laid. Seal exposed Nuraply TPO membrane edges at the end of each work period to ensure complete system remains dry.

Installation - preparation

3.6 PRELIMINARY WORK

Ensure that preliminary work, including formation of falls, flashing rebates, grooves, ducts, provision of battens and fillets and fixing of vents and outlets to levels, is complete and properly constructed to enable the system to work as intended. This work and the substrate to be smooth, clean, dry and stable.

3.7 ACCEPTANCE OF SUBSTRATE

Confirm that the substrate complies with Codemark CMNZ70166 for the relevant substrates and Nuralite documents, including sumps, outlets and projections, and ensure work is of the required standard.

Confirm the moisture content of substrates:

Concrete substrate:	Relative humidity of 75% maximum
Plywood/ timber substrate:	Moisture Content of 20% maximum

Confirm constructed falls:

Roofs and decks:	1:80 minimum
Gutters:	1:100 minimum

3.8 PLYWOOD SUBSTRATE

Ensure that sheets have been stretcher bond laid to falls, are rigid, with joints flush, edges arrised, upstands filleted, no lumps or hollows, smooth, clean, dry and free of debris. Plywood grain across the line of supports below.

Constructed falls on roofs and decks to be 1 in 80 minimum and 1 in 100 for gutters.

3.9 RIGID AIR BARRIER (RAB)

Fibre cement or Gypsum where they are placed behind cladding only.

Application - Nuratherm insulated roof system with Nuraply TPO

3.10 LAY VAPOUR BARRIER

Lay Nuraply ALU self-adhesive vapour barrier into the Nuraflux QD primed substrate to Nuralite requirements, with joints being rolled and well-sealed shut.

3.11 LAY NURATHERM INSULATION

Ensure that sheets have been stretcher bond laid to falls, are rigid, with joints flush upstands filleted, no lumps or hollows, smooth, clean, dry and free of debris.

For double layered systems, use one fixing to hold the first layer of sheets and then fix down the second sheet using IKOfix thermal flanges at the prescribed amount.

Seal any gaps in the insulation with expanding foam to produce a continuous insulation blanket with no gaps. Apply a layer of Aluminium Tape to any exposed ends of insulation sheets, fixings and sheet joins to provide a surface for the membrane to adhere to. On the lip of gutters, a Gutter Lip Trim may be installed if the insulation sheet edge requires additional protection from damage.

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When using tapered boards to create the fall, layout needs to be carefully considered before commencing so that there is positive drainage to all outlets.

Secure the sheets to the substrate with Nuratherm fasteners at a rate based in the Installation checklist.

3.12 APPLY ELECTRONIC LEAK DETECTION SYSTEM

Apply 50mm wide strips of Nuralite Electronic Leak Test Tape centred over every Nuratherm insulation board join. Install Nuralite Electronic Leak Test Earthing Plates to the surface of Nuratherm insulation boards at a rate of 1 per 500m2 roof area. Run and connect earthing cable through a dedicated Goose Neck cable duct in accordance with Nuralite installation details.

3.13 POSITION MEMBRANE

Position Nuraply TPO membrane over acceptable substrate and fold membrane back to expose half of the underside.

3.14 APPLY ADHESIVE (ADHESIVE FIX)

Apply bonding adhesive to the exposed underside of the membrane and to the corresponding substrate. Apply using a plastic core, medium nap paint roller, at a coverage rate of 1.5m² per litre per finished surface (includes coverage on both membrane and substrate).

3.15 INSTALL MEMBRANE SHEETS (ADHESIVE FIX)

Allow bonding adhesive to dry tacky and roll the coated Nuraply TPO membrane onto the coated substrate. Brush down the bonded section of Nuraply TPO membrane immediately with a soft bristle broom. Fold back the un-bonded half of the sheet and repeat procedure.

3.16 LAP JOINTS ADHERED MEMBRANE AND HOT-AIR WELD (ADHESIVE FIX)

Allow for overlapping membrane edges a minimum of 75mm to provide for a minimum 40mm hot-air weld.

3.17 HOT AIR WELD

Hot-air weld the adjoining Nuraply TPO membrane sheets with an automatic hot-air welding machine or using hand welding techniques.

3.18 PENETRATIONS

Form and finish upstands, downturns, penetrations, sumps and vents to conform with Nuralite required details.

3.19 PENETRATIONS AND JUNCTIONS

Check that adjoining walls and parapets are prepared ready for the installation of the Nuraply TPO membrane. Note: Ensure that no penetrations will occur until after the Nuraply TPO membrane has been laid.

Installation - Nurajack and Nurapad deck support system

3.20 NURAJACK & NURAPAD INSTALLATION

Refer to 4381NJ NURAJACK DECK SUPPORT SYSTEM for details.

Testing

3.21 TEST - ELECTRONIC LEAK DETECTION - WARM ROOFS

Carry out leak detection testing on warm roofs using Nuralite Electronic Leak Detection system upon completion of membrane installation and prior to any covering. Make good any lack of water tightness when the surface is completely dry. Depending on conditions, repeat a total or localised test process after making repairs.

Finishing

3.22 FOOT TRAFFIC

Keep foot traffic to a minimum after laying the Nuraply TPO membrane. Lay protection at all traffic concentration points.

3.23 ACCESS BOARDS

Provide access boards for later operations and remove when no longer needed.

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3.24 ACCEPTANCE

Arrange for an inspection of the completed work. Protect and maintain roofing until completion of the contract works.

3.25 SUBSEQUENT WORK

Make good any covering that has been cut or deformed by later work. Making good to take the form of inserting a new whole or part infill sheet to maintain the appearance of the covering as originally laid.

Completion

3.26 COMPLETION MATTERS

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

4 SELECTIONS

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

Nuratherm insulated roof system with Nuraply TPO Fleece-back Membrane

4.1 NURATHERM INSULATED ROOF SYSTEM ON TIMBER SUBSTRATES WITH NURAPLY TPO FLEECE-BACK MEMBRANE - ADHESIVE FIX

Location:	~
Supplier:	Nuralite
Substrate:	~
Substrate adhesion:	Nuraflux QD
Vapour barrier:	Nuraply ALU
Insulation layer:	IKO Nuratherm ALU insulation board
Thickness:	~mm
R-value:	~
Fixings:	IKO Fix fasteners - fixing pattern to suit wind loading (for fixing insulation board to substrate)
Membrane:	Nuraply TPO Fleece-Back Membrane
Thickness:	1.5mm
Colour:	Grey
Finish:	Smooth
Adhesive:	Nuraply TPO Membrane Bonding Adhesive

Materials - detail membrane

4.2 NURAPLY TPO WALKPAD MEMBRANE

Location:	~
Supplier:	Nuralite
Description:	Nuraply TPO walkway membrane - extruded and embossed TPO
Size:	3.81mm thick x 15m long x 766mm wide
Colour:	grey
Pattern:	herringbone

4.3 NURAPLY TPO DETAIL MEMBRANE

Location:	~
Supplier:	Nuralite
Description:	Nuraply TPO Detail membrane
Size:	1.5mm thick x 1524m long x 610mm wide
Colour:	grey

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Accessories

4.4 NURAJACK & NURAPAD DECK SUPPORT SYSTEM
Refer to 4381NJ NURAJACK DECK SUPPORT SYSTEM for details.

4.5 NURAPLY TPO MATERIAL ACCESSORIES

Location: ~
Supplier: Nuralite
Type: ~

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4511 EXTERIOR TIMBER WINDOWS & DOORS

1 GENERAL

This section relates to the supply and installation of:

- exterior timber windows
- exterior door frames and doors
- generally unglazed

1.1 RELATED WORK

Refer to glazing sections for glazing

Refer to painting sections for finishes

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:

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

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 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

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the manufacturer/supplier

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~

1.5 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state

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Warranties

1.6 WARRANTY

Provide warranty for:

5 years for materials
Warrantor: ~

Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.

Refer to the general section 1237 WARRANTIES for additional requirements.

Performance

1.7 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.

1.8 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.

1.9 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 to NZS 4211

1.10 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.

1.11 PERFORMANCE - WINDOWS AND DOORS

To NZS 4211,including:

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

Refer to SELECTIONS.

Performance - Wind (design by contractor)

1.12 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.

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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.

2.10 STANDARD DOORSETS, SLIDING-FOLDING
Timber frames to profile as detailed and dimensioned.

Components

2.11 FLASHINGS GENERALLY
Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

2.12 WINDOW AND DOOR FURNITURE
Refer to 5521 HARDWARE for type.

2.13 METAL FASTENINGS
Galvanized steel or non-corrodible metal.

2.14 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.

2.15 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.

2.16 SASH STAYS
Aluminium, nylon-bearing friction stays - 2 per sash. Size and gauge to suit sash size and weight.

2.17 SAFETY STAYS
Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Section 2.0, **Opening windows**.

2.18 HINGES
Size and gauge to carry door size and weight. Refer to SELECTIONS for type, size and material.

Finish

2.19 PRIMER
Alkyd wood primer coating system.

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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 FABRICATE DOORS

Fabricate doors in the factory, with provision for door furniture.

3.7 CHECK ALL OPENINGS

Check all openings on site for size and standard of execution before installing window or door frames.

3.8 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.
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).

Assembly

3.9 FABRICATION GENERALLY

Manufacture and fabricate frames, doors and sashes as detailed. Install hinges, stays and running gear as scheduled.

3.10 FABRICATION SASHES

Solid/finger-jointed timber to profiles detailed, complete with weather seals and weather hoods as necessary and as detailed.

3.11 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

3.12 FACTORY FINISHING

Before delivery to site:

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- 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.

3.13 ON SITE FINISHING

Before installation:

- Prime assemblies scheduled for paint finish not already primed with an alkyd wood primer.
- Prime all rebates and concealed faces of beads of assemblies scheduled for clear finish with an alkyd wood primer.
- Re-prime/seal any subsequently cut edge.
- Refer to painting section/s for finishing.

Installation - frames

3.14 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.

3.15 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.

3.16 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.

3.17 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.

3.18 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.

3.19 COMPLETE AIR SEAL

To NZBC E2/AS1, 9.1.5 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.

3.20 FIX HARDWARE

Fix all sash hardware and furniture as scheduled.

3.21 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 - doorsets

3.22 PROPRIETARY ELEMENTS

Fix in accordance with the door manufacturer's requirements.

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3.23 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

3.24 CONCRETE MASONRY WALLS - TIMBER FRAMES

Fix in place with 10mm expanding masonry anchors with countersunk heads. At hinge side fix direct to opening and pack on the other side to wedge in place. Fix at hinges and opposite, with one fixing in the vicinity of the lock. Separate steel and timber by a damp-proof membrane.

3.25 TIMBER STUD 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.

3.26 BOTTOM CLEARANCE

With inward opening doors, ensure clearance over internal floor coverings by set of sill.

3.27 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.

3.28 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.

3.29 MANIFESTATIONS

To NZS 4223.3, 2.2 Manifestation (making glass visible).

3.30 INSTALL FURNITURE

Install latches, locks and door furniture as scheduled.

3.31 CHECK

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

Completion

3.32 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.

3.33 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.

3.34 PROTECTION

Provide the following temporary protection of the finished work:

~

4 SELECTIONS

Performance - thermal

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4531 STEEL WINDOWS & DOORS

1 GENERAL

This section relates to the manufacture, supply and installation of:

- steel windows
- steel doors and frames
- steel doorsets
- internal glazed screens
- hardware and furniture

1.1 RELATED WORK

Refer to glazing section/s for glass type and thickness

Refer to 4582 STEEL FIRE WINDOWS AND DOORS for fire windows, doors and doorsets
Refer to powder coating section for powder coating products
Refer to painting section/s for paint finishes

1.2 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state

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 2312.3	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 3: Thermal metal spray coatings
NZS 3604	Timber-framed buildings
AS 3894.3	Site testing of protective coatings - Determination of dry film thickness
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
BS 6510	Steel framed windows, and glazed doors
ISO 2063	Thermal spraying - Metallic and other inorganic coatings - Zinc, aluminium and their alloys
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

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

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Web: ~
Email: ~
Telephone: ~
Facsimile: ~

Warranties

1.5 WARRANTY

Warrant this work under normal environmental and use conditions against failure of materials, water tightness and execution

Installation warranty: 5 years
Product warranty: 5 years

Warrant the powder coating / epoxy coating under normal environmental and use conditions against failure of materials and execution
Warranty period: 1 years

Warranties to be joint warranties by both the window manufacturer and the window installer.

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

Requirements

1.6 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

1.7 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:

- Design calculations
- Fully dimensioned elevations of all elements (minimum scale 1:20)
- Complete details of construction, connections and all support systems (minimum scale 1:5)
- Dimensions of all typical elements and of any special sizes and shapes
- Provision for the exclusion and/or drainage of moisture
- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Provision for adjustment of fixings to ensure true alignment of windows and doors
- Sealant types and full size sections of all sealants and backing rods
- Provision for seismic movement and movement under wind loads
- Sequence of installation
- Co-ordination requirements with other work
- A full schedule of materials, finishes, componentry, hardware and fittings

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If requested provide the following additional information:
~

Submit shop drawings for review to ~.

- ~ working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication and/or installation.

1.8 QUALIFICATIONS

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

Performance

1.9 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.

1.10 PERFORMANCE - WINDOWS AND DOORS

To NZS 4211, including:

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

Refer to SELECTIONS.

1.11 THERMAL PERFORMANCE - WINDOWS & DOORS

Thermal performance of windows & doors to NZBC H1/AS1 or H1/AS2 & NZBC H1/VM1 or H1/VM2. The construction R-value of windows & doors determined by NZBC H1/VM1 or 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.

1.12 SEISMIC SUB-FRAMES

The following units to have seismic sub-frames. Refer to NZS 1170.5, section 8 Requirements for parts and components.

Windows number: ~

Performance - Wind (design by contractor)

1.13 DESIGN PARAMETERS - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, table 5.1.

Refer to SELECTIONS for wind zone.

Finishes

1.14 POWDER COATING THICKNESS TEST

Test for film thickness to AS 3894.3 for certifying thickness where any dispute arises as to the thickness provided.

The coating to be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

2 PRODUCTS

Materials

2.1 STEEL WINDOW, DOOR AND FRAME AND DOORSET SECTIONS

To BS 6510.

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2.2 GLAZING BEADS

Interior or exterior fitted. Refer to SELECTIONS for type.

Corrosion Protection

2.3 ZINC METAL SPRAY

Steel frame to be steel grit blasting prior to application of 75 - 100 microns minimum zinc metal spraying with coating thickness when measured to AS 3894.3. Refer to SELECTIONS for details.

Components

2.4 HARDWARE AND FURNITURE

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

2.5 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Section 2.0, Opening windows.

2.6 GLAZING

To NZS 4232.2. Refer to glazing section/s for glass type and thickness.

2.7 FLASHINGS GENERALLY

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.

Finishes

2.8 EXTERNAL POWDER COAT FINISH

Refer to powder coating section for polyester powder coat finish.

3 EXECUTION

Conditions - generally

3.1 DELIVERY

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

3.2 UNLOAD

Unload, handle and store elements in accordance with the window manufacturer's requirements, without distortion, avoiding prefinished surfaces rubbing together and avoiding contact with mud, plaster and cement.

Store windows, doors and frames under cover. Place units in a vertical position with heads up, spaced by timber blocking, on minimum 100mm high timber blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. Keep paper and cardboard wrappings dry. Provide 6mm minimum space between each stacked door to permit air circulation.

3.3 PROPRIETARY ELEMENTS

Fix in accordance with the window manufacturer's requirements.

3.4 FIXINGS AND FASTENINGS

Use fixings and fastenings recommended by the manufacturer of the component being fixed.

Assembly

3.5 FABRICATION

Fabricate frames as detailed on the shop drawings. Frame and sash joints to be welded, dressed square and flat. Install hinges, stays and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

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3.6 CORROSION PROTECTION

To AS/NZS 2312.3. Abrasive blast clean all frames and ancillary profiles before applying zinc metal spraying.

3.7 ANCHORAGES

Install all required anchorages for the steel windows and doors, including sleeves, concrete inserts, anchor bolts and items with integral anchors that are to be embedded in concrete and/or masonry.

3.8 FINISH COAT APPLICATION

Finish all significant surfaces with either a polyester powder coat or a two coat epoxy coat finish. Refer to SELECTIONS.

3.9 HARDWARE GENERALLY

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

3.10 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 - generally

3.11 CHECK ALL OPENINGS

Check all openings prior to manufacture for size and standard of execution before installing door frames.

3.12 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.
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).
- application of waterproof sealer to all door and window sills in concrete floor or concrete sill situations. To door sills only, apply a suitable membrane over the sealer

3.13 INSTALLATION

Fix to comply with the reviewed shop drawings and manufacturer's installation details, including flashings, bedding compounds and sealants.

3.14 TOLERANCES

Install the finished prehung door to a dimensional accuracy of ± 2mm.

3.15 CONCRETE MASONRY WALLS - STEEL FRAMES

Fix in place with 10mm expanding masonry anchors with countersunk heads. At hinge side fix direct to opening and pack on the other side to wedge in place. Fix at hinges and opposite, with one fixing in the vicinity of the lock.

3.16 TIMBER STUD WALLS - STEEL FRAMES

Using a pilot hole in the frame, fix to timber studs with countersunk self-drilling corrosion proof screws. Fix at hinges and opposite, with one fixing in the vicinity of the lock.

3.17 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.

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Except where window/door frames are recessed, ensure that head flashings over-sail jamb facings by 30mm at each end. Refer to 4821 FLASHINGS section for supply and installation. Refer to manufacturer for appropriate installation details.

3.18 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.

3.19 GLAZING

Install selected glazing to NZS 4232.2 into the specified window, door or doorset system assembly. Refer to the glazing section/s for details for glass types, thickness and glazing method.

3.20 INSTALL HARDWARE

Install sash and door hardware as scheduled.

Application - jointing and sealing

3.21 PREPARATION

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 any adjoining surfaces which would be difficult to clean if smeared with sealant.

3.22 BACKING

Insert polyethylene rod or tape back-up behind joints being pointed with sealant.

3.23 POINTING

Tool sealant to form a smooth fillet, with profile and dimensions required by the sealant manufacturer.

3.24 FINISHING

Remove excess sealant from adjoining surfaces, using cleaning materials required by the sealant manufacturer and to leave frames unstained and clean.

Completion

3.25 PROTECTION

Protect finishes against damage from adjacent and following work. Protect glass from damage by crossing clearly visible reinforced paper or plastic tape between jamb liners and clear of the glass.

3.26 CHECK

Check and adjust operation of all doors and windows.

3.27 REPLACE

Replace damaged, cracked or marked elements.

3.28 LEAVE

Leave work to the standard required for following procedures.

3.29 REMOVE

Remove safety indicators and protective coverings, and wipe down all joinery thoroughly to leave it perfectly clean, using the method required by the window manufacturer. Remove debris, unused materials and elements from the site.

4 SELECTIONS

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4554 SKYLIGHTS

1 GENERAL

This section relates to the manufacture, supply, and installation of sloped overhead skylights including:

- proprietary skylights fixed
- proprietary skylights opening
- moulded dome skylights
- tube skylights
- operating systems
- accessories including ventilation systems and lights.

1.1 RELATED WORK

Refer to ~ for ~

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:

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

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 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 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
AS/NZS 2208	Safety glazing materials in buildings
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 4666	Insulating glass units
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
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)

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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.
BRANZ BU 634	Finishing Aluminium

1.4 MANUFACTURER / SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web: ~
Email: ~
Telephone: ~
Facsimile: ~

Warranties

1.5 WARRANTY - MANUFACTURER / SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years: For the supply of product as specified in SELECTIONS

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER / APPLICATOR

Provide an installer/applicator warranty:

10 years: For the installation of product as specified in SELECTIONS.

- 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

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

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:

- Construction details (minimum scale 1:5) showing product profiles, components, fixings, flashings and accessories
- Dimensions of all typical elements and of any special sizes and shapes.
- Glazing specification and details.

If requested provide the following additional information:

~

Submit shop drawings for review to ~.

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~ working days (at least) before fabrication is planned to commence, provide shop drawings for review.
Complete shop drawing review before commencing fabrication and/or installation.

1.9 SELECTION OF GLASS

Selection of glass for sloped overhead glazing and insulated glass units to NZS 4223.4 and NZS 4223.2.

1.10 SAFETY GLAZING MATERIAL

To NZS 4223.3, and the relevant requirements of AS/NZS 2208. Ensure material is legibly marked and if cut by the distributor or installer mark each piece to NZS 4223.3.

Performance

1.11 THERMAL PERFORMANCE - SKYLIGHTS

Thermal performance of skylights to NZBC H1/AS1 or H1/AS2 & NZBC H1/VM1 or H1/VM2. The construction R-value of skylight determined by NZBC H1/VM1 or H1/VM2, Appendix D, D2 Skylights:

- Thermal transmittance of skylights in accordance with ISO 10077-1.
- Thermal transmittance of framing in accordance with ISO 10077-2.
- Thermal transmittance of glazing using BS EN 673, considering the effects of horizontal or angled glazing on the heat transfer.

Refer to SELECTIONS for Construction R-values.

1.12 PERFORMANCE, WIND, DEAD, SNOW, AND LIVE ACTIONS

The design wind pressures, and snow loads to NZS 3604 and NZS 4223.4. Live loads and glazing design, for glass or equivalent plastics, to NZS 4223.4, and to manufacturer's literature and details.

2 PRODUCTS

2.1 SKYLIGHTS FIXED

Prefinished aluminium exterior frame with timber internal frame, fitted with toughened double glazing (IGU), complete with manufacturer's flashing kit.
Refer to SELECTIONS for type, finish and accessories.

Components

2.2 ALUMINIUM EXTRUSIONS

Alloy designation to comply with AS/NZS 1866. Branded and extruded for anodising or powder coating.

2.3 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.

2.4 STAINLESS STEEL SHEET AND STRIP

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

2.5 FIXINGS

Ensure all fixings and brackets are compatible with the skylight. Do not use electroplated zinc fasteners or brass fastenings.

2.6 GLAZING

IGU to AS/NZS 4666, NZS 4223.2 and NZS 4223.1

2.7 FLASHINGS GENERALLY

Material, grade and colour of flashings to be compatible with the roofing material. Use proprietary flashing kits where supplied by the manufacturer.

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Accessories

2.8 SKYLIGHT HARDWARE

Fasteners, stays, locks, vents and other hardware as scheduled. Refer to SELECTIONS for type and finish. Where hardware is not scheduled, use hardware from manufacturer's standard range.

Finishes

2.9 POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER

Polyester powder organic coating in accordance with WGANZ PQAS, AS 3715, and AAMA 2603.

2.10 TIMBER TREATMENT

Treated with water repellent coating, suitable for later finishing. Refer to 6721 PAINTING INTERIOR.

3 EXECUTION

Generally

3.1 CONFIRM

Confirm framed openings on site for dimensions, to suit the proprietary skylight.

3.2 EXECUTION GENERALLY

Check that the preparation of the opening is to NZBC E2/AS1, 8.1.7 Roof penetrations.

3.3 HARDWARE GENERALLY

Factory fit all required and scheduled hardware.

3.4 HANDLING

Avoid distortion of elements during transit, handling and storage. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement. Do not deliver to site any elements which cannot be immediately unloaded into suitable conditions of storage.

3.5 RETAIN PROTECTIVE COVERINGS

Retain protective coverings and coatings in place during fixing wherever possible. Provide additional protection to prevent marking of surfaces visible in the completed work. Remove protection on completion.

Skylights

3.6 INSTALL SKYLIGHTS

Check that the trimmed openings are formed and constructed to suit the required units. Do not proceed until roof and structural openings are properly formed and weathertight roof flashings installed. Install and fix the skylight units strictly in accordance with the skylight manufacturer's requirements and installation instructions. Repack any thermal insulation around rough openings where disturbed by the installation. Install proprietary flashings and overflashings as detailed by the manufacturer to make the installation completely weatherproof.

3.7 SKYLIGHT ACCESSORIES AND OPERATING SYSTEMS

Install selected accessories and hardware and complete all operating systems.

Completion

3.8 CLEAN FRAMES AND GLAZING

On completion clean down both sides of skylight frames, using the methods required by the respective manufacturer's. Remove any manufacturer's stickers and clean glass. Ensure all installed units are adequately protected from damage and adverse weather during construction.

3.9 CONFIRM

Confirm the proper operation of hardware and operating systems on completion of the installation and again at completion of the contract works.

4 SELECTIONS

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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.

1.1 RELATED WORKS

Refer to ~ for ~.

Documents

1.2 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.

1.3 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Requirements

1.4 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

1.5 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.

1.6 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.

1.7 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

~

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

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4610 GLAZING RESIDENTIAL

1 GENERAL

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

- windows and doors
- frameless shower and bath screens
- splashbacks, wall linings
- balustrade systems, pool fences
- mirrors and mirror frames

1.1 RELATED WORK

Refer to ~ for ~

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:

PVB	Polyvinyl Butyral
CIP	Cast in place

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 provisions for building elements
NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
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 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 636	Protecting Glass From Damage

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available at

Company:	~
Web:	~
Email:	~
Telephone:	~

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

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

Performance

1.6 THERMAL PERFORMANCE - EXTERNAL GLAZING

Provide external glazing to comply with H1 Energy efficiency requirements of NZBC H1/AS1 or H1/AS2 and NZBC H1/VM1 or H1/VM2.

Refer to RELATED WORK sections for Construction R-values for complete windows / glazed doors / curtain walls and/or skylights including glazing.

2 PRODUCTS

Materials

2.1 CLEAR FLOAT GLASS

Clear ordinary annealed transparent float glass for general window glazing. Thickness to NZS 4223.1 and NZS 4223. Supp 1.

2.2 TEXTURED, PATTERNED OR OBSCURE GLASS

Translucent, annealed, rolled glass with a decorative pattern on one surface.

2.3 LAMINATED GLASS

Grade A Safety Glass to AS/NZS 2208 with PVB or CIP resin interlayer.

2.4 TOUGHENED GLASS

Grade A Safety Glass to AS/NZS 2208.

Heat soaked toughened glass to NZS 4223.1, Appendix E required for critical areas.
Refer to SELECTIONS.

2.5 TINTED FLOAT GLASS

Body tinted float glass.

2.6 REFLECTIVE AND COATED FLOAT GLASS

Either coated float glass incorporating both solar and thermal insulation properties; or coated float glass with only the thermal insulation properties.

2.7 INSULATING GLASS UNITS (IGU'S)

To AS/NZS 4666, NZS 4223.2 and the IGU Manufacturers Association (IGUMA) requirements.

Marking to NZS 4223.2 as modified by NZBC B2/AS1, 3.4.3 Insulating glass units.
Refer to SELECTIONS for specified surfaces of the IGU.
Surface numbering order for glass panes in an IGU are #1, #2, #3, and #4 as follows:
- Surface #1 - outer face of exterior pane
- Surface #2 - cavity face of the exterior pane
- Surface #3 - cavity face of the interior pane
- Surface #4 - outer face of the interior pane

Materials, mirrors

2.8 MIRROR GLASS

Clear annealed mirror float glass, including silver, activation, passivation and two protective coats.

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2.9 SAFETY MIRROR GLASS

4mm, 5mm and 6mm annealed float glass mirror vinyl back safety glazing material to AS/NZS 2208.

Materials, screens

2.10 GLASS SCREENS SHOWER & BATH

Proprietary shower / bath screens, formed to shape before toughening, complete with matching hardware.

Components, timber glazing

2.11 PUTTY, TIMBER FRAME

Linseed oil base glazing putty. Not to be used with laminated or IGUs.

2.12 SPRIGS

Diamond metal pieces to retain glass in timber sashes and frames.

2.13 GLAZING TAPE

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes for bead glazing. For internal use only.

2.14 GASKETS

PVC or Santoprene to window manufacturers' requirements.

2.15 SETTING BLOCKS

Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes. Use with bead glazing and for IGUs.

Components, steel glazing

2.16 STEEL GLAZING COMPONENTS

~

Components, wall mounted glass (mirrors and splashbacks)

2.17 GLASS ADHESIVE

Adhesive mirror-mastic and double-sided adhesive tape.

2.18 MIRROR DE-MISTER

Refer to appropriate eletrical section(s) for type.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.3, NZS 4223.4. All external glazing to be wind and watertight on completion.

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 636.

3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces.

3.4 GLASS THICKNESS

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

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

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3.5 REBATE DIMENSIONS

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

3.6 JOINTING, PUTTY AND SEALING MATERIAL COMPATIBILITY

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

Conditions - human impact safety requirements

3.7 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 for thickness and maximum areas of safety glass.

3.8 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in NZS 4223.3, that also comply with the relevant requirements of AS/NZS 2208. Ensure material is permanently marked and if cut by the distributor or installer mark each piece to NZS 4223.3, 2.8 Identification.

3.9 CONTAINMENT

Edge cover to comply with NZS 4223.1, Section 4 Glazing, table 5. Otherwise to NZS 4223.3, 2.3 Edge cover.

Assembly

3.10 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.11 EDGE WORK AND BEVELLING

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

3.12 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.13 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

3.14 INSTALL SAFETY GLASS

To NZS 4223.3.

Application - timber glazing

3.15 PREPARE REBATES

Ensure all rebates and grooves are clean, dry and unobstructed at time of priming, sealing and glazing.

3.16 PREPARE TIMBER SURROUNDS

Ensure that all rebates have been primed with a primer suitable for this purpose and applied to the requirements of the painting section/s.

3.17 PREPARE TIMBER BEADS

Before fixing ensure that timber beads are sealed and painted to match the timber surround.

3.18 LOCATE BLOCKS

Centralise the glass in the rebate opening using setting, location and spacer blocks as required in NZS 4223.1, Section 4 Glazing, to prevent movement of glass in the rebate and cushion the effect of wind loading on the sealing system.

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3.19 INSTALL PUTTY FRONTING

Back putty to give a bedding of not less than 1mm to 2mm between the glass and the back of the rebate when the glass has been pressed back. Strip off squeezed out putty at a positive angle. Fix glass to wooden surrounds with diamond points or sprigs at maximum 460mm centres. Fix glass to metal surrounds with spring clips or pins provided by the sash manufacturers. Apply putty to the face to form a triangular fillet stopping 1-2 mm below sight line. Finish putty smooth and true to line and face and with a light brushing.

Leave all windows and doors closed until putty has set sufficiently to prevent glass displacement.

Prime putty fronting once surface has skinned - normally within 10 - 15 days of completion of glazing, but this can be reduced with special XHP putty.

3.20 BEAD GLAZING, PREFORMED STRIPS

Apply the preformed tape to the rebate upstand with securely formed (or sealed) butt joints at corners. Place setting blocks, offer the glass and press back against the tape centralised in the opening and apply the second tape. Press the beads against and compressing the tapes and fix true to line and face sufficiently rigid to prevent flexing or movement. Trim off excess strip.

If a capping bead is required clean and paint the timber surface and when dry apply sealant capping between bead and glass and tool to a smooth camber.

3.21 BEAD GLAZING, NON SETTING COMPOUNDS

Apply compound to the rebate. Push setting blocks into place with distance pieces against the rebate upstand before offering the glass to the surround on setting blocks, centralised in the opening and pushed back into the glazing compound. Fill all voids with compound and apply more compound before setting distance pieces in it opposite the distance pieces already in place. Bed the beads to the glass and rebate and fix true to line and face sufficiently rigid to prevent flexing or movement. Finish compound off at an angle both sides of the glass.

3.22 INSTALLING INSULATING GLASS UNITS

Refer to the glazing manufacturer's requirements and before glazing ensure that the materials forming the opening are strong enough to accept the weight, the rebates are the correct size and prepared to receive the units to AS/NZS 4666. Fit setting and location blocks and bead glaze units using a compatible sealant to NZS 4666 section 3 Glazing, and to the glazing manufacturer's requirements.

3.23 INSTALLING REFLECTIVE AND COATED GLASS

In addition to the type of glazing specified refer to the requirements of the glass manufacturer and ensure that the rebate dimensions, clearances and edge cover are sufficient to allow for the movement created by the particular solar glass being used. Check thermal stability for the particular location and ensure any sealant or compound is compatible with the coating.

Application Steel

3.24 INSTALL GLASS TO STEEL FRAMES

Install glass to steel frame manufacturers requirements.

Application - wall mounted glass (mirrors and splashbacks)

3.25 WALL MOUNTED GLASS, ADHESIVE FIXED

For mirrors and splashbacks, fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive area 0.2 m2 per 1 m2 of glass to NZS 4223.3.

Application miscellaneous

3.26 INSTALL GLASS SHOWER & BATH SCREENS

Install shower and bath screens and doors to manufacturer's requirements.

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Finishing

3.27 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

Completion

3.28 TRADE CLEAN

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

3.29 REPLACE

Replace damaged, cracked or marked glass.

3.30 LEAVE

Leave work to the standard required by following procedures.

3.31 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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4611 GLAZING EXTERIOR

1 GENERAL

This section relates to the supply and fixing of glass products for external joinery in complex residential and commercial buildings, including:

- window and doors
- curtain wall systems
- balustrade systems
- canopies
- screens

1.1 RELATED WORK

Refer to ~ for ~

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:

PVB	Polyvinyl Butyral
CIP	Cast in place

Documents

1.3 DOCUMENTS

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

NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
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 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 636	Protecting Glass From Damage
BPS	Building Product Specifications

1.4 MANUFACTURER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available at:

Company:	~
Web:	~
Email:	~
Telephone:	~

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

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

Requirements

1.6 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

Performance

1.7 THERMAL STRESS ANALYSIS

For non heat treated glass obtain a thermal stress analysis for spandrel panels, tinted, reflective and other solar control vision glass including IGU's for review before placing final order.

1.8 THERMAL PERFORMANCE - EXTERNAL GLAZING

Provide external glazing to comply with H1 Energy efficiency requirements of NZBC H1/AS1 or H1/AS2 and NZBC H1/VM1 or H1/VM2.

Refer to RELATED WORK sections for Construction R-values for complete windows / glazed doors / curtain walls and/or skylights including glazing.

2 PRODUCTS

Materials

2.1 INSULATING GLASS UNITS (IGU'S)

To AS/NZS 4666, NZS 4223.2 and the IGU Manufacturers Association (IGUMA) requirements.

Marking to NZS 4223.2 as modified by NZBC B2/AS1, 3.4.3 Insulating glass units.
Refer to SELECTIONS for specified surfaces of the IGU.
Surface numbering order for glass panes in an IGU are #1, #2, #3, and #4 as follows:
- Surface #1 - outer face of exterior pane
- Surface #2 - cavity face of the exterior pane
- Surface #3 - cavity face of the interior pane
- Surface #4 - outer face of the interior pane

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Components, general

2.2 JOINTING, PUTTY AND SEALING MATERIALS

Ensure jointing, putty and sealing materials are compatible with glass substrates. Confirm compatibility with laminated glass, IGU's and coatings.

Components, timber glazing

2.3 PUTTY, TIMBER FRAME

Linseed oil base glazing putty.

2.4 SPRIGS

Diamond metal pieces to retain glass in timber sashes and frames.

2.5 GLAZING TAPE

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes for bead glazing.

2.6 GASKETS

PVC or Santoprene to window manufacturers' requirements.

2.7 SETTING BLOCKS

Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes. Use with bead glazing and for IGU's.

Components, steel glazing

2.8 PUTTY, STEEL FRAME

Steel Sash Putty.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.2, NZS 4223.3, as modified by BPS paragraph 4.4.1.4 and NZS 4223.4. All external glazing to be wind and watertight on completion.

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 636.

3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces.

3.4 GLASS THICKNESS

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

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

3.5 REBATE DIMENSIONS

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

Conditions - human impact safety requirements

3.6 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 for thickness and maximum areas of safety glass.

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3.7 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in NZS 4223.3, as modified by BPS paragraph 4.4.1.4, that also comply with the relevant requirements of AS/NZS 2208. Ensure material is permanently marked and if cut by the distributor or installer mark each piece to NZS 4223.3, 2.8 Identification.

3.8 CONTAINMENT

Edge cover to comply with NZS 4223.1, Section 4 Glazing, table 5. Otherwise to NZS 4223.3, 2.3 Edge cover.

3.9 SHOP FRONTS

To NZS 4223.3, 9 Shopfronts, ensure adequate edge cover to retain glass under load.

Assembly

3.10 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.11 EDGE WORK AND BEVELLING

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

3.12 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.13 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

Application - timber glazing

3.14 PREPARE REBATES

Ensure all rebates and grooves are clean, dry and unobstructed at time of priming, sealing and glazing.

3.15 PREPARE TIMBER SURROUNDS

Ensure that all rebates have been primed with a primer suitable for this purpose and applied to the requirements of the painting section/s.

3.16 PREPARE TIMBER BEADS

Before fixing ensure that timber beads are sealed and painted to match the timber surround.

3.17 LOCATE BLOCKS

Centralise the glass in the rebate opening using setting, location and spacer blocks as required in NZS 4223.1, Section 4 Glazing, to prevent movement of glass in the rebate, and cushion the effect of wind loading on the sealing system.

3.18 INSTALL PUTTY FRONTING

Back putty to give a bedding of not less than 1 to 2mm between the glass and the back of the rebate when the glass has been pressed back. Strip off squeezed out putty at a positive angle. Fix glass to wooden surrounds with diamond points or sprigs at maximum 460mm centres. Fix glass to metal surrounds with spring clips or pins provided by the sash manufacturers. Apply putty to the face to form a triangular fillet stopping 1-2mm below sight line. Finish putty smooth and true to line and face and with a light brushing.

Leave all windows and doors closed until putty has set sufficiently to prevent glass displacement.

Prime putty fronting once surface has skinned - normally within 10 - 15 days of completion of glazing, but this can be reduced with special XHP putty.

3.19 BEAD GLAZING, PREFORMED STRIPS

Apply the preformed tape to the rebate upstand with securely formed (or sealed) butt joints at corners. Place setting blocks, offer the glass and press back against the tape centralised in the opening and apply the second tape. Press the beads against and compressing the tapes and fix true to line and face sufficiently rigid to prevent flexing or movement. Trim off excess strip.

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If a capping bead is required clean and paint the timber surface and when dry apply sealant capping between bead and glass and tool to a smooth camber.

3.20 BEAD GLAZING, NON SETTING COMPOUNDS

Apply compound to the rebate. Push setting blocks into place with distance pieces against the rebate upstand before offering the glass to the surround on setting blocks, centralised in the opening and pushed back into the glazing compound. Fill all voids with compound and apply more compound before setting distance pieces in it opposite the distance pieces already in place. Bed the beads to the glass and rebate and fix true to line and face sufficiently rigid to prevent flexing or movement. Finish compound off at an angle both sides of the glass.

3.21 INSTALLING INSULATING GLASS UNITS

Refer to the glazing manufacturer requirements and before glazing ensure that the materials forming the opening are strong enough to accept the weight, the rebates are the correct size and prepared to receive the units to AS/NZS 4666. Fit setting and location blocks and bead glaze units using a compatible sealant to AS/NZS 4666 section 3 Glazing, and to the glazing manufacturer requirements.

3.22 INSTALLING REFLECTIVE AND COATED GLASS

In addition to the type of glazing specified refer to the requirements of the glass manufacturer and ensure that the rebate dimensions, clearances and edge cover are sufficient to allow for the movement created by the particular solar glass being used. Check thermal stability for the particular location and ensure any sealant or compound is compatible with the coating.

Application uPVC

3.23 INSTALL GLASS TO UPVC FRAMES

Install glass to NZS 4223.1.

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

3.24 INSTALL SAFETY GLASS

To NZS 4223.3.

Application - steel

3.25 PREPARE METAL FRAMES

Follow the requirements of the compound manufacturer and surround manufacturer in ensuring that if required a suitable primer has been applied and in preparing the surround and beads.

3.26 BEAD GLAZING, STEEL

Remove drilled and tapped beads. Back tape rebates, fit glass on setting blocks and refix beads with anti-corrosive treated screws.

3.27 PUTTY GLAZING, STEEL

Back tape or back putty, fit glass on setting blocks and completely putty fill the rebate, forming a neat triangular fillet stopping 1-2 mm short of the sight line. Wait until putty has cured before applying any protective coatings.

Finishing

3.28 SAFETY

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

3.29 MANIFESTATIONS

To NZS 4223.3, 2.2 Manifestation (making glass visible).

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Completion

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

3.31 REPLACE
Replace damaged, cracked or marked glass.

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

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

4 SELECTIONS

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4612 GLAZING INTERIOR

1 GENERAL

This section relates to the supply and fixing of glass products for interior spaces including:

- partition glazing, framed and frameless
- doors, framed and frameless
- frameless shower and bath screens
- splashbacks / wall linings
- balustrade systems
- counter tops / furniture
- floors treads and landings
- mirrors and mirror frames

1.1 RELATED WORK

Refer to ~ for ~

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:

PVB	Polyvinyl Butyral
CIP	Cast in place

Documents

1.3 DOCUMENTS

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

NZBC F4/AS1	Safety from falling
AS/NZS 2208	Safety glazing materials in buildings
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.3	Glazing in buildings - Human impact safety requirements
BRANZ BU 636	Protecting Glass From Damage
BPS	Building Product Specifications

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available at

Company:	~
Web:	~
Email:	~
Telephone:	~

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

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

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Requirements

1.6 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

2 PRODUCTS

Materials

2.1 CLEAR FLOAT GLASS

Clear ordinary annealed transparent float glass for general window glazing. Thickness as required by NZS 4223.1 and NZS 4223.3.

2.2 LAMINATED GLASS

Grade A Safety Glass to AS/NZS 2208 with PVB or CIP resin interlayer.

2.3 TOUGHENED GLASS

Grade A Safety Glass to AS/NZS 2208.

Materials, mirrors

2.4 SAFETY MIRROR GLASS

4mm, 5mm and 6mm annealed float glass mirror vinyl back safety glazing material to AS/NZS 2208.

Materials, shower and bath screens

2.5 GLASS SHOWER AND GLASS SCREENS

Proprietary shower/bath screens, formed to shape before toughening, complete with matching hardware.

Components, general

2.6 JOINTING, PUTTY AND SEALING MATERIALS

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

Components, aluminium glazing

2.7 GLAZING TAPE AND GASKETS

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

2.8 SETTING BLOCKS

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

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Components, wall mounted glass (mirrors and splashbacks)

2.9 GLASS ADHESIVE

Adhesive mirror-mastic and double-sided adhesive tape.

2.10 MIRROR DE-MISTER

Refer to appropriate electrical section(s) for type.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1 and NZS 4223.3 as modified by BPS paragraph 4.4.1.4.

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 636.

3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces.

3.4 GLASS THICKNESS

If not specifically stated in the glazing schedule determine the minimum thickness of glass for each sheet as required by NZS 4223.1 and NZS 4223.3.

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

3.5 REBATE DIMENSIONS

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

Conditions - human impact safety requirements

3.6 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 for thickness and maximum areas of safety glass.

3.7 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in NZS 4223.3 as modified by BPS paragraph 4.4.1.4, that also comply with the relevant requirements of AS/NZS 2208. Ensure material is permanently marked and if cut by the distributor or installer mark each piece to NZS 4223.3, 2.8 Identification.

3.8 CONTAINMENT

Edge cover to comply with NZS 4223.1, Section 4 Glazing, table 5. Otherwise to NZS 4223.3, 2.3 Edge cover.

Assembly

3.9 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.10 EDGE WORK AND BEVELLING

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

3.11 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.12 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

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Application aluminium

3.13 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS 4223.1.

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

3.14 INSTALL SAFETY GLASS

To NZS 4223.3.

Application - wall mounted glass (mirrors and splashbacks)

3.15 WALL MOUNTED GLASS, ADHESIVE FIXED

For mirrors and splashbacks, fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive area 0.2 m2 per 1 m2 of glass to NZS 4223.3.

Application miscellaneous

3.16 INSTALL GLASS SHOWER AND BATH SCREENS

Install shower and bath screens and doors to manufacturer's requirements.

Finishing

3.17 SAFETY

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

3.18 MANIFESTATIONS

To NZS 4223.3, 2.2 Manifestation (making glass visible).

Completion

3.19 TRADE CLEAN

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

3.20 REPLACE

Replace damaged, cracked or marked glass.

3.21 LEAVE

Leave work to the standard required by following procedures.

3.22 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS



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4711T TERRA LANA NATURAL WOOL INSULATION

1 GENERAL

This section relates to **Terra Lana** wool and polyester fibre blend insulation for new and retrofit residential buildings. Installed, laid, hung or fitted as thermal and acoustic insulation, including:

- ceiling service cavity insulation
- skillion/truss roof insulation
- I-Beam rafter fillet
- wall and service cavity insulation
- wall insulation
- underfloor insulation
- new build drop in floor insulation
- pipe lagging
- acoustic internal walls/mid-floor insulation

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for wall underlay and roofing underlay.

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:

SCI	side clearance to insulation

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 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/VM1	Protection from Fire
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G9/VM1	Electricity
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
AS/NZS 5110	Recessed Luminaire Barriers
AS/NZS 3000	Electrical installations (Known as the Australian/New Zealand Wiring Rules)
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings

BRANZ Appraisal 682 Terra Lana Wool Insulation
Health and Safety at Work Act 2015.

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Terra Lana, Technical Datasheet, 1 March 2023
Branz Appraisal 682 - Terra Lana Wool Insulation
Terra Lana 50-year product Warranty
Terra Lana Drop-In Floor insulation - 14-day product exposure Warranty
Terra Lana Wool Insulation, Installation Instructions. Version 1, 5 December 2022
Marshall Day Acoustics - report on Terra Lana 90mm insulation - Chatterblock
Marshall Day Acoustics - report on Terra Lana 60mm insulation - Chatterblock

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Manufacturer/supplier contact details
Company: **Terra Lana Products Ltd**
Web: www.terralana.co.nz
Email: sales@terralana.co.nz
Telephone: 0800 485 262 / (03) 982 0211

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years: For materials (refer Terra Lana for details)

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERAL

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Terra Lana** systems, or associated components and products.

1.8 RETURNING OFFCUTS TO TERRA LANA FACTORY FOR RECYCLING

After completion of works, the installer/contractor contacts Terra Lana manufacturer/supplier to organise return of any offcuts to the factory for recycling.

Performance - General

1.9 COMPLIANCE

Terra Lana Wool Insulation, meets the requirements of Branz Appraisal 682 [2022] when designed, used, installed and maintained within the standards and conditions of this Appraisal.

1.10 FIRE PREVENTION

Provide separation or protection from heat sources: fireplaces, heating appliances, flues, chimneys and recessed luminaires to NZBC C/VM1, NZBC C/AS1-AS2 and NZBC G9/VM1.

1.11 SOUND RATING REQUIREMENTS

Provide sound rated systems as detailed in SELECTIONS.

2 PRODUCTS

Materials

2.1 SKILLION ROOF INSULATION - SEGMENT

Terra Lana Skillion Roof insulation to NZBC H1/AS1-AS2 and AS/NZS 4859.1, is manufactured from a minimum of 60% recycled and new, sheep wool fibre, combined with high performance melt bond polyester fibres. Refer to SELECTIONS for options.

2.2 TRUSS ROOF INSULATION - SEGMENT

Terra Lana Truss Roof insulation to NZBC H1/AS1-AS2 and AS/NZS 4859.1, is manufactured from a minimum of 60% recycled and new, sheep wool fibre, combined with high performance melt bond polyester fibres. Refer to SELECTIONS for options.

2.3 DOUBLE LAYER TRUSS ROOF INSULATION - SEGMENT

Terra Lana Double Layer Truss Roof insulation to NZBC H1/AS1-AS2 and AS/NZS 4859.1, is manufactured from a minimum of 60% recycled and new, sheep wool fibre, combined with high performance melt bond polyester fibres. Refer to SELECTIONS for options.

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2.4 WALL SERVICE CAVITY INSULATION

Terra Lana Wall Service Cavity insulation to NZBC H1/AS1-AS2 and AS/NZS 4859.1, is manufactured from a minimum of 60% recycled and new, sheep wool fibre, combined with high performance melt bond polyester fibres. Refer to SELECTIONS for options.

2.5 WALL INSULATION - SEGMENT / BLANKET

Terra Lana Wall insulation to NZBC H1/AS1-AS2 and AS/NZS 4859.1, is manufactured from a minimum of 60% recycled and new, sheep wool fibre, combined with high performance melt bond polyester fibres. Refer to SELECTIONS for options.

2.6 TERRA LANA PIPE LAGGING - HOT WATER PIPING

Terra Lana Pipe Lagging insulation to NZBC H1/AS1-AS2 and AS/NZS 4859.1, is manufactured from recycled and natural wool fibres on a jute substrate.

2.7 TERRA LANA CHATTERBLOCK® ACOUSTIC WALL / MID-FLOOR INSULATION

Terra Lana Chatterblock® acoustic insulation to NZBC H1/AS1-AS2 and AS/NZS 4859.1. Recycled Terra Lana insulation offcuts blended with polyester melt bond fibre. It varies in colour from light to dark grey. Chatterblock® is designed to absorb reverberation within walls, to improve the acoustic performance of wall systems. Refer to SELECTIONS for options.

Components

2.8 STAPLES FOR UNDERFLOOR INSULATION

Use 14mm stainless steel staples, edge fix insulation at no greater than 100mm centres.

2.9 WIRE NETTING

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting used to support the insulation.

2.10 PLASTIC STRAPPING TAPES

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

For drained cavities where stud spaces are greater than 450mm and only flexible underlay is used, strapping required to NZBC E2/AS1, paragraph 9.1.1.5.

2.11 STAPLES FOR FIXING PLASTIC STRAPPING

Use galvanized staples with 10mm crown and 8 or 10mm leg.

Accessories

2.12 BARRIERS/GUARDS

A proprietary barrier manufactured and tested to AS/NZS 5110. Consisting of a rigid non-combustible, electrically non-conductive material.

2.13 INSTALLER/APPLICATOR TOOLS

Terra Lana proprietary set-down joist clips for 100mm thick segments, proprietary stapler, proprietary cutting clamp.

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: 20% maximum for timber framing at the time of insulation installation

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Location and framing	Cavities are not interconnected

3.4 HAZARD & RISK MANAGEMENT

To Health and Safety at Work Act 2015 and take all safety precautions necessary to reduce potential hazards and risks. Refer also to NZS 4246, Appendix B. - Health and Safety.

Application - general

3.5 INSULATION - GENERAL

Remove insulation from packaging within 3 months for full loft recovery.

3.6 INSTALL INSULATION - GENERAL

Lay, install, fit and fix insulation without gaps, tucks, folds and over compaction to NZBC H1/AS1 H1/AS2, C/AS1, C/AS2, BRANZ Appraisal 682 and the recessed light fitting manufacturer's requirements. For housing and buildings up to 300m². Install in accordance to NZS 4246 section 6 Ceilings & Roofs. For buildings greater than 300m². Install insulation in accordance with AS/NZS 3000 as required by NZBC G9/VM1. Allow insulation to re-loft/relax prior to installation. Do not cover vents. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath. For optimum performance, use within 6-months of the date of manufacture (on the pack label).

3.7 INSULATION CLEARANCES

Provide insulation clearances to NZS 4246 and for recessed luminaires AS/NZS 3000, 4.5.3.2. Where allowed by these standards provide insulation clearances to product manufacturer's stated clearances. Secure insulation in place so clearances are maintained and use guards/barriers , if required, where insulation is not secured.

Application - insulation ceiling

3.8 FIT CEILING INSULATION BLANKET - BETWEEN RAFTERS / TRUSS BOTTOM CHORDS

Friction fit **Terra Lana** insulating blankets in place to completely fill the cavity. Slightly oversize by 10 to 15mm for friction fitting to framing or abutting another segment. Use smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating blankets over the whole of the installation. Staple to the side of rafters/bottom chord where extra support is required. Refer to SELECTIONS for options.

3.9 FIT ROOF TRUSS DOUBLE LAYER SYSTEM

Lay a second layer of insulation, perpendicular to the bottom layer, covering the top of the truss bottom chords. Leave no gaps between, and maintain full thickness of the insulating blanket over the whole of the installation. Refer to SELECTIONS for options.

3.10 FIT ROOF BATTEN INSULATION (FOR SKILLION AND TRUSS)

After fixing ceiling battens, and the ceiling insulation is installed between rafters or truss bottom chords. Friction-fit **Terra Lana** roof batten insulation between timber battens, below rafter/truss bottom chords. Slightly oversize by 15 to 20mm and staple at 300mm centres to the side of timber battens. If installing between steel rondo batten, support by stapling through the insulation, directly into the rafter above. If installed above a suspended ceiling, strapping could be used for extra support if needed. Use smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulation over the whole of the installation. Refer to SELECTIONS for options.

Application - insulation wall

3.11 FIT WALL INSULATION

Friction fit **Terra Lana** insulating segments in place to completely fill the whole of the cavities. Tear across the width of the Fold at dwangs/nogs and the bottom plate aiming to slightly oversize by 5 to 10mm on each edge for friction fit to framing and each other. Rip and fit smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulation over the whole of the installation.

Refer to SELECTIONS for options.

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3.12 FIT DRAINED CAVITY WALL INSULATION

Friction fit **Terra Lana** Wall Insulation with a controlled nominal thickness. Fix intermediate restraints in accordance with NZBC E2/AS1. Refer to SELECTIONS for options.

3.13 RETROFIT EXTERNAL WALL INSULATION

Retrofit **Terra Lana** Wall Insulation at least 20 mm thinner than the framing In external timber-framed walls without a wall underlay, or with direct-fixed claddings. Leave a gap of at least 20 mm between the insulation and the wall cladding. Staple horizontal straps to the sides of the wall studs at 300 mm centres maximum before the insulation is installed. Refer to SELECTIONS for options.

Application - under floor/mid-floor

3.14 FIT MID-FLOOR ACOUSTIC INSULATION BLANKET - BETWEEN FLOOR JOISTS

Fit **Terra Lana** acoustic insulation blanket to Terra Lana instructions. Tear across the width of the roll at dwangs/nogs and the perimeter joist aiming to slightly oversize by 5 to 10mm on each edge for friction fit to framing and other batting. Rip and fit smaller pieces for smaller spaces and around penetrations. Leave no gaps between and maintain full thickness of the insulation over the whole of the installation. Refer to SELECTIONS for options.

Application - hot water pipes

3.15 FIT TERRA LANA PIPE LAGGING - HOT WATER PIPING

Fit **Terra Lana Pipe Lagging**, tubular or flat, to Terra Lana instructions.

Application - components

3.16 LAY WIRE NETTING - UNDER RAFTERS/JOISTS / PURLINS

Lay at right angles under the rafters/roof joists/ceiling battens. Pull tight and fix.

3.17 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.

Completion

3.18 COMPLETION MATTERS

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

4 SELECTIONS

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

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4811 SEALANTS

1 GENERAL

This is a reference section dealing with the selection of and application methods for sealants nominated in other work sections.

1.1 RELATED WORK

Refer to ~ for ~.

Documents

1.2 DOCUMENTS

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

US Federal Specifications:

TT-S-00230C:	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures).
TT-S-001543A:	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)

1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:
Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For materials

- 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:

5 years	For installation

- 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

1.6 SUBMIT

Before commencing work submit the manufacturer's specifications for the specified sealant system, including the following:

- trade name

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- generic type: one/multi part, non slump/self levelling, low/medium/high modulus
- chemical composition
- maximum joint movement
- tensile strength
- elastic recovery
- service temperature range
- shrinkage
- staining properties
- toxicity
- tack free time
- through cure time
- colour range
- life expectancy
- clean up solvents required
- primers required
- method of preparing surface
- method of application.

1.7 TEST SUBSTRATES

Before commencing the sealant installation, obtain and submit a certificate from the sealant manufacturer confirming that adjoining substrates and materials have been examined and are deemed suitable for sealant application, and are compatible with the sealant material specified.

1.8 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

1.9 QUALIFICATIONS

Sealant work, including preparation, to be carried out by competent and experienced sealant applicators, approved by the sealant manufacturer. Provide evidence of technical competence and experience for review before commencing work.

1.10 MANUFACTURER'S TECHNICAL SERVICES

Use the research and development, and the technical information provided by the various sealant manufacturers throughout the design, development and installation stages of sealant work.

1.11 VISIT THE SITE

Arrange for the sealant manufacturer to visit the site to examine the site conditions, to inspect the surfaces and joints, and to discuss the installation procedures, before any sealing work proceeds

2 PRODUCTS

Materials

2.1 COMPRESSED SHEET JOINTING SEALANT

For use to bond and seal between fibre cement sheets and aluminium backing at horizontal joints.

1-part, medium or low modulus adhesive sealant complying with US Federal Specification TT-S-00230C.

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2.2 AIR SEAL AND JOINT FILLER

Bitumen impregnated sponge plastic, bitumen adhesive-fixed.

2.3 JOINTING SEALANT, INTERNAL

For use between pre-finished fibre cement sheets.

1-part, non-acetic, low modulus silicone rubber, to US Federal Specification TT-S-00230C. Sealant to contain mould inhibiting agents.

Colour: White

2.4 MOVEMENT JOINT SEALANT, INTERIOR WALL TILING

1-part, non-acetic, neutral cure, low modulus silicone rubber, to US Federal Specification TT-S-00230C. Sealant to contain mould inhibiting agents.

Colour: White

2.5 MOVEMENT JOINT SEALANT, INTERIOR TRAFFICABLE

For movement joints and skirting-edge joints in internal tiling.

Fast-curing, high modulus, 40 (minimum) Shore A hardness, or equal approved trafficable sealant.

2.6 SEALANT, WALL PLATE TO CONCRETE, INTERNAL

For sealing timber or galvanized steel bottom wall plate to concrete slab.

Exterior grade joint sealant, compatible with bituminous floor cleavage layer under floor tiles.

2.7 SEALANT, SANITARY FIXTURES

For between sanitary fixtures and accessories and adjacent floor or wall surfaces.

1-part, silicone, containing mildew resistant agents.

Colour: White

Accessories

2.8 JOINT CLEANING MATERIALS

Xylol, methyl-ethyl-ketone, toluol, as acceptable for the substrate material and/or finish and as required by the sealant manufacturer for the particular application. Test solvents to confirm suitability before using on finished work.

2.9 MASKING TAPE

Pressure sensitive, self adhesive crimped paper tape. Do not use masking-grease materials.

2.10 SURFACE PRIMER

As required by the sealant manufacturer for each surface substrate and particular applications. Primers to suit the various project conditions.

2.11 JOINT BACKING ROD

Extruded closed cell polyethylene foam rod, open cell foam polyurethane, or rod stock of butyl or Neoprene, chemically compatible with the sealant. Use backing rod diameter 25% greater than the joint width before installation. Use in long lengths.

2.12 BOND BREAKER TAPE

Pressure sensitive self adhesive polyethylene breaker tape. Masking tape or PVC insulation tape is not permitted.

3 EXECUTION

Conditions

3.1 COMPATIBILITY

Ensure sealants, joint fillers, primers, backing rods, bond breaker tape and cleaning solutions are compatible with each other.

3.2 NON-BLEEDING SEALANTS

Use only non bleeding sealants capable of supporting their own weight (non slump), except for self-levelling sealant.



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3.3 COLOURS

Refer to material selection. Where colour not specified, choose sealant colours from the manufacturer's standard/special colour ranges.

Preparatory work

3.4 ENSURE

Ensure that joints to receive sealants are suitable for the proposed application. Ensure that surfaces are sound, dry, free from dust, dirt, scale, laitance, corrosion or other loose material, oil, grease, paint, release agents or other contaminants which may affect the bond, or the performance of the sealing material.

Ensure that joints and spaces receiving sealant are not less than 12mm deep, with width to suit the sealant being used.

3.5 TEST SUBSTRATES

Test substrates for indications of staining or poor adhesion. If poor adhesion is evident from initial tests, consult the sealant manufacturer about the application of a suitable primer. Only use combinations of sealants and substrates for which favourable adhesion and compatibility have been confirmed sufficiently for satisfactory adhesion of the selected sealant.

Do not apply sealant to concrete or concrete block until concrete and/or mortar has cured.

3.6 CLEAN JOINTS

Clean joints as required by the manufacturer to achieve acceptable joint surfaces for the application of sealant. Protect adjacent surfaces from abrasion or other damage.

3.7 CLEAN METAL SURFACES

Clean metal surfaces with solvent to remove any grease deposits.

3.8 MASK

Mask adjacent surfaces alongside joints to prevent contamination. Mask off any surfaces which would be difficult to clean if smeared with sealant, or where excess sealant could not be neatly trimmed off or removed.

3.9 VENTILATION

Ensure adequate ventilation for sealant applicators during the preparation and application of sealant work.

Application

3.10 FINAL PREPARATION

Prepare joints in accordance with the sealant manufacturer's requirements, using only recommended solvents and cleaning methods.

3.11 BACKING

Insert backing material in joints. Use only blunt instruments to install backing rods to avoid puncturing or damage. Do not twist rods when installing. When using backup material do not leave gaps and do not reduce the depth of the sealant joint to less than the minimum required by the sealant manufacturer.

3.12 PRIMING

Use manufacturer supplied/recommended primers. Allow to cure for the manufacturer recommended time (minimum and maximum). Refer to manufacturer for instructions if maximum cure time is exceeded before sealant is applied. Do not contaminate bond breakers with primer.

Allow primer to dry as recommended by the manufacturer. Do not prime more than can be completed in one day. Prevent contamination of the primed surfaces prior to applying sealant.



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3.13 JOINT FILLING

Fill joint cavity with sealant in accordance with the sealant manufacturer's requirements and quality control programmes. Use a pressure gun with a nozzle cut to suit the required joint width. Ensure sealant is deposited in a uniform, continuous bead, without gaps or air pockets and with clean, neat edges.

3.14 TOOLING

Tool sealant to form a smooth, flat bead, or a smooth convex fillet, with a profile as required by the sealant manufacturer. Complete tooling before the sealant surface starts to form a skin.

3.15 FINISHING

Remove masking immediately after tooling and before sealant surface starts to skin. Remove excess sealant from adjoining surfaces before the sealant has set, using the cleaning materials and methods required by the sealant manufacturer, leaving surfaces clean and the sealant runs undamaged.

3.16 SURROUNDING WORK

Leave surrounding surfaces in a neat, clean condition with no evidence of spill overs.

Completion

3.17 CLEAN UP

Clean up as the work proceeds.

3.18 LEAVE

Leave work to the standard required by following procedures.

3.19 REMOVE

Remove masking tape, used packaging and waste products from the site.

4 SELECTIONS



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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 ~ for ~.

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 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 C.1.1.1 and NZBC E2/AS1, Table C.1.1.1A: Material selection.

1.6 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with NZBC E2/AS1, Table C.1.1.1A: Material selection, 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 C.1.1.1B: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off.

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 Flashings. 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 Flashings, 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 Flashings, 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 - SOLDER

Eutectic solder of 60% tin/40% lead using a suitable proprietary flux.

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 4.5.1.1: General dimensions of metal flashings and other flashings as listed, 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 - SOLDER

Solder joints in galvanized steel and non-ferrous metals when specified with lead/tin solder. Clean joint ensuring it is dry and free of grease immediately prior to applying a proprietary flux. Lap the flashing 25mm in the direction of the water flow and fasten the lap with rivets or screws at 50mm centres. Completely sweat the joint to avoid leaving any flux residue. Wash down the joint to remove any trace of flux.

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



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4911 STEEL METALWORK

1 GENERAL

This section relates to the fabrication and installation of steel items, including:

- support frames
- fabricated brackets
- stairs
- ladders
- balustrades
- screens
- shutters
- sheet steel items

1.1 RELATED WORK

Refer to ~ for ~

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1163	Cold-formed structural steel hollow sections
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1554.1	Structural steel welding - Welding of steel structures
AS/NZS 1594	Hot-rolled steel flat products
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Method selection guide - Abrasive blast cleaning
AS 1627.9	Metal finishing - Preparation and pretreatment of surfaces - Method selection guide - Pictorial surface preparation standards for painting steel surfaces
AS/NZ 2312.3	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 3: Thermal metal spray coatings
AS/NZS 3679.1	Structural steel - Hot rolled bars and sections
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 special process
NZS/BS 1387	Screwed and socketed steel tubes and tubulars and for plain end steel tubes suitable for welding or for screwing to BS 21 pipe threads
BS 2630	Resistance projection welding of uncoated low carbon steel sheet and strip using embossed projections
BS 6497	Powder organic coatings for application and stoving to hot-dip galvanized hot-rolled steel sections and pre-formed steel sheet
BRANZ BU 567	E2/AS1 Flashing Requirements
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.

1.3 MANUFACTURER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from
Company: ~

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Web: ~
Email: ~
Telephone: ~

Requirements

1.4 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Metalworkers to be qualified as welders and experienced in working with steel and the techniques specified.

1.6 HOT WORK - FIRE SAFETY

Refer to section 1270 CONSTRUCTION

1.7 SHOP DRAWINGS

2 PRODUCTS

Materials

2.1 STEEL SECTIONS

Hot-rolled steel bars and sections to AS/NZS 3679.1.

2.2 HOLLOW STEEL SECTIONS

Cold formed to AS/NZS 1163, or hot-rolled as required.

Components

2.3 SCREWS

Self-tapping metal with similar composition and mechanical properties to the parent metal and with the type of head, length, gauge and thread to suit the work and its location.

2.4 SCREWS

Hexagonal head, self-drilling, with similar composition and mechanical properties to the parent metal. Select type of head, length, gauge and thread to suit the work and its location.

2.5 BOLTS

Similar composition and mechanical properties to the parent metal, selecting type and size to suit the work and its location.

2.6 RIVETS

Solid domed with similar composition and mechanical properties to the parent metal. Flat head mild steel to be galvanized.

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2.7 TUBULAR RIVETS

Domed/countersunk head steel with composition and mechanical properties to suit the parent metal.

2.8 THREADED STUDS

Mild steel with similar composition and mechanical properties to the parent metal. Select stud and nut threads to suit the base material and the nut being used.

2.9 CLIPS

Form clips to detail of the same metal as the metal sheet to be fixed/secured.

2.10 NAILS

Spiral rolled flat-head/clout type, with similar composition and mechanical properties to the parent metal. Select length and gauge to suit the work and its location.

Finishes

2.11 EXTERNAL ORGANIC COATINGS

Polyester exterior grade coatings to BS 6497.

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 AVOID DISTORTION

Avoid distortion of elements during transit, storage and handling.

3.4 PREVENT SURFACE DAMAGE

Prevent pre-finished surfaces rubbing together, and any contact with mud, plaster or cement. Keep protective coverings dry.

3.5 PREPARATION

Ensure location and substrate is ready to receive the elements and will allow work of the required standard.

3.6 FLASHINGS

Select and use sheet metals suited to the element, process or finish specified, jointing them as necessary to allow full development of their expected durability with a minimising of corrosion and to BRANZ BU 567.

Assembly

3.7 PROTECTION

During fabrication protect all surfaces which will be visible in completed work.

3.8 COLD FORMING

Cold formed work to be free from warping, buckling and fractures. Form bends with a brake press or by cold rolling.

3.9 CORNERS

Unless specified otherwise, mitre junctions of identical sections.

3.10 HOLES

Form without distortion of surrounding metal.

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3.11 MOVING PARTS

When assembled, all moving parts must move freely and without binding.

3.12 CLEANING

Remove all burrs and sharp arrises which would be visible after fixing, or a hazard to the user.

3.13 RIVETED JOINTS

Draw riveted joints tightly together, with rivets closed to completely fill holes.

3.14 MECHANICAL JOINTS

Ensure mechanical joints are tight with no visible gaps.

3.15 MECHANICAL JOINTS, ELEMENTS

Bed in mastic all mechanical joints of elements which will be located externally, including all mating surfaces, cleats and other fixings.

3.16 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.

Assembly - Welding

3.17 PREPARATION

Remove grease, dirt, moisture and oxide from edges being welded. Remove scale and residue from arc and power cutting by machining or hand grinding.

3.18 ACCURACY

Ensure accurate fit using clamps and jigs where practical. Use tack welds for temporary attachment where jigging is not practical.

3.19 TACK WELDING

Use only for temporary attachment unless otherwise specified.

3.20 WELDS

Make joints with parent and weld metal fully fused throughout with no inclusions, holes, porosity or cracks.

3.21 SPATTER

Prevent weld spatter falling on surfaces of materials which will be self finished and/or visible in completed work.

3.22 RESIDUES

Ensure complete removal of flux residues and slag.

3.23 BUTT WELDS

Finish butt welds which will be visible in completed work smooth and flush with adjacent surfaces.

3.24 WELDING OF STEEL

Use one of the following methods for welding steel:

- gas welding
- metal-arc welding to AS/NZS 1554.1 for mild steel
- projection welding to BS 2630
- other methods subject to approval.

3.25 WELDING GALVANIZED STEEL

When welding already Galvanized steel either:

- remove coating locally and carry out a standard weld
- leave coating and adjust welding technique to those recommended in GANZ After-Fabrication Hot Dip Galvanizing document. (Among other things, this will generally mean a slower welding speed.)

Final weld shall meet all the standards and requirements of a standard weld.



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3.26 WELDING THERMAL METAL SPRAY COATED STEEL

Where possible, welding to be carried out prior to thermal metal spraying. Where welding to be carried out after thermal spraying, the weld zone to be masked and not coated with thermal metal spray for approximately 100mm from the weld zone to AS/NZS 2312.3. Carry out standard weld.

Refer to 6782 METAL SPRAY CORROSION PROTECTION.

Application

3.27 INSTALLATION

Locate plugs accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the specified standards, the reviewed shop drawings and installation details, including brackets, bolts, fixings, grout, bedding compounds and sealants.

3.28 LOADING

Elements must not carry any structural load unless designed to do so. Do not use as strutting or support when in place.

Finishing

3.29 PREPARATION FOR COATINGS

Before applying coatings remove all welding slag, weld spatter, anti-splatter compounds, paints, grease, flux, rust, burrs and sharp arrises. Make good all defects which would show after application of coating. Finish surfaces smooth.

3.30 THERMAL METAL SPRAY

Refer to 6782 METAL SPRAY CORROSION PROTECTION for thermal metal spray.

3.31 BRUSHING AND POWER TOOL CLEANING

Remove oil and grease by the use of solvents. Scrape and power wire brush to a minimum Class 2 finish to AS 1627.9. Clean to bright metal, but avoid producing a polished surface. Check that no burrs or sharp arrises remain which may prevent full coating thickness being attained.

3.32 ABRASIVE BLASTING

Remove oil and grease by the use of solvents. Abrasive blast clean to a Class 2.5 finish to AS 1627.4. Clean to bright metal, but avoid producing a polished surface. Select grit type and equipment such that the cleaned surface profile between peaks and valleys does not exceed one third of the dry film thickness. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

3.33 APPLY COATINGS

Prepare surfaces and apply the coating system strictly in accordance with the coating manufacturer's technical information.

3.34 REPAIR DAMAGED THERMAL SPRAY

Refer to 6782 METAL SPRAY CORROSION PROTECTION for repair to thermal metal spray.

Completion

3.35 COMPLETION MATTERS

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

4 SELECTIONS

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4933 ALUMINIUM METALWORK

1 GENERAL

This section relates to the fabrication and installation of aluminium items of a general nature.

Related work

1.1 RELATED SECTIONS

Refer to ~ for ~.

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
BRANZ BU 567	E2/AS1 Flashing Requirements

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.

1.3 MANUFACTURER DOCUMENTS

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Requirements

1.4 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:

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Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Metalworkers to be experienced in working with aluminium and the techniques specified.

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1.6 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:

- plans, elevations and sections
- methods of fixing
- methods of joint forming
- finishing techniques
- methods of fabrication and site assembly of large units.

If requested provide the following additional information:
~

Submit shop drawings for review to ~.

- ~ working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication and/or installation.

2 PRODUCTS

Materials

2.1 ALUMINIUM SHEET

Pre-finished/anodised/plain finish sheet/strip to AS/NZS 1734.

2.2 ALUMINIUM SECTIONS

Refer to SELECTIONS.

Components

2.3 SCREWS

Grade 316 stainless steel self-tapping screws with type of head, length, gauge and thread to suit the work and its location.

2.4 BOLTS

Grade 316 stainless steel, selecting type and size to suit the work and its location.

2.5 RIVETS

Domed with similar composition and mechanical properties to the parent metal.

2.6 TUBULAR RIVETS

Aluminium with domed/countersunk head.

2.7 THREADED STUDS

Of similar composition and mechanical properties to the parent metal. Select stud and nut threads to suit the base material and the nut being used.

2.8 CLIPS

Form clips to detail of the same metal as the metal sheet to be fixed/secured.

2.9 NAILS

Spiral rolled flat-head/clout type, with similar composition and mechanical properties to the parent metal. Select length and gauge to suit the work and its location.

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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Do not deliver any elements to the site which cannot be unloaded immediately into suitable storage conditions. Avoid distortion of elements during transit, storage and handling. Prevent surfaces rubbing together, and any contact with mud, plaster or cement. Keep protective coverings dry.

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 PREPARATION

Ensure location and substrate is ready to receive the elements and will allow work of the required standard.

3.4 FLASHINGS

Select and use sheet metals suited to the element, process or finish specified, jointing them as necessary to allow full development of their expected durability with a minimising of corrosion and to BRANZ BU 567.

Assembly

3.5 PROTECTION

During fabrication protect all surfaces which will be visible in completed work.

3.6 COLD FORMED

Ensure cold formed work is free from warping, buckling and fractures. Form bends with a brake press or by cold rolling.

3.7 CORNERS

Unless specified otherwise, mitre junctions of identical sections.

3.8 HOLES

Form without distortion of surrounding metal.

3.9 MOVING PARTS

When assembled, all moving parts must move freely and without binding.

3.10 CLEANING

Remove all burrs and sharp arrises which would be visible after fixing, or a hazard to the user.

3.11 WELDING OF ALUMINIUM

Grind flush visible welds.

Application

3.12 INSTALLATION

Locate plugs accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the specified standards, the reviewed shop drawings and installation details, including brackets, bolts, fixings, bedding compounds and sealants.

3.13 LOADING

Elements must not carry any structural load unless designed to do so. Do not use railings, balustrades, or similar elements as strutting or support when in place.

Assembly - sheet aluminium

3.14 FABRICATE

Fabricate and assemble in a workshop wherever practicable.

3.15 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.

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3.16 CUT SHEETS

Cut sheets by mechanical methods leaving edges true to line, square, smooth and free from all burrs.

3.17 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).

3.18 PRE-ASSEMBLE

Pre-assemble in the workshop and match mark items being assembled or erected on site. Do not strain, twist, bend or open such items to force them into the correct position while assembling or erecting.

3.19 SEPARATION

Isolate dissimilar materials (metal and non-metal) in close proximity by painting the surfaces or fitting separator strips. Place isolators between aluminium and treated timber and cement-based materials. Do not use unpainted lead sheet in contact with or allow water run-off onto aluminium. Refer also to BRANZ BU 567.

3.20 JOINING ALUMINIUM SHEET

Use self-secured seams, aluminium pop rivets, bolts and welding as best suits the form and location of the work.

3.21 INSTALLATION

Locate fixings accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the installation details and complete with bedding compounds and sealants.

3.22 LOADING

Ensure all elements are fully supported unless designed to be self-supporting.

Finishing

3.23 PREPARATION FOR COATINGS

Before applying coatings remove all welding slag, weld spatter, anti-splatter compounds, paints, grease, flux, rust, burrs and sharp arrises. Make good all defects which would show after application of coating. Finish surfaces smooth.

Completion

3.24 COMPLETION MATTERS

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

4 SELECTIONS

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5113 PLASTERBOARD LININGS

1 GENERAL

This section relates to the supply, fixing and jointing of gypsum plasterboard sheets and accessories to timber and steel framed walls and ceilings to form:

- standard systems
- superior finish quality systems
- wet area systems
- bracing systems
- minor related fire rating
- minor related sound rating

1.1 RELATED SECTIONS

Refer to ~ for ~

1.2 ABBREVIATIONS

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

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.3 DOCUMENTS REFERRED TO

Documents referred to in this section are:

BPS	Building Product Specifications
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 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 3602	Timber and wood based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
AS/NZS 4600:2005	Cold-formed steel structures
ASTM C630/C630M-96a	Water-resistant gypsum backing board
BRANZ Technical Paper P21	Technical Paper P21: A wall bracing test and evaluation procedure (2010)
NASH Standard Part 2: Light steel framed 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'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~

Requirements

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications. Plasterboard fixers and stoppers to be experienced competent workers, familiar with materials and techniques specified. Submit evidence of experience on request. For example:

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- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance

1.6 INSPECTIONS AND ACCEPTANCE

Inspect the finished surface of the installed plasterboard:

- 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.

Performance - systems

1.7 BRACING REQUIREMENTS

Provide braced wall systems using bracing rated plasterboard sheet to meet the requirements of NZS 3604, section 5, **Bracing design**, when tested in accordance with BRANZ Technical Paper P21.

2 PRODUCTS

Materials

2.1 GYPSUM PLASTERBOARD

Gypsum plaster core encased in a durable face and backing paper formed for standard use to AS/NZS 2588.

2.2 GYPSUM PLASTERBOARD, HIGH FINISH SYSTEMS

Gypsum plaster core encased in a special fine surface durable face and backing paper formed for standard and fire rated use to AS/NZS 2588.

2.3 GYPSUM PLASTERBOARD, WATER RESISTANT SYSTEMS

Gypsum plaster core containing a wax emulsion encased in a durable face and backing paper formed for standard and fire rated use to AS/NZS 2588 and for water resistance use to ASTM C630/C630M-96a.

2.4 GYPSUM PLASTERBOARD, WALL BRACING SYSTEMS

Gypsum plaster core encased in a durable face and backing paper bracing rated sheet to AS/NZS 2588.

2.5 CORNICE

Plasterboard, scotia pattern.

Components

2.6 CEILING BATTENS, METAL

0.55mm galvanized steel (275 g/m² zinc coating) battens and matching perimeter channels.

2.7 SCREWS, TIMBER FRAME

10mm plasterboard: Type S gypsum screws 25mm x 6 gauge
13mm plasterboard: Type S gypsum screws 32mm x 6 gauge

Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.8 NAILS, TIMBER FRAME

10mm plasterboard: 30mm x 2.5mm galvanized drywall clouts
13mm plasterboard: 40mm x 2.5mm galvanized drywall clouts

Nails for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

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Nails for perimeter nailing for bracing systems complete with 15mm galvanized steel washers as required by the sheet manufacturer's approved specification.

2.9 SCREWS, STEEL FRAME / BATTENS

10mm plasterboard: Type S gypsum screws 25mm x 6 gauge
13mm plasterboard: Type S gypsum screws 32mm x 6 gauge

Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.10 SECTIONS AND TRIM MATERIAL

Form from galvanized steel of a coating class not less than ZM275 to AS 1397 and fix with 30mm x 2.5mm galvanized clouts.

2.11 EXTERNAL ANGLE

Perforated.

2.12 INTERNAL REINFORCING ANGLE

Perforated.

2.13 CONTROL JOINT

With plastic protective tape.

2.14 CASING BEAD

To suit sheet thickness.

2.15 J MOULD

Extruded uPVC dimensioned to suit the sheet thickness and fixed with 25mm x 1.6mm nickel panel pins.

2.16 TAPE ON EDGE TRIMS

Tape-on paper tape and galvanized steel trims and edges.

2.17 EDGE PROFILES

Pre-formed aluminium profiles, with perforated edge trims.

Accessories

2.18 ADHESIVE

Multi-purpose water based wallboard adhesive.

2.19 JOINTING COMPOUNDS

System match bedding compound and finishing compound. Refer to the sheet manufacturer's literature and follow their requirements on which compounds to use with which accessory and in which location, to achieve the required level of finish.

2.20 JOINTING TAPE

System match reinforcing tape.

Finishes

2.21 SKIMCOAT PLASTER

Proprietary spray-on surface finish.

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.

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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. Do not commence work until the substrate is plumb, level and to the standard required by AS/NZS 2589 and the sheet manufacturer's requirements.

Do not begin installation until the building is closed in, fully glazed, the roof watertight and the atmospheric conditions within the plasterboard manufacturer guidelines.

3.4 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

Ensure that the timber framing to which plasterboard lining is fixed, shall comply with NZS 3602, NZS 3603 & NZS 3604. Where adhesion of gypsum linings is required, surfaces shall be free of oil, grease, dust and other foreign materials.

Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to NZBC E2/AS1, 10.0 Construction Moisture.

3.5 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.

3.6 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.

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping plasterboard prior to the application of a range of decorative finishes under various lighting conditions. Refer to AS/NZS 2589.

3.7 PROTECTION

Protect surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

3.8 GENERAL REQUIREMENTS

Leave a 10mm gap at floor level. Do not break the face paper. Position sheets to a "touch fit" with no forcing or springing into place. Run sheets over doors and under and over window openings. Apply adhesive in daubs 25mm diameter and 10mm thick. Do not place daubs at sheet perimeters or under nail and screw fixings.

Application - general

3.9 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.10 INSTALL CEILING BATTENS

Install in accordance with the batten manufacturer's requirements.

3.11 LINE CEILINGS AND WALLS

Line ceilings and walls with the various sheets and fix to the sheet manufacturer's details and requirements, using tapered edge joints as far as possible.

3.12 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.

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3.13 END BUTT JOINTS

When end butt joints are unavoidable, locate staggered off the framing, back block, fix and stop to the sheet manufacturer's details and requirements.

Application - bracing systems

3.14 LINE BRACING WALLS

Line walls with high density plasterboard sheet to form panels or systems, clout-washer and clout fixed to the sheet manufacturer's details. Do not fix bracing sheets until steel bracing and/or straps are in place.

Application - wet area systems

3.15 LINE WET AREA WALLS

Line walls in accordance with the sheet manufacturer's requirements.

Application - finishing sections and trim

3.16 FIX EXTERNAL ANGLE

Fix full length to external corners with clouts at 100mm centres each side staggered to the sheet manufacturer's details and requirements.

3.17 FIX INTERNAL REINFORCING ANGLE

Fix full length to internal corners with clouts at 100mm centres each side staggered to the sheet manufacturer's details and requirements.

3.18 FIX CASING BEAD

Fix between dissimilar materials and caulk with sound rated sealant to the sheet manufacturer's details and requirements.

3.19 FIX J MOULD

Fix between dissimilar materials and caulk with sound rated sealant to the drawings supplied.

3.20 FORM CONTROL JOINTS

Provide at maximum 9 metre centres in long unbroken walls and 12 metre centres to ceilings to the sheet manufacturer's details and requirements. Fix control joint section into joint by staples at 150mm both sides. Fill gap in voids with sound rated sealant. Remove plastic tape after stopping.

3.21 FIX COVER MOULDS

Fix to the sheet manufacturer's details and requirements and to the drawings supplied.

3.22 FIX CORNICE

Fix with adhesive required by the sheet manufacturer and joints mitred to the sheet manufacturer's details and requirements

3.23 FORM SQUARE STOPPED CORNERS

Form taped reinforced square stopped ceiling-to-wall angles to the sheet manufacturer's requirements.

3.24 INSTALL TAPE-ON TRIMS

Install in accordance with the trim manufacturer's requirements.

3.25 INSTALL SPECIAL EDGES AND BANDS

Install in accordance with the edging manufacturer's requirements.

Finishing - stopping

3.26 FORM JOINTS

Fill recess with bedding compound, centre the reinforcing tape, apply a second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off, to the sheet manufacturer's details and requirements.

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3.27 STOPPING NAILS AND SCREWS

Apply two successive coats of bedding compound and a coat of finishing compound to the sheet manufacturer's requirements.

3.28 SQUARE STOPPED CORNERS

Fill with bedding compound, centre reinforcing tape into internal angle and apply a coat of finishing compound and complete to the sheet manufacturer's details and requirements.

3.29 EXTERNAL ANGLES

Apply two coats of bedding compound followed by a coat of finishing compound to the sheet manufacturer's requirements.

3.30 END BUTT JOINTS

Fill, tape and coat as for tapered edge joints except that each stage is doubled in width.

3.31 APPLYING SKIMCOAT PLASTER

Apply spray-on surface finish in accordance with the sheet manufacturer's requirements.

Completion & Commissioning

3.32 COMPLETION MATTERS

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

4 SELECTIONS

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5124 TIMBER BOARD LININGS

1 GENERAL

This section relates to the supply and fixing of tongue and grooved narrow boards as lining, nailed, secret nailed or adhesive fixed.

1.1 RELATED SECTIONS

Refer to ~ for ~.

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:

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

Documents

1.3 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed 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'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Requirements

1.5 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

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2 PRODUCTS

Materials

2.1 BATTENS

SG6 radiata pine gauged.

Moisture content: 14 - 18% at fixing.

2.2 LINING BOARDS

In long lengths tongue and groove profile as detailed or selected with species and grade to the requirements of NZS 3602.

Moisture content: 12 - 14% at fixing.

2.3 BEADS

To profiles as detailed.

Moisture content: 12 - 14% at fixing.

2.4 DAMP-PROOF COURSE

Heavy kraft strip laminates saturated and coated with bitumen.

Components

2.5 NAILS

2½ times the thickness of the lining and of commensurate gauge.

2.6 BOLTS

Masonry anchor bolt and sleeve, overall diameter 8mm. Fitted to the bolt manufacturer's requirements.

2.7 POWDER ACTUATED FASTENERS

Heavy shank drive pins powder driven with a fastening tool and fixed to the fastener manufacturer'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.

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 SUBSTRATE

Before starting fixing ensure that the substrate conforms to NZS 3604 and that the relative humidity is suitable to receive lining.

3.4 MOISTURE CONTENT, CONCRETE

Before starting fixing ensure that the concrete moisture content is less than 5%.

3.5 MOISTURE CONTENT, LINING

Immediately before starting fixing, test the moisture content of the lining to ensure the moisture content is acceptable. Use an electrical moisture meter to the board manufacturer's requirements, testing 5% of not less than 10 boards in the centre of the length. Do not commence laying if 90% of values obtained are not within the range specified.

3.6 HEATING OR AIR CONDITIONING

Make arrangements for operating the heating or air conditioning installation up to completion of the works.



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3.7 ENVIRONMENTAL CONDITIONS, HEATING

The heating is designed to provide spaces with continuous/intermittent heating. Refer to SELECTIONS. Fix timber strip lining to suit these conditions.

3.8 ENVIRONMENTAL CONDITIONS, AIR CONDITIONING

The air conditioning system is designed to provide spaces with heating and humidity control. Refer to SELECTIONS. Fix timber strip lining to suit these conditions.

3.9 DO NOT START

Do not start cutting down and fitting and fixing linings before the building is enclosed and external moisture excluded from the area.

Application

3.10 BATTENS

Rigidly fix in place in straight lines with bolts or power fixing and damp-proof course separation, with butt joints staggered and all true to plane for fixing of linings.

3.11 FIX LININGS

Fix lining strips to studs/rafters in pattern as detailed in straight parallel lines with tongues tightly fitted into grooves. Slightly undercut end joints square, fully supported, fitted tight and random staggered across adjacent boards. Allow for movement at all corners. Select board lengths to give a minimum number of end joints. Fit beads to areas to be lined as detailed.

3.12 SECRET NAIL FIX

Secret nail fix with brads/panel pins diagonally through the tongue only. Punch nails to ensure correct alignment of the next board.

3.13 SAND LININGS

Sand linings with a machine sander to the standard required for the finish specified.

Completion & Commissioning

3.14 COMPLETION MATTERS

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

4 SELECTIONS

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5151 INTERNAL TRIM

1 GENERAL

This section relates to simple lengths of trim fixed on site as of isolated internal members, with simple end joints.
It includes:

- timber
- MDF
- metal
- plastic

1.1 RELATED WORK

Refer to ~ for ~.

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:

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

Documents

1.3 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
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3610	Specification for profiles of mouldings and joinery

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

2 PRODUCTS

Materials

2.1 TIMBER TRIM

To NZS 3610 and to profiles detailed on the drawings. Timber species, grade and treatment to NZS 3602.

Components

2.2 NAILS

Bright steel to dimension requirements of NZS 3604. Use galvanized where prone to dampness.

2.3 BRADS

Bright steel of a length three times the thickness of the member being fixed. Use cadmium plated where prone to dampness.

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2.4 SCREWS, STEEL

Bright steel of a length to penetrate the substrate up to the shank. Use stainless steel in wet areas.

2.5 SCREWS, CHROME PLATED

Chrome plated of a length to penetrate the substrate up to the shank.

3 EXECUTION

Conditions

3.1 GENERALLY

To comply with 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 STORAGE

Take delivery of trims undamaged and unmarked and store on site under cover, away from moisture, heat and direct sunlight in adequately ventilated area and clear of areas where work is in progress, to ensure materials are of the required standard when fixed in place.

3.3 ACCLIMATISE MATERIALS

Remove materials from packaging, separate and allow to acclimatise in the proposed installation area for 48 hours minimum prior to installation.

3.4 ENSURE

Ensure that the substrate to trims will allow work of the required standard. If it does not, do not proceed until the substrate has been remedied.

Application - Generally

3.5 INSTALL TIMBER TRIM

Use full lengths. Fit with scribed internal joints, mitred external joints and, mitred and returned at stop ends. Fix plumb, level and true to line and face using nails or brads to suit. Leave secure and with no movement possible.

Finishing

3.6 PUNCH

Punch all nail heads below the face of trim ready to receive stopping, as specified under painting preparation.

3.7 COUNTERSINK

Countersink screw heads not less than 2mm below the faces of trim to be painted. Stop and finish off flush with the face, as specified under painting preparation.

3.8 PELLETING

Countersink screw head 6mm below the faces of trim which is to be clear finished. Glue in grain-matched pellets not less than 6mm thick and cut from matching timber. Finish off flush with the face.

Completion

3.9 LEAVE

Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following procedures.

3.10 PROTECTION

Protect the completed work and make good before any surface finish is applied.

3.11 REPLACE

Replace damaged or marked elements.

3.12 REMOVE

Remove debris, unused materials and elements from the site.



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4 SELECTIONS

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5231 INTERIOR DOORS & WINDOWS

1 GENERAL

This section relates to the supply and installation of interior:

- doors
- windows
- doors and frames
- doorsets

1.1 RELATED WORK

Refer to ~ for ~

Refer to glazing sections for glazing
Refer to painting sections for finishes

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:

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

Documents

1.3 DOCUMENTS

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

AS/NZS 1170.1	Structural design actions - Permanent, imposed and other actions
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3610	Specification for profiles of mouldings and joinery
NZS 4223.3	Glazing in buildings - Human impact safety requirements

Window & Glass Association NZ (WGANZ) documents:

PQAS	Powder Coating Quality Assurance System
SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Requirements

1.5 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:
~

If requested provide the following additional information:

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~

Submit shop drawings for review to ~. ~ working days (at least) before fabrication is planned to commence.

Complete shop drawing review before commencing fabrication.

Performance - doorsets

1.6 PERFORMANCE REQUIREMENTS
Refer to 5241 FIRE AND ACOUSTIC INTERIOR DOORS AND WINDOWS for fire and acoustic performance details.

2 PRODUCTS

Materials - door and window frames general

2.1 TIMBER DOORS AND WINDOWS
To NZS 3602. Moisture content 10-14%. To NZS 3610.

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

Materials - doors general

2.3 TIMBER
To NZS 3602. Moisture content 10-14%. To NZS 3610. Solid or hollow core.

Materials - doorsets

2.4 STANDARD DOORSETS, SIDE HUNG DOOR
Frames to profile as detailed and dimensioned, fitted with solid or hollow core door.
Refer to SELECTIONS.

2.5 STANDARD DOORSETS, SLIDING
Frames to profile as detailed and dimensioned, fitted with solid or hollow core door.
Refer to SELECTIONS.

Components

2.6 WINDOW AND DOOR FURNITURE
Refer to 5521 HARDWARE for type and finish.

2.7 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.

2.8 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.

2.9 DOOR HINGES
Size and gauge to carry door size and weight. 3 hinges per door.

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

2.10 INTERIOR SLIDING DOOR GEAR
To suit door size and weight and as detailed.

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2.11 DOOR SKIN (FACINGS)
Doors skins as detailed and dimensioned.

Finish

2.12 TIMBER - PAINT FINISH
Factory applied coating system.

2.13 TIMBER - CLEAR FINISH
Factory applied coating system.

2.14 TIMBER - LACQUER FINISH
Factory applied coating system.

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, 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 and windows in the factory with doors hung, provision for furniture made, finishes applied and fully operable.

3.6 FABRICATE DOORS
Fabricate doors in the factory, with provision for door furniture.

3.7 CHECK ALL OPENINGS
To NZS 3604.Check all openings on site for size and standard of execution before installing window or door frames. Installation tolerances of windows subject to earthquake design to comply with AS/NZS 1170.1.

Assembly

3.8 FABRICATION GENERALLY
Manufacture and fabricate frames and doors as detailed. Install hinges and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

Application - generally

3.9 FIXING FRAMES
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 architraves.

3.10 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.

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3.11 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.

Application - doorsets

3.12 PROPRIETARY ELEMENTS

Fix in accordance with the door manufacturer's requirements.

3.13 INSTALLATION GENERALLY

Wedge frames into opening and fix through into the wall framing. 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.

3.14 CONCRETE MASONRY WALLS - TIMBER FRAMES

Fix in place with 10mm expanding masonry anchors with countersunk heads. At hinge side fix direct to opening and pack on the other side to wedge in place. Fix at hinges and opposite, with one fixing in the vicinity of the lock. Separate steel and timber by a damp-proof membrane.

3.15 TIMBER STUD 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.

3.16 BOTTOM CLEARANCE

Provide for specified floor coverings plus 5mm clearance at any point of swing. When floor covering is not specified, allow 25mm total.

For ventilated and/or air conditioned spaces allow 20mm clearance above finished floor coverings for supply/return air.

3.17 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.

3.18 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.

3.19 INSTALL FURNITURE

Install latches, locks and door furniture as scheduled.

3.20 CHECK

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

Application - windows

3.21 CONFIRM PREPARATION OF WALL OPENINGS

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

3.22 INSTALLATION

Fix to comply with the installation details including bedding compounds and pointing sealants.

3.23 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Completion

3.24 PROTECTION

Protect all finishes against damage from adjacent and following work.



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3.25 REPLACE
Replace damaged, cracked or marked elements.

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

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

3.28 REMOVE
Remove safety indicators and protective coverings, and wipe down all doorsets thoroughly to leave them perfectly clean. Remove all debris, unused materials and elements from the site.

4 SELECTIONS

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5433 PLYWOOD FLOORS

1 GENERAL

This section relates to the use of plywood sheets for floors.

1.1 RELATED SECTIONS

Refer to ~ for ~.

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:

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

Documents

1.3 DOCUMENTS

Documents referred to in this section are:

BPS	Building Product Specifications
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 2269.0	Plywood - structural - specifications
NZS 3604	Timber-framed 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 DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Requirements

1.5 QUALIFICATIONS

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

2 PRODUCTS

Materials

2.1 PLYWOOD

Radiata pine veneer ply to AS/NZS 2269.0, face sanded, grade as scheduled.

H3 CCA treated to AS/NZS 1604.1, when used as a wet area substrate. Confirm compatibility with adhesives being used with the waterproofing membrane. F11 grade to be used for flooring.

Components

2.2 NAILS

Refer to the plywood manufacturer's requirements for size and use.

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15mm ply:	50mm x 2.8mm galvanized annular grooved flooring nails
17 - 21mm ply:	60mm x 2.8mm galvanized annular grooved flooring nails
25mm ply:	75mm x 3.15mm galvanized annular grooved flooring nails

Jolt head nails to be used for exposed (clear finished) plywood.

2.3 SCREWS

Counter-sunk screws, stainless steel for treated plywood, minimum Class 3 or stainless steel for untreated plywood. Refer to the plywood manufacturer's requirements for size and use.

15mm ply:	No. 8 x 40mm
17mm ply:	No. 10 x 40mm
19 - 21mm ply:	No. 10 x 45mm
25mm ply:	No. 10 x 50mm

2.4 ADHESIVE

Polyurethane adhesive to American Plywood Association specification AFG 01.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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:	~% maximum

3.4 SUBSTRATE

Do not commence work until the framing is plumb and level, in true alignment and to suit the floor manufacturer's requirements.

Ensure framing suits the required laying pattern.

3.5 FLOOR DIAPHRAGMS

Install floor diaphragms in accordance with NZS 3604, 7.3 Structural floor diaphragms and floor manufacturer's requirements.

3.6 EXPANSION JOINTS - LARGER FLOORS

Lay flooring to allow for a large expansion gap for large floor areas to manufacturer's requirements. Locate as shown, under internal walls where possible.

Application

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 SUPPORT AND JOINTS - SQUARE EDGE SHEETS

Fully support edges and joints on square edged sheets.

3.9 SUPPORT AND JOINTS - DIAPHRAGMS

Fully support all edges and joints on all sheets, to NZS 3604, fig 7.9 **Floor Diaphragms**.

3.10 FIXING PLYWOOD SHEETS

Fix sheets to the plywood manufacturers requirements and NZS 3604, section 7.2.3, **Wood-based Sheet Flooring**. Lay sheets in a staggered layout, face-grain of sheet at right-angles to support and with sheets in square, true alignment and plane.

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3.11 WET AREAS

Ensure plywood is structural grade treated to H3 or H3.2 (CCA treated) to AS/NZS 1604.1.
Plywood substrates must have moisture content not more than 18% before installing membrane.
With primed/sealed face and edges.

NOTE: Treated plywood must be allowed to breath for a minimum of 7 days before installation of membrane. Fixing must be to manufacturer's specifications.
LOSP treated plywood must not be used.

Requirements if used for:
Flooring: Stress grade F8, minimum thickness 18mm with framing at minimum 400mm centres both ways, or min 21mm with framing at 600mm centres both ways. Fixing, glue and stainless steel screws.
Floor Overlay: Stress grade 8, minimum thickness 12mm.

3.12 ADHESIVE FIXING

Apply a 10mm adhesive bead to joists.

3.13 FIXINGS

Minimum 10mm, maximum 15mm from the edge, 150mm centres along edges and 300mm centres on intermediate supports.

Completion & Commissioning

3.14 COMPLETION MATTERS

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

4 SELECTIONS



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5438H JAMES HARDIE® FIBRE CEMENT SECURA™ FLOORING

1 GENERAL

This section relates to the supply and installation of James Hardie New Zealand Ltd Secura™ Flooring structural flooring substrate for interior applications.

1.1 RELATED WORK

Refer ~ for ~.

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:

MS	Modified silane
PEF	Polyethylene foam

Documents

1.3 DOCUMENTS

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

AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3604	Timber-framed buildings
ISO 9239-1:2010	Reaction to fire tests for floorings - Determination of the burning behaviour using a radiant heat source
NASH Standard Part 2	May 2019 Light Steel Framed Buildings
CodeMark™ CMNZ30181 verA	Secura™ Flooring

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Secura™ Flooring Installation Manual (Feb 2025)
Secura™ Flooring Product Technical Statement
Secura™ Flooring Product Warranty
BRANZ Appraisal 850 (2025) - Secura™ Flooring

Manufacturer/supplier contact details

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

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

25 years	For Secura™ Flooring
15 years	For accessories supplied by James Hardie

- 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 purchase

Refer to the general section 1237 WARRANTIES for additional requirements.



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1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years For installation

- 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.

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:
Secura™ Flooring Product Technical Statement - Section 8, Maintenance

Provide this information prior to practical completion.

Compliance information

1.10 COMPLIANCE - CODEMARK CERTIFICATE

Secura™ Flooring meets the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ30181.

2 PRODUCTS

Materials

2.1 SECURA FIBRE CEMENT SHEET FLOORING

19mm thick lightweight fibre cement sheetof treated cellulose fibre, Portland cement, ground sand, water and proprietary additives manufactured to AS/NZS 2908.2. Sheets 2400mm x 600m with tongue and groove edges. Pre-sealed with a water resistant sealer. Sheets labelled each side with instructions.

Components

2.2 FIXINGS

Refer to SELECTIONS.

2.3 ADHESIVE

Refer to SELECTIONS.

2.4 WATERPROOFING MEMBRANE

Refer to waterproofing section(s) for waterproofing membrane.

Accessories

2.5 BACKING ROD

PEF backing rod.

2.6 SEALANT

BRANZ appraised flexible MS sealant. Refer to SELECTIONS.

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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.

Timber substrate: 20% maximum moisture content

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Cut, prepare, and install underlay in accordance with Secura™ Flooring Installation Manual.

3.6 APPLY ADHESIVE

Apply 6mm continuous bead of adhesive over floor joists.

3.7 LAY SHEETS - TILE APPLICATIONS

Lay sheets with 'this side up for tiles' label facing up in a staggered layout with the long edge at a right angle to support and the short edges fully supported over the floor framing. Butt square edges. Interlock tongue and groove joints.

3.8 FIX SHEETS

Fix sheets minimum 50mm from a corner, 25mm from the tongue and groove edge, 12mm from the square edge, 200mm maximum centres along edges and on intermediate supports. Finish heads flush with surface.

3.9 CONTROL JOINTS - TILE APPLICATIONS

Provide a 6mm gap between sheet edges to form control joint and fit a PEF backing rod.

3.10 WATERPROOFING MEMBRANE

Refer to waterproofing section(s) for installation of waterproofing membrane.

Completion & Commissioning

3.11 COMPLETION MATTERS

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

4 SELECTIONS

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

5511 JOINERY & CABINETRY FIXTURES

1 GENERAL

This section relates to custom joinery fittings and cabinetwork, purpose made in a factory and fitted on site.

1.1 RELATED WORKS

Refer to ~ for ~.

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:

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

Documents

1.3 DOCUMENTS REFERRED TO

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

AS/NZS 1859.1	Reconstituted wood based panels - Specifications - Particleboard
AS/NZS 1859.2	Reconstituted wood based panels - Specifications - Dry processed fibreboard
AS/NZS 1859.3	Reconstituted wood based panels - Specifications - decorative overlaid wood panels
AS/NZS 4386.1	Domestic kitchen assemblies - Kitchen units
AS/NZS 4386.2	Domestic kitchen assemblies - Installation

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

1.5 WARRANTY - MANUFACTUER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	For ~

- 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 installed/applicator warranty:

2 years	For installation

- 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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2 PRODUCTS

Materials

2.1 TIMBER BOARDS AND FRAMES

Boards and frames carefully sawn to minimise the inherent warping, twisting and bowing of the selected species and to give a finish suitable for clear finishing.

2.2 PLYWOOD PANEL

Urea-formaldehyde resin hot-press bonded timber veneers, select grade interior.

2.3 SOLID POLYMER BOARD

Non-porous polymer formed with a homogenous blend of alloys and fillers into a solid rigid sheet. Worked by certified fabricators only.

2.4 BACKING BOARD

Urea-formaldehyde resin bonded very fine wood fibre sheet to AS/NZS 1859.2.

Minimum thickness: 6mm

2.5 PRE-FINISHED BACKING BOARD

Urea-formaldehyde resin bonded fine wood fibre sheet to AS/NZS 1859.2 and AS/NZS 1859.3, veneered one side with melamine sheet.

Minimum thickness: 6mm

Components

2.6 BENCHTOPS

As detailed on the drawings and as required for specified fittings and appliances.

2.7 CARCASE CONNECTORS

One-piece steel, straight deep-cut thread, fibre board screws with press fit plastic trim cap.

2.8 CARCASE FASTENERS

Knock down type centric sphere zinc alloy connectors with connecting bolts, sleeves and dowels, to suit each particular fastening location.

2.9 BUTT HINGES

Butt, broad butt, flush butt or overlay steel or brass, to suit the location, or as detailed.

2.10 CONCEALED HINGES

All-metal zinc alloy with automatic spring and screw-fixed. Door stops of plastic foam with self adhesive backs, or plastic buttons clear or coloured to match unit.

2.11 GLASS DOOR HINGES

All-metal zinc alloy body and metal/plastic glass cup, with automatic spring, screw-fixed and with matching door pulls.

2.12 FLAP HINGES

All-metal, flush-fitted and screw-fixed with no gap when the flap is down.

2.13 FLAP STAY

All-metal, slide/folding and screw fixed.

2.14 DRAWER RUNNERS

Under mounted type, precision running ball-mounted full extension, bright steel finish system.

Accessories

2.15 ADHESIVES

As approved by the manufacturer for the timber product or pre-finished timber product joint being used.



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Finishes

2.16 LIGHT DUTY COATING SYSTEM

Single pack, clear or pigmented nitro-cellulose or pre-catalysed lacquer.

2.17 MEDIUM DUTY COATING SYSTEM

Two pack, clear or pigmented acid catalysed coating.

2.18 HEAVY DUTY COATING SYSTEM

Two pack, clear or pigmented polyurethane coating.

3 EXECUTION

Conditions

3.1 JOINERY FIXTURES GENERALLY

Execution to include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs). Take responsibility for the completed joinery fixtures including fittings included within fixtures and the on site installation.

3.2 DOMESTIC KITCHEN ASSEMBLIES

Unless otherwise specified / detailed, domestic kitchens to be constructed to AS/NZS 4386.1 and installed to AS/NZS 4386.2

3.3 SITE MEASURE

Site check and confirm dimensions after wall linings have been fixed. Verify positions of electric power outlets, wiring to light fittings included in joinery fixtures, water supplies and waste pipe locations.

3.4 SHRINKAGE

Arrange jointing and fixing so that shrinkage in any part and direction does not impair the strength or appearance of the finished work or damage the adjoining work.

3.5 TOLERANCES

Provide reasonable tolerances at connections between the joinery fittings and the building fabric so that any irregularities are adequately compensated for in the site fixing.

3.6 NATURAL FINISH TIMBER

Select timber for match or uniformity or symmetry of colour or grain of adjacent pieces. Finish to same standard on all faces.

Conditions - site

3.7 TRANSIT

Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather.

3.8 DELIVERY

Deliver fittings to the site only when floor, wall and ceiling surfaces are in place and the fittings can be immediately placed in their final location.

Assembly

3.9 MACHINING

Carry out machining within the practices required for the particular timber, wood product or pre-finished wood product being used. Machine drill holes, cut recesses and form joints ready for assembly to the componentry manufacturer's requirements. Ensure work is accurate, square and true to line.

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3.10 MAKE CUT OUTS FOR APPLIANCES AND FITTINGS

Obtain fitting templates from the appliances and other fittings to be installed within joinery fixtures and bench tops. Ensure appliances and fittings can be installed with the required tolerances and clearances. Where bench tops are being provided under other work sections, provide templates and confirm dimensions to others.

3.11 ASSEMBLY

Carry out gluing, dowelling, and other operations necessary for the proper assembly of the fittings as detailed with fixings concealed unless detailed otherwise. Scribe fit adjustable shelves with 4 shelf pins to each and with force fit pin holes at 50mm maximum centres in solid cheeks. Construct drawers and using groove mounting runners, fit them with 3mm clearance into drawer space. Hang doors on concealed hinges with 115 degree openings except where detailed for 170 degrees.

3.12 GLUE JOINTS

Use glue joints where provision for shrinkage is not required. Cross-tongue or otherwise reinforce. Surfaces in contact to have an even sawn or planed finish and be free of contamination. Mix, apply and set to the glue manufacturer's requirements with adequate pressure applied to ensure intimate contact that will be maintained while the glue sets.

3.13 CONNECTOR JOINTS

Locate and drive connectors to the board manufacturer's requirements. Fit plastic trim cap where detailed. Conceal or hide from sight other connector heads.

3.14 FASTENER JOINTS

Locate and drive connecting bolts to the board manufacturer's requirements. Form joint and fit and rotate centric sphere connector to finish it rigid and tightly fitting over the whole length of the joint.

Application

3.15 FIXING ON SITE

- Scribe fit and conceal fix rigidly in place square, level, plumb and true to line and face as detailed and to the required standard.
- Assemble fittings on-site if brought in sections.
- Fit counter and bench tops and upstands.
- Complete with moveable parts in place and freely moving in their proper range.

Finishing

3.16 COATING SYSTEM - PREPARATION

- Fill timber defects with proprietary wood filler. (e.g. cracks, holes, etc)
- Sand timber to a smooth even finish using 180 grit paper.
- Remove all sanding dust using air guns and tack rags.
- Ensure substrate is free from dust, grease, dirt and other contaminants.
- Ensure moisture content of the timber is less than 15% immediately before commencing coating operations.

3.17 COATING SYSTEM - APPLICATION

To coating manufacturer's requirements.

3.18 PROTECT

Protect finished surfaces from damage, particularly benchtops.

Completion

3.19 REPLACE

Replace damaged or marked elements.

3.20 LEAVE

Leave work complete, clean and without blemish and to the standard required by following procedures.

3.21 REMOVE

Remove debris, unused materials and elements from the site.

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4 SELECTIONS

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5521 HARDWARE

1 GENERAL

This section covers the supply and installation of door and window hardware and furniture.

1.1 RELATED WORK
Refer to ~ for ~.

Documents

1.2 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS.

1.3 MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:
Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~
Company:
Web:
Email:
Telephone:

Requirements

1.4 SUPPLIER
A specialist in the supply of hardware, employing an experienced architectural hardware representative available to assist during the course of the hardware installation.

1.5 SUBMIT A SUPPLIER'S SCHEDULE
~

2 PRODUCTS

2.1 DOOR HARDWARE
Refer to SELECTIONS for product selection.

2.2 WINDOW HARDWARE
Refer to SELECTIONS for product selection.

2.3 CABINET WORK HARDWARE
Refer to SELECTIONS for product selection.

Components

2.4 FIXINGS
Provide matching fixings, including screws, clips, bolts and brackets for hardware supplied.

3 EXECUTION

Conditions

3.1 RETAIN
Retain hardware in the manufacturer's original packaging. Ensure that units are complete with fixings and installation instructions. Label each unit separately with its hardware number and door/window number to match the submitted and approved schedule.

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3.2 PACKAGE

Package required hardware units in clear plastic and label each package with its hardware and door/window number and location to match the drawings and the submitted and approved schedule. Place packages in cartons selected for "level", "location", and/or "sector" and label the packages and the cartons similarly.

3.3 STORE

Store hardware 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.

Installation

3.4 INSPECTION

Before starting the hardware installation, check frames, doors, sashes and adjacent finishes are ready for the proper installation of the hardware.

3.5 LOCATE

Locate hardware units at heights and/or locations shown on the drawings, or as required to comply with relevant Codes and Standards. Before proceeding, confirm any dimension not shown or known.

3.6 CUTTING AND FITTING

Carry out cutting and fitting of the substrate necessary for installing any hardware unit before painting or finishing of that surface. Remove 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.

3.7 INSTALL HARDWARE

Install each hardware unit in accordance with the hardware manufacturer's requirements using templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with all moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion

3.8 ADJUST

Adjust and check each operating hardware unit for correct and smooth functioning. Replace those units that cannot be adjusted if they do not function correctly. Clean units and adjoining surfaces upon completing their installation. Only use lubricant if and when recommended by the hardware manufacturer/supplier.

3.9 REPLACE

Replace damaged or marked elements.

3.10 LEAVE

Leave work with parts fully and freely working and to the standard required by following procedures.

3.11 REMOVE

Remove debris, unused materials and elements from the site.

3.12 PROTECT

Protect hardware units from damage or marking.

3.13 FINAL ADJUSTMENT

Where hardware is installed more than a month prior to project completion, return and make a final check and adjustment of hardware units to ensure they are operating correctly, fitted properly and are undamaged.

4 SELECTIONS



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5573 TIMBER SCREENS & SHUTTERS

1 GENERAL

This section relates to the fabrication and installation of timber:

- screens
- shutters

1.1 RELATED WORK

Refer to ~ for ~.

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:

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

Documents

1.3 DOCUMENTS

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

AS/NZS 1859.2	Reconstituted wood-based panels - Specifications - Dry processed fibreboard
NZS 3602	Timber and wood-based products for use in building

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

2 PRODUCTS

Materials

2.1 SOLID TIMBER COMPONENTS

Selection to NZS 3602.

Components

2.2 HARDWARE

Brackets, metal supports, angles and sundry fittings, all as shown and described on the drawings. Allow to install.

3 EXECUTION

Conditions

3.1 GENERALLY

Execution to include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).



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3.2 ALL WORK

Check site dimensions. Carry out machining within the practices recommended for the particular timber, wood product or pre-finished wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's recommendations. Work to be accurate, square and true to line and face.

Application

3.3 FABRICATE AND INSTALL TIMBER SCREENS AND SHUTTERS

Fabricate and install as detailed.

Completion

3.4 LEAVE

Leave work to the standard required by following procedures.

3.5 REMOVE

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

4 SELECTIONS



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5574 INTERIOR HANDRAILS & TIMBER BALUSTRADES

1 GENERAL

This section relates to the fabrication and installation of interior timber balustrades.

1.1 RELATED WORK

Refer to ~ for ~.

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:

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

Documents

1.3 DOCUMENTS REFERRED TO

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 F4/AS1	Safety from falling
NZS 3602	Timber and wood-based products for use in building

1.4 MANUFACTURER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

2 PRODUCTS

2.1 SOLID TIMBER COMPONENTS

Timber species, grade, installation moisture and treatment to NZS 3602, table 2, and NZBC B2/AS1. Refer to SELECTIONS/DRAWINGS.

2.2 HARDWARE

Handrail brackets, metal supports, angles and sundry fittings, all as shown and described on the drawings.

3 EXECUTION

Conditions

3.1 GENERALLY

Execution to include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

Check site dimensions. Carry out machining within the practices recommended for the particular timber, wood product or pre-finished wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's recommendations. Work to be accurate, square and true to line and face.



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Application

3.2 HANDRAILS

Fabricate and install the handrails as detailed, complete with all associated metal componentry and hardware. Unless otherwise detailed construct to comply with NZBC F4/AS1.

Completion

3.3 LEAVE

Leave work to the standard required by following procedures.

3.4 REMOVE

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

4 SELECTIONS



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6141 GROUND, SEALED OR POLISHED CONCRETE

1 GENERAL

This section relates to the provision of a high quality concrete finish to new or existing concrete surfaces incorporating mixed design aggregates and plain concrete.
It includes:

- plain polish
- grind and seal
- grind and polish

1.1 RELATED WORK

Refer to ~ for ~.

Refer to appropriate concrete section(s) for mix design and placement.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following definitions apply specifically to this section:

Plain polish:	The concrete is mechanically ground just enough to clean it (virtually no aggregate exposed) and clear sealed.
Grind:	The concrete is mechanically ground to expose aggregate
Grind and seal:	The concrete is mechanically ground and clear sealed.
Grind and polish:	The concrete is mechanically ground, then hardened, then polished, then sealed and finally burnished.

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
NZS 3114	Specification for concrete surface finishes

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

Requirements

1.5 QUALIFICATIONS

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

1.6 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~

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Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	

1.7 TECHNIQUE DISCUSSION - CONCRETE PLACEMENT

Advise the concrete placer of the areas scheduled for ground/polished finishes. Ensure the placed concrete to be ground is not overworked resulting excess sand /cement pasts at the concrete surface

1.8 TECHNIQUE DISCUSSION AND FINISH STANDARD

Before commencing work, arrange a meeting to confirm the method of carrying out the work. Select an area on site, grind and finish the selected area to achieve the agreed finish. When agreement is reached, this then becomes the finish standard for the balance of the work.

Performance - Slip resistance

1.9 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt testing.

2 PRODUCTS

2.1 PENETRATING SEALER

Refer to SELECTIONS.

2.2 SURFACE SEALER

Refer to SELECTIONS.

2.3 GROUT

Cement base slurry grout.

3 EXECUTION

Conditions

3.1 CONFIRM CONCRETE SURFACE

Confirm concrete surface is of the required standard for the concrete polishing and finishing processes. Do not proceed if placed concrete is not capable of delivering the specified finish. Seek written direction as to what action is required.

3.2 PLACING THE CONCRETE

Place concrete with light vibrate only, do not over vibrate. The concrete pavement or floor must be to NZS 3114, a Class U3 finish. Very light power float (1 or 2 light passes).

3.3 PROTECTION

Cover glass, anodised aluminium and other surfaces to protect from damage that is caused from cementitious dust.

Application - grind and polish

3.4 GRIND TYPE - GRIND AND POLISH

For type and depth of grind refer to SELECTIONS.

3.5 FIRST GRIND - GRIND AND POLISH

For new slabs grind 7 -10 days minimum after placing the concrete. Grind the floor to expose the aggregate using a 20/40 grit steel bonded diamond. Aggregate should be consistent over the surface.

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3.6 APPLY DENSIFIER - GRIND AND POLISH

Apply selected densifier to manufacturer's requirements.

3.7 SECOND GRIND - GRIND AND POLISH

When the building is appropriately enclosed, linings completed before fittings, fixtures and skirtings are installed, grind the residue off the floor and start polishing the surface using a 50 grit resin bonded diamond, progressing by approximately doubling the grit each pass up to 800 to 3000 grit resin bonded diamond, depending on gloss level required. Refer to SELECTIONS for gloss levels.

3.8 APPLY CONCRETE SEALER - GRIND AND POLISH

Apply selected concrete penetrating sealer to manufacturer's requirements.

3.9 BURNISH

Burnish to remove final residue and polish with purpose made pad.

Application - holes and cuts

3.10 GROUT HOLES

Grout slurry the air holes left in the concrete surface. Polish to remove grout within 24 hours of application using a 120 grit diamond.

3.11 GROUTING CONCRETE CUTS

Grout construction cuts and decorative cuts. Polish to remove excess grout within 24 hours of application using a 120 grit diamond.

Protect slab

3.12 PROTECT SURFACE AFTER FIRST GRIND

Fully cover and protect from damage after the first grind and once the building is enclosed. Ensure material allows the floor to breath and is non-staining.

3.13 PROTECT FINISHED POLISHED CONCRETE

Protect floor from damage. Provide protection by laying breathable, non staining sheet material for the period between completion of polishing and completion of the contract works.

Completion

3.14 LEAVE

Leave work to the standard required by following procedures.

3.15 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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6211 WALL TILING SYSTEMS

1 GENERAL

This section relates to the supply and installation of interior and exterior wall tiling systems:
It includes:

- Tiles
- Tile adhesives and grouts
- All relevant underlays, components and accessories necessary to complete installation.

1.1 RELATED WORK

Refer to 6221 FLOOR TILING SYSTEMS for floor tiling systems.

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:

WMAI	Waterproofing Membrane Association NZ Inc

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 E3/AS1	Internal moisture
NZBC E3/AS2	Internal moisture
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives -Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for grouts
BS EN 12004.1	Adhesives for ceramic tiles. Requirements, assessment and verification of constancy of performance, classification and marking
BS EN 13888.1	Grouts for ceramic tiles. Requirements, classification, designation, marking and labelling.
WMAI	Code of Practice for Internal Wet-area Membrane Systems

Health & Safety at Work Act: 2015

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer. ~

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

Warranties - tiling

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	For ~

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- 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 installation of tiling systems

- 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 - TILING SYSTEMS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 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.

1.9 NO SUBSTITUTIONS

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

1.10 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator~	Contract administrator~	Contract administrator~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

1.11 HEALTH & SAFETY - SILICA DUST

Comply with Health & Safety at Work Act:2015 and take all necessary precautions as recommended in WorkSafe guidelines for Respirable Crystalline Silica (RCS).

2 PRODUCTS

Materials

2.1 TILES

Refer to SELECTIONS.

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Materials - preparation & underlays

2.2 LEVELLING COMPOUND / RENDER

Proprietary cementitious render / levelling compound for concrete / concrete masonry walls. Refer to SELECTIONS for details.

Materials - adhesive and grout

2.3 TILE ADHESIVE

Tile adhesive, and if required primer, to suit particular location/use. To AS ISO 13007.1 and BS EN 12004.1. Refer to SELECTIONS.

2.4 PROPRIETARY GROUT

Proprietary grout to suit particular location/use. To AS ISO 13007.3 and BS EN 13888.1. Refer to SELECTIONS.

Accessories

2.5 MOVEMENT JOINT SEALANT

Neutral cured or acid-cured sealant to AS 3958.1, 2.7.5 Sealant. Refer to SELECTIONS.

2.6 TILE EDGE TRIMS

Refer to SELECTIONS.

2.7 SEALER

Proprietary sealer. Refer to SELECTIONS

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Inspect tiles on delivery 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 and any tiles that are damaged.

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

Ensure concrete or concrete masonry walls are fully cured and dry. Ensure new concrete has cured for 28 days or more.

If in doubt check for moisture content by hygrometer. Ensure moisture content is:
Concrete 75% relative humidity or less

3.4 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles, movement joints and other visual considerations of the finished work. Minimise in number of cut tiles and where possible, no cut tiles less than half size and only at the perimeter of the work.

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3.5 TEMPERATURE

Unless otherwise specified by selected tiling installation product manufacturer, do not carry out tiling where the air temperature is below 5°C or substrate temperature is above 40°C.

3.6 EXTERNAL CONDITIONS

Ensure any areas of external tiling, waterproofing, floor levelling, grouting or concrete repair must be protected from hot windy conditions, rain and/or frosts during application.

3.7 LIGHTING

Light the tile work as closely and clearly as possible to that of the finished lighting, to ensure that differences in plane surface are highlighted during installation.

Installation/application

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 GENERALLY

Prepare surface and complete tiling installation in accordance with AS 3958.1 and if required complete interior waterproof membrane installation to sections 1-4 of WMAI Code of Practice for Internal Wet-area Membrane Systems as modified by NZBC E3/AS2.

Application - substrate preparation

3.10 PREPARE SUBSTRATES

Prepare backgrounds as described in AS 3958.1, Section 4. All surfaces to be structurally sound, dry, clean and free from movement, dirt, dust, oil, grease, wax and any other loose or contaminating materials. Concrete substrates should also be free of laitance, efflorescence, curing compounds and release agents.

Remove any projections or unevenness. Substrate material must be even and true with a maximum variation in plane of no greater than 4mm in every 2m, in accordance with AS 3958.1, section 4.

Suitably prepare backgrounds and substrates in accordance with the manufacturer's instructions of the tiling installation products for the relevant substrate type.

3.11 PRIME SUBSTRATE

If required, surfaces should be primed as per manufacturer's instructions for the selected products and substrate types. Refer to SELECTIONS.

3.12 LEVELLING SUBSTRATE

Smooth out irregular concrete / concrete masonry substrates using proprietary levelling compound or render in accordance with manufacturer's requirements. Ensure maximum variation in plane of no greater than 4mm in every 2m, in accordance with AS 3958.1, section 4.

Application -tiling

3.13 FITTING TILES

Setting out, cutting and fitting of tiles to be as described in AS 3958.1, section 5. If not shown on drawings, confirm set out, bond and pattern before installation.

- Ensure cut edges are smooth and installed without jagged or flaked edges.
- Always use whole tiles or if tiles have to be cut the largest portion of a cut tile possible.
- Maintain the heights of wall tile work in full courses to the nearest dimension.
- Within allowed tolerances, ensure corners of tiles are flush and level with corners of adjacent tiles.
- Keep joint lines, including mitres, straight and of an even width.
- Fully bed trim units, moulded or shaped pieces and other accessories with an appropriate bedding material.
- Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

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3.14 TILE FINISH AND JOINTS

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

- Ensure finished surfaces are flat and true to a tolerance of ±4mm in 2 metres from the required plane.
- Lippage between adjacent tiles shall not exceed 2mm and where joint widths are less than 3mm wide lippage shall not exceed 1mm. For tiles ground flat, such as polished tiles, lippage shall not exceed 1.5mm.
- Ensure joint widths are consistent throughout the installation, measured at the tile face.
- Ensure joint alignment is consistent throughout the installation and to a tolerance of ±4mm in 2 metres from the detailed joint alignment.
- Clean surplus bedding material from joint spaces and tile surface.

3.15 ADHESIVE APPLICATION - THIN BED

Apply a thin bed of selected tile adhesive to the adhesive manufacturer's requirements, generally final bed thickness does not exceed 3mm. Install using the following methods:

Notched trowel method

- Adhesive application to be as described in AS 3958.1, 5.6.2(a) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness and rib using notched trowel. Select trowel square notch size to suit tile size and type, to achieve full coverage. Press tile firmly onto substrate and beat into place. Additional back buttering of tiles may also be required, usually required for tiles 400x400mm and larger.

Floating method

- Adhesive application to be as described in AS 3958.1, 5.6.2(b) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness. Apply tiles with a twisting or sliding action and tap back firmly into the floated bedding.

Buttering method

- Adhesive application to be as described in AS 3958.1, 5.6.2(c) and to adhesive manufacturers requirements. Apply adhesive evenly to the back of each tile with a flat edged trowel. Press tile firmly onto substrate and tap into place. This method is not suitable for mosaic tile installation.

Tiles in awkward locations

- The buttering method may be required, or fixing might be necessary to achieve full bedding, even though the notched trowel method is used generally.

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

3.16 INSTALL TRIMS

Accurately locate and fully bed edge trim units, dividing strips, moulded or shaped pieces and other accessories with an appropriate bedding material. Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.17 SEALING

Apply selected sealer to tiling in accordance with manufacturer's requirements.

3.18 APPLY GROUTING

Remove any spacer inserts, prepare joints and apply grout in accordance with manufacturers requirements and as described in AS 3958.1, 5.7 Grouting. Ensure finish is uniform in colour, smooth and without voids, pinholes or low spots.

Application - movement joints

3.19 FORM MOVEMENT AND EXPANSION JOINTS

Install movement joints in accordance with AS 3958.1, 5.4.5 Movement Joints. Joints to go right through the tile and bed to the background, maintaining any waterproofing.

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Movement joints to walls to be a minimum of 6mm wide and to be located:

- Over existing movement joints
- At junction between different background materials
- Where tiling abuts other materials, including sanitary fixtures and windows/doors frames.
- At inter-storey height horizontally and at 3m to 4.5m apart vertically.
- At internal vertical corners in shower compartments.

3.20 MOVEMENT AND EXPANSION JOINTS, INSTALL COMPOUND/SEALANT FILL

Carefully clean out the joint, if required install bond breaker or backing rod to control width/depth ratio, and fill with compound/sealant placed by gun. After the correct interval, finish the surface off smooth, and flush on flat areas or concave in corners, to the compound/sealant manufacturer's requirements.

Cleaning

3.21 CLEAN TILES

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

Completion

3.22 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.



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6221 FLOOR TILING SYSTEMS

1 GENERAL

This section relates to the supply and installation of interior and exterior floor tiling systems. It includes:

- Tiles
- Tile adhesives and grouts
- All relevant underlays, components and accessories necessary to complete installation

1.1 RELATED WORK

Refer to 6211 WALL TILING for wall tiling systems.

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:

WMAI	Waterproofing Membrane Association NZ Inc

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
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E3/AS1	Internal moisture
NZBC E3/AS2	Internal moisture
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
NZS 4121	Design for access and mobility - Buildings and associated facilities
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for grouts
BS EN 12004.1	Adhesives for ceramic tiles. Requirements, assessment and verification of constancy of performance, classification and marking
BS EN 13888.1	Grouts for ceramic tiles. Requirements, classification, designation, marking and labelling.
WMAI	Code of Practice for Internal Wet-area Membrane Systems

Health & Safety at Work Act: 2015

1.4 MANUFACTURER/ SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Company:	~
Web:	~
Email:	~
Telephone:	~

Warranties - tiling

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

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~ years: For ~

- 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 installation of tiling systems

- 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.

Warranties - waterproofing

1.7 WARRANTY - MANUFACTURER/SUPPLIER - FOR WATERPROOFING SYSTEMS

Provide a material manufacturer/supplier warranty:

~ years For waterproofing system

- Provide this warranty on manufacturer/supplier standard warranty 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.

1.8 WARRANTY - INSTALLER/APPLICATOR - FOR WATERPROOFING SYSTEMS

Provide an installer/applicator warranty:

5 years: For installation of waterproofing systems

- 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

1.9 QUALIFICATIONS - TILING SYSTEMS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.10 QUALIFICATIONS - WATERPROOFING SYSTEMS

Workers to be approved / accredited / registered / licensed / certified by manufacturer / supplier. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.11 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.

1.12 NO SUBSTITUTIONS

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

1.13 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:

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	Sample A	Sample B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

1.14 HEALTH & SAFETY - SILICA DUST

Comply with Health & Safety at Work Act:2015 and take all necessary precautions as recommended in WorkSafe guidelines for Respirable Crystalline Silica (RCS).

Compliance information

1.15 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer / supplier warranty -waterproofing membrane
- Installer / applicator warranty -waterproofing membrane
- Producer Statement - Construction (PS3) from the waterproof membrane applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.16 INTERNAL / EXTERNAL MOISTURE - WATERPROOFING SYSTEMS

Wet area membranes under tiled areas to comply with NZBC E2/AS1 for exterior applications, NZBC E3/AS1 & sections 1-4 of WMAI Code of Practice for Code of Practice for Internal Wet-area Membrane Systems as modified by E3/AS2 for interior applications.

Performance - Slip resistance

1.17 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 TILES

Refer to SELECTIONS.

Materials - preparation & underlays

2.2 FLOOR LEVELLING COMPOUND

Proprietary floor levelling compound. Refer to SELECTIONS.

2.3 PROPRIETARY SCREED

Manufactured screed systems. Refer to SELECTIONS.

Materials - waterproofing

2.4 WATERPROOFING MEMBRANE - INTERIOR

Proprietary interior wet area waterproofing system to AS/NZS 4858. Refer to SELECTIONS.

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Materials - adhesive and grout

2.5 TILE ADHESIVE

Tile adhesive to suit particular location/use, and if required primer. To AS ISO 13007.1 and BS EN 12004.1. Refer to SELECTIONS.

2.6 PROPRIETARY GROUT

Proprietary grout to suit particular location/use. To AS ISO 13007.3 and BS EN 13888.1. Refer to SELECTIONS.

Accessories

2.7 MOVEMENT JOINT SEALANT

Neutral cured or acid cured sealant to AS 3958.1, 2.7.5 Sealants. Refer to SELECTIONS.

2.8 TILE EDGE TRIMS

Refer to SELECTIONS.

2.9 SEALER

Proprietary sealer. Refer to SELECTIONS.

2.10 UNDERFLOOR HEATING

Refer to 7553 UNDERFLOOR HEATING MAT SYSTEM for underfloor heating section for electric undertile heating system.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

Inspect tiles on delivery 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 and any tiles that are damaged.

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

Ensure concrete floors are fully cured and dry. New concrete must have cured for 28 days or more.

If in doubt check for moisture content by hygrometer. Ensure moisture content is:
Concrete 75% relative humidity or less

3.4 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work. Minimise in number of cut tiles and where possible, no cut tiles less than half size and only at the perimeter of the work.

3.5 TEMPERATURE

Unless otherwise specified by selected tiling product manufacturer, do not carry out tiling where the air temperature is below 5°C or substrate temperature is above 40°C.

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3.6 EXTERNAL CONDITIONS

Ensure any areas of external tiling, waterproofing, floor levelling, grouting or concrete repair must be protected from hot windy conditions, rain and/or frosts during application.

3.7 LIGHTING

Light the tile work as closely and clearly as possible to that of the finished lighting, to ensure that differences in plane surface are highlighted during installation.

Installation/application

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 GENERALLY

Prepare surface and complete tiling installation in accordance with AS 3958.1 and if required complete interior waterproof membrane installation to sections 1-4 of WMAI Code of Practice for Interior Wet Area Membrane Systems as modified by E3/AS2 or exterior waterproofing to NZBC E2/AS1.

Application - substrate preparation

3.10 PREPARE SUBSTRATES

Prepare backgrounds as described in AS 3958.1, Section 4. All surfaces to be structurally sound, dry, clean and free from movement, dirt, dust, oil, grease, wax and any other loose or contaminating materials. Concrete substrates should also be free of laitance, efflorescence, curing compounds and release agents. Remove any projections or unevenness.

Concrete floor substrates, after any levelling compounds or screeds applied, must be even and true with a maximum variation in accordance with AS 3958.1 Table 4.3:

- For adhesive fixing, thin bed 5mm in every 3 m
- For adhesive fixing, thick bed 10mm in every 3 m
- For mortar cement fixing, 5mm in every 3m

Suitably prepare backgrounds and substrates in accordance with the manufacturer's instructions of the tiling installation products for the relevant substrate type.

3.11 PRIME SUBSTRATES

Surfaces should be primed as per manufacturer's instructions for the selected products and substrate types. Refer to SELECTIONS.

3.12 FLOOR LEVELLING

Ensure all existing surfaces are smooth and level. If levelling is required, prepare for and apply floor levelling compounds to manufacturer’s instructions.

Application - underlays

3.13 INSTALL WATERPROOFING MEMBRANE - INTERIOR WET AREAS

Install waterproofing membrane to manufacturers requirements and in accordance with NZBC E3/AS1 and sections 1-4 of WMAI Code of Practice for Interior Wet Area Membrane Systems as modified by E3/AS2.

3.14 INSPECT & FLOOD TEST - INTERIOR WATERPROOF MEMBRANE

Prior to application of tiling over, visually inspect and flood test waterproof membrane system, in accordance to WMAI Code of Practice for Interior Wet Area Membrane Systems, 4.0.5. Make good any damage that is identified in accordance with waterproof membrane manufacturer/supplier requirements.

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Application - screeds

3.15 FLOOR SCREEDS

Form screeds to manufacturer's instructions with a deviation from plane of not more than 5mm over 3 metres. Where specified, place galvanized steel mesh over with spacers to centralise it in the floor screed. Lap the reinforcing mesh at least one full mesh and do not butt against vertical surfaces.

3.16 FLOOR SCREED TO FALLS

Form screeds, to manufacturer's instructions, 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:

1 : 40 minimum	For tiled decks which also acts 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

Application - Undertile heating

3.17 INSTALL UNDERTILE FLOOR HEATING

Refer to 7553 UNDERFLOOR HEATING MAT SYSTEM for electric undertile heating system.

Application –tiling

3.18 FITTING TILES

Setting out, cutting and fitting of tiles to be as described in AS 3958.1. If not shown on drawings, confirm set out, bond and pattern before installation.

- Ensure cut edges are smooth and installed without jagged or flaked edges.
- Always use whole tiles or if tiles have to be cut the largest portion of a cut tile possible.
- Maintain the heights of wall tile work in full courses to the nearest dimension.
- Within allowed tolerances, ensure corners of tiles are flush and level with corners of adjacent tiles.
- Keep joint lines, including mitres, straight and of an even width.
- Fully bed trim units, moulded or shaped pieces and other accessories with an appropriate bedding material.
- Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.19 TILE FINISH AND JOINTS

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

- Ensure finished surfaces are flat and true to a tolerance of ±4mm in 2 metres from the required plane.
- Lippage between adjacent tiles shall not exceed 2mm and where joint widths are less than 3mm wide lippage shall not exceed 1mm. For tiles ground flat, such as polished tiles, lippage shall not exceed 1.5mm.
- Ensure joint widths are consistent throughout the installation, measured at the tile face.
- Ensure joint alignment is consistent throughout the installation and to a tolerance of ±4mm in 2 metres from the detailed joint alignment.
- Clean surplus bedding material from joint spaces and tile surface.

3.20 ADHESIVE APPLICATION - THIN BED

Apply a thin bed of selected tile adhesive to the adhesive manufacturer's requirements, generally final bed thickness does not exceed 3mm. Install using the following methods:

Notched trowel method

- Adhesive application to be as described in AS 3958.1, 5.6.2(a) and to adhesive

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manufacturers requirements. Apply adhesive to substrate to a uniform thickness and rib using notched trowel. Select trowel square notch size to suit tile size and type, to achieve full coverage. Press tile firmly onto substrate and beat into place. Additional back buttering of tiles may also be required, usually required for tiles 400x400mm and larger.

Floating method

- Adhesive application to be as described in AS 3958.1, 5.6.2(b) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness. Apply tiles with a twisting or sliding action and tap back firmly into the floated bedding.

Buttering method

- Adhesive application to be as described in AS 3958.1, 5.6.2(c) and to adhesive manufacturers requirements. Apply adhesive evenly to the back of each tile with a flat edged trowel. Press tile firmly onto substrate and tap into place. This method is not suitable for mosaic tile installation.

Tiles in awkward locations

- The buttering method may be required, or fixing might be necessary to achieve full bedding, even though the notched trowel method is used generally.

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

3.21 INSTALL TRIMS

Accurately locate and fully bed edge trim units, dividing strips, moulded or shaped pieces and other accessories with an appropriate bedding material. Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.22 SEALING

Apply selected sealer to tiling in accordance with manufacturer's requirements.

3.23 APPLY GROUTING

Remove spacer inserts, prepare joint, apply and finish off grout to the manufacturer's requirements and as described in AS 3958.1, 5.7 Grouting. Ensure grout finish is uniform in colour, smooth and without voids, pinholes or low spots.

Application - movement joints

3.24 FORM MOVEMENT AND EXPANSION JOINTS

Install movement joints in accordance with AS 3958.1, 5.4.5 Movement Joints. Joints to go right through the tile and bed to the background, maintaining any waterproofing.

Joints, except those with reinforced edges, subject to traffic heavier than light pedestrian should not be wider than 10mm. Movement joints to floor to be located at:

- Over existing movement joints
- Intermediate movement joints to be provided to internal floors at approximately 4.5m centres where any floor dimension exceeds 9m or 6m if subjected to direct sunlight.
- Intermediate movement joints to be provided to external floors at approximately 4.5m centres where any floor dimension exceeds 4.5m.
- At perimeter where abutting perimeter walls, columns, curbs and steps. Also, where there is a change of conditions such as under-floor heating, substrate type or tile type.

3.25 MOVEMENT AND EXPANSION JOINTS, INSTALL COMPOUND/SEALANT FILL

Carefully clean out the joint, if required install bond breaker or backing rod to control width/depth ratio, and fill with compound/sealant placed by gun. After the correct interval, finish the surface off smooth, and flush on flat areas or concave in corners, to the compound/sealant manufacturer's requirements.

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Cleaning

3.26 CLEAN TILES

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

Completion

3.27 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.



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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:

- laminated timber
- solid timber

1.1 RELATED WORK

Refer to ~ for ~.

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:

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

The following definitions apply specifically to this section:
~

Documents

1.3 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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years:	For ~

- 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.

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1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 years: For ~

- 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

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.

1.9 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

Performance

1.10 TESTING MOISTURE CONTENT

Sample and test the substrate to ensure that moisture content is within the limits specified. Provide a written record.

1.11 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.

2 PRODUCTS

Materials

2.1 CONSTRUCTION PLYWOOD UNDERLAY

Rotary cut radiata pine veneer ply, face sanded, treated H3 for wet areas and to AS/NZS 2269.0.

2.2 FOAM UNDERLAY

2mm Thick, closed cell foam underlay to provide a moisture membrane.

2.3 TIMBER STRIP, BLOCK AND PLANK FLOORING

Refer to SELECTIONS for product selection.

2.4 TIMBER TRIM

Skirting, edge strip, reducer strip and nosing as detailed and to match overlay flooring.

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Accessories

2.5 FOAM UNDERLAY TAPE
Moisture resistant tape, 48mm wide.

2.6 CONCRETE SEALER
Two part water based epoxy coating.

2.7 EXPANSION STRIPS
Coloured silicone flexible expansion sealant.

2.8 EXPANSION COVERS
Selected expansion covers as supplied.

2.9 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.

2.10 ADHESIVE, FLOATING
PVA or aliphatic resin, as recommended by the overlay flooring supplier.

Finishes

2.11 SEALER
Two coats of penetrating oil sealer 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:	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.

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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.

3.10 SURFACE TOLERANCES, FLOATING

Substrate to have no deviations greater than 5mm over a 3 metre straightedge in any given direction and no abrupt variations greater than 2mm over 250mm.

Conditions - floor heating

3.11 UNDERFLOOR HEATING, FLOATING APPLICATIONS

If a moisture test has not been carried out, turn off the underfloor heating 1 week prior to the test. Check for moisture content by hygrometer and do not commence installation until hygrometer readings show 60-70%.

Turn off underfloor heating during and for 48 hours either side of the work period. Wait 48 hours after laying is complete before turning on the underfloor heating. Allow the temperature to build up at a rate of 1°C day to a maximum of 27°C. Ensure the thermostat is fitted with a maximum temperature of 27°C.

3.12 ON-FLOOR HEATING, FLOATING APPLICATIONS

Check with the supplier of the on-floor heating. Floating installations may be installed directly over cables and elements when approved in writing by the on-floor heating and flooring suppliers.

Application - general

3.13 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - surface preparation - new

3.14 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.

3.15 PREPARATION, NEW PLYWOOD OR PARTICLEBOARD

Clear substrate of debris, machine sand to make level, then vacuum to remove dust. Refer to allowable surface tolerances.

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Application - floor underlays

3.16 INSTALLING PLYWOOD UNDERLAYS

Lay plywood sheets with joints staggered, with a 1mm gap between sheets and 2mm at perimeters. Use 18mm divergent staples at 100mm centres throughout the whole sheet and 30mm apart, 18mm in from the edges of the sheets. Punch staples below the surface and sand joints level.

Application - installation

3.17 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.

3.18 LAYING, FLOATING

Install 2mm foam underlay to the total floor area, in long, continuous runs, allowing to cove up walls by 50mm. Tape joints using moisture resistant tape, to create an impervious membrane. Install the timber floor strictly in accordance with the flooring supplier's stated requirements. Ensure the required expansion gap is left at perimeters and around fixed obstacles.

3.19 LAYING, STAIRCASES AND LANDINGS

Check for moisture content and suitability of substrate prior to installation. Adhesive fix flooring to stair treads, risers and landings.

3.20 EXPANSION GAPS, PERIMETERS

Calculate expansion gaps strictly to manufacturer's requirements, to suit the environment, size of the installation and product type.

3.21 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.

3.22 EXPANSION COVERS

Cover expansion joints using matching expansion joint covers supplied by flooring manufacturer.

Finishing

3.23 WAX COATING, UNFINISHED FLOORS

Apply two coatings of timber sealer and then a spirit based wax polish to the flooring supplier's requirements.

3.24 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

3.25 PROTECTION

Provide the following temporary protection of the finished work:

~

3.26 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.

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6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 RELATED WORK

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Refer to 6721 PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

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

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

Documents

1.3 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
AS/NZS 2311	Guide to the painting of buildings
AS/NZS 2312.1	Guide to the protection of structural steel against exterior atmospheric corrosion by the use of protective coatings - Paint Coatings
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 9001	Quality management systems - requirements
SNZ TS 3404	Durability requirements for steel structures and components
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Guidelines for the management of lead-based paint
MPNZA	Health and Safety Programme

Health and Safety at Work Act 2015

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS

Painters to be a member of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.

1.7 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 B	Sample C

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Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

1.8 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 is not possible then minimise hazards 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 put in place procedures for dealing with emergencies.

Refer to WorkSafe: Guidelines for the management of lead-based paint for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

1.9 MATERIAL SAFETY DATA SHEET

Obtain from each paint manufacturer the material safety sheet for each product used. Keep sheets on site and comply with the required safety procedures.

Warranties

1.10 WARRANTY

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

2 years: Warranty period

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

Performance

1.11 MANUFACTURER'S INSPECTION

Allow the paint manufacturers to inspect the work in progress and to take samples of their products from site if requested.

1.12 INSPECTION OF WORK

Inspection of the whole of the work at each of the stages scheduled may be made. Agree 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 PAINT TYPES

Use the manufacturer's complete system and only the products specified.

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2.2 MATERIALS GENERALLY

Use only the Manufacturer's products which are guaranteed for their consistency and performance under AS/NZS ISO 9001 and APAS approval, prepared, mixed and applied as directed in the Manufacturer's specification sheets, specification manuals and product data sheets.

2.3 THINNERS AND ADDITIVES

Only use thinners or additives within the stated limits for the particular situations specified.

Accessories

2.4 FILLERS

For recommendations on; fillers, stopping, paint strippers, cleaning agents, etching solutions, mould inhibitors, rust inhibitors, knotting and other commodities used for the surface preparation, refer to the manufacturer of the specified coating.

3 EXECUTION

Conditions

3.1 EXECUTION

To conform to manufacturer's requirements and those methods, practices and techniques contained in AS/NZS 2311 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry.

3.2 CORROSION PROTECTION SUPERVISION FOR STRUCTURAL STEEL

To AS/NZS 5131, 9.9.20, for corrosion protection of structural steel. Provide an Inspection and Test Plan (ITP) to AS/NZS 5131, 13.9.1, prior to commencement.

Corrosion protection painting to be supervised by a competent person.

3.3 PREPARE

Prepare surfaces to the coating manufacturer's requirements.

3.4 COATED SURFACES

Ensure that substrate surfaces are able to achieve the specified finish.

3.5 PRE-PRIMED SURFACES

Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.

3.6 BRUSH DOWN

Brush down surfaces immediately before application, to remove dust, dirt and loose material.

3.7 COMPATIBILITY

Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.

3.8 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.

3.9 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

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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.

3.10 ANCILLARY SURFACES

The coatings listed 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 instructions before proceeding.

3.11 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

3.12 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

Preparation - unpainted and pre-primed timber and wood based products

3.13 MOISTURE CONTENT

Ensure moisture content at the time of application is near to the equilibrium moisture content pertaining to the particular locality in which the timber is used, without any excessive moisture content gradient between core and surface.

3.14 PREPARING DRESSED TIMBER

Ensure dressed timber is smooth, free from raised or woolly grain, planing burrs or other machining defects. Slightly round or ease sharp edges to ensure they can be properly coated. Sand timber to bring up to a smooth finish along the direction of the grain. Sand timber back to new condition timber that has been weathered.

3.15 PREPARING ROUGH SAWN TIMBER

Thoroughly brush along the direction of the grain to remove dust and dirt.

3.16 PREPARING PRE-PRIMED TIMBER

Check pre-prime coat for damage, powdering, weathering or loss of adhesion. Where primer is sound, thoroughly brush along the direction of the grain to remove dust and dirt. If there is doubt, sand back and re-prime.

3.17 TIMBER SPECIES

Check that the preparation and paint system is suitable for the timber species.

3.18 PREPARING DAMAGE AND DEFECTS

Scrape clean loose or soft material holes, depressions, resin or gum pockets, knot holes, surface splits, checks, or any localised decay. Apply primer and/or sealer specified and fill these areas with linseed oil putty or other appropriate filler.

3.19 FIXINGS

Take timber fixings below the painted or clear finished surface. Leave corrosion resistant timber fixings flush with clear finished surfaces.

3.20 CLEANING

Remove grease and oil by wiping down with solvent or water-based degreasing agent. Remove resin by wiping down with solvent or water-based degreasing agent or heating and scraping. Remove sanding dust. Bad staining may be untreatable and require replacement of timber, discuss with paint manufacturer and main contractor.

Preparation - unpainted metal

3.21 PREPARING STEEL

All steel to AS/NZS 2312.1 and structural steel also to SNZ TS 3404.

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Remove loose rust and mill scale by hand-tool or power-tool cleaning. Remove more adherent rust and scale by abrasive blast cleaning or pickling. Use chemical pre-treatment to remove the last traces of rust and to inhibit rust formation.

3.22 PREPARING ZINC AND ALUMINIUM-ZINC ALLOY COATED STEEL

Remove grease, oil and other solvent soluble contaminants by wiping and/or brushing with mineral turpentine or white spirit. Wipe with a clean solvent. Allow to dry and proceed immediately with the next operation.

3.23 PREPARING ALUMINIUM

Remove grease, oil and dust by wiping and/or brushing with mineral turpentine or white spirit. Wash thoroughly using water with a few drops of detergent, then wash with clean water. Allow to dry and proceed immediately with the next operation.

Preparation - gypsum plaster

3.24 PREPARING GYPSUM PLASTER

Fill and sand small crevices and cracks. Surface moisture content not to exceed 12% at time of coating.

Preparation - painted surfaces generally

3.25 SURFACE PREPARATION

Refer to the Manufacturer's specification sheets and product data sheets. Carry out the preparatory work required by them for each of the substrates.

For interior surfaces such as paper faced plasterboard use the Manufacturer's recommended finishing compound as an aid to achieving a Level 5 finish.

3.26 MOULD

Sterilise surface mould by washing or sponging the whole surface with a one part sodium hypochlorite household bleach to three parts clean water solution. Allow bleach to act for 30 minutes and wash off with clean water. Wash cloths and sponges regularly in clean water. Reapplication may be necessary. Treat with anti-mould solution to the treatment manufacturer's requirements.

3.27 GAP FILLING

Fill cracks, holes, indented and damaged surfaces with putty, plaster filler, wood filler, or plastic wood, as appropriate and in accordance with the paint manufacturer's requirements. Allow to dry or set before sanding back level with the surface. Prime coat or seal the timber before using putty. Wet cement or gypsum base plasters before applying filler. Use only Portland cement base types, or water-insoluble organic-based gap fillers in exterior or wet areas.

Application - before applying final coatings

3.28 OFF-SITE WORK

Carry out off-site preparation and coating under cover, in a suitable environment and with adequate 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 permit air circulation and to prevent sticking of surfaces.

3.29 PRIMING JOINERY

Before priming preservative treated timber ensure that any cut surfaces have been retreated. Liberally coat end grain, allow to soak in and then recoat. Ensure LOSP. treated joinery has dried sufficiently to lose odour.

3.30 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

3.31 CONCEALED METAL SURFACES

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



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3.32 DOORS

Prime or seal and paint all six faces of doors before hanging.

3.33 BEAD GLAZING

Before glazing apply the first two coats, or the primer and one undercoat, to rebates of stained, varnished or painted joinery and beads.

3.34 PUTTY GLAZING

Follow putty manufacturers recommendations for application, drying, and painting. Ensure that the putty is fully protected by the coating system as soon as it is sufficiently hard.

Application - generally

3.35 PAINTING GENERALLY

Comply with the paint manufacturer's requirements and any additional requirements in this specification.

3.36 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

3.37 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- 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
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

3.38 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 paint in the specified sequence using the specified paint
- allow full drying time between coats to the paint manufacturer's requirements
- do not expose primers, undercoats and intermediate coats beyond manufacturers stated instructions 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

3.39 PAINT APPLICATIONS

Select brush, roller, or pad and apply paint to the requirements of the paint manufacturer and to obtain a smooth even coating of correct thickness, uniform gloss and colour.

3.40 DRYING TIME

Before handling or applying the next coat of paint, give each coat the full drying time as required by the paint manufacturer. Ensure that surfaces are dry and that condensation does not occur before the paint reaches surface-dry condition.

3.41 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Remove dust immediately before applying the next coat.

3.42 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the paint system specified.

3.43 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
- the specified 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, brush marks, ladder marks and blistering
- proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application

Completion

3.44 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at completion of the building works. Clean glass inside and out to a shining finish.

3.45 CLEAN EQUIPMENT

Use the Manufacturer's environmental wash system for the cleaning of water-based paint and plasters from brushes, rollers, plastering or spray equipment to separate the solids from the water component for safe disposal.

3.46 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.

3.47 REMOVE

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

3.48 REPLACE HARDWARE

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

4 SELECTIONS

4.1 SELECTIONS

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

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6711 PAINTING EXTERIOR

1 GENERAL

This section relates to the preparation of exterior unpainted and pre-painted surfaces, and the application of exterior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.

Refer to 6721 PAINTING INTERIOR for interior paint systems.

Documents

1.2 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web: ~
Email: ~
Telephone: ~
Facsimile: ~

Warranties

1.3 WARRANTY

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

2 years: 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

1.4 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~
Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

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2 PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3 EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4 SELECTIONS

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6721 PAINTING INTERIOR

1 GENERAL

This section relates to the preparation of interior unpainted and pre-painted surfaces, and the application of interior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

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
BPS	Building Product Specifications

1.3 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Warranties

1.4 WARRANTY

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

2 years:	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 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 B	Sample C
Sample description:	~	~	~
Sample type:	~	~	~
Number:	~	~	~
Location:	~	~	~
Supporting documentation:	~	~	~

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Reviewer:	Contract administrator ~	Contract administrator ~	Contract administrator ~
Time for review:	10 working days ~	10 working days ~	10 working days ~
Review criteria:	~	~	~

2 PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3 EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4 SELECTIONS

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7123 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 of buildings
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
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 fittings - 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 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
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

1.3 MANUFACTURER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Warranties

1.4 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

1.5 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.

1.6 PIPEWORK LAYOUTS

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1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

1.8 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.
- 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.

1.9 QUALITY CONTROL SYSTEM - LEAD FREE

If requested, by the contract administrator or consenting authority, provide test reports from IANZ or equivalent accredited testing facility confirming products that contain copper alloy and are used in contact with potable water for human consumption are lead free.

Performance

1.10 TESTING - TO NZBC G12/AS1

Test to NZBC G12/AS1, 7.6, Watertightness, for hot and cold water.

- Test to a pressure of 1500 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.

1.11 GAS CERTIFICATE OF COMPLIANCE

Provide a Certificate of Compliance (CoC) as required by the Gas (Safety and Measurement) Regulations 2010 to the owner, and when required provide a copy to the energy supplier before connection.

1.12 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

1.13 GAS APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.



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2 PRODUCTS

Materials

2.1 COPPER PIPE

To NZBC G12/AS1, 2 Materials. Copper pipe to NZS 3501, AS 1432 (type A, B & C) and AS 3688 for fittings

2.2 PVC-U PIPE

To NZBC G12/AS1, 2 Materials. PVC-U pipes and fittings to AS/NZS 1477 and PVC-U solvent cements and primers to AS/NZS 3879. Protect from sunlight. For cold water applications only.

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 fittings 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 CROSS LINKED POLYETHYLENE PIPE

To NZBC G12/AS1, 2 Materials. Cross Linked Polyethylene Pipe to AS/NZS 2492 and fittings to AS/NZS 2537.1, AS/NZS 2537.2, AS/NZS 2537.3 and AS/NZS 2537.4. Except for solid black PE-X, protect from sunlight.

2.6 DE-ZINCIFICATION RESISTANT WATER SUPPLY SYSTEM COMPONENTS

All copper alloy components to comply with G12/AS1 clause 2.2.3 and AS 2345.

2.7 WATER METER

To the requirements of the network utility operator.

2.8 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.

2.9 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, table 2, Selection of Backflow Protection and table 2A Containment Backflow Protection.

2.10 TEMPERING VALVE

Tempering valve to NZS 4617 or AS 4032.2 to NZBC G12/AS1.

2.11 HEADER TANKS

Pre-formed black polyethylene or stainless steel tank, complete with access opening and lid and overflow tray.

2.12 EXPANSION VESSEL

Expansion vessel to NZBC G12/AS, 6.6.7 Expansion Vessels or AS/NZS 3500.4 5.9 Valves and expansion vessels.

Materials - Hot water heating appliances

2.13 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305, NZS 4606.1, NZS 4606.2 and NZS 4606.3,electric storage cylinder, insulated and complete with required fittings.

2.14 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE

To NZS 4305, and NZS 4602, copper thermal storage cylinder insulated and complete with pressure reducing valve and required fittings.

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2.15 ELECTRIC HOT WATER CYLINDER, UNDER-SINK, LOW PRESSURE

To NZS 4305, and NZS 4602, copper thermal storage cylinder insulated and complete with required fittings.

2.16 ELECTRIC HOT WATER HEATER, INSTANTANEOUS TYPE

Instantaneous flow unit complete with required fittings to AS/NZS 60335.2.35.

2.17 ELECTRIC BOILING CYLINDER, WALL MOUNTED

To NZS 4305, wall-mounted boiling water heater in pre-finished cabinet, complete with tap draw off.

2.18 GAS HOT WATER HEATER, STORAGE TYPE

Insulated cylinder to NZS 4305 and Gas (Safety and Measurement) Regulations with an integral gas burner and flue.

2.19 GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Continuous flow unit with an integral gas burner and flue to NZS 4305 and Gas (Safety and Measurement) Regulations.

2.20 HEAT PUMP WATER HEATER - INTEGRAL SYSTEM

Heat pump water heating system, with insulated storage cylinder and compressor/condenser /evaporator, complete with required fittings.

2.21 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

2.22 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZS 4305 and AS/NZS 3500.4.

2.23 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

Fire resistant accessories

2.24 FIRE STOPPING SYSTEMS

Refer to 7382 FIRE STOPPING SYSTEMS for fire stopping systems of pipe penetrations through fire walls and floors.



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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 PVC-U PIPE

Solvent welded joints using spigots and sockets, flanged joints and seal ring compression joints to NZBC G12/AS1 and AS/NZS 2032.

3.12 JOINTING POLYBUTYLENE PIPE

Aluminium clamped, seal ring compression or push fit "O" ring seal jointing to pipe system manufacturer's requirements.

3.13 JOINTING POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to NZBC G12/AS1 and AS/NZS 2033.

Application - Pipework installation

3.14 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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3.15 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.

3.16 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 NZBC G12/AS1.

3.17 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to metallic water pipes and metallic sanitary fixtures as required by NZBC G12/AS1, 9.0 Equipotential bonding and/or AS/NZS 3000, 5.6 Equipotential bonding.

3.18 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.

3.19 PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Application - Hot water systems

3.20 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 4606 for Valve-vented systems.

3.21 SEISMIC RESTRAINTS - GAS WATER HEATING APPLIANCES

Gas appliances to be restrained to manufacturer's requirements, NZBC G11/AS1 and AS/NZS 5601.1.

3.22 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.

3.23 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to NZS 4305, AS/NZS 3500.4, 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.

3.24 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.11 or NZS 4607 for Valve-vented systems.

3.25 INSTALL LOW PRESSURE UNDER-SINK HOT WATER CYLINDER

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6.11 Water heater installation. Connect to sink tap.

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3.26 INSTALL ELECTRIC HOT WATER HEATER, INSTANTANEOUS TYPE

To AS/NZS 3500.4.

Install the unit to the manufacturer's requirements, provide isolating valve on cold water feed.

3.27 INSTALL WALL-MOUNTED BOILING CYLINDER

Install to the cylinder manufacturer's stated requirements. Locate where shown.

3.28 INSTALL GAS HOT WATER HEATER, STORAGE TYPE

Install complete with the necessary fittings to the manufacturer's requirements and in accordance with NZBC G12/AS1, 6. 11 Water heater installation. Install flue in accordance with the manufacturer's details and requirements and, AS/NZS 5601.1 (for internal or external appliances) or NZBC G4/AS1 (internal appliances). Refer to section 7221 GAS APPLIANCES for installation of gas appliances.

3.29 INSTALL GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Install complete with the necessary fittings to the manufacturer's requirements and in accordance with NZBC G12/AS1, 6. 11, Water heater installation. Install flue in accordance with the manufacturer's details and requirements and, AS/NZS 5601.1 (for internal or external appliances) or NZBC G4/AS1 (internal appliances). Refer to section 7221 GAS APPLIANCES for installation of gas appliances.

3.30 INSTALL HEAT PUMP WATER HEATER - INTEGRAL SYSTEM

Install complete with the necessary fittings to the manufacturer's installation instructions.

3.31 INSTALL HEAT PUMP WATER HEATER - SPLIT SYSTEM

Install complete with the necessary fittings and pipe work, to the manufacturer's installation instructions.

3.32 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.33 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.

3.34 INSTALL EXPANSION VESSEL

Install expansion vessel to NZBC G12/AS, 6.6.7 Expansion Vessels or AS/NZS 3500.4, 5.9 Valves and expansion vessels.

Application - Fire resistant work

3.35 FIRE STOPPING SYSTEMS

Refer to 7382 FIRE STOPPING SYSTEMS for fire stopping devices for pipe penetrations through fire walls and floors.

Installation - valves

3.36 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.

3.37 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.

3.38 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.



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Completion

3.39 LABEL
Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.40 CLEAN IN-LINE FILTER
Clean all in-line filters on completion of works.

3.41 REPLACE
Replace damaged or marked elements.

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

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

4 SELECTIONS

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7150 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 7120 or 7123 HOT AND COLD WATER SYSTEM for hot water cylinders.

Refer to 7420 or 7421 SANITARY SYSTEMS for the supply and fitting of waste disposal pipework
Refer to the electrical section/s for electrical connection of accessories.

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 G1/AS1	Personal hygiene
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
NZBC G13/AS1	Foul water
NZBC G13/AS3	Plumbing and drainage
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.1	Plumbing and drainage - water services
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 4223.3	Glazing in buildings - Human impact safety requirements

Plumbers, Gasfitters and Drainlayers Act 2006

1.3 MANUFACTURER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Manufacturer/supplier contact details
Company:
Web:
Email:
Telephone:

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	For sanitary fixtures tapware and accessories

- 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.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For installation

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)

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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

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Workers or supervisors of work are required to be a Certifying Plumber under the Plumbers, Gasfitters and Drainlayers Act 2006. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 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.

1.9 NO SUBSTITUTIONS

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

1.10 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

1.11 QUALITY CONTROL SYSTEM - LEAD FREE

If requested, by the contract administrator or consenting authority, provide test reports from IANZ or equivalent accredited testing facility confirming products that contain copper alloy and are used in contact with potable water for human consumption are lead free.

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 SANITARY ACCESSORIES

Refer to SELECTIONS for product selection.

2.5 ELECTRICAL SANITARY ACCESSORIES

Refer to SELECTIONS for product selection.

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.

Ensure water supply and drainage pipework match the requirements of selected fixtures without force or distortion.

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION REQUIREMENTS INCLUDING NZBC G13/AS1

Install to NZBC G1/AS1, AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3, NZBC G12/AS1, NZBC G13/AS1, NZBC E3/AS1 and to the fixture manufacturer's installation requirements for each component.

3.6 INSTALLATION SANITARY FIXTURES

Carry out preparatory and assembly work, including connections to supply and drainage services and the application of all required slurries/bedding and sealants in sequence.

Fit the sanitary fixture in position, plumb, level, flush and rigid without stressing the attachment points of the component. Fixings to be corrosive resistant.

Seal between all sanitary fixtures and floors, wall linings, fixtures and the tops they are in, the tops and wall linings, to NZBC E3/AS1, 3.2. Fixtures include toilets, urinals, baths, basins, tubs, sinks. Tops include, vanities, bath surrounds, sink benches, etc, and their upstands. Form joint or seal between shower bases or urinals and impervious wall linings to NZBC E3/AS1, 3.3.

3.7 INSTALLING URINALS - WATERLESS

Ensure discharge will not go through metal pipework/drains. Install the cartridge in each unit, charge with fluid and test for proper operation.

3.8 INSTALLING SPA BATHS

Connect up interconnected discharge jets to supply, connect waste and overflow to drainage services. Fit electric motor and pump so as to prevent vibration and noise.

3.9 INSTALLING SHOWER OR BATH DOOR AND SCREEN

To 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.

3.10 INSTALLATION TAPWARE

In accordance with the manufacturer's requirements. Maintain safe water temperatures to comply with NZBC G12/AS1, 6.14 Safe water temperatures.

3.11 SEAL SHOWER TAPWARE

Seal shower wall lining penetrations such as shower head, shower hose, mixer, taps etc to NZBC E3/AS1, Fig. 6.

3.12 SANITARY APPLIANCES

Install and provide all required connections to sanitary appliances in accordance with manufacturers requirements.

3.13 EARTHING OR EQUIPOTENTIAL BONDING METALLIC FIXTURES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to metallic water pipes and metallic sanitary fixtures using an earth bonding conductor to requirements of NZBC G12/AS1, 9.0 Equipotential bonding and/or AS/NZS 3000, 5.6 Equipotential bonding.

Application - sanitary accessories

3.14 INSTALLING ACCESSORIES

Fit specified fittings firmly in place, all plumb and level.

Locate 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



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3.15 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.

3.16 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 & Commissioning

3.17 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.



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7221 GAS APPLIANCES

1 GENERAL

This section relates to the supply and installation of gas-powered appliances using low pressure gas.

1.1 RELATED WORK

Refer to ~ for ~

Refer to hot and cold water system section for gas water heaters

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 of buildings
NZBC G10/AS1	Piped services
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS/NZS 3500.4	Plumbing and drainage - Heated water services
AS/NZS 5601.1	Gas Installations - general installations

Electricity (Safety) Regulations 2010 (Reprint as at 4 April 2016)
Gas (Safety and Measurement) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006

1.3 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years:	For; range, wall oven, hob
~ years:	For; central heating, room heater, fireplace

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 COMPLY

Comply with the Gas (Safety and Measurement) Regulations 2010, Electricity (Safety) Regulations 2010 and the network utility operator's/gas suppliers requirements. Give notices for inspections and carry out tests as required.

1.6 QUALIFICATIONS

Gasfitters to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying gasfitter under the Plumbers, Gasfitters and Drainlayers Act 2006.

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Performance

1.7 FINAL INSPECTION AND TEST

Submit the work for inspection and test and prove to the satisfaction of the network utility operator that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.

1.8 GAS CERTIFICATE OF COMPLIANCE

Provide a Gasfitting Certificate of Compliance as required by Clause 46 and 47 of the Gas (Safety and Measurement) Regulations 2010 and when required provide a copy to the energy supplier.

1.9 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

1.10 APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

2 PRODUCTS

Materials

2.1 GAS APPLIANCES

Refer to SELECTIONS for product selection.

2.2 GAS TYPE

All appliance to be specifically suited to the gas type supply, refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 GENERALLY

Carry out the whole of this work to the requirements of NZBC G10/AS1, NZBC G11/AS1 and AS/NZS 5601.1.

Application

3.2 INSTALL GAS APPLIANCES

Fit and connect gas appliances to AS/NZS 5601.1, complete with isolation valves as required to the appliance manufacturer's requirements.

3.3 INSTALL FLUES

Install flues in accordance with the manufacturer's details and requirements, and AS/NZS 5601.1 (for internal or external appliances) or NZBC G4/AS1 (internal appliances)

3.4 SEISMIC RESTRAINTS - GAS APPLIANCES

Where gas appliances require seismic restraints, restrain to manufacturer's requirements, NZBC G11/AS1 and AS/NZS 5601.1.

3.5 CONNECT UP GAS HOT WATER HEATERS

Connect gas hot water heaters supplied and fitted under Hot and Cold Water system section or by gas fitter, to NZBC G10/AS1, G11/AS1, G12/AS1 or AS/NZS 3500.4 as modified by NZBC G12/AS3 and to AS/NZS 5601.1 and the water heater manufacturer's requirements.

Completion

3.6 REPLACE

Replace damaged, cracked or marked elements.

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3.7 LEAVE

Leave appliances clean and in full working order and leave work to the standard required by following procedures.

3.8 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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7352 TYPE 1 DOMESTIC SMOKE ALARM SYSTEMS

1 GENERAL

This section relates to the installation and commissioning of Type 1 domestic smoke alarm systems.

It includes:

- Power supply
- Associated components to complete the installation

1.1 RELATED WORK

Refer to ~ for ~

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:

dB(A)	A-weighted decibel
VAC	Volts alternating current
VDC	Volts direct current

The following definitions apply specifically to this section:

Heat alarm	Integral device containing heat detector and alarm sounding feature.
Hush-button	Feature that temporarily silences audible alarm signals triggered by conditions resembling a fire i.e. steam or dust but not generated by sources of fire (nuisance alarm).
Smoke alarm	Integral device containing smoke detector and alarm sounding feature.
Type 1	To NZBC C/AS1 Type 1 is a single smoke alarm or multiple interconnected smoke alarm devices each containing smoke detector and alarm sounding feature.

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 for buildings with sleeping (residential) and outbuildings (risk group SH)
AS/NZS 1125	Conductors in insulated electric cables and flexible cords
AS 1603.17	Automatic fire detection and alarm systems - Warning equipment for people with hearing impairment
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS/NZS 3000	Electrical Installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3808	Insulating and sheathing materials for electric cables
NZS 4512	Fire detection and alarm systems in buildings
NZS 4514	Interconnected smoke alarms for houses
AS/NZS 5000.2	Electric cables - Polymeric insulated - For working voltages up to and including 450/750 V
BS 5446.3	Detection and alarm devices for dwellings, specification for fire alarm and carbon monoxide alarm systems for deaf and hard of hearing people

Electricity (Safety) Regulations 2010



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1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Manufacturer/supplier contact details

Company: ~
Web: ~
Email: ~
Telephone: ~

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years For ~

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 QUALIFICATIONS - ELECTRICAL WORK

Electrical work to be carried out by workers appropriately qualified to Electricity (Safety) Regulations 2010 requirements, and to be inspected, tested and certified by a licensed electrical worker. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 TYPE 1 DOMESTIC SMOKE ALARM SYSTEM

Comply with NZBC C/AS1 providing Type 1 domestic smoke alarm system to NZS 4514.

1.9 NO SUBSTITUTION

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

1.10 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of manufacturer's operation and maintenance information as electronic PDF format documents. Documents to include maintenance, checks, tests and replacement requirements to NZS 4514, Maintenance.

Provide this information prior to practical completion.

2 PRODUCTS

Alarm devices

2.1 MULTI-SENSOR SMOKE ALARM

Multi-sensor smoke alarm to NZS 4514 comprising two or more detection technologies i.e. ionisation and photoelectric smoke sensor or photoelectric smoke and heat sensor. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply. Refer to SELECTIONS.

2.2 PHOTOELECTRIC SMOKE ALARM

Photoelectric smoke alarm to NZS 4514 comprising photoelectric smoke detecting technology. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply. Refer to SELECTIONS.

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2.3 HEAT ALARM

Heat alarm to NZS 4514 comprising heat detecting technology. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply. Refer to SELECTIONS.

Components

2.4 ACCESSIBLE HUSH-BUTTON

Hush-button to manufacturer's requirements located at readily accessible location, i.e. a hallway. Refer to SELECTIONS.

2.5 CABLES

Tough plastic sheathed copper wire cable to AS/NZS 5000.2, AS/NZS 3808 and AS/NZS 1125. Minimum 1mm² solid cable for 230VAC mains powered alarm devices and minimum 0.5mm² stranded cable for extra-low voltage (less than 32VAC or 50VDC) powered alarm devices to NZS 4514.

2.6 INTERNAL BATTERY - HARD WIRED ALARMS

To NZS 4514, Power Supplies. Batteries contained within alarm device to be of type nominated by the smoke alarm manufacturer and if inaccessible to be rechargeable.

2.7 EXTERNAL BATTERY - HARD WIRED ALARMS

To NZS 4514, Power Supplies. Batteries external to alarm device to comply with NZS 4512 or AS/NZS 2201.1 where alarm devices are integrated in intruder alarm systems.

2.8 SEALED BATTERY - WIRELESS ALARMS

To NZS 4514, Power Supplies. Long-life (minimum 10 years), non-removable, sealed batteries.

2.9 SENSORY STIMULATING ALARM DEVICES

Sensory stimulating alarm devices such as visual or vibrating alerting devices to AS 1603.17 and BS 5446.3. Refer to SELECTIONS.

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.

3.4 COMPATIBILITY

Confirm all interconnected devices are compatible.

Installation - generally

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 LOCATION & SPACING

Location and spacing of smoke alarms to NZS 4514. Install smoke alarms within 10m of each other and a maximum of 5m away from any wall.

3.7 AUDIBLE ALARM

Install smoke alarms so that audible alarm sound pressure level when measured at 1.8m height is between 75dB(A) and 110dB(A) to NZS 4514, Alarm Signals.

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3.8 POWER SUPPLY

Connect hard wired alarms to either permanently energised 230VAC mains fed from permanently energised (unswitched) circuit i.e. lighting or to external direct current (DC) power supply maintained from 230VAC mains to NZS 4514, Power Supplies.

Installation - smoke alarm system

3.9 INSTALL CABLES

Install smoke alarm system's hard wiring to AS/NZS 3000, NZS 4514 and manufacturer's instructions.

3.10 INSTALL BATTERIES

Install primary and secondary batteries to NZS 4514 and manufacturer's instructions. Indelibly mark batteries with the date of installation.

3.11 INSTALL ALARMS

Install alarm devices to manufacturer's instructions fitted neatly and without damage to the surrounding finish using brackets and mounts supplied or recommended by the manufacturer.

3.12 INSTALL SENSORY STIMULATING ALARM DEVICES

Install sensory stimulating alarm devices to manufacturer's instructions and to comply with AS 1603.17 and BS 5446.3.

3.13 INSTALL ACCESSIBLE HUSH-BUTTON

Install accessible hush-button to manufacturer's instructions fitted neatly and without damage to the surrounding finish using brackets and mounts supplied or recommended by the manufacturer.

3.14 INTERCONNECT

Interconnect devices so that when one activates all alarms sound.

Completion & Commissioning

3.15 COMPLETION MATTERS

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

3.16 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

Completed smoke alarm system to be inspected, tested and where required for electrical installations certified to NZS 4514, including (but not limited to):

- Correct location of alarm devices
- Correct sound pressure level of audible alarm signals
- Correct installation to manufacturer's installation instructions
- Correct and fault free operation of the smoke alarm system and interconnected devices

4 SELECTIONS

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

7411 RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to rainwater disposal systems including spouting and downpipes in:

- metal
- PVC

1.1 RELATED WORK

Refer to ~ for ~.

1.2 ABBREVIATIONS AND DEFINITIONS

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

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
Spouting	Roof gutter bracketed off the roof edge or fascia.
Gutter	Internal gutter or gutter formed as integral part of the roof fabric.

Documents

1.3 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

1.4 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~
Facsimile:	~

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions:

10 Years	For failure of coating adhesion
10 Years	For weatherproofing by material penetration

Form:	Manufacturer's standard warranty form
From:	Commence the warranty from the date of completion of installation

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

1.6 WARRANTY - INSTALLER/APPLICATOR

Warrant this work under normal environmental and use conditions against:

3 years:	For weatherproofing by substandard workmanship:
From:	Commence the warranty from the date of completion of installation

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Form: Installers standard warranty form

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

Requirements

1.7 QUALIFICATIONS

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

Performance

1.8 TEST

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

2 PRODUCTS

Materials - uPVC

2.1 UPVC SPOUTING

Rainwater system to AS 1273, profile, jointing, brackets, rainwater heads and fittings brand matched and complete to the manufacturer's requirements. Refer to SELECTIONS for type.

2.2 UPVC DOWNPIPES

To suit the spouting system, pipes solvent cement jointed and complete with stand-off brackets, galvanized screws and accessories, brand matched and complete to the manufacturer's specifications. Refer to SELECTIONS for type.

Materials - metal

2.3 SPOUTING

Complete with matching brackets to suit spouting and screws. Refer to SELECTIONS for type.

2.4 SPOUTING BRACKETS

All exposed brackets to be colour matched before installation. Brackets to be hot-dipped galvanised, zincalume, aluminium, stainless steel or brass as specified and to suit application. Electroplated components are not acceptable. Refer to SELECTIONS for type.

2.5 DOWNPIPES

Complete with stand-off brackets, screw fixed. Refer to SELECTIONS for type.

Materials - fascia/barge system

2.6 CONCEALED FASCIA/BARGE SPOUTING SYSTEM

Fascia/barge type complete with jointing, brackets, fittings and accessories, brand matched and complete to the manufacturer's requirements. Refer to SELECTIONS for type.

2.7 EXTERNAL FASCIA/BARGE SPOUTING SYSTEM

Fascia/barge type complete with jointing, brackets, fittings and accessories, brand matched and complete to the manufacturer's requirements. Refer to SELECTIONS for type.

Components

2.8 DROPPERS

Metal or uPVC droppers, compatible with spouting material and sized to fit inside the downpipe.

2.9 FASTENERS GENERALLY

Minimum Class 4 durability and not less than the roofing material being fixed.

2.10 RIVETS

Sealed aluminium, minimum diameter 4mm.

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2.11 SEALANT

MS Polymer sealant.

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

3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 18 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. Do not allow copper downpipes to discharge onto lower galvanized or zinc aluminium coated steel roofs.

Application - uPVC

3.5 INSTALL UPVC SPOUTINGS

From high points fix brackets true-to-line to give a fall of 1mm every 2 metres to outlets. Allowing for necessary expansion, fit expansion joiners, assemble and fit spouting to brackets complete with all accessories solvent welded or rubber sealed.

3.6 INSTALL UPVC DOWNPIPES

Assemble downpipes, solvent welded complete, fit to outlets, galvanized screw fix with pipe clips to rigidly stand 25mm off the wall, plumb and discharging into the stormwater gully or pipe inlet to the downpipe manufacturer's required practice.

Application - metal

3.7 INSTALLATION GENERALLY

Install to NZMRM CoP recommendations where not otherwise specified.

3.8 INSTALL VALLEY GUTTERS

Attach valley gutters to valley boards by clips allowing for thermal movement to NZMRM CoP, clause 5.6, **Valley Gutters**. Separate valley gutter from valley boards with a layer of bituminous roof underlay.

3.9 INSTALL SECRET GUTTERS

Install secret gutters to fall allowing for thermal movement to NZMRM CoP, clause 5.5.7 **Secret Gutters**. Rivet and seal joints with MS Polymer sealant.

3.10 INSTALL METAL SPOUTING

Establish minimum falls necessary (minimum 1:500, 2mm in 1 metre) to outlets to prevent ponding and screw fix brackets, true to line at 750mm centres maximum for external gutters less than 175mm wide and at 600mm centres maximum for gutters 175mm to 300mm wide. In areas where snow fall is possible the centres should be reduced to 600mm maximum. Lap spouting joints a minimum of 40mm, silicone seal between surfaces and pop rivet to the manufacturer's recommendations. 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 NZMRM CoP recommendations.

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3.11 INSTALL PRE-PAINTED METAL SPOUTING

Establish minimum falls necessary (minimum 1:500, 2mm in 1 metre) to outlets to prevent ponding and screw fix brackets true-to-line at 750mm centres maximum for external gutters less than 175mm wide and at 600mm centres maximum for gutters 175mm to 300mm wide. In areas where snow fall is possible the centres should be reduced to 600mm maximum. Lap spouting joints a minimum of 40mm and silicone seal and pop rivet to the manufacturer's recommendations. Cut out neatly for and fit the pre-formed downpipe dropper and silicone seal around the lap joint. All installation to NZMRM CoP recommendations.

3.12 INSTALL EXTERNAL FASCIA/BARGE SPOUTING SYSTEM

Install concealed fascia brackets to rafters with either screws or nails and fit fascia to a level line. Fit gutter brackets to fall to outlet. Cut and form corner junctions and barge junctions and fit spouting rigidly to brackets. Cut out neatly for and fit pre-formed downpipe droppers. Silicone seal and pop-rivet all lap joints. All installation to NZMRM CoP recommendations.

3.13 INSTALL DROPPERS

Install either 2 outlets or one outlet and an overflow to each spouting section. Cut out neatly for and fit the pre-formed downpipe dropper and rivet and seal around the joint. All installation to NZMRM CoP recommendations.

3.14 INSTALL METAL DOWNPIPES

Form downpipes complete with angle bends as needed with joints lapped and sealed. Screw fix with pipe clips to rigidly stand off the wall plumb and discharging into stormwater gully or inlet pipe. All installation to NZMRM CoP recommendations.

3.15 INSTALL DOWNPIPE SPREADERS

Install downpipe spreaders where required to NZMRM CoP, clause 5.7.1, **Downpipe Spreaders**. Provide spreaders to downpipes that discharge on to a lower roof. Ensure spreaders do not discharge directly over fasteners or laps. Spreaders to have holes equalling twice the diameter of the downpipe.

3.16 INSTALL SUMPS

Install sumps where required to NZMRM CoP, clause 5.8, **Sumps**.

3.17 INSTALL RAINWATER HEADS

Install rainwater heads where required to NZMRM CoP, clause 5.8.1, **Rainwater Heads**.

3.18 INSTALL OUTLETS AND OVERFLOWS

Install outlets and overflows where required to NZMRM CoP, clauses 5.8.2, **Outlets and Overflows.**

3.19 INSTALL SUMP PROTECTION

Install leaf guards of the same area as the sump. Set the leaf guard above the calculated level of flow; not directly in the outlet.

Application - copper

3.20 INSTALL COPPER SPOUTING

From high points fix brackets true-to-line to give a fall of 1mm every 2 metres to outlets. Allowing for necessary expansion, assemble and fit spouting to brackets complete with outlets. Lap all joints 40mm and solder, ensuring the joint is soldered throughout the full girth and extent of the lap.

3.21 INSTALL COPPER DOWNPIPES

Form downpipes complete with offsets and shoes as needed with all joints lapped and soldered. Brass screw fix with copper pipe clips to rigidly stand 25mm off the wall, plumb and discharging into the stormwater gully or pipe inlet.

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Application - concealed fascia/barge spouting system

3.22 INSTALL CONCEALED FASCIA/BARGE SPOUTING SYSTEM - NZBC E1/AS1

Ensure rafters/outriggers are true-to-line and face and fix stand-off brackets before roofing is in place. Cut fascia/barge to required length, seal edges and clip fit rigidly to brackets. Fit corner soaker joints. Cut spouting to length to form folded lap joints elsewhere complete with downpipe droppers and expansion joints for thermal movement, all silicone sealed and riveted. Install overflows equal to the downpipe cross section area at rainwater heads and downpipe locations as required by the spouting manufacturer. Install to NZBC E1/AS1 and completed to the spouting manufacturer's required practice and fixed by the spouting manufacturer's approved installers.

3.23 INSTALL CONCEALED FASCIA/BARGE SPOUTING SYSTEM - AS/NZS 3500.3 & NZBC E1/AS2

Ensure rafters/outriggers are true-to-line and face and fix stand-off brackets before roofing is in place. Cut fascia/barge to required length, seal edges and clip fit rigidly to brackets. Fit corner soaker joints. Cut spouting to length to form folded lap joints elsewhere complete with downpipe droppers and expansion joints for thermal movement, all silicone sealed and riveted. Install overflows equal to the downpipe cross section area at rainwater heads and downpipe locations as required by the spouting manufacturer. Install to AS/NZS 3500.3 as modified by NZBC E1/AS2 and completed to the spouting manufacturer's required practice and fixed by the spouting manufacturer's approved installers.

Completion

3.24 REPLACE

Replace damaged or marked elements.

3.25 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.

3.26 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS



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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 RELATED WORK

Refer to ~ for ~

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

NZMRM	New Zealand Metal Roofing Manufacturers Inc
ASA	Acrylonitrile styrene acrylate plastic

Documents

1.3 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

1.4 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

1.5 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

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website .
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

~ years For Allproof Industries balcony and roof drainage installation

- 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 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.

1.8 NO SUBSTITUTIONS

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

1.9 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.

1.10 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

1.11 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.

1.12 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.

1.13 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 ROOF DRAINS - LARGE DIAMETER BRONZE

Allproof Industries Cast Bronze Roof Drains with removable grates for easy down-pipe access without disturbing membrane. Bronze base flange fits inside pipe with o-ring seal. Suits pipe sizes 65mm, 80mm, 100mm, 150mm and 200mm. Refer to SELECTIONS for options.

2.2 ROOF DRAINS - SMALL DIAMETER BRONZE

Allproof Industries Cast Bronze Roof Drains with removable grates for easy down-pipe access without disturbing membrane. Bronze base flange fits inside pipe with o-ring seal. Suits pipe sizes 50mm, 65mm, 80mm, 100mm. Refer to SELECTIONS for options.

2.3 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.

2.4 VINYLRITE THICK WALL - BALCONY DRAIN

Allproof Industries small diameter, thick wall PVC flange roof and/or balcony drain. Compatible with a heat applied or liquid based waterproof membrane. Option of domed and overflow in black (carbon infused PVC for UV resistance) Stainless steel and brass, plus the option of a flat grate in a PVC or bronze finish. Refer to SELECTIONS for options.

2.5 VINYLRITE ROOF - ROOF DRAIN

Allproof Industries Vinylrite, a high quality PVC drain, with cam-lock grate for easy waste access without disturbing vinyl/membrane. Base flange fits inside 50mm, 80mm and 100mm pipe. Clamp ring/grate feature flush finish with membrane. Refer to SELECTIONS for options.

2.6 PARAPET DRAIN

Allproof Industries Parapet Drain including bronze base flange, clamping ring and 100mm outlet. Flat grate and domed grate options available. Refer to SELECTIONS for options.

2.7 SCUPPERS

Allproof Industries scuppers made from stainless steel, HDPE plastic or synthetic rubber applied as a horizontal drain with free waterfall or to discharge into an Allproof rainwater head. Refer to SELECTIONS for options.

2.8 RAINWATER HEADS

Refer to SELECTIONS for rainwater head option.

Materials - full stainless steel rainwater system

2.9 ALLPROOF RAINWATER HEADS

Allproof Industries 316 stainless steel rainwater heads designed to work in conjunction with Allproof custom made joiners and stainless downpipe range. Available in two sizes to suit downpipe size and three Allproof Classic designs. Refer to SELECTIONS for rainwater head options (Classic 1, 2 and 3) and sizes.

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.

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 CAST BRONZE ROOF DRAINS

Install Allproof Cast Bronze Roof Drains in accordance with Allproof Industries Roof & Balcony Drainage Systems Installation Details.

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3.5 INSTALL SUREFLOW ROOF OUTLET

Install Allproof Sureflow roof outlets in accordance with Allproof Industries Roof & Balcony Drainage Systems Installation Details.

3.6 INSTALL VINYLRITE THICK WALL BALCONY DRAIN

Install Allproof Vinylrite thick wall balcony drain in accordance with Allproof Industries Roof & Balcony Drainage Systems Installation Details.

3.7 INSTALL VINYLRITE ROOF DRAIN

Install Allproof Vinylrite roof drain in accordance with Allproof Industries Roof & Balcony Drainage Systems Installation Details.

3.8 INSTALL ALLPROOF STAINLESS STEEL RAINWATER SYSTEM

Install rainwater system in accordance with Allproof Industries Roof & Balcony Drainage Systems Installation Details.

3.9 INSTALL RAINWATER HEAD

Install rainwater head in accordance with manufacturer's installation details.

3.10 INSTALL PARAPETS

Install Allproof parapets in accordance with Allproof Industries Roof & Balcony Drainage Systems Installation Details.

3.11 INSTALL SCUPPERS/ OVERFLOWS

Install Allproof scupper/overflow in accordance with Allproof Industries Roof & Balcony Drainage Systems Installation Details.

Installation generally;

- Insert the Scupper Drain in the hole through the wall and at the same time mark the point to cut in relation to the thickness of the wall.
- Install with a gradient of 3°, built into the scupper drain.
- Fasten Scupper to substrate mechanically.
- When installing into rainwater head, the cutting of the Scupper shaft to be cut at 45° with the top edge longer than the bottom.
- Lay waterproofing membrane over Scupper inlet. Welding or adhering membrane to Scupper flange can be done with heat torch or adhesives depending on membrane type. Ensure adhesion to whole flange surface.
- Cut membrane around or dish into Scupper shaft.

Installation - connection

3.12 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.

3.13 CLEAN

Clean and flush out the whole installation and remove all silt and debris before handing over.

Completion & Commissioning

3.14 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.



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7421AI ALLPROOF INTERIOR FLOOR WASTE SYSTEMS

1 GENERAL

This section relates to **Allproof Industries** interior floor waste systems suitable for residential and commercial applications.
It includes:

- Vision series shower channel kit
- Tile waste kit
- Vinyl waste kit
- Cyclone waste kit
- Easy clean trap floor waste kit
- Revolver waste kit
- Flange and grate system (flange and grate combo only, not a full kit)
- Grate, flange and floor waste gully components necessary to complete the installation

1.1 RELATED WORK

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures.

Refer to 7420 and 7421 SANITARY SYSTEMS for above ground gravity flow sanitary systems

Documents

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 G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and 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 interior floor waste system brochures
Allproof Industries interior floor waste system technical details
Allproof Industries interior floor waste system installation guide.

Manufacturer/supplier contact details

Company:	**Allproof Industries**
Web:	www.allproof.co.nz
Email:	info@allproof.co.nz
Telephone:	09 481 8020

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5-50 years	For Allproof Industries interior floor waste 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 purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 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.

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1.6 NO SUBSTITUTIONS

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

1.7 PIPEWORK LAYOUTS

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1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

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Provide this information prior to practical completion.

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:

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

Compliance information

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

Performance

1.11 TESTING

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.

2 PRODUCTS

Materials - Allproof floor waste kit systems

2.1 VISION SERIES SHOWER CHANNEL KIT

Allproof Vision series shower channel kit comprised of the following:

- Stainless steel grate and channel with a central outlet
- VF80 leak control flange
- 80mm x 50mm Floor waste gully standard, 80mm x 65mm available
- Channels available in 4 stock lengths, 5 grate options, and custom colour powder coating options.
- Customized lengths and outlet locations available

Refer to SELECTIONS for options.

2.2 EASY CLEAN TRAP FLOOR WASTE KIT - FOR TILE

Allproof easy clean trap floor waste kit - Tile Install comprised of the following:

- Cyclone puddle flange with threaded spigot
- Internal trap/gully with removable easy clean bucket
- Squat 115mm install depth – 88 degree, 50mm outlet
- Grates - 13 options available

Refer to SELECTIONS for options.

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Materials - Allproof floor waste systems, flange and grate combo only

2.3 CAST BRONZE VINYL FLANGE AND GRATE

Allproof cast bronze vinyl flange and grate system comprised of the following:

- Base flange - fits inside 50mm, 80mm and 100mm pipe riser
- Outlet range includes 50mm, 50mm/90° outlet, 65mm, 65mm/90° outlet, 80mm, 100mm and 100mm double strainer
- Cam-lock grate
- Vinyl-waterproofing membrane - clamped using 3 x stainless steel screws and clamp ring
- Clamp ring / grate finished flush with flooring
- Grates - 4 options and 4 finishes available

Refer to SELECTIONS for options.

2.4 VINYL CLAMPING CHANNEL - FOR SHOWER

Allproof vinyl clamping channel comprised of the following:

- Custom made channel constructed of 304 stainless steel
- 80mm O-ring outlet to suit i.d. PVC and HDPE
- Grate options - Wedge Wire and LAS

Refer to SELECTIONS for options.

Components - grates

2.5 ELEGANCE GRATE

Allproof Elegance grates with features as follows:

- Grates - 8 stainless steel design options
- Compatible with Tile Shower Waste Kit, Revolver and 100mm Cyclone Flange
- Suits 80mm or 100mm outlets
- stainless steel standard and custom colour powder coating options
- 2 metallic finishes available on SS7 grate only

Refer to SELECTIONS for options.

2.6 KAITERI GRATE

Allproof Kaiteri grates with features as follows:

- Grates - round and round in square grate design
- Compatible with Leak Control Flange, Revolver and 100mm Cyclone
- Suits 80mm or 100mm outlets
- stainless steel standard and custom colour powder coating options

Refer to SELECTIONS for options.

2.7 INVISIDRAIN SS

Allproof Invisidrain with features as follows:

- Forms an edge to surrounding floor tiles, leaving a gap for water to flow through
- Plastic body with stainless steel edge
- Product options - 80mm and 100mm stainless steel
- Compatible with Leak Control Flange, Revolver and 100mm Cyclone
- 2 metallic finishes (stainless steel standard) and custom colour powder coating options

Refer to SELECTIONS for options.

Components - flanges

2.8 LEAK CONTROL FLANGE

Allproof Leak Control Flange with features as follows:

- PVC leak control flange to suit 50mm to 100mm pipe sizes
- Construction cap available
- Flange has locating lugs for floor waste grate, allowing sub-tile moisture to escape through DWV pipe system
- Outlet range includes 50mm, 50mm/90°outlet, 65mm, 80mm and 100mm pipe size
- Grates - 18 options available

Refer to SELECTIONS for options.

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2.9 CYCLONE

Allproof Cyclone with features as follows:

- Texture finish on flange for adhesion of water-proofing membrane
- Height adjustable threaded grate
- Spigot fit inside grate
- Product options - 50mm, 80mm and 100mm pipe sizes
- 100mm CYC flange compatible with Invisidrain, Kaiteri, Elegance WW (SSO)
- Grates - 13 options available

Refer to SELECTIONS for options.

2.10 TILERITE

Allproof Tilerite PVC floor waste flange with features as follows:

- Base flange fits inside 80mm and 100mm pipe riser
- Threaded clamp ring and cyclone spigot
- Vinyl / waterproofing membrane clamped using 3 x stainless steel screws and clamp ring
- Height adjustable grate with threaded spigot
- Grates - square and round options
- Product options - 80mm and 100mm pipe sizes

Refer to SELECTIONS for options.

Component - floor waste gully

2.11 FLOOR WASTE GULLY

Allproof Floor Waste Gully with features as follows:

- Injection moulded PVC floor waste gullys / traps
- Product options - 80x50mm, 80x65mm, 100x50mm and 100x65mm

Refer to SELECTIONS for options.

3 EXECUTION

Conditions

3.1 EXECUTION GENERALLY - NZBC G13/AS1

Carry out this work to NZBC G13/AS1 and NZBC G1/AS1 and complete all tests to G13/AS1, 7.1 Test Methods.

3.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

3.3 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.

3.4 SETTING OUT

Set out location of all fittings and vent pipes and the completeness of their discharge into the drainage system.

3.5 CORE HOLES AND SLEEVES

Fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Sleeve diameter to be 25mm larger than outside diameter of pipe accommodated when installed in the foundation, Allproof Pipe Sleeve to be used through other penetrations. Strip core holes and make good after installation of pipework.

3.6 PIPE ACCESS

Fit and fix wastes and pipes in ducts independent of all other services so they are easily replaceable for their full length. Wrap or tape pipes buried in concrete.

3.7 FITTINGS ACCESS

Fit and fix traps and wastes to enable access for cleaning and for maintaining the total system.

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3.8 CONFIRM LOCATION

Unless the location and height are clearly delineated on the drawings, confirm installation height and plan locations of sanitary fittings before commencing the piping installation.

3.9 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.

Installation - generally

3.10 INSTALLATION - WATERPROOFING MEMBRANES

Refer to relevant waterproofing membrane section(s) for installation of membranes and associated sub-trades.

Installation - Allproof floor waste kit systems

3.11 INSTALL FLOOR WASTE KIT SYSTEMS

Install floor waste kit systems in accordance with Allproof interior floor waste system brochure and installation guide.

Installation - components

3.12 INSTALL GRATE, FLANGE AND FLOOR WASTE GULLY COMPONENTS

Install grate, flange and floor waste gully components in accordance with Allproof interior floor waste system brochure and installation guide.

Completion

3.13 ROUTINE CLEANING

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

3.14 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable.

Commissioning

3.15 TESTING

Pre-test all waste pipe during construction. On completion of the work and before approval for acceptance of the pipework, carry out a final test to the approval of the engineer and if required witnessed by the representative of the territorial authority.

4 SELECTIONS

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

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7441 GROUNDWATER DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity flow groundwater drains for:

- ground water removal

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters

Refer to 7451 SURFACE WATER DRAINAGE for storm/surface water drainage
Refer to 7461 FOUL WATER DRAINAGE for waste/foul water drainage
Refer to 7462 WASTEWATER TREATMENT SYSTEM for waste water disposal

Documents

1.2 DOCUMENTS

Documents referred to in this and the above sections are:

AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3111	Methods of test for water and aggregate for concrete
NZS 4402.2	Methods of testing soils for civil engineering purposes - Soil classification tests
NZTA F2	Specification for pipe subsoil drain construction

1.3 MANUFACTURER'S DOCUMENTS

Documents referred to in this and the above sections are:

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Company:	~
Web:	~
Email:	~
Telephone:	~

2 PRODUCTS

Materials

2.1 PERFORATED GROUNDWATER PIPING

Perforated corrugated coil high density polyethylene groundwater drainage pipe to AS 2439.1 with polypropylene geotextile filter sock over.

Accessories

2.2 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.

2.3 DRAINAGE MATERIAL

Free draining crushed stone, 7mm to 20mm in size.

2.4 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.

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The filter material when tested in accordance with NZS 4402.2, 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

2.5 TRENCH BACKFILLING MATERIAL

Free draining crushed stone, 7mm to 20mm in size.

3 EXECUTION

Conditions

3.1 EXISTING DRAINS/SERVICES

Report existence of existing drains/services to the contract administrator for direction.

Application

3.2 HANDLING

Store and handle perforated groundwater drainage piping as per the manufacturer's requirements. Reject any damaged product.

3.3 SETTING OUT

Use string line, boning rod or laser equipment methods.

3.4 APPLICATION GENERALLY

To AS/NZS 3500.3, 6.4 Subsoil Drains.

3.5 FILTER FABRIC TO DRAINAGE MATERIAL

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.

3.6 LAY PERFORATED DRAINAGE PIPING

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.

3.7 LAY PERFORATED DRAINAGE PIPING TO BASEMENT WALLS

Ensure any required waterproofing and protection sheets are in place before starting work.

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. The pipe must not excessively elongate during installation. Lay in straight runs to 1:150 gradients with invert of the highest horizontal point 50mm minimum below floor slab level, discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

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3.8 LAY PERFORATED DRAINAGE PIPING TO RETAINING WALLS

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage metal comprising of filter material to the NZTA F2 specification. Pipe bedding not less than 75mm deep. Backfill not less than 300mm deep. The pipe must not excessively elongate during installation. Lay in straight runs to correct gradients , discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Place granular fill in layers not exceeding 150 mm thick loose depth, to full height of wall, with an allowance for the thickness of the surface finish. Compact to provide support of not less than that of the adjacent material. Where geocomposite drain is used, the backfill shall follow the manufacturer's recommendations. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.9 BACKFILLING

Complete backfilling with drainage material.

3.10 CLEAN OUT PIPING INSTALLATION

Clean and flush out the whole piping installation and remove silt and debris before handing over.

4 SELECTIONS

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7451 SURFACE WATER DRAINAGE

1 GENERAL

This section relates to below ground, gravity flow stormwater pipework complete with maintenance access and fittings and connected to network utility operators 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 G13/AS2	Foul water
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
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
AS/NZS 4058	Precast concrete pipe (pressure & non pressure)
NZS 4442	Welded steel pipes and fittings for water, sewage and pressure gas
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications

1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:
Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Company:	~
Web:	~
Email:	~
Telephone:	~

Performance

1.4 TESTING - NZBC E1/AS1

Complete all tests to NZBC E1/AS1, 8.0, Drain Leakage Tests.

1.5 TESTING - AS/NZS 3500.3 & NZBC E1/AS2

Complete all tests to AS/NZS 3500.3 as modified by NZBC E1/AS2.

2 PRODUCTS

Materials

2.1 REINFORCING STEEL

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

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2.2 SURFACE WATER SUMPS - NZBC E1/AS1

Precast concrete complete with lift-up cast iron grate and frame to NZBC E1/AS1 3.6, Surface water inlets to drains.

2.3 SURFACE WATER SUMPS - AS/NZS 3500.3 & NZBC E1/AS2

Precast concrete complete with lift-up cast iron grate and frame to AS/NZS 3500.3 as modified by NZBC E1/AS2.

2.4 CHANNEL DRAIN, GRATING AND SUMPS

Proprietary PVC channel or precast concrete drain complete with friction fit grating sections and matching sumps.

2.5 INSPECTION CHAMBERS - NZBC E1/AS1

Circular precast concrete or plastic to NZBC E1/AS1, 3.7, Access for maintenance, complete with removable cast iron lid and frame.

2.6 INSPECTION CHAMBERS - AS/NZS 3500.3 & NZBC E1/AS2

Circular precast concrete or plastic to AS/NZS 3500.3 as modified by NZBC E1/AS2, complete with removable cast iron lid and frame.

2.7 ACCESS CHAMBERS - NZBC E1/AS1

Circular precast concrete or plastic to NZBC E1/AS1, 3.7,Access for maintenance, complete with lift up cast iron lid and frame.

2.8 ACCESS CHAMBERS - AS/NZS 3500.3 & NZBC E1/AS2

Circular precast concrete or plastic to AS/NZS 3500.3 as modified by NZBC E1/AS2, complete with lift up cast iron lid and frame.

Accessories

2.9 BEDDING SURROUND AND FILLING MATERIALS

Granular:	Clean gravel or crushed stone or a blend of these. Particle size from minimum 7mm to maximum 20mm.
Selected:	Fine grain soil or granular material suitable for bedding and excluding topsoil, organic matter and rubbish.
Ordinary:	Top soil or other excavated materials excluding organic matter and rubbish.

2.10 CONCRETE

To NZS 3104.

Prescribed mix 17.5 MPa:	For in situ bases, anchors and pipe surrounds.
Prescribed mix 14 MPa:	For bedding only.

3 EXECUTION

3.1 EXECUTION GENERALLY - NZBC E1/AS1

Carry out this work to NZBC E1/AS1 and complete all tests to E1/AS1, 8.0, Drain Leakage Tests.

3.2 EXECUTION GENERALLY - AS/NZS 3500.3 & NZBC E1/AS2

Carry out this work to AS/NZS 3500.3 as modified by NZBC E1/AS2 and complete all tests to AS/NZS 3500.3, section 9, as modified by NZBC E1/AS2.

Application

3.3 BEDDING - NZBC E1/AS1

Place to NZBC E1/AS1, 3.9, Bedding and backfilling, using compacted granular material to avoid differential settlement and to obtain longitudinal support of the pipe.

3.4 BEDDING - AS/NZS 3500.3 & NZBC E1/AS2

Place to AS/NZS 3500.3 as modified by NZBC E1/AS2, using compacted granular material to avoid differential settlement and to obtain longitudinal support of the pipe.

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3.5 SURROUND AND BACKFILL - NZBC E1/AS1

Place to NZBC E1/AS1, 3.9, Bedding and backfilling, using compacted granular material and compacted fill. Compact in layers not exceeding 100mm.

3.6 SURROUND AND BACKFILL - AS/NZS 3500.3 & NZBC E1/AS2

Place to AS/NZS 3500.3 as modified by NZBC E1/AS2, using compacted granular material and compacted fill. Compact in layers not exceeding 100mm.

3.7 SETTING OUT

Use string line, boning rod or laser equipment methods. Use surveying and levelling equipment to accurately set out design invert levels.

3.8 LAYING AND JOINTING

Lay in straight lines between changes of line or grade from the lower end of the pipeline with sockets pointing uphill, each pipe set true to line and grade and each joint completed before the next pipe is laid. Install PVC Pipes to AS/NZS 2032 or AS/NZS 2566.1 and AS/NZS 2566.2. Install polyethylene Pipes to AS/NZS 2033. To prevent entry of foreign matter cap ends of uncompleted runs each day. Test drains and backfill progressively to minimise site disruption. Concrete cap trenches to all drains with less than 375mm cover.

3.9 LAYING STORM WATER SYSTEM

From the building rainwater system, sealed yard areas and including all access chambers, sumps, bends and junctions, lay the drainage system as detailed to discharge into the network utility operator water system and to their requirements.

3.10 DIFFERENTIAL SETTLEMENT

Provide flexible jointing, bedding and surrounding of pipes at junctions with manholes, foundation walls and other points where differential settlement may occur.

Application - fittings

3.11 CONSTRUCT ACCESS CHAMBERS - NZBC E1/AS1

Construct as detailed on a poured concrete footing to NZBC E1/AS1, 3.7, Access for maintenance. Provide all necessary haunching to channels.

3.12 CONSTRUCT ACCESS CHAMBERS - AS/NZS 3500.3 & NZBC E1/AS2

Construct as detailed on a poured concrete footing to AS/NZS 3500.3 as modified by NZBC E1/AS2. Provide all necessary haunching to channels.

3.13 CONSTRUCT INSPECTION CHAMBERS - NZBC E1/AS1

Construct as detailed on a poured concrete footing to NZBC E1/AS1, 3.7, Access for maintenance. Provide all necessary haunching to channels.

3.14 CONSTRUCT INSPECTION CHAMBERS - AS/NZS 3500.3 & NZBC E1/AS2

Construct as detailed on a poured concrete footing to AS/NZS 3500.3 as modified by NZBC E1/AS2. Provide all necessary haunching to channels.

3.15 CONSTRUCT SUMPS

Bed in concrete to the manufacturer's recommendations.

3.16 INSTALL CHANNEL DRAIN

Excavate for, provide bedding to fall and install channel drains and sumps complete with grated covers, to the manufacturer's requirements.

Application - connections

3.17 CONNECT TO SURFACE WATER - PUBLIC MAINS

Locate, excavate and expose the existing drain, connect new pipework to existing drain to the requirements of the network utility operator.

3.18 CONNECT TO SURFACE WATER - PUBLIC MAINS ACCESS OR INSPECTION CHAMBER

Locate, excavate and break into the existing chamber, modify as necessary and connect new pipes to the requirements of the network utility operator.

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3.19 CONNECT TO SURFACE WATER - ON SITE

Locate, excavate and expose the existing drain, connect new pipework to existing drain using a 'Y' junction, to meet the standards of the new work.

3.20 CONNECT TO ON-SITE WATER STORAGE

Connect to on-site water storage system. Refer to 7112 WATER STORAGE TANKS.

3.21 CONNECT TO ON-SITE SURFACE WATER DISPOSAL SYSTEM

Connect to on-site surface water disposal system as detailed.

4 SELECTIONS



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7461 FOUL WATER DRAINAGE

1 GENERAL

This section relates to below ground, non-pressure foul water pipework complete with all maintenance access and fittings and connected to network utility operator sewers.

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters

Refer to 7421 SANITARY SYSTEMS for above ground pipework
Refer to 7441 GROUNDWATER DRAINAGE for sub-soil drainage
Refer to 7451 SURFACE WATER DRAINAGE for storm/surface 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 G13/AS2	Foul water - Drainage
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
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/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
NZS 3104	Specification for concrete production
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
AS/NZS 4058	Precast concrete pipe (pressure & non pressure)
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
BS EN 1124 .1	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. Requirements, testing, quality control.
BS EN 1124 .2	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. System S, forms and dimensions.

1.3 MANUFACTURER'S DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Copies of the above literature are available from ~

Company:	~
Web:	~
Email:	~
Telephone:	~

Performance

1.4 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS2,6.1 Testing 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.



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2 PRODUCTS

Materials

2.1 CONCRETE PIPES
Precast concrete to AS/NZS 4058.

2.2 STEEL PIPES AND FITTINGS
Welded steel pipes and fittings to NZS 4442.

2.3 PVC-U PIPES AND FITTINGS
Unplasticised PVC pipe and fittings to AS/NZS 1260, buried pipes 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 POLYETHYLENE PIPES AND FITTINGS
Polyethylene pipe and fittings to AS/NZS 5065.

2.5 STAINLESS STEEL PIPES AND FITTINGS
Stainless Steel pipe and fittings to BS EN 1124.1 and BS EN 1124.2.

2.6 GULLY TRAPS - NZBC G13/AS2
Gully traps complete with grating to NZBC G13/AS2, 3.3 Gully traps.

2.7 INSPECTION CHAMBERS - NZBC G13/AS2
Circular precast concrete or plastic to NZBC G13/AS2, 5.7 Access points, complete with cast iron lid and frame. All joints watertight (base/pipes, base/riser, riser/riser, riser/lid, lid throat and throat/frame). Use epoxy mortar joints in concrete chambers. Use ring seals in plastic chambers.

2.8 ACCESS CHAMBERS - NZBC G13/AS2
Circular precast to NZBC G13/AS2, 5.7 **Access points**, complete with lift up cast iron lid and frame. All joints watertight (base/pipes, base/riser, riser/riser, riser/lid, lid throat and throat/frame). Use epoxy mortar joints in concrete chambers. Use ring seals in plastic chambers.

Accessories

2.9 TRENCH BACKFILLING MATERIAL - NZBC G13/AS2
Bedding and backfilling material to NZBC G13/AS2, 2.0 Materials, or methods shown in NZBC G13/AS2, figure 7, Bedding and backfilling.

2.10 TRENCH BACKFILLING MATERIAL - 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.

2.11 CONCRETE
To NZS 3104.

Prescribed mix 17.5 MPa:	For in situ bases, anchors and pipe surrounds.
Prescribed mix 14 MPa:	For bedding only.

3 EXECUTION

Conditions

3.1 EXECUTION GENERALLY - NZBC G13/AS2
Carry out this work to NZBC G13/AS2 and NZBC G1/AS1 and complete all tests to G13/AS2, 6.1 Testing.

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Bedding, backfilling and encasement

3.2 TRENCH BACKFILLING GENERALLY - FOUL & SURFACE 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.

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.

3.3 FOUL WATER TRENCH BACKFILLING - NZBC G13/AS2

Carry out foul water trench backfilling to NZBC G13/AS2, 5.3 to 5.5 and fig 7.

UPVC pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.4 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.

UPVC pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.5 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.

Application

3.6 SETTING OUT

Use string line, boning rod or laser equipment methods. Use surveying and levelling equipment to accurately set out design invert levels.

3.7 LAYING AND JOINTING

Lay in straight lines between changes of line or grade from the lower end of the drain with sockets pointing uphill. Set each pipe true to line and grade and each joint completed before the next pipe is laid. Install PVC-U pipes to AS/NZS 2032 or AS/NZS 2566.1 and AS/NZS 2566.2. Install polyethylene Pipes to AS/NZS 2033. Cap ends of uncompleted runs each day to prevent entry of foreign matter. Test drains and backfill progressively to minimise site disruption. Concrete cap trenches to drains with less than 375mm cover.

3.8 LAYING FOUL WATER DRAINS

Lay the drainage system from soil stacks and gully traps, including access chambers, inspection chambers, bends, junction inspections, and vents (fresh air inlets). Discharge into the network utility operator foul water system to their requirements.

3.9 DIFFERENTIAL SETTLEMENT

Provide flexible jointing, bedding and surrounding of pipes at junctions with manholes, foundation walls and other points where differential settlement may occur.

Application - fittings

3.10 CONSTRUCT GULLY TRAPS - NZBC G13/AS2

Set in a minimum 75mm thick concrete with top surround 25mm above paving and 100mm above other surfaces, to NZBC G13/AS2, 3.3 Gully traps.

3.11 CONSTRUCT ACCESS CHAMBERS - NZBC G13/AS2

Construct as detailed on a poured concrete footing using precast concrete units and a removable cast iron cover, to NZBC G13/AS2, 5.7 Access points. Provide all necessary haunching to channels.

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3.12 CONSTRUCT INSPECTION CHAMBERS - NZBC G13/AS2

Construct as detailed on a poured concrete footing to NZBC G13/AS2, 5.7 Access points. Provide all necessary haunching to channels.

Application - connections

3.13 CONNECTION TO FOUL WATER - PUBLIC MAINS

Locate, excavate and expose the existing drain, connect new pipework to existing drain to the requirements of the network utility operator.

3.14 CONNECTION TO FOUL WATER - PUBLIC MAINS ACCESS CHAMBER

Locate, excavate and break into the existing chamber, modify as necessary and connect new pipes to the requirements of the network utility operator.

4 SELECTIONS

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7545 UNDERFLOOR HEATING

1 GENERAL

This section relates to the supply and installation of a Hydronic Underfloor Heating (UFH) system for domestic or commercial applications.

1.1 RELATED WORK

Refer to 7211 GAS SYSTEM UTILITY NETWORK for piped gas supply.

Refer to 7212 GAS SYSTEM LPG CYLINDERS for cylinder gas supply
Refer to electrical section/s for electric power supply and water heating system for underfloor heating.
Refer to the appropriate concrete section for insulation under concrete slabs.
Refer to the HOT & COLD WATER SYSTEM section for hot and cold water piping, gas water heaters and hot water cylinders.

1.2 ABBREVIATIONS

The following abbreviations are used in this specification.

UFH	Underfloor Heating

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 provisions for building elements
NZBC G10/AS1	Piped services
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 3500.4	Plumbing and drainage - Heated water systems
BS EN 1264	Floor heating - Systems and components
BS 7291	Thermoplastic pipes and associated fittings for hot and cold water for domestic purposes and heating installations in buildings

Gas (Safety and Measurement) Regulations 2010
Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).
Plumbers, Gasfitters and Drainlayers Act 2006

1.4 MANUFACTURER DOCUMENTS

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

Available by contacting the supplier/manufacturer.

Requirements

1.5 ACCREDITED INSTALLERS

Installers shall be accredited by the proprietary UFH manufacturer. The installer is responsible to insure any equipment connected to the controls and supplied by others is suitable for the purpose and installed to manufacturer requirements.

1.6 QUALIFICATIONS

Plumbers to be certified installers, 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.

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance manual information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

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Documentation

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:
General arrangement of pipework, equipment and controls

If requested provide the following additional information:
~

Submit shop drawings for review to ~.

- ~ working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication and/or installation.

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:
Photographs recording actual layout.
Drawings showing the as built layout.

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

Warranties

1.10 WARRANTY

Warrant this part of the work under normal environmental and use conditions against failure of materials and execution.

Warranty period: 5 years

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

Performance

1.11 GENERAL INSPECTIONS

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

1.12 FINAL INSPECTION AND TEST

Submit the work for inspection and test and prove to the satisfaction of the network utility operator that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.

Testing should be at the time of completion. Confirm this timing before carrying out any tests. Test and demonstrate the system according to piping manufacturer's specifications.

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2 PRODUCTS

Materials

2.1 PIPEWORK

To BS 7291, AS/NZS 2492, NZBC B2/AS1, NZBC G10/AS1, NZBC G12/AS1. Refer to the SELECTIONS for pipe type and size.

2.2 CONTROLS

Controls include water temperature controls, boiler controls and air temperature controls. Refer to SELECTIONS for type.

2.3 INSULATION - SOLID CONCRETE FLOOR

Polystyrene under slab. Refer to SELECTIONS for thickness.

Components

2.4 MANIFOLD

Thermostatically controlled multi-valve manifold to control the temperature of the water and control the flow rate to the various zones. The manifold is available in a range of sizes. Refer to SELECTIONS for port arrangement.

2.5 PUMPING UNIT

Pump to take heated water from the primary boiler and inject the water down to the required temperature for the UFH. Refer to SELECTIONS for type.

2.6 MIXING VALVE

Mixing valve to mix the 80°C water from the boiler with the cooler water from the return of the floor heating circuits. Refer to SELECTIONS for type.

2.7 THERMOSTATS

Programmable thermostats complete with setback temperature reduction mode. Refer to manufacturer for options to use in wet areas. Refer to SELECTIONS for type and location.

2.8 HEAT SOURCE

Refer to SELECTIONS for type.

Finishes

2.9 FLOOR COVERING

Refer to SELECTIONS for type of floor covering.

3 EXECUTION

Conditions

3.1 GENERALLY

To AS/NZS 3500.4, BS EN 1264, NZBC B2/AS1, NZBC G10/AS1, NZBC G11/AS1, NZBC G12/AS1 or AS/NZS 3500.4 as modified by NZBC G12/AS3. Confirm suitability of heat source, concrete/screed, insulation, floor finishes with the manufacturer before installation of the UFH system.

3.2 INSTALLATION

Ensure the area for installation remains dry and weathertight by incorporating a damp-proof membrane in the floor slab. Lay insulation to the total area of the installation, with edge insulation on all internal and external wall lines. If the floor construction is a two part slab with the walls already in place edge insulation is required around the walls to prevent heat loss up the walls.

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Application

3.3 HEAT SOURCE

Confirm suitability of the heat source with the UFH system, before connecting it to the UFH installation. Comply with AS/NZS 3500.4 as modified by NZBC G12/AS3 and Electricity (Safety) Regulations 2010. When using a gas heat source comply with Gas (Safety and Measurement) Regulations 2010.

3.4 PIPEWORK LAYOUT

Lay pipes to provide an even spread of heat and a relatively even surface temperature across the area to UFH manufacturer's recommendations. Lay pipes to the layout pattern recommended by the manufacturer and approved by the owner. Insure the layout allows for increased heat required against colder exterior surfaces (perimeter zone).

3.5 INSTALL PIPEWORK - TIED TO REINFORCEMENT

Pipework to be cable tied to the concrete mesh. Lay pipes in a continuous length from the manifold in the pre-designed configuration. Connections must not be made in the area to be concreted. Pipes start and finish at the manifold position. Run pipes to the corresponding port on the manifold. Do not cross pipes over in the floor. Allow for pressure testing of the pipework to 600kpa. Leave at this pressure until concrete is cured.

3.6 CONDUIT SLEEVING

Sleeve all flow pipes with conduit sleeving where the pipe enters and returns from concrete for the first metre to manufacturer's requirements. Sleeve across construction joints in floor.

3.7 FILLING AND PRESSURE TESTING

Pressure test the system with water to ensure all joints are watertight and no damage has occurred to the pipe during installation.

3.8 CONNECT TO HEAT SOURCE

Install pump and manifold when wall finishes are completed. Connect heat source to pump pack using recommended pipe and fittings to manufacturer's installation instructions.

Finishing

3.9 INITIAL START UP

The start up procedure following installation to be done to BS EN 1264 and to UFH manufacturer's requirements.

Completion

3.10 COMMISSIONING

Commission the UFH system. Pipes flushed and refilled with the use of an inhibitor. Following the initial start up period commission the system with all floor coverings laid to ensure the system can be correctly balanced. Ensure the complete central heating system, including radiators if present, is working to required operational temperature. Adjust each circuit slowly via the valves on the manifold to ensure an even flow and heat up is achieved.

3.11 FLOOR FINISHES

Run the system for two weeks before the floor covering is finally laid. Use adhesive suitable for temperatures up to 40°C.

3.12 REPLACE

Replace damaged or marked elements.

3.13 LEAVE

Leave work to the standard required by following the UFH system manufacturer's recommended procedures.

3.14 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS



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7552W WARMUP FLOOR HEATING SYSTEMS

1 GENERAL

This section relates to the supply and installation of Warmup New Zealand Ltd electrical floor heating systems for domestic and commercial applications.
It includes:

- undertile heating
- undercarpet heating
- in-slab heating
- thermostats and associated control systems and accessories

1.1 RELATED WORK

Refer to 6812W WARMUP WATERPROOFED SHOWER SYSTEM for the supply and installation of interior tiled shower and wet areas tiling systems.

Documents

1.2 DOCUMENTS

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

NZBC G9/VM1	Electricity
AS/NZS 60335.1	Household and similar electrical appliances - Safety - General requirements
AS/NZS 60335.2.96	Household and similar electrical appliances - Safety - Particular requirements for flexible sheet heating elements for room heating.
NZS 6110	Electrical installations - floor and ceiling heating systems

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Warmup™ Product Brochures
Warmup™ Undertile Installation Manual
Warmup™ Undercarpet Installation Instructions
Warmup™ In-Slab Preparation and Installation instructions
Warmup™ Thermostat Installation and Operating Instructions
BRANZ Appraisal 644 - Warmup Undertile Heating

Manufacturer/supplier contact details

Company:	**Warmup New Zealand Ltd**
Web:	www.warmup.co.nz
Email:	info@warmup.co.nz
Telephone:	09 820 4001

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a Warmup™ manufacturer/supplier warranty:

Conditional lifetime: For Warmup™ Undertile

5 years:	For Warmup™ Undercarpet heaters
10 years:	For Warmup™ In-slab heating elements
5 years:	For Warmup™ floor heating controllers

- Provide this warranty on the Warmup™ New Zealand 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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1.5 WARRANTY - INSTALLER/APPLICATOR

Provide a Warmup™ installer/applicator warranty:

Conditional lifetime: For Warmup™ Undertile
5 years: For Warmup™ Undercarpet heaters
10 years: For Warmup™ In-slab heating elements
5 years: For Warmup™ floor heating controllers

- Provide this warranty on the Warmup™ New Zealand 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.

Requirements

1.6 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

Installation to be performed by a registered electrician or a Warmup approved installer to Warmup recommendations.

1.7 NO SUBSTITUTIONS

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

1.8 MANUFACTURERS DOCUMENTATION

Refer to Warmup New Zealand Ltd for all product information and installation instructions.

1.9 COMPLY

Comply with NZBC G9/VM1, NZS 6110, and AS/NZS 60335.2.96.

Quality control and assurance

1.10 INSPECTIONS

~

2 PRODUCTS

Materials- floor heating products

2.1 UNDERTILE HEATING ELEMENTS

Warmup™ undertile heating elements, 2.4mm in diameter comprised of multi-stranded heating conductors, Teflon - fluro-polymer primary insulation, full knitted earth screen and PVC secondary insulation. Tested to AS/NZS 60335.1 and AS/NZS 60335.2.96. Available in a number of lengths, wattages and coverage. Refer to SELECTIONS for options.

Thermostats

2.2 THERMOSTAT - PROGRAMMABLE

Warmup™ Colour Touch programmable thermostat W3WT01 and W3WT02 with built-in clock/calendar and battery backup, includes 4 and 6 event program for automatic comfort and setback temperatures, with up to 7 different program combinations. W3WT02 has Wi-Fi capability, setup with installation wizard, remote access and control via app. Refer to SELECTIONS.

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 GENERALLY

All work and materials to comply with Warmup New Zealand Ltd installation instructions.

3.4 CONFIRM LAYOUT

Before commencing work confirm the proposed location of heating cables/elements and controls.

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.

Application - general

3.6 PRELIMINARY WORK

Ensure all walls (where required) and floor penetrations are clearly marked.

3.7 CHECK SUBSTRATE

Ensure that substrate is level, not subject to movement, deflection and is structurally sound. Ensure all surfaces are clean dry and free from dust and dirt, oil and grease with no projection of sharp materials. Complete all remedial work before commencing installation.

Installation - under tile floor heating

3.8 FLOOR PREPARATION

Check floor has been cleaned and primed prior to the installation of the heating elements. All fixings such as door stops and floor mounted cabinetry to be clearly marked out on the floor.

3.9 INSTALL UNDERTILE HEATING

Install Warmup™ undertile heating in accordance with Warmup™ Undertile Installation Manual, and as follows:

- Chisel out channels for cold tail connections
- Clean and sweep floor
- Mark out element positions
- Spray adhesive to floor areas where the element will be looped
- Tape element down with Warmup fixing tape
- Band tape to hold the element at the correct centres
- Fix floor probe in place
- Test element and fit alarm monitor.

Ensure that as much of the floor area is covered in each of the zones shown on the plan / Warmup™ schedule.

Note: Warmup™ "Watchdog" audible alarm must be installed and remain turned on until tiling, grouting and all perimeters and movement joints are sealed. Electrical connection of heating controller must be carried out by registered electrician once tiling is completed.

3.10 COLD TAIL CONNECTIONS

Terminate all cold tails in a flush box mounted approximately 300 mm above F.F.L.

3.11 CONNECTION TO POWER SUPPLY

Connect from wall mounted flush box to power supply protected by an RCD. Refer to the appropriate electrical section for electrical connections of the undertile heating elements. All electrical connections to be carried out by a registered electrician.

3.12 TILING

After installation of Warmup™ heating elements the floor tiler is to install tiles using an approved flexible tile adhesive. Refer to the appropriate tiling section for installation of tiles, adhesives, grouting, movement joints, sealants and accessories.

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3.13 TIMBER FLOORS

For timber overlay floors ensure:

- If a moisture test has not been carried out, turn off the underfloor heating 1 week prior to the test.
- Turn off underfloor heating during and for 48 hours either side of the flooring work period.
- Post flooring installation, turn on heating with thermostat set at 5°C and increase by 5°C increments daily, until desired maximum temperature is reached.
- Ensure the thermostat is fitted with a maximum temperature of 27°C.

Installation - thermostat controls

3.14 INSTALL THERMOSTAT SENSORS

Install thermostat sensors for each zone in accordance with the Warmup™ schedule. Install sensors within a conduit so they are easily replaced after completion. For a timber floor install the sensor higher than the heating cables / directly under the flooring.

3.15 TEST ALL ELEMENTS

Test all elements for continuity, resistance and insulation resistance prior installation of flooring, and after installation and prior to livening. Fill out the pre and post floor placement test result sheets and forward these results to the owner. It is recommended that all elements are tested at prewired stage of the installation.

3.16 TEST AND ACTIVATE ALL CONTROLS

Activate all thermostats and check for correct operation. Where programmable or intelligent thermostats are installed the correct day and time to be programmed in. Once these thermostats have been checked, leave in manual and off unless instructed otherwise.

3.17 CONNECTION TO POWER SUPPLY

Connect from wall mounted flush box to power supply protected by an RCD. Refer to the appropriate electrical section for electrical connections of thermostats. All electrical connections to be carried out by a registered electrician.

Completion & Commissioning

3.18 COMPLETION MATTERS

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

3.19 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

~

3.20 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

- Allow to commission the system fully to Warmup™ instructions.

4 SELECTIONS

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

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7556W RINNAI WARMINGTON SOLID FUEL FIRES

1 GENERAL

This section relates to the supply and installation of **Warmington** solid fuel burning appliances, for space heating and outdoor cooking.

1.1 RELATED WORK

Refer to ~ for ~

Documents

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:

NES	Resource Management (National Environmental Standards for Air Quality) Regulations 2004
ECAN	Environment Canterbury
CM1	ECAN Canterbury Method 1 for testing of ultra-low emission wood burners
NCC	Nelson City Council
NZHHA	New Zealand Home Heating Association
SFAIT	Solid Fuel Appliance Installation Technician

The following definitions apply specifically to this section:

Open fire	Traditional type of fire, prefabricated or in-situ, with one side (or more) open and no or little air flow control. Generally restricted to properties ≥ 2 ha (4.94 acres)
Open fire with glass front	Similar to the open fire, usually prefabricated, but with a glass front(door) and some air flow control. May or may not be tested (to AS/NZS 4012 & AS/NZS 4013 - emissions ≤ 1.5 g/kg, efficiency ≥ 65%)
Solid fuel burner (tested - non-NES compliant)	Purpose made, prefabricated, fully enclosed with airflow control (& possibly other features). Tested to AS/NZS 4012 & AS/NZS 4013. Generally restricted to properties ≥ 2 ha (4.94 acres)
Solid fuel burner (NES compliant)	Purpose made, prefabricated, fully enclosed with airflow control (& possibly other features). Tested to demonstrate compliance with the NES standards (to AS/NZS 4012 & AS/NZS 4013, emissions ≤ 1.5 g/kg, efficiency ≥ 65%). For properties of any size (subject to Local Authority rules)
Solid fuel burner, low emission (LEB)*	Generally has only one air flow control. Can not be banked down overnight. Tested to AS/NZS 4012 & AS/NZS 4013 with emissions ≤ 1 g/kg, efficiency ≥ 65%. (Note: NES emissions ≤ 1.5 g/kg). For rural or urban properties of any size
Exterior fire	An appliance intended to be installed in a fireplace or a suitably flued enclosure outdoors

* ECAN classification.

1.3 DOCUMENTS REFERRED TO

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

NZBC B1/AS3	Small chimneys
NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies

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AS/NZS 2918:2001	Domestic solid fuel burning appliances - Installation
AS/NZS 3500.4	Plumbing and drainage - Heated water services
AS/NZS 3869	Domestic solid fuel burning appliances - Design and construction
AS/NZS 4012	Domestic solid fuel burning appliance - Method for determination of power output and efficiency
AS/NZS 4013	Domestic solid fuel burning appliances - Method for determination of flue gas emission
AS 4558 (AG 108)	Decorative gas log and other fuel effect appliances

Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NES)
Plumbers, Gasfitters and Drainlayers Act 2006
ECAN Canterbury Method 1 for testing of ultra-low emission wood burners (CM1)

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Warmington product catalogue, specifications and installation details.

Manufacturer/supplier contact details:

Web:	https://rinnai.co.nz/
Email:	info@warmington.co.nz
Telephone:	09 273 9227

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide the material manufacturer's/supplier's warranty :

~ years:	For the supply of Warmington ~ and associated flue kit

- Provide this warranty on the manufacturer/supplier standard form (if unavailable use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of Practical Completion of the contract works.

Warranty terms and conditions depend on product type and location - contact Warmington for details.

Refer to the GENERAL section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER

Provide the installer's warranty for the installation work, to the project administrator.

1 year	For installation of Warmington solid fuel fire appliance and associated flue kit

- Provide this warranty in the approved installer's standard form (if unavailable use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Warranty to commence from the date of Practical Completion of the contract works.

Refer to the GENERAL section 1237 WARRANTIES for additional requirements.

Requirements

1.7 NO SUBSTITUTIONS

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

1.8 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Installation to be carried out by a certified Warmington installer, an LBP registered plumber or an Approved NZHHA Installation Technician. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

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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:

- Provide the Warmington operation and maintenance instructions to the owner.

Provide this information prior to Practical Completion.

1.10 DURABILITY

Solid fuel-burning appliances to be installed to comply with NZBC B2/AS1 Table C.1.1.1.

Compliance information

1.11 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 (PS3) from the applicator / installer
- Producer Statement - Construction Review (PS4) from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

1.12 COMPLIANCE WITH STANDARDS

Solid fuel-burning appliances installed to AS/NZS 2918. Where required by the regulatory authority, the appliance is to comply with the requirements of AS/NZS 4012 and AS/NZS 4013 or CM1, and be fitted with a compliance plate fixed to the appliance and marked 'Tested to AS/NZS 4012 and AS/NZS 4013' or 'Tested to CM1'.

Quality control and assurance

1.13 INSPECTIONS

On completion of installation	To AS/NZS 2918, AS/NZS 4012 and AS/NZS 4013 Tested for leakage and proved to be fully operational.

2 PRODUCTS

Indoor Fires

2.1 IN-BUILT OPEN FIRE

Solid fuel appliance comprising of a firebox, firebricks, outer casing to firebox, front surround, stainless steel flue, shield, outer shield, ceiling plate, flashing and weather cowl. Caitec™ draws air from an external air source to ensure that the open fire has pre-heated combustion air maximizing efficiency while maintaining the home at constant pressure equilibrium, reducing the risk of back drafting.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction and tested to AS/NZS 2918.

Options may include ceiling sleeve, wetback, floor protector, safety screen and decorative frame - refer to SELECTIONS.

2.2 FREESTANDING OPEN FIRE

Solid fuel appliance comprising of firebox, firebricks, outer casing to firebox with hearth and plinth, and complete with stainless steel flue, shield, outer shield, flashing and weather cowl. Caitec™ draws air from an external air source to ensure that the open fire has pre-heated combustion air maximizing efficiency while maintaining the home at constant pressure equilibrium, reducing the risk of back drafting.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction and tested to AS/NZS 2918.

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Options may include ceiling sleeve, wetback, floor protector, safety screen and decorative frame - refer to SELECTIONS.

2.3 IN-BUILT OPEN FIRE WITH GLASS FRONT

Solid fuel appliance comprising of a firebox, firebricks, door, outer casing to firebox, front surround, stainless steel flue, shield, outer shield, ceiling plate, flashing and weather cowl. Caitec™ draws air from an external air source to ensure that the open fire has pre-heated combustion air maximizing efficiency while maintaining the home at constant pressure equilibrium, reducing the risk of back drafting.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction and tested to AS/NZS 2918.

Options may include ceiling sleeve, wetback, floor protector, safety screen and decorative frame - refer to SELECTIONS.

2.4 FREESTANDING WOOD BURNER (TESTED - NON-NES COMPLIANT)

Solid fuel heating appliance comprising of free standing base, firebox, firebricks, door, outer casing to firebox with hearth, and complete with stainless steel flue, shield, outer shield, ceiling plate, flashing and weather cowl on some appliances. Caitec™ draws air from an external air source to ensure that the burner has pre-heated combustion air maximizing efficiency while maintaining the home at constant pressure equilibrium, reducing the risk of back drafting.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction and tested to AS/NZS 2918.

2.5 FREESTANDING WOOD BURNER (NES COMPLIANT)

Solid fuel heating appliance comprising of free standing base, firebox, firebricks, door, outer casing to firebox with hearth, and complete with stainless steel flue, shield, outer shield, ceiling plate, flashing and weather cowl on some appliances. Caitec™ draws air from an external air source to ensure that the burner has pre-heated combustion air maximizing efficiency while maintaining the home at constant pressure equilibrium, reducing the risk of back drafting.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction and tested to AS/NZS 4012 and AS/NZS 4013 (emissions ≤ 1.5g/kg, efficiency ≥ 65%), and installed to AS/NZS 2918.

Options may include ceiling sleeve, wetback, floor protector, safety screen and decorative frame - refer to SELECTIONS.

2.6 FREESTANDING LOW EMISSION BURNER (LEB)

Solid fuel heating appliance comprising of free standing base, firebox, firebricks, door, outer casing to firebox with hearth, wetback, and complete with stainless steel flue, shield, outer shield, ceiling plate and ceiling sleeve, flashing and weather cowl on some appliances. Caitec™ draws air from an external air source to ensure that the burner has pre-heated combustion air maximizing efficiency while maintaining the home at constant pressure equilibrium, reducing the risk of back drafting.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction and tested to AS/NZS 2918.

Outdoor Fires

2.7 IN-BUILT OUTDOOR WOOD FIRE

Solid fuel open fire with cooking facilities, built into an exterior enclosure, and comprising of a firebox, firebricks, outer casing to firebox, front surround, stainless steel flue, shield, outer shield, flashing and weather cowl.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction and tested to AS/NZS 2918.

Options include various cooking facilities such as grill, hotplate, oven etc. Other options may include stainless steel cover - refer to SELECTIONS.

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2.8 FREESTANDING OUTDOOR WOOD FIRE

Solid fuel heating appliance comprising of firebox, firebricks, outer casing to firebox with hearth and plinth, and complete with stainless steel flue, shield, outer shield, flashing and weather cowl.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction and tested to AS/NZS 2918.

Options may include various cooking facilities such as grill, hotplate, oven etc. Other options may include floor protector or stainless steel cover - refer to SELECTIONS.

Components & Accessories

2.9 FLUE SYSTEM

To be a Warmington approved Flue System consisting of stainless steel flue, shield, outer shield, flashing and weather cowl. All seams in the stainless steel flue pipe to be lock-folded or continuously welded to AS/NZS 2918.4.2. Joints between sections of flue pipe to be push-fitted with the upper section entering the lower section and secured with 3x fasteners to prevent accidental separation.

For vitreous enamelled flue pipe sections within a room, these may be joined without fasteners using a series or overlapping sections having a minimum overlap of 50mm.

Flue systems beyond the ceiling penetrations to be provided with either a double casing or a tested single casing to AS/NZS 2918 clause 4.5.1. Flue pipe casings fabricated from copper or brass to have at least a 25mm minimum air gap from the flue pipe.

2.10 COWL

Purpose made weather cowl for Warmington approved Flue System. Supplied by Warmington.

2.11 WETBACK

Purpose made wetback for fires that are designed for a wetback. Supplied by Warmington.

2.12 FLOOR PROTECTOR

Designed to suit the individual setting of the fire appliance. Installation and construction to comply with AS/NZS 2918.

2.13 HEAT-POWERED FAN

Convection-powered fan, mounted on top of a freestanding wood burner, to assist in heat distribution from the appliance.

2.14 HEAT CELL

75mm AAC panels to Warmington recommendations and details to create a heat cell around the fire box.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

3.2 ROUTINE MATTERS

Refer to the GENERAL section 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION / APPLICATION REQUIREMENTS

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

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Installation

3.4 STANDARDS AND TOLERANCES

Refer to the GENERAL section 1270 CONSTRUCTION for general requirements.

Refer to the MANUFACTURER'S DOCUMENTS for product-specific requirements and tolerances.

3.5 INSTALLATION - IN-BUILT WOOD BURNING APPLIANCE

Install the wood burner to AS/NZS 2918. Refer to Warmington installation instructions for specific model details. If required, assemble AAC heat cell around the firebox using 75mm panels as recommended by Warmington. Ensure the cavity is vented to external air source by 2 x 100mm diameter vents or of equivalent area. Hearths and mantels to be installed to Warmington installation instructions. Commission unit to ensure installation complies with Warmington installation instructions. External requirements to AS/NZS 2918.4.9.

3.6 INSTALLATION - FREE STANDING WOOD BURNING APPLIANCE

Install the wood burner to AS/NZS 2918. Refer to Warmington installation instructions for specific model details. For free-standing appliances, bolt base down securely to floor to Warmington installation instructions. Commission unit to ensure installation complies with Warmington installation instructions. External requirements to AS/NZS 2918.4.9.

3.7 INSTALLATION OF OUTDOOR WOOD BURNING APPLIANCE

Install the wood burner to AS/NZS 2918. Refer to Warmington installation instructions for specific model details. Assemble AAC heat cell around the firebox using 75mm panels as recommended by Warmington. Ensure the cavity is vented to external air source by 2x 100mm diameter vents or of equivalent area. Commission unit to ensure installation complies with Warmington installation instructions. External requirements to AS/NZS 2918.4.9.

3.8 INSTALLATION - FLUE

To be a Warmington approved Flue System. Install the flue to AS/NZS 2918 and to NZBC E2/AS1. Refer to Warmington installation instructions for specific model details.

3.9 WETBACK

Install wetback system to NZBC G12/AS1 6.13 Wet-back water heater or AS/NZS 3500.4 section 7 Uncontrolled heat sources, as modified by NZBC G12/AS3.

Refer to the HOT & COLD WATER SYSTEM section for pipework connecting wetback to hot water system.

3.10 FLOOR PROTECTOR

Installation and construction to comply with AS/NZS 2918, manufacturer's specifications and to the design drawings.

Completion & Commissioning

3.11 COMPLETION - TESTS & CERTIFICATION

Refer to the GENERAL section 1270 CONSTRUCTION for general test and certification requirements at completion.

~

4 SELECTIONS

For further details on selections refer to www.warmington.co.nz.
Substitutions are not permitted to the following, unless stated otherwise in writing.

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7701 ELECTRICAL BASIC

1 GENERAL

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

- power
- lighting
- electrical automation
- security system
- complete with componentry
- electrically-powered fittings
- fire rated sealers, liners and accessories

1.1 RELATED WORK

Refer to ~ for ~.

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:

AFDD	Arc Fault Detection Device
COC	Certificate of Compliance
ELV	Extra Low Voltage
IP	international (ingress) protection classification
MCB	Miniature circuit breakers
NUO	Network Utility Operator
PCB	printed circuit board
RCCB	Residual Current-operated Circuit Breaker
RCD	Residual Current Device
SIA	security integration architecture
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 provisions for timber-framed buildings up to 10 m in height
NZBC F6/AS1	Visibility in escape routes
NZBC F8/AS1	Signs
NZBC G4/AS1	Ventilation of buildings
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 2648.1	Underground marking tape - Non-detectable tape
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3111	Approval and test specification - Miniature overcurrent circuit-breakers

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AS/NZS 3112:2017	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
NZS 3604	Timber framed buildings
NZS 4246	Energy Efficiency - Installing bulking thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60898	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Series
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61008.1	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) - Part 1: General rules
IEC 61009.1	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules
IEC 61643	Components for low voltage surge protection devices
IEC 62423	Type F and type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses
IEC 62606	General requirements for arc fault detection devices

Electricity (Safety) Regulations 2010
NZ Telecommunications Forum (TCF) Premises Wiring Guidelines
Private Security Personnel Investigations Act 2010

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Available by contacting the supplier/manufacturer.

Manufacturer/supplier contact details:

Company:	~
Web:	~
Email:	~
Telephone:	~

Warranties

1.5 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

1.6 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Guidelines 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.

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1.7 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Electrical workers holding a current Practising Licence (with an appropriate Registration class) to carry out prescribed electrical work. An Electrical Worker who holds a Trainee Limited Certificate or a Limited Certificate to be supervised by a licensed electrical worker with an appropriate Registration class.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 QUALIFICATIONS WORKERS - LICENSED UNDER STATUTE - SECURITY TECHNICIAN

Security technician holding a licence under the Private Security Personnel and Private Investigators Act 2010. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.9 NO SUBSTITUTIONS

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

1.10 CONFIRM SELECTIONS

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

1.11 INSPECTIONS

Type:	~
Requirement:	~
Location:	~
Notify:	Contract administrator
	~
Notification:	2 working days prior to work/item being carried out.

Requirements - Compliance

1.12 ELECTRICAL CERTIFICATE OF COMPLIANCE

At the completion of electrical work provide a Certificate of Compliance (CoC) to Electricity (Safety) Regulations 2010, regulation 65-67. Provide a copy to the Contract Administrator and NUO prior to connection and when required to the BCA for Code Compliance.

- 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 high risk electrical work as required by Electricity (Safety) Regulations 2010, regulation 70 High-risk prescribed electrical work to be inspected.

1.13 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, to the Contract Administrator and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

1.14 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Other information required by the BCA in the Building Consent Approval documents

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2 PRODUCTS

2.1 MAINS SUPPLY

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

2.2 CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0mm², 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 high temperature cable 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 (roof spaces above insulation etc).

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 61439.3, and installed in accordance with AS/NZS 3000, 2.10 Switchboards. 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 EARTH ELECTRODE

To AS/NZS 3000, 5.3.6 Earth electrodes and Table 5.2 Acceptable Earth Electrodes. Installed as a vertical-type electrode to a minimum depth of 1.8m or a strip-type electrode buried in horizontal trench with not less than 0.5m cover and minimum horizontal length of 7.5m.

2.6 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A to AS/NZS 3000, 2.3.3 Main Switches and additional isolating switches to AS/NZS 3000, 2.3.4 Additional isolating switches.

Residual current protection, maximum sensitivity of 30mA, to AS/NZS 3000, 2.6 Additional Protection by Residual Current Devices, as modified by Electricity (Safety) Regulations 2010. RCD and RCCBs' to meet Type A to IEC 61009.1 / IEC 61008.1 or Type F or Type B RCD to IEC 62423.

Miniature Circuit Breakers (MCB) to AS/NZS 60898 series or AS/NZS 3111, 4.5kA domestic or 6kA for commercial.

2.7 CIRCUIT PROTECTION - ARC FAULT DETECTION DEVICES

Arch Fault Detection Devices (AFDD) to IEC 62606 and to AS/NZS 3000, 2.9 Protection against fire hazard due to Arching Faults. Provide to all final subcircuits not exceeding 20A.

2.8 SURGE PROTECTION

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Provide surge protection device(s) to AS/NZS 3000, Appendix F Surge Protection Devices. Protection for the home's 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.

2.9 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.

2.10 SWITCH UNITS

Single pole switches to be 10 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units.
Label all switch units that control electrical equipment or special lighting circuits by proprietary engraved switch mechanisms where applicable.
Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.
Refer to SELECTIONS.

2.11 SWITCHED SOCKET UNITS

To AS/NZS 3000, 4.4 Socket-Outlets, 10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters to AS/NZS 3112 clause 3.12 as modified by Electricity (Safety) Regulation, single or multi gang as detailed. Refer to SELECTIONS.

2.12 HOT WATER SYSTEM ISOLATION SWITCH

To AS/NZS 3000, 4.8.2 Water heaters, one way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

2.13 DEGREES OF PROTECTION - DAMP CONDITIONS

For electrical equipment installed in classified zones (baths, showers, and other fixed water containers), provide a degree of protection to AS/NZS 3000, clause 6.2.4.1.

Zone 0	IPX7
Zones 1 and 2	IPX4
Zone 3	no specific degree of protection

Refer to AS/NZS 3000, Table 6.1 for requirement for selection and installation of electrical equipment.

For other damp situations such pools, water features, saunas, refrigeration rooms and in areas used for sanitization or general hose down operations, refer to AS/NZS 3000, section 6 for required degree of protection.

2.14 EXTERIOR SWITCHES AND SWITCHED SOCKET UNITS

Exterior grade, weather protected, switches and sockets to IP56 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on. Refer to SELECTIONS.

2.15 LIGHT FITTINGS

To AS/NZS 3000, 4.5 Lighting Equipment and Accessories and if required, complete with lamps and, if required, transformer and control gear for dimming. Refer to SELECTIONS.

2.16 CEILING ROSES

White plastic mounting base with screwed cover, manufactured to AS/NZS 3113. Terminal type. Suspended fittings to have sheathed round flexible cord to AS/NZS 3008.1.2. Refer to SELECTIONS.

2.17 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.18 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.

Refer to SELECTIONS.

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2.19 EXTERIOR LIGHT FITTINGS

Using materials with superior UV protection, impact strength, and addition chemical resistance.

Weather protection minimums:

- IP54 for protected areas under eaves or verandahs etc.
- IP55 for exposed areas not subject to pressurised water (hoses).
- IP66 for areas subject to pressurised water or major splashing.
- IP67 for inground lights
- IP68 for submerged pool fittings

Refer to SELECTIONS.

2.20 SPACE HEATERS

Fixed wired room heaters radiant or convector, and compliant with Electrical (Safety) Regulations 2010, Schedule 4, 1 Household & similar appliances. Flush or surface mount, fitted with safety cut-outs. Refer to SELECTIONS

2.21 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to NZBC G4/AS1, and compliant with Electrical (Safety) Regulations 2010, Schedule 4, 1 Household & similar appliances. Refer to SELECTIONS.

2.22 HEATED TOWEL RAILS

Fixed wired heated towel warmers, IPX4 splash-proof, compliant with Electrical (Safety) Regulations, Schedule 4, 1 Household & similar appliances. Refer to SELECTIONS.

2.23 DOOR BELL SYSTEM

Complete with transformer for mounting on distribution board. Refer to SELECTIONS.

2.24 ELECTRICAL AUTOMATION SYSTEM

Electrical automation system designed to enable if required:

- Lighting - automated control and dimming timer control.
- Heating including heated towel rails and ventilation systems.
- Security - programmable to simulate lights and other devices to give appearance home is occupied - ability to interface with security system and smoke detectors to activate lights.
- Energy efficiency - automatically switch circuits off when not required or on during low tariff times.
- Appliances.
- Spa pools.
- Irrigation systems.

Refer to SELECTIONS.

Security system

2.25 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.

2.26 DETECTORS

Standard passive infrared sensors: Install in stable environments with no wind flow and no direct bright sunlight

or

Passive infrared/ microwave sensors: Install in area where environmental stability is an issue.

2.27 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, 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.

2.28 CABLING

Security alarm wiring to AS/NZS 1125 for cables.



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Security alarm wiring to be multi stranded and not single stranded, minimum 0.5mm².

2.29 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.

2.30 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.

Signage

2.31 WARNING SIGNAGE - RECESSED LUMINAIRES

To AS/NZS 3000, 4.5.2.3.2 Warning Signs.

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.

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install electrical wiring and systems in accordance with Electricity (Safety) Regulations 2010, AS/NZS 3000 and other cited standards.

3.6 MAIN SUPPLY

Lay underground mains to the NUO and AS/NZS 3000, 3.11 Underground Wiring Systems requirements. Excavate trench, ensure minimum depth of cover to AS/NZS 3000 Table 3.6 Under-Ground Wiring Systems - Minimum Depth of Cover, install cable and marker tape complying with AS/NZS 2648.1 and backfill. If required, provide permanent cable marker signs to indicate the point where a cable enters or leaves a structure.

3.7 METER BOX

Fit to meter box manufacturer and Electricity Retailer requirements. Recess into external wall in sheltered area and flash to weatherproof to NZBC E2/AS1, Figure 9.1.8.3B: General meterbox and similar penetrations. Arrange for meter installation and connection.

3.8 DISTRIBUTION BOARD

Fit to AS/NZS 3000, 2.10 Switchboards and board manufacturer requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

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3.9 LABELLING

To AS/NZS 3000, 2.10.5 Equipment identification, 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.

3.10 CIRCUIT BREAKERS

Install MCBs at distribution board to AS/NZS 3000 to protect each final sub circuit.

3.11 EARTHING CONDUCTIVE STRUCTURE & MATERIALS

Earth all at risk structural metalwork and conductive building materials to AS/NZS 3000, 5.4.6, and the Electricity (Safety) Regulations 2010.

If they form part of the building, this includes:

- Structural steel frames or members
- Light steel framing
- Exposed conductive materials, like metal sink/tub or vanity benches etc, with attached electrical units or equipment

3.12 EQUIPOTENTIAL BONDING

Equipotential Bond extraneous conductive parts together and to the electrical installation earthing system to AS/NZS 3000, 5.6, and the Electricity (Safety) Regulations 2010 and the fitting manufacturer requirements.

If they form part of the building, this includes:

- Conductive water piping (including tap etc) and exposed related connected conductive surfaces (like metal sink benches or metal cladding etc). Not required where isolated by non-conductors (plastic pipe etc) from the mass of earth.
- Other conductive piping (not earthed by other means) and exposed related connected conductive surfaces.
- Concrete reinforcing - for floor or wall forming part of a room with a shower or bath, or the shell and surround of a swimming/spa pool
- Built-in Swimming pool and spa pool - exposed conductive parts of electrical equipment, as well as exposed conductive, fixtures, fittings and pool structures within 1.25m of pool edge

3.13 MAIN EARTH

Install main earthing conductor to AS/NZS 3000, 5.5.1 Main Earthing conductor. Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.14 ARC FAULT DETECTION DEVICE (AFDD)

To AS/NZS 3000 clause 2.9, AFDD on all final sub-circuits not exceeding 20A. Install to AS/NZS 3000, Appendix O, Installation of Arc Fault Detection Devices (AFDD'S)

3.15 SURGE PROTECTION

Install surge protection devices to manufacturer requirements and in accordance with AS/NZS 3000, Appendix F, F1.2.2 Installation.

3.16 RCD - RESIDENTIAL INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets (except for fixed or stationary cooking equipment), lighting & directly connected handheld electrical equipment, to AS/NZS 3000, 2.6.3.3.1 Residential installations - New Zealand only.

3.17 RCD - DAMP SITUATIONS

Install 30-mA RCD protection as required to AS/NZS 3000, section 6 for damp situations, including in the following higher risk areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.

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3.18 SET-OUT - OUTLETS & EQUIPMENT

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.

3.19 CABLING

Install wiring systems to AS/NZS 3000, Section 3 Selection and Installation of Wiring Systems. All cabling run concealed fix in position by suitable clips, saddles or clamps. Where possible, run cabling horizontally / vertically in straight line.

Locate holes in timber framing for the passage of cables at the centre line of member ensuring structural strength in maintained to NZS 3604 requirements. In steel studs/ structural steel, ensure aperture is brushed and shaped to minimize abrasion of cable. Cables may be supported by suspended ceiling systems unless not permitted by suspended ceiling manufacturer. Install cable in conduits where required to pass through concrete or underground.

3.20 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.

3.21 OUTDOOR/EXTERIOR SERVICES

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems, in accordance with AS/NZS 3000 and the fixture/fitting manufacturer's recommendations.

Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services to AS/NZS 3000, 3.11 Underground Wiring Systems.

Use the appropriate rated fittings for power control and power supply. Weather protected switches and sockets to IP56 minimum. Install to manufacturer 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.

3.22 PROTECTION OF CABLING NEAR BUILDING SURFACES

Protect concealed wiring to AS/NZS 3000, 3.9.4 Protection against mechanical damage, where wiring is fixed in position by fastening, or held in position by thermal insulation or passes through an opening in a structural member and they are located within 50mm from the surface of a wall, roof, ceiling or floor.

3.23 WALL BOXES

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.

3.24 SWITCHES AND SWITCHED SOCKET UNITS

Fit all switch units and socket units to the manufacturers requirements with heights and mounting directions as indicated in SELECTIONS.

3.25 SWITCHES AND SWITCHED SOCKET UNITS - FOR PERSON WITH DISABILITIES

Fit all switch units and socket units to the manufacturers requirements with heights (& mounting direction) and location to NZBC G9/AS1.

3.26 LIGHT FITTINGS

Install light fittings in locations and at heights as confirmed by the Contract Administrator, when not specifically shown on the drawings. Install to the luminaire manufacturer's requirements (including clearances) and to AS/NZS 3000, 4.5 Lighting Equipment & Accessories, in correct orientation for light output, complete with lamps.

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Fix through linings to structure or framing, provide additional nogs, trim and packing if required. Ensure transformers/drivers and luminaires are adequately ventilated and clear of any building elements, to AS/NZS 3000.

3.27 INSULATION CLEARANCES

Refer to relevant INSULATION section.

3.28 INSULATION CLEARANCES – RETROFIT RECESSED LUMINAIRES

For retrofitting or replacement recessed luminaire applications, check insulation clearances to NZS 4246, AS/NZS 3000, 4.5.2.3 and, where allowed by these standards, to the light manufacturers stated insulation clearances.

3.29 SPACE HEATERS

Install to the heater manufacturer requirements, and to AS/NZS 3000, 4.9 Room Heaters. Fit neatly and without damage to surrounding finishes. Ensure control switches and thermostats are fitted to appliance or otherwise connect to a control switch located adjacent to the heater and a remote thermostat. Isolation switch shall be provided adjacent to entrance of room or area the heating system is located or installed in switchboard.

3.30 AIR CONDITIONING & HEAT PUMP SYSTEMS

Connect to electricity supply to manufacturer's requirements and to AS/NZS 3000, 4.19 Air Conditioning & Heat Pump Systems. Any system incorporating a compressor shall be provided with a lockable isolating switch installed adjacent to the unit.

3.31 COOKING APPLIANCES

Install cooking appliances to manufacturer's requirements and to AS/NZS 3000, 4.7 Cooking appliances. Provide a switching device to all cooking appliances that have an open cooking surface such as a hob in a visible and accessible position within 2m of appliance, but not in prohibited location, refer to Figure 4.17.

3.32 GAS APPLIANCES

Connect gas appliances to electricity supply to manufacturer's requirements and to AS/NZS 3000, 4.18 Gas Appliances and Equipment as modified by Electricity (Safety) Regulations 2010. Refer to 7221 GAS APPLIANCE.

3.33 EV CHARGING STATIONS

Connect EV charging station to electricity supply to manufacturer's requirements and to AS/NZS 3000, 7.9 Supplied for Electric Vehicles. Install a 30mA RCD Type B for Mode 3 EV car charger circuits for domestic applications and for all EV car charging circuits in other electrical installations. Refer to relevant 7765 ELECTRIC VEHICLE (EV) CHARGING STATIONS.

3.34 ELECTRICAL FIXTURES

Install all electrical fixtures and wire to AS/NZS 3000, 4.3 Connection of Electrical Equipment, and manufacturers requirements. Refer to SELECTIONS. If required, provide operating or isolating switches.

3.35 ELECTRICAL AUTOMATION SYSTEM

Fit distribution cabinet in wall, cut-out to finish flush with the wall surface, or surface mounted. Configure installation to manufacturer instructions. Provide adequate user training and operating manual to the owner.

Security system

3.36 SECURITY SYSTEM

Install to the system manufacturer 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.

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Completion & Commissioning

3.37 WARNING SIGNS - RECESSED LUMINAIRES

Where recessed luminaires are installed in an accessible roof space, install warning sign to AS/NZS 3000 requirements.

3.38 COMPLETION MATTERS

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

3.39 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

Testing:	To Electricity (Safety) Regulations 2010 and AS/NZS 3000, 8.3 testing
Certificate of Compliance:	To Electricity (Safety) Regulations 2010 and ensure Verification Records supplied to AS/NZS 3000, clause 8.4
Submit results to:	~

3.40 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

~ ~

4 SELECTIONS

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7765 ELECTRIC VEHICLE (EV) CHARGING STATIONS

1 GENERAL

This section relates to the selection and installation of EVSE:
It includes:

- EVSE for residential, commercial, and public applications
- Safe Modes of EV charging
- Smart charging and bi-directional charging
- Types of EV chargers and connectors
- Load Management Systems
- Periodic Verification of EVSE

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:

BMS	Battery Management System
DSRC	Dedicated Short-Range Communications: one-way or two-way short-range wireless communication channels, specifically designed for automotive use and the corresponding set of protocols and standards.
EPOD	Electrical Portable Outlet Device
EV	Electric road vehicle (implies PHEV and BEV). (PHEV) Plug-in Hybrid Electric Vehicle (BEV) Battery Electric Vehicle
EVSE	Electrical Vehicle Supply Equipment - Any components (including software) used for charging an electric vehicle such a charging stations, IC-CPD, supply leads and socket outlets.
IC-CPD	In-Cord Control and Protection Device - A safety device incorporated into the charging cable for shutting off power if there is a problem.
IK rating	Enclosure impact protection
IP rating	Enclosure ingress protection
MEN	Multiple Earthed Neutral system (to AS/NZS 3000)
NUO	Network Utility Operator
OCPP	Open Charge Point Protocol for telecommunications between EVSE and Load Management System, and online payments.
PSOA	Portable Socket Outlet Assembly
RCD	Residual Current Device.
RCD-DD	Residual Direct Current Detecting Device
V2G	Vehicle-to-Grid
V2H	Vehicle-to-Home
V2I	Vehicle-to-Infrastructure

The following definitions apply specifically to this section:

Battery Management System	Protects the battery from functioning outside its safe operating parameters
Load Management System	Manages electricity distribution to the EV, and prevents the building electricity supply or local grid becoming overloaded, causing a power blackout
Charging operator	A person with the capability to remotely control the charging rate/time/max charge level of an EVSE connected to an EV. A charging operator can be a residential EV owner remotely controlling their EVSE via a smart phone app, or an employee managing many commercial or public EVSE.

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Charging point	A location where one or more charging stations are sited e.g. a service station
Charging station	The actual charging device that supplies electricity to the EV. Also known as (EVSE)
Charging Station Operator	A Charging Station Operator (CSO), is a person who owns, operates or manages EVSE that provide public charging for electric vehicles. Refer to WorkSafe - Electric Vehicle Charging Safety Guidelines
Connector	A connection at the end of a EVSE cable that plugs into the EV charging socket
Mode 2	Mode 2 charging is via an In Cord-Control and Protection Device (IC-CPD). Residential use only.
Mode 3	Mode 3 charging supplies AC charge to the EV on-board charger
Mode 4	Mode 4 charging supplies DC directly to the EV BMS

1.2 RELATED WORK

Refer to appropriate electrical section(s) for general electrical work:

Refer to ~	for ~

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
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation condition
AS/NZS 3820	Essential safety requirements for electrical equipment
SNZ PAS 6010	Electric Vehicle (EV) chargers for Commercial applications
SNZ PAS 6011	Electric Vehicle (EV) chargers for residential use
IEC 62196	Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles
RMA (1991)	Resource Management Act 1991
NZ Telecommunications Forum	TCF Premises Wiring Installer Guidelines 2015
WorkSafe	Supplier Declaration of Conformity (SDoc)
WorkSafe	Electric Vehicle Charging Safety Guidelines (May 2019, 2nd Edition)

Electricity (Safety) Regulations 2010

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Available by contacting the supplier/manufacturer.	~

Manufacturer/supplier contact details

Company:	~
Web:	~
Email:	~
Telephone:	~



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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years For EVSE equipment and materials

- 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

Provide an installer warranty:

2 years For installation of EVSE

- Provide this warranty on the installer 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 NO SUBSTITUTIONS

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

1.8 COORDINATE 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.

1.9 COMPLY

Comply with the Electricity (Safety) Regulations 2010, New Zealand electrical test specification standards, AS/NZS 3000, AS/NZS 3008.1.2, TCF Premises Wiring Installer Guidelines 2015, for listed and prescribed work and with the utility network operator requirements. Apply for the service connection, arrange for the required inspections of listed work if required, pay all fees as necessary.

1.10 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Workers and supervisors to be appropriately qualified to applicable legislative requirements. Carry out work under the supervision of an electrical licensed supervisor. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.11 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Installers to be competent (trained and experienced) to perform the task required, and familiar with all local electrical regulations and EVSE manufacturer instructions and specifications. If requested provide evidence of qualification / experience prior to commencing work.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.12 SAFETY OF INSTALLATION - DESIGN BY ELECTRICAL ENGINEER

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

1.13 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

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

1.14 ELECTRICAL CERTIFICATE OF COMPLIANCE

Refer to the main electrical section. 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.

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- 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 the Electricity (Safety) Regulations (2010).

1.15 ELECTRICAL SAFETY CERTIFICATE

Refer to the main electrical section. Provide an Electrical Safety Certificate (ESC), as required by the Electricity (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.

1.16 WIRING DIAGRAMS

Refer to the main electrical section. Submit wiring diagrams detailing power supply, datalinks, and control systems, clearly differentiating between manufacturers installed wiring, field installed wiring, and between components provided by the manufacturer and those provided by others.

- Submit typical connection diagrams, to the contract administrator, for all components including, but not limited to, inputs to the EVSE and outputs from the EVSE

1.17 OPERATION AND MAINTENANCE MANUALS

Refer to the general section 1239 OPERATION & MAINTENANCE for the requirements for submission and review of operation and maintenance manuals.

Provide the following operation and maintenance manual(s):
~

Include the following in the operation and maintenance manual(s):
~

1.18 DEMONSTRATION REQUIREMENTS

For installations, demonstrate and train the Principal's nominated personnel, and EVSE Charging Station Operator (CSO).

- Procedures and schedules related to start up and shut down, troubleshooting, servicing, and preventive maintenance.
- Review data in operation and maintenance manuals.
- Schedule training, through the contract administrator, with at least seven day's advanced notice.

Compliance - general

1.19 EV CHARGING STATION COMPLIANCE

To New Zealand electrical test specification standards, the Electricity (Safety) Regulations 2010, AS/NZS 3000 and best practice guidance SNZ PAS 6010 and SNZ PAS 6011.

1.20 SUPPLIER DECLARATION OF CONFORMITY (SDOC)

To Electricity (Safety) Regulations 2010, Clause 83 and relevant standard listed in Schedule 4, clause 17 Electric Vehicles and electric vehicle supply equipment , and Worksafe.

1.21 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer / supplier warranty
- Installer warranty
- Electrical Certificate of Compliance & Electrical Safety Certificate
- Supplier Declaration of Conformity (SDoC)
- Other information required by the BCA in the Building Consent Approval documents.

2 PRODUCTS

Load Management Systems - Continuity of Electricity Supply

2.1 LOAD MANAGEMENT SYSTEMS - RESIDENTIAL (MODE 3 or MODE 4)

Demand Flexibility (DF) using Static Load Management/Dynamic Load Management/Timetable-based load management/Bi-Directional energy transfer to AS/NZS 3000 and SNZ PAS 6011.
Refer to SELECTIONS.

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EVSE - Smart Charging

2.2 SMART CHARGING - GENERAL

In-built EVSE communications capability enabling external control by a charging operator to SNZ PAS 6010, SNZ PAS 6011, and EVSE manufacturer specifications.

Refer to SELECTIONS

2.3 BI-DIRECTIONAL CHARGING - VEHICLE TO HOUSE (V2H)

Two-way charger enabling charging as well as discharging of the EV on-board battery, to SNZ PAS 6011 and EVSE manufacturer specifications.

Refer to SELECTIONS

2.4 BI-DIRECTIONAL CHARGING - VEHICLE TO GRID (V2G)

Two-way charger enabling charging as well as discharging of the EV on-board battery, to SNZ PAS 6011 and Electricity Industry Act 2010 (Section 7).

Refer to SELECTIONS

EVSE - Bespoke design

2.5 BESPOKE EVSE

To corporate branding/client requirements, designer/fabricator details and technical specifications. Performance to SNZ PAS 6010, SNZ PAS 6011, AS/NZS 3000.

Refer to SELECTIONS

Safe Charging Modes

2.6 MODE 4 (DC) CHARGING - COMMERCIAL, AND PUBLIC

Wall or floor mounted EVSE to SNZ PAS 6010 and EVSE manufacturer technical specification. 400 Volt three phase AC supply connected to the EVSE to AS/NZS 3000, and Electricity (Safety) Regulations 2010. Data communications to SNZ PAS 6010 and EVSE manufacturer technical specification. Ingress Protection (IP and IK) to AS/NZS 3000, Appendix G.

Refer to SELECTIONS

EVSE - Connector Type

2.7 SAE J1772 DC CCS COMBO 1 - MODE 4

Combined Charging System (CCS) for single-phase AC, or DC charging, to IEC 62196 and EVSE manufacturer technical specification.

Refer to SELECTIONS

2.8 EU DC CCS Combo 2 - MODE 4

Combined Charging System (CCS) for single-phase or three-phase AC, or DC charging, to IEC 62196 and EVSE manufacturer technical specification.

Refer to SELECTIONS

2.9 CHADEMO YAZAKI DC - MODE 4

DC rapid-charging connector, to IEC 62196, and EVSE manufacturer technical specification.

Refer to SELECTIONS

2.10 TESLA SUPERCHARGER - MODE 4

DC fast-charging connector, to IEC 62196 and EVSE manufacturer technical specification.

Refer to SELECTIONS

EVSE - Data Communication

2.11 EVSE DATA COMMUNICATIONS - RESIDENTIAL

To SNZ PAS 6011.

Refer to SELECTIONS

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2.12 EVSE DATA COMMUNICATIONS - V2I

To SNZ PAS 6010. Wireless transmission via Dedicated Short-Range Communications (DSMC)

Refer to SELECTIONS

3 EXECUTION

Pre-installation

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.

Electricity capacity analysis (Residential)	To SNZ PAS 6011
Cabling	Trunking, clearances, and shielding to AS/NZS 3000
MEN system Earthing continuity	Verify continuity of MEN earthing systems to SNZ PAS 6010, SNZ PAS 6011, and AS/NZS 3000
EVSE IP and IK ratings	To suit
EVSE location (Residential)	Spatial, ventilation, and multi-vehicle charging to SNZ PAS 6011
Solid substrate:	Ensure solid substrate/base for fixing brackets or mounting systems into.

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 LOCATE EVSE SOCKET-OUTLET(S), TETHERED CABLE(S), AND USER INTERFACE FOR PUBLIC PAYMENTS

To AS/NZS 3000, P3 and P6. Socket outlets, tethered cables, controls and user interface for public payments at a height between 800mm - 1200mm above floor or ground level. One socket-outlet or connection point per EV.

Refer to SELECTIONS for socket-outlet mounting height.

3.6 INSTALL EVSE

Install EVSE, complete with components and accessories to AS/NZS 3000, and EVSE manufacturer requirements. Co-ordinate system installation with related and adjacent work. Define each circuit breaker.

3.7 CONNECT EVSE

Connect power supply cables to the designated terminals inside the EV charger in accordance with manufacturer installation guide, and requirements.

3.8 WEATHERTIGHTNESS

For external wall mounted fixings, maintain the weather tightness of the external cladding. For floor mounted EVES, ensure that tanking membranes are not penetrated.

Completion & commissioning

3.9 COMPLETION MATTERS

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



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3.10 COMMISSIONING - FINAL INSPECTION, TESTING, AND CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning. Final commissioning of EVSE to be in accordance with Electricity (Safety) Regulations 2010, and AS/NZS 3000.

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3.11 DEMONSTRATION REQUIREMENTS

For complex installations, demonstrate and train the Principal's nominated personnel, and EVSE charging station operator, refer to MAINTENANCE CONTRACT PROPOSAL - PERIODIC VERIFICATION

- Procedures and schedules related to start up and shut down, troubleshooting, servicing, and preventive maintenance.
- Review data in operation and maintenance manuals.
- Schedule training, through the contract administrator, with at least seven day's advanced notice.

4 SELECTIONS

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