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Architects Plus Ltd

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

3 Parks Architects Plus

3 Parks Development Specification

11 Sir Tim Wallis Drive, Three Parks, Wanaka, New Zealand
Project Ref: 3PK-1

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masterspec

Specification built using Masterspec software
Project ID: 325317 - 401141

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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

Construction of a 3-story commercial building and associated services, predominately mass timber construction.

1.3 NO RESTRICTED BUILDING WORK

This project does not include 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:
none

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: flat, square greenfields site
As shown on drawing: Sheet 1-01

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

none

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)

Site environment - Wind

1.11 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

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The design wind pressures are to NZS 3604, Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.
Building wind zone High/1.20kPa (refer to NZS 3604, table 5.4)

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: -
none.

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1232 INTERPRETATION & DEFINITIONS

1 GENERAL

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

Definitions

1.1 DEFINITIONS

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

1.2 PERSONNEL

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

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMA	American Architectural Manufacturers Association
AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
ASTM	American Society for Testing and Materials
AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc.
BCA	Building Consent Authority
BPIR	Building Product Information Requirements
BRANZ	Building Research Association of New Zealand

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

1.4 DEFINED WORDS

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

1.5 WORDS IMPORTING PLURAL AND SINGULAR

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

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1232S1 EXPLANATION OF SCHEDULE SECTIONS

1 GENERAL

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

1.1 EXPLANATION OF SCHEDULE SECTIONS

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

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

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

1.2 SCHEDULE SECTIONS

The following Schedule sections are contained within the specification:

1235S1	Schedule of Shop Drawings
1237S1	Schedule of Warranties
1238S1	Schedule of As Built Documentation
1239S1	Schedule of Operation & Maintenance Info
1270S1	Schedule of Samples & Prototypes
1270S2	Schedule of Spares & Maintenance Products
1278SR	Schedule Of Slip Resistance Testing

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1234 DOCUMENTATION

1 GENERAL

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

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

Building Consent Authority documentation

1.1 BUILDING CONSENT

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

1.2 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004

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

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

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

1.3 PROJECT PERSONNEL

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

Compliance information

1.4 DOCUMENTATION REQUIRED FOR CODE COMPLIANCE

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

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

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

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

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

1.5 PRODUCER STATEMENTS

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

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Substitutions

1.6 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.

1.7 NO SUBSTITUTIONS

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

1.8 PROPOSED SUBSTITUTIONS

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

1.9 NOTIFICATION OF SUBSTITUTIONS

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

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

Plus an assessment of:

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

and if requested:

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

1.10 ACCEPTANCE OF SUBSTITUTIONS

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

Amendments to issued Building Consent

1.11 CONTRACTOR AMENDMENTS TO BUILDING CONSENT

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

The contractor must:

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

1.12 PRINCIPAL AMENDMENTS TO BUILDING CONSENT

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

The principal will:

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

Manufacturer's documents

1.13 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

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

1.14 CONTRACTOR TO OBTAIN CURRENT DOCUMENTATION

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

1.15 DOCUMENTATION PROVIDED FOR BUILDING CONSENT

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

Branded work sections

1.16 BRANDED PRODUCTS / SYSTEMS

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

1.17 CROSS REFERENCED WORK SECTIONS

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

Care of construction documents

1.18 CONSTRUCTION ISSUE

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

1.19 REVISIONS TO CONSTRUCTION ISSUE

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

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

1.20 RETURN DOCUMENTS ISSUED FOR CONSTRUCTION

On completion of the contract works:

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

The Contract Administrator will advise whether such documents shall be:

- delivered to the Contract Administrator/Owner; or
- disposed of by normal waste disposal methods; or
- disposed of by secure document disposal methods.

Confidentiality of documents

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1.21 CONFIDENTIALITY OF DOCUMENTS

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

2 SELECTIONS

Receipt of construction documents

2.1 INITIAL ISSUE & REVISIONS - HARD COPIES

Initial issue:	Consent issue #1 - Electronic
Revisions:	TBC

2.2 DOCUMENT RECEIPT - HARD COPIES

Hard copies of plans, specifications and other documents issued for construction shall be sent to the main contractor

2.3 DOCUMENT RECEIPT - ELECTRONIC DOCUMENTS

Electronic documents issued for construction shall be sent to the main contractor

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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.

1.9 RESUBMISSION OF SHOP DRAWINGS

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

1.10 WORK MAY PROCEED

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

1.11 BIM MODEL

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

2 SELECTIONS

2.1 SHOP DRAWING FORMAT

Submit the shop drawings in the following format

	Format/Size
Hardcopy	size to suit
Electronic copy	PDF
CAD file	.dwg

2.2 BIM (BUILDING INFORMATION MODEL) FORMAT

Only structural design has been modelled in BIM. Refer to engineers

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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:

3130	Precast Concrete
3410	Structural Steel

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.

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.

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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

Weathertightness and watertightness warranty

2.1 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:

3114E	Expol Underslab Insulation
4161T	Kingspan Thermakraft Underlays, Foils, DPC, DPM, & Tapes
4239	Soffit Cladding
4251SA	Symonite Alucobond® Plus ACP Cladding Systems
4257	Steel Clad Insulated Panel Systems
4271	Natural Stone Veneer Cladding
4381NJ	Nurajack Deck Support System
4422NT	Nuraply TPO Roof & Deck Membrane
4521NR	Altus Residential Aluminium Windows & Doors
4711	Thermal Insulation
4711P	Pink® Batts® Thermal Insulation
4811S	Sika Sealants
5231C	CS For Doors
5241	Fire & Acoustic Interior Doors & Windows
6211	Wall Tiling Systems
6411J	Jacobsen Vinyl Surfacing
6612AM	Advance Entry Mats & Carpet
7123	Hot & Cold Water System
7126RH	Rinnai Hot Water Systems
7150	Sanitary Fixtures, Tapware & Accessories.
7411	Rainwater Spouting Systems
7451AL	Allproof Level Threshold Drainage Systems
7702	Electrical Standard

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:

7431 Drainage Common Requirements

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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1239 OPERATION & MAINTENANCE

1 GENERAL

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

1.1 SCHEDULE SECTION

Refer to 1239S1 SCHEDULE OF OPERATION & MAINTENANCE INFO for work sections contained in this specification that have requirements for:

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

Operation and maintenance documents

1.2 OPERATION AND MAINTENANCE INFORMATION

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

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

1.3 MAINTENANCE REQUIREMENTS

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

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

1.4 EQUIPMENT AND APPLIANCE MANUALS AND OPERATING INSTRUCTIONS

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

1.5 SELECTIONS INFORMATION

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

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

Include brochures and other information included with the items supplied.

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1.6 SELECTIONS INFORMATION - SUBSTITUTIONS

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

Documentation format

1.7 O&M DOCUMENTATION FORMAT

Unless otherwise specified in a work section,

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

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

Submission and review

1.8 O&M DOCUMENTATION SUBMISSION & REVIEW

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

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

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

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

The reviewer may advise that:

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

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

Final documentation

1.9 SUBMISSION OF FINAL DOCUMENTATION

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

1.10 FINAL O&M DOCUMENTATION - HARDCOPY

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

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

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

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

1.11 FINAL O&M INFORMATION - ELECTRONIC COPY

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

1.12 REVIEW OF FINAL DOCUMENTATION

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

2 SELECTIONS

O&M Documentation

2.1 FINAL DOCUMENTATION - INFORMATION FOR OPERATION AND MAINTENANCE

Provide a complete electronic copy to the contract administrator.

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

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

2.2 FINAL DOCUMENTATION - OPERATION AND MAINTENANCE MANUALS

Provide a complete electronic copy to the contract administrator.

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

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

Maintenance contract proposals

2.3 MAINTENANCE CONTRACT PROPOSALS

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

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1239S1 SCHEDULE OF OPERATION & MAINTENANCE INFO

1 GENERAL

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

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Information for operation and maintenance

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the following sections:

4239	Soffit Cladding
4271	Natural Stone Veneer Cladding
4521NR	Altus Residential Aluminium Windows & Doors
6612AM	Advance Entry Mats & Carpet
7123	Hot & Cold Water System
7126RH	Rinnai Hot Water Systems
7150	Sanitary Fixtures, Tapware & Accessories.
7431	Drainage Common Requirements

Operation and maintenance manuals

1.3 OPERATION AND MAINTENANCE MANUALS

There are no work section requirements.

Maintenance contract proposals

1.4 MAINTENANCE CONTRACT PROPOSALS

Refer to the following sections:

4811S	Sika Sealants

Additional Items

1.5 ADDITIONAL ITEMS

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

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1240 ESTABLISHMENT

1 GENERAL

This general section relates to site establishment including:

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

Notices and approvals

1.1 STATUTORY OBLIGATIONS

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

1.2 BUILDING CONSENT AUTHORITY AND NETWORK UTILITY APPROVALS

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

1.3 NOTIFY NETWORK UTILITY OPERATORS

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

Inspections

1.4 CARRY OUT INSPECTIONS

The Main Contractor shall inspect the site prior to commencement of the contract. He/She shall be fully aware of the site parameters and any existing site features that may affect the contracted design prior to and throughout the contracted period. The Main Contractor shall also be responsible for the work of his/her sub contractors and any nominated sub contractors ensuring the work of previous contracts is in order and of a tradesman-like finish to allow continuance of the contract. Any sub standard work identified shall be subject to rectification without cost to the principal.

All drawn documents shall be assessed for inconsistencies and reported to the architect for resolution prior to any commitment of material.

Drawn dimensions shall be established, by set out, on site and against existing site parameters and any discrepancy shall be reported to the architect for resolution.

Site preparation

1.5 SITE ACCESS

Access to the site is limited to: access via Sir Tim Wallis Drive and shared lane behind

1.6 WORKING AREA

Limited to the following designated working areas on the site:
See Sheet 1-01

1.7 SITE AND SOIL SURVEYS

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

1.8 GROUND CONDITIONS

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

Temporary construction

1.9 TEMPORARY BUILDINGS

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

1.10 TEMPORARY SITE FENCING

Provide and maintain a temporary site fence, 2 metres high from ground level on the side accessible to the public. Construct to comply with NZBC F5/AS1 Construction and demolition hazards.

1.11 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

First aid

1.12 FIRST AID EQUIPMENT

Provide first aid equipment.

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1250 TEMPORARY WORKS & SERVICES

1 GENERAL

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

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

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

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

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

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

1.4 CONSULTANTS TEMPORARY SITE OFFICE

Provide temporary accommodation and facilities for site meetings and for use by consultants while on site.

1.5 SITE FENCING

Provide and maintain a site fence, 2 metres high from ground level on the side accessible to the public. Construct to comply with NZBC F5/AS1 Construction and demolition hazards. Construct as required for public areas and as shown on the drawings.
Construct the fence with:

- galvanized chain link netting with a 50mm x 50mm maximum grid size
- posts at 2.5 metre centres maximum
- gap at the bottom of the fence no greater than 100mm

1.6 SITE FENCING - NON-PUBLIC AREAS

Provide and maintain a 1 metre high site fence to non-public areas. Construct using:

- warratah stakes at 1.5 metre centres fitted with safety caps
- plastic safety mesh

1.7 SITE HOARDINGS

Provide and maintain hoardings, 2 metres high from ground level on the side accessible to the public. Construct to comply with NZBC F5/AS1 Construction and demolition hazards. Construct as required for public areas and as shown on the drawings.
Construct hoardings with continuous cladding of:

- close butted timber at least 19mm thick; or
- 6mm exterior grade plywood on studs at 600mm centres maximum; or
- 9mm exterior grade plywood on studs at 1 metre centres maximum; or
- continuous metal cladding suitably supported to provide strength and rigidity

1.8 GANTRIES, PLANKED FOOTWAYS, GUARD RAILS

Provide temporary gantries, planked footways and guard rails as necessary to protect the public and others, for the proper execution of the works and to meet the requirements of territorial or other authority.

1.9 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

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

- exposing only as much ground as required at any time
- providing run off channels, contour drains or earth bunds to divert clean water away from the

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site on to stable sealed or grassed ground
- capture silt by the use of silt fences, vegetation buffer strips, sediment ponds or earth bunds.

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

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

1.10 PROVIDE CONCRETE WASHWATER RUN OFF PROTECTION

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

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

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

Large project and those without suitable ground area - prevent run off by:
- plan and implement washwater control measures based on the expected volumes, allow for the timely removal and safe disposal of liquids and solids.
- Limit the volume of water used for washing down to the extent required.
- Control the flow of washwater so that it is directed to proper catchments.
- providing watertight bunds, pits or tanks, filtered washwater is not to be discharged to drains.

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

Pump washwater away from drains, waterways and adjoining property.

1.11 EXCAVATION SAFETY

To the Health and Safety at Work Act 2015.
Carry out excavation to WorkSafe, Good Practice Guidelines - Excavation Safety. This may include deep excavation, trenching, and areas behind unfilled retaining walls.
Carry out excavation using plant and equipment suitable for the purpose.

Scaffolding

1.12 SCAFFOLDING

Provide scaffolding for the efficient execution of the works.
Comply with:
- Health and Safety at Work Act 2015
- Health and Safety in Employment Regulations 1995
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
- Worksafe - Scaffolding in New Zealand - Good Practice Guidelines

Temporary services

1.13 WATER

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

1.14 ELECTRICITY

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To AS/NZS 3012.
Nominate the person to install and be responsible for the complete temporary electrical installation. The name and designation of the person responsible is to be displayed prominently and close to the main switch or circuit breaker.

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

1.15 TELEPHONE

Provide on-site temporary telephone facilities.

1.16 COMPUTER FACILITIES

Provide on-site temporary computer facilities complete with an email and internet connection capable of sending, receiving and printing site communications.

1.17 PRINTER

Provide on-site temporary printing facilities capable of printing A4 and A3 colour prints.

1.18 IMAGING

Keep available devices able to take and send quality printable digital photographs.

Care and protection - Site

1.19 LOCATE AND PROTECT SURVEY MARKS

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

1.20 LOCATE EXISTING SERVICES

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

1.21 PROTECT EXISTING SERVICES

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

1.22 PROTECT EXISTING LANDSCAPE ELEMENTS

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

1.23 MAKE GOOD - SITE

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

Care and protection - Project

1.24 TEMPORARY PROTECTION

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

1.25 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

1.26 SPECIAL PROTECTION PROJECT

Care and protection - miscellaneous

1.27 CONSTRUCTION KEYING AND SECURITY

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

1.28 TEMPORARY STORAGE

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

Rubbish removal

1.29 PERIODIC RUBBISH REMOVAL

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

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1260 PROJECT MANAGEMENT

1 GENERAL

This general section relates to project management requirements including:

- Meetings
- Reporting
- Cost control
- Communicating and records
- Confidentiality
- Programming
- Hold points and notification points
- Working hours
- Health and safety

Site Meetings

1.1 PURPOSE OF SITE MEETINGS

The purpose of site meetings is to:

- Ensure that the Contractor has all information required to construct the work
- To address and clarify aspects of construction of the work including quality
- To address issues relating to project delivery including, site progress and cost.

1.2 SITE MEETING ATTENDANCE

The following persons to attend:

- Principal
- Contract administrator
- Project manager
- Contractor
- Architect
- Designer
- Engineer
- Quantity surveyor
- Services consultants when needed
- Subcontractors when needed (contractor to inform them)

1.3 REPORTING

The following reports are required to be presented at site meetings:
Contractor: A detailed status report

1.4 SITE MEETING MINUTES

The contract administrator is to keep full minutes of all site meetings and arrange distribution to all those involved within 3 working days.

The minutes are to record

- Documentation and information issued and required
- Directions and variations issued
- Confirmation of contract insurances
- Programme items
- General business
- Site health and safety
- Payment claim processing including costing variations

Project Control Group (PCG) meetings

1.5 PURPOSE OF PCG MEETINGS

The purpose of PCG meetings is:

- To consider matters arising from the regular site meetings that fall outside of the scope of those meetings.
- To address issues relating to project delivery including quality, programme and cost.
- To allow reporting by consultants.

1.6 PCG ATTENDANCE

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The following persons to attend:

- Principal
- Contract administrator
- Project manager
- Contractor
- Architect
- Engineer
- Quantity surveyor
- Other consultants

1.7 PCG REPORTING

The following reports are required to be presented at PCG meetings:

Contract administrator:	A report on matters addressed at the site meetings
Contractor:	A detail status report
Consultants:	A status report

1.8 PCG MINUTES

The designated person is to keep full minutes of all PCG meetings and arrange distribution to all those involved within 5 working days.

Reporting

1.9 CONTRACTORS DETAILED STATUS REPORT

A contractor's detailed status report is to address the following:

- Progress performance, addressing actual progress against the programme and any variance from the programme.
- Procurement progress on parts of the work being undertaken under a monetary allowance including the time by which direction must be given on monetary allowances to conform to the programme.
- Details of measures being taken to get work back on programme where there has been a delay and details of any future events that will or are likely to affect compliance with the programme.
- Compliance with the issued Building Consent and notification of any work or inspections that have not been passed by the BCA inspector.
- Compliance with the issued Resource Consent and any compliance issues.
- Site health and safety including any notifiable incidents.
- Details of any discrepancies in the contract documents that require clarification or determination
- A list of information requests by the contractor, the date when they were made, the person who they were directed to and the date by which a response is required.
- A variation report including progress on agreed variations, variations to be agreed and anticipated variations and the time implication of variations.
- Variation costing and the adjusted contract price including an assessment of the cost of known and potential variations.
- Review of sums not yet directed for expenditure.

Cash flow estimates

1.10 CASH FLOW ESTIMATES

The contractor is required to submit to the contract administrator a detailed cash flow estimate of all payments to which the contractor considers they will be entitled to under the contract. Where no time is stated in the conditions of contract, provide the cash flow estimate within 20 working days of the date of award of the contract. The contractor shall subsequently submit such revised cash flow estimates at 3 month intervals.

Cost control

1.11 MEASUREMENT

Give reasonable notice to the contract administrator before covering up work which requires to be measured.

1.12 DAYWORK VOUCHERS

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To be signed by the contractor's representative as confirming the labour, times and materials used, before being supplied to the contract administrator.

Communicating and records

1.13 MEANS OF COMMUNICATION

Communications between the parties shall be as follows:

Directions:	In writing delivered by email with a copy by post or hand
Meeting minutes:	In writing delivered by email
RFI's:	(Requests for information) by email or in writing to the contract administrator

1.14 DELIVERY OF COMMUNICATIONS

Deliver communications to the addresses listed in the contract agreement by means as allowed. Where such addresses are not included in the contract agreement:

- deliver to the addressee by hand; or
- post to the postal address stated in the project directory; or
- deliver to the street address as stated in the Project Directory; or
- send by email to the email address stated in the Project Directory; or
- where agreed, deliver via a file hosting service or an electronic project management system.

1.15 SERVICE OF NOTICES

Serve notices to the addresses listed in the contract agreement by means as allowed.

1.16 CHANGE OF ADDRESS

The principal, contractor and the contract administrator must notify the others if they change their address for delivery or transmission of communications.

1.17 RECORDS

Ensure all records specified are kept, held and collated on site in a form that makes the information easily accessible when it is needed. Distribute copies as and when necessary to those persons entitled under the contract to that information.

1.18 PROGRESS PHOTOGRAPHS

Take digital photographs recording progress. Refer to SELECTIONS.

Confidentiality

1.19 CONFIDENTIALITY - PUBLICITY

Unless specifically agreed photographs and other images of the work are not to be used by the contractor, subcontractors, material suppliers and others involved in the construction of the works.

Photographs taken for record purposes may be kept but must not be passed to other persons.

1.20 CONFIDENTIALITY AGREEMENT

Where required as a condition of the contract arrange for workers to provide a confidentially agreement. Workers who have not provided such an agreement shall be excluded from the site.

Programming

1.21 PROGRAMME

Include the proposed sequence of all significant on-site and off-site activities, including any intermediate key dates mentioned in the contract. Identify the critical path. Provide a tabulated schedule of information for each activity in order of:

- brief description
- duration in suitable time unit
- earliest start and latest finish time
- total float
- key dates for the supply of information or materials by others.

Identify the dates by which particular information, material or plant need to be supplied or arranged by the contract administrator. Also identify any constraints which may have been imposed by the programme.

Supply copies of the programme to the following:

Contract administrator 1

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Architect	1
Designer	1
Principal	1
Quantity surveyor	1
Site supervisor	1

Monitor the programme by:

- recording progress regularly on the site chart
- informing the contract administrator promptly of any circumstances affecting any part of the programme structure and timing
- reviewing the programme once a month making alterations as needed and agreed to and re-issuing the required copies.

Hold Points and Notification Points

Refer to section 1232 INTERPRETATION & DEFINITIONS for definition of hold points and notification points.

1.22 HOLD POINTS

The following hold points are in addition to hold points nominated in work sections. Notify of hold point work/item, do not to proceed further with work/item until advised to continue.

Notify:	Contract administrator
Notification:	2 working days prior to work/item being carried out.

Hold Point Schedule

Location	Hold Point	Requirement
as required by council or engineers	refer to council & engineers docs	

1.23 NOTIFICATION POINTS

The following notification points are in addition to notification points nominated in work sections. Notify of notification point work/item, continue with the work/item and subsequent work unless advised otherwise.

Notify:	Contract administrator
Notification:	2 working days prior to work/item being carried out.

Notification Point Schedule

Location	Notification Point	Requirement
as required by council or engineers	refer to council & engineers docs	

Working hours

1.24 WORKING HOURS

Work on site is not restricted. Comply with territorial authority consent conditions and noise and nuisance controls.

Health and safety

1.25 HEALTH AND SAFETY LEGISLATION

Refer to the requirements of the Health and Safety at Work Act 2015. Comply also with all other relevant New Zealand safety legislation.

The Contractor will ensure, so far as is reasonably practicable, that, each subcontractor they engage and each separate contractor is aware of and complies with its obligations under health and safety-related law.

For the purpose of health and safety-related law, the contract administrator and others involved in contract administration and observation and construction monitoring will not at any time have management or control of the Workplace.

1.26 HEALTH AND SAFETY REGULATIONS, CODES AND GUIDES

Comply with:

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- Relevant New Zealand safety legislation including, Health and Safety at Work (General Risk and Workplace Management) Regulations 2016, also Health and Safety in Employment Regulations 1995 as amended by that Regulation and the appropriate Health and Safety at Work Regulations.
- WorkSafe publications including "Guidelines for the provision of facilities for general safety in the construction industry".
- Relevant codes of practice, guides, guidelines and standards.

Until further regulations are made under the Health and Safety at Work Act 2015 to cover them, the transitional provisions of the Act continue in force until revoked or amended.

1.27 HEALTH AND SAFETY IMPLEMENTATION

Take all practical steps to make the site and the contract works safe and to provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards and risks.

Co-operate, consult and co-ordinate health and safety matters with each PCBU including all subcontractors, suppliers, separate contractors, others engaged on the project and others who may be affected by the construction of the works.

Identify any significant hazards and risks.

Maintain proper procedures for dealing with any emergencies that may arise. Immediately investigate accidents, identify their cause and maintain a register of accidents and serious harm. Provide a copy of any report which the contractor is required to make to a public authority on any accident which is associated with carrying out the contract works and results in serious harm to any person.

Refer to individual work sections for detailed requirements on this project.

1.28 SUSPENSION OF HAZARDOUS WORK

On the request of the contract administrator, acting on reasonable grounds, suspend any identified hazardous activities and proceed to eliminate, isolate or minimise them in order to comply with the Act, without prejudice to any other rights of the principal under the contract.

1.29 SITE SAFETY PERSON

Appoint a suitably qualified site safety person to co-ordinate site safety and to attend all site meetings.

1.30 HEALTH AND SAFETY PLAN

Prepare and submit a health and safety plan to the contract administrator before commencing work on site. Include in that plan all people on site and the general public, as well as the following items and any other necessary items:

- identification of existing and potential construction hazards and risks
- Any design construction safety matters identified in section 1220 PROJECT and/or any separate project design construction safety report.
- safety procedures to eliminate, isolate or minimise construction hazards and risks
- the equipment to be used to minimise the hazards and risks
- the maintenance of a register of hazards and risks for the site
- the name and qualifications of the site safety person
- emergency procedures
- first aid facilities and safety equipment
- the methodology for notifying, recording and investigating accidents and injuries.

Advise the contract administrator of unusual or atypical features in the Plan in addition to any features already identified in section 1220 PROJECT and/or any separate project design construction safety report. Keep a copy of the plan in the site office.

1.31 MAINTAIN HEALTH AND SAFETY PLAN

Maintain health and safety plan and alter to accommodate changing situations and /or substitutions. Advise contract administrator of changes.

1.32 COMPLY WITH SITE SAFETY PLAN

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

1.33 INFORM WORKERS OF HAZARDS AND RISKS

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Inform workers and others on the site of:

- hazards and risks they may be exposed to while working or other legitimate activities
- hazards and risks they may create while working which could harm others
- how these hazards and risks may be minimised
- emergency procedures
- the location of first aid facilities and safety equipment.

1.34 EXPLOSIVES

Do not use explosives except with the written approval of the territorial authority/WorkSafe. Comply with their safety requirements and use construction blasters holding a current, appropriate Approved Handler Certificate and Controlled Substance Licence issued by WorkSafe, to the Health and Safety at Work (Hazardous Substances) Regulations.

1.35 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.

2 SELECTIONS

Meetings

2.1 SITE MEETINGS

to be discussed with main contractor

2.2 PCG MEETINGS

to be discussed with main contractor

Photographs

2.3 PROGRESS PHOTOGRAPHS

To be taken when necessary to document essential waterproofing, plumbing, fixings and anything requiring inspection that won't be visible at a later date.

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1270 CONSTRUCTION

1 GENERAL

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

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

1.1 SCHEDULE SECTION

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

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

Quality control and assurance

1.2 QUALITY ASSURANCE

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

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

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

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

1.3 NOTICE

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

1.4 NOTIFIABLE WORK

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

Noise and nuisance

1.5 LIMIT CONSTRUCTION NOISE

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

1.6 ACCEPTABLE NOISE LEVELS

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

1.7 PROVIDE INFORMATION TO NEIGHBOURS

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

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

1.8 INCONVENIENCE TO OTHERS

When the works are to be carried out in or around occupied premises, ascertain the nature and times of occupation and use. Carry out the works in a manner to minimise inconvenience, nuisance and danger to occupants and users.

1.9 ROADWAY AND FOOTPATH

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

1.10 VEHICLE CROSSING

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

1.11 TRAFFIC SAFETY

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

1.12 DIRT AND DROPPINGS

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

1.13 DAMAGE AND NUISANCE

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

1.14 SMOKE FREE REQUIREMENTS

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

1.15 RESTRICTIONS

Do not:

- light rubbish fires on the site.
- bring dogs on to or near the site.
- bring radios/audio players on to the site.

Set-out and tolerances

1.16 SURVEY INFORMATION

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

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

1.17 DATUM

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

1.18 SET-OUT

Set out the work to conform with the drawings.

1.19 USE OF SET-OUT INSTRUMENTS

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

1.20 CHECK DIMENSIONS

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

1.21 TOLERANCES

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

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

Refer to work sections for tolerance requirements for finishes.

Execution

1.22 EXAMINE PREVIOUS WORK

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

1.23 REPORT DEFECTIVE PREVIOUS WORK

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

1.24 EXECUTION GENERALLY

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

1.25 EXECUTION - NO DETAIL IS PROVIDED

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

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

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

1.26 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

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

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1.27 MINIMISE DELAYS DUE TO WEATHER

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

Defective or damaged work

1.28 DEFECTIVE OR DAMAGED WORK

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

Hot work - fire safety

1.29 HOT WORK

Generally, to NZS 4781 Code of Practice for Safety in Welding and Cutting, includes but not limited to: Welding; flame cutting; disc cutting; grinding; bitumen blowers; blow lamps; brazing; burning off; soldering; use of hot air guns.
Note - where the standard refers to the use of asbestos, alternative fire-resistant materials are to be used.

1.30 COMBUSTIBLE MATERIAL

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

1.31 HOT WORK PERMIT

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

1.32 FIRE SYSTEMS

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

1.33 DURING SUSPENDED WORK

Maintain a fire watch at least 30-minutes after hot works are suspended e.g. during lunch breaks or overnight, to NZS 4781, clause 6.2.7.
For hot works in confined spaces, prevent potential ignition of flammable gases, to NZS 4781 clause 6.5.

Qualifications

1.34 QUALIFICATIONS GENERALLY

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

1.35 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

Where restricted building work (RBW) forms part of the contract works, workers, or supervisors of that work must be licensed building practitioners (LBP) holding current licenses for the particular restricted building work.
For rare instances where non-RBW also requires an LBP refer to individual work sections for details.

1.36 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

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

1.37 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

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

1.38 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

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

1.39 QUALIFICATIONS – PRODUCER STATEMENTS

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

1.40 REPLACEMENT OF PERSON

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

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

Products

1.41 NEW PRODUCTS

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

1.42 COMPATIBILITY OF PRODUCTS

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

1.43 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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

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

Refer to individual work sections for any special requirements.

1.44 SUBSTRATE CONDITIONS

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

1.45 INSTALLING PRODUCTS

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

1.46 COMPLY WITH STANDARDS

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

1.47 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.48 INCOMPATIBLE PRODUCTS

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

Samples

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1.49 SAMPLES FOR REVIEW

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

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

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

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

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

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

Refer to SAMPLES clauses in work sections for further detail.

1.50 CONTROL SAMPLES

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

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

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

1.51 OTHER SAMPLE REQUIREMENTS

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

Prototypes

1.52 PROTOTYPES - TESTING

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

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

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

1.53 PROTOTYPES - REVIEW

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

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

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

1.54 PROTOTYPES - GENERAL

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

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

Spares & maintenance products

1.55 SPARES & MAINTENANCE PRODUCTS

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

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

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

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

Cleaning during the works

1.56 PERIODIC SITE CLEANING

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

1.57 TRADE CLEANING

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

1.58 SPECIAL SITE CLEANING

Organise a full clean to the building ready for tenants to move in to.

Remove protection

1.59 REMOVE PROTECTION

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

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

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

Refer to individual work sections for any special removal requirements.

Completion

1.60 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.61 LEAVE WORK

Leave work to the standard required for the following procedures.

1.62 COMPLETION - TESTS & CERTIFICATION

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

1.63 REMOVE CONSTRUCTION WASTE

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

1.64 COMPLETE ALL SERVICES

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

1.65 CLEANING BY CONTRACTOR

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

- Wipe all surfaces to remove construction dust.
- Clean out service ducts and accessible concealed spaces.
- Clean out all gutters and rainwater heads.
- Wipe dust from both sides of glass. Take particular care when removing paint or cementitious materials to not damage the glass. Do not use metal scrappers that may damage the glass.
- Remove adhesive residue left by labels and other temporary protection/markings.
- Clean out the interior of all cabinetry.
- Wash down external concrete including driveways and concrete masonry. Take care when waterblasting to not cause damage to the surface or allow water to enter the building.
- Remove rubbish and building material from the area immediately adjacent to the contract works.

1.66 CLEANING BY COMMERCIAL CLEANER

In addition to cleaning carried out by the contractor, use a commercial cleaning company to clean the whole of the interior of the building, including all appliances, equipment, fittings, surfaces and finishes to leave it without any blemish. Cleaning to include:

- Clean and wash down all external surfaces to remove dirt, debris and marking.
- Clean all interior surfaces including cabinetwork, joinery, sanitary and hardware items.
- Clean all floor finishes.
- Clean and polish all glass, both sides. Take particular care when removing paint or cementitious materials to not damage the glass. Do not use metal scrappers that may damage the glass.

Commissioning

1.67 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.68 MOVING PARTS

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

1.69 COMMISSIONING - TESTS & CERTIFICATION

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

1.70 INSTRUCTION AND DEMONSTRATION

Provide instruction and demonstration to the owner/occupier to the extent that is listed below and as required for them to reasonably occupy and use the building. This is to include at least the following:

- Location and isolation of all services connections.
- Operation of all emergency systems.
- Locking and security arrangements.
- Operation of basic building services including lighting, heating, mechanical ventilation, air conditioning and security.
- Special cleaning requirements and procedures.
- Any other features that the owner/occupier needs to know about.

1.71 SECURITY AT COMPLETION

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

Practical completion submission

1.72 ADDITIONAL PRACTICAL COMPLETION INFORMATION

In addition to requirements in the contract and contained elsewhere in the specification provide the following information submissions for practical completion:

- All documents which the contractor has obtained on behalf of the owner/occupier.
- Information required by the owner/occupier to be able to use the building.
- Advice that NUO accounts in the contractor's name have been closed and as appropriate changed to be in the name of the owner/occupier.
- A list of persons to be contacted to carry out any emergency or remedial work including 24 hour/7 day contact details.

1.73 ADDITIONAL PRACTICAL COMPLETION REQUIREMENTS

Refer to the conditions of contract for the definition of practical completion and the conditions relating to practical completion.

Defects period submissions

1.74 DEFECTS REMEDIATION - SUBMISSIONS

Provide the following at periods required by the contract administrator, where no period is stated, provide this information monthly:

- A copy of the contractor's check list identifying remaining defects and omissions to be completed recording progress made in completing and correcting the items.
- A copy of lists issued by the principal/employer identifying omissions and defects recording progress made in completing and correcting the items.
- A copy of lists issued by the contract administrator identifying omissions and minor defects recording progress made in completing and correcting the items.

Completion submissions

1.75 FINAL COMPLETION - SUBMISSIONS

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

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

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1270S1 SCHEDULE OF SAMPLES & PROTOTYPES

1 GENERAL

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

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Samples

1.2 SAMPLES

Refer to the following sections:

4271 Natural Stone Veneer Cladding

1.3 SAMPLES - ADDITIONAL ITEMS

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

Prototypes

1.4 PROTOTYPES - REVIEW

There are no work section requirements.

1.5 PROTOTYPES - TESTING

There are no work section requirements.

1.6 PROTOTYPES - ADDITIONAL ITEMS

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

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1270S2 SCHEDULE OF SPARES & MAINTENANCE PRODUCTS

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Spares & maintenance products

1.2 SPARES & MAINTENANCE PRODUCTS

Refer to the following sections:

6211	Wall Tiling Systems
6612AM	Advance Entry Mats & Carpet

1.3 SPARES & MAINTENANCE PRODUCTS - ADDITIONAL ITEMS

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

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1278SR SCHEDULE OF SLIP RESISTANCE TESTING

1 GENERAL

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

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

This section includes schedules identifying work sections with:

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

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

Slip resistance - surfaces not requiring testing

1.4 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

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

4383	Timber Decking
6411J	Jacobsen Vinyl Surfacing

1.5 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

Walking surfaces on access routes that have previously been tested for slip resistance and found to comply with NZBC D1/AS1 requirements are covered in the following Work sections:

6411J	Jacobsen Vinyl Surfacing

Slip resistance - surfaces requiring testing

1.6 SLIP RESISTANCE - SURFACES REQUIRING TESTING

Refer to the following work sections for surfaces to be tested for slip resistance, including location, test condition, slope requirement and specific reporting requirements:

6411J	Jacobsen Vinyl Surfacing

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:

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Level access wet	39 SRV	Wet pendulum test method of AS 4586, Appendix A using the Slider 96 rubber.
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°
0.557	1 in 8	7.125°

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1.8 GENERAL REPORTING REQUIREMENTS

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

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

Slip resistance - additional items

1.9 SLIP RESISTANCE - ADDITIONAL ITEMS

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

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2241 EXCAVATION

1 GENERAL

This section relates to the excavating required for the building works, removing surface soils and the disposal of excavated material.

Related work

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZS 4402	Methods of testing soils for civil engineering purposes
WorkSafe	Good Practice Guidelines - Excavation Safety

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

Requirements

1.2 ARCHAEOLOGICAL DISCOVERY

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

Performance

1.3 GROUND CONDITIONS

Foundation investigations and drilling have been carried out. Place your own interpretation on this information as no warranty is implied that the information is truly representative or complete. Make such extra investigations as considered necessary.

Copies of bore logs are included in the geotechnical report.

1.4 PROOF DRILLING

Site bores already carried out indicate underlying layers of unsuitable material in certain areas. For the foundations designated on the plan, hand augered proof holes may be required to determine the extent of such material. Include for this work in programming and adjust against provisional quantities scheduled.

1.5 ACCESS FOR MACHINES

Determine working conditions and access for machines. Take into account the time of year, the nature of the ground and subsoil to be excavated, the ground water table and all matters influencing the carrying out of the work.

1.6 SAFE WORKING CONDITIONS

Provide safe working conditions and adequate support to excavations at all times to WorkSafe, Good Practice Guidelines - Excavation Safety. Cover holes and fence off trenches and banks.

1.7 FOUNDATION BEARING

Request written instructions if a natural bearing is:

- reached at a lesser depth or
- not reached at the depth shown on the drawings.

In made-up ground excavate down to a natural bearing. Remove unsuitable material that is exposed and replace with compacted backfill.

1.8 INSPECTION

Arrange for inspections and before placing any new work. If bearing becomes inadequate due to any cause then stop work and request further instructions.

1.9 SITE MEASUREMENT, ROCK

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Where rock is shown to be part of the site condition by the bore logs, all rock removed to be solid measured and the quantity recorded and agreed to in writing as the excavation proceeds.

1.10 SITE MEASUREMENT, OTHER FORMATIONS

If for any reason the excavations have to vary from the drawings, those affected to be solid measured and the quantity recorded and agreed to in writing as the excavation proceeds.

2 PRODUCTS

Materials

2.1 TOPSOIL

Weathered soil, with organic inclusions capable of supporting the growth of vegetation.

2.2 CUT MATERIAL

Consisting of sands, gravels, sedimentary materials, clays, scoria and similar deposits.

2.3 ROCK

Defined as material encountered in excavations which because of its size or position can be removed only by breaking up by explosives or mechanical plant such as jack hammers or percussion drills.

2.4 UNCONTROLLED FILL

Variable fill material placed with little or no compaction control.

2.5 EXCAVATED FILL

Material from other formations in the excavation which may be selected and approved as suitable for filling and complying with NZS 4402 by having grading and moisture content properties that will allow compaction to 95% of maximum density.

3 EXECUTION

Conditions

3.1 REPORT

Report any survey pegs, bench marks, and the like on any features, leaving them undisturbed until approval is given for removal.

3.2 COMPLY

Comply with the requirements of WorkSafe, Good Practice Guidelines - Excavation Safety.

3.3 WORK BY OTHERS

Before taking over work done on the site by others check all levels and conditions and report any discrepancies affecting further work.

3.4 EXISTING SERVICES AND FOUNDATIONS

Locate underground services and foundations before work is started. Any information provided regarding the location of these services and foundations is given from available records but with no guarantee of accuracy as regards alignment or depth. Furthermore no guarantee is given or implied that the information provided covers all existing services and foundations. Make good at no extra cost damage to existing services to the satisfaction of the appropriate network utility operator. Protect existing roads, footpaths, gutters, crossings etc from damage during work.

3.5 KEEP FREE OF WATER

Keep excavations free from water and keep water from excavations clear of other construction work.

3.6 TERRITORIAL AUTHORITY REQUIREMENTS

Obtain from the territorial authority requirements for the method of discharging water from the site.

3.7 FORM SUMPS

Form sumps outside the line of foundations and deep enough to drain excavations. Pump from sumps without disturbing excavations or any material in place.

3.8 SILT CONTROL

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Undertake silt control measures required by territorial authorities and network utility operators in relation to design, location and discharge into the drainage system.

Application

3.9 STRIP TOPSOIL

Strip topsoil carefully over the whole site and stockpile where directed on the site, on the prepared subgrade, for re-spreading at the completion of the contract.

3.10 STRIP TO SUBGRADE

Strip the soil over the whole site to form a subgrade generally, but at a minimum of 200mm below the original ground level. Leave the subgrade level, clear of all loose material and with no impediment for the excavation work.

3.11 DIVERT WATERWAYS

Temporarily divert as necessary all ditches, field drains and other waterways encountered during the excavations and reinstate to approval on completion.

3.12 DIVERT DRAINS AND SERVICE LINES

Divert services, drains and field drains encountered in the excavations to new routes clear of the building and reconnect to the requirements of the network utility operator.

3.13 BREAK OUT

Break out and remove old foundations, floor slabs, drains, manholes and septic tanks, seal up connections and remove contaminated soil. Grub out roots in excess of 75mm diameter to a minimum of 500mm below the bottom level of footings or paving. Backfill with selected excavated material, well rammed in layers.

Take special care when working close to retained trees and shrubs.

3.14 EXCAVATION GENERALLY

Excavate for pads, strip foundations and tie beams to the profiles and levels shown on the drawings. Allow clearance for working space and formwork as necessary. Trim to required profiles, falls and levels. If pouring against natural ground excavate an extra 25mm that side to provide 75mm minimum cover to reinforcement horizontally. Bench surface of sloping ground to receive filling. Use plant and equipment suitable for the purpose.

3.15 OVER EXCAVATION

Make good with well compacted backfill.

3.16 EXCAVATED BACKFILL

Stockpile selected excavated backfill on site where directed so that it does not impede continuing works until it is required.

Finishing

3.17 BATTERS, TEMPORARY PROTECTION

Protect batters with a change of level between crest and toe of more than 1.5 metres from weather erosion with a waterproof covering of either hessian and tar, or heavy duty black polythene sheet. Seal at joints and securely fix down at crest and toe. Maintain coverings in good condition until the ground is secured by permanent construction.

Completion

3.18 LEAVE

Leave work to the standard required by following procedures.

3.19 SURPLUS TOPSOIL

Remove unwanted stripped soil from the site continually as the work proceeds. Clean up continually any soil if dropped on footpaths or roads.

3.20 SURPLUS MATERIAL

Remove surplus excavated material from the site continually as the excavation proceeds. Clean up continually any excavated material dropped on footpaths or roads.

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4 SELECTIONS

4.1 BORE LOGS

Copies of bore logs are included in the geotechnical report.

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3102 CONCRETE WORK - STANDARD

1 GENERAL

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

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:

DPM	Damp proof membrane
MPa	Megapascal
CCANZ	Concrete NZ (Legacy Documents)

The following definitions apply specifically to this section:

ACRS	Australasian Certification Authority for Reinforcing and Structural Steels - An independent certification scheme for reinforcing steel and structural steel. Certifies compliance with Australia/New Zealand Standards. Web site - www.steelcertification.com
CNZ PAS:	Concrete New Zealand Plant Audit Scheme - an independent audit scheme for the production of concrete which certifies compliance with NZS 3104 Specification of Concrete Production. Web site: http://rmcplantaudit.org.nz

Documents

1.2 DOCUMENTS

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

NZBC B1/AS1	Structure
NZBC E2/AS3	External moisture
AS 1366.3	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS 1478	Chemical admixtures for concrete, mortar and grout - Admixtures for concrete.
AS/NZS 2269.0	Plywood - Structural - Specifications
AS/NZS 3000	Electrical installations
NZS 3101.1	Concrete structures standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3121	Water and aggregate for concrete
NZS 3122	Specification for Portland and blended cements (General and special purpose)
NZS 3125	Specification for Portland-limestone filler cement
NZS 3604	Timber-framed buildings
NZS 3631	New Zealand timber grading rules
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4672.1	Steel prestressing materials - General requirements
Concrete NZ TR3	Alkali silica reaction

Requirements

1.3 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications

1.4 RECORDS

Retain the following records and make available to the contract administrator upon request:

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- Mixing records
- Concrete delivery docket
- Reinforcing steel batch certificate
- Time, date, location and weather condition of each pour.

Performance

1.5 CONCRETE PRODUCTION COMPLIANCE

Concrete production and testing to comply with NZS 3104. Concrete to be supplied from a concrete batching plant holding a current quality Certificate of Audit provided by CNZ PAS Concrete NZ Plant Audit Scheme or an Auditing Engineer with credentials nominated in NZS 3104.

1.6 STEEL REINFORCING COMPLIANCE

Steel reinforcing and steel prestressing materials for concrete to AS/NZS 4671 or AS/NZS 4672.1, respectively. Steel reinforcing to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid NZ S Mark or ACRS certificate for that type of steel.

If requested, the supplier to provide certification upon delivery that reinforcing steel complies with the grades specified on the drawings.

Steel that fails to meet these requirements is not to be used (or ordered) without the contract administrators written approval, further proof and/or testing may be required.

Quality control and assurance

1.7 CONCRETE ASSESSMENT - ON SITE

Where the quality of concrete supplied in in doubt, carry out concrete assessment during construction to NZS 3109: section 9 Concrete Assessment.
Make all test records available, if requested.

1.8 INSPECTIONS

Reviewer:	**Stage:**	**Hold/Notification Point:**
Construction Reviewer:	refer to engineer, geotech and councils requirements	as instructed

1.9 QUALITY ASSURANCE

Carry out the whole of this work to the requirements of NZS 3109.

Quality assurance procedures to include all aspects of concrete construction including;

- Formwork construction
- Reinforcing steel placing
- Cast in items
- Concrete supply
- Concrete placing and compaction
- Concrete finishes
- Construction tolerances

2 PRODUCTS

Materials

2.1 CEMENT

General purpose Portland cement (Type GP) and general purpose blended cement (Type GB) to NZS 3122.

2.2 CEMENT, FILLER

Portland limestone filler cement to NZS 3125.

2.3 SAND

To NZS 3121 and NZS 3104 clause 2.5.4. The provisions of Concrete NZ TR3 apply when the sand is potentially reactive.

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2.4 COARSE AGGREGATE, NORMAL CONCRETE

To NZS 3121, except as modified by NZS 3104: clause 2.5.3, Coarse aggregate. The provisions of Concrete NZ TR3 apply when the aggregate is potentially reactive.

2.5 WATER

To NZS 3121.

2.6 ADMIXTURES, SITE OR PLANT

To AS 1478.
For concrete defined as Normal Concrete(N) to NZS 3104, admixtures may be added at the Plant Engineers discretion as required by concrete producers mix design, subject to the following requirements:

- The quantity of admixture used and the method of mixing to be in accordance with manufacturers recommendations.
- Admixtures containing calcium chloride will not be permitted.
- Concrete must comply with the entrained air requirements of NZS 3101 when the surface is subject to freeze-thaw cycles.
- Additional admixtures may be added to concrete at the Contractor's request to control the set, in response to weather or environmental factors, subject to approval by Engineer.
- Admixtures containing calcium chloride will not be permitted where steel reinforcing is present.

Concrete

2.7 NORMAL CONCRETE

Normal concrete 17.5, 20, 25 MPA up to 50 MPa grade, maximum aggregate size 37.5mm, ready-mixed to NZS 3104 section 2 Provisions for Ready-Mixed Concrete. Refer to SELECTIONS.

Reinforcement

2.8 GRADE 300E STEEL

To AS/NZS 4671. Round bars are shown by symbol "R" and deformed bars by symbol "D", followed by the diameter in millimetres.

2.9 GRADE 500E STEEL

To AS/NZS 4671. Round bars shown by symbol "HR" and deformed bars by symbol "HD" followed by diameter in millimetres.

2.10 WELDED WIRE FABRIC

Hard drawn steel wire spot welded with correct gauge to AS/NZS 4671 Class E, smooth or deformed and to the spacings and dimensions either specified or shown on the drawings.

2.11 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.12 SPACERS AND CHAIRS

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

Damp proof membrane

2.13 DAMP-PROOF MEMBRANE

0.25mm minimum polyethylene to NZS 3604, 7.5.4, **Damp-proof membrane**.

Accessories

2.14 CEMENT GROUTS

Cement mixed with the minimum quantity of water to obtain a suitable consistency. Grout cement to NZS 3122. Use grout within 30 minutes of preparation.

2.15 CELLULAR POLYSTYRENE INSULATION

Proprietary polystyrene foam board to AS 1366.3. Refer to SELECTIONS.

3 EXECUTION

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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/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Unless stated otherwise on the drawings permissible deviations from established lines, grades, dimensions and cambers to remain within the tolerances laid down in NZS 3109: table 5.1, Tolerances for precast components and table 5.2,Tolerances for in situ construction.

3.5 TOLERANCES OF CONCRETE SURFACE FINISHES

Unless stated otherwise on the drawings, permissible abrupt, offset and gradual deviations for the specified surface finish to remain within the tolerances laid down in NZS 3114: table 3, Tolerances for abrupt deviations or offsets and gradual deviations.

Install damp proofing

3.6 INSTALL DAMP-PROOF MEMBRANE

Install to NZS 3604.7.5.6 Polyethylene (polythene) sheet damp proof membranes. Bring granular hardfill to a suitable surface to receive the DPM using maximum 25mm sand blinding.
Lay the DPM on prepared basecourse with 150mm laps between sheets. Seal laps and penetrations with 50mm wide pressure sensitive plastic tape.
Refer to drawings for perimeter details.

Install insulation

3.7 INSTALL UNDERSLAB POLYSTYRENE INSULATION

Install polystyrene insulation system to manufacturer's requirements.

Install reinforcing / cast-in items

3.8 INSTALL REINFORCEMENT TO NZS 3101 & NZS 3109

Install reinforcing in accordance to NZS 3101as modified by NZBC B1/VM1 and NZS 3109. Reinforcement spacing as dimensioned on drawings, or if not shown, to the clear distance minimums in NZS 3109, 3.6, Spacing of reinforcement and requirements of NZS 3101.1 8.3 Spacing of reinforcement.

3.9 CUT AND BEND

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3101.1, 8 and NZS 3109: 3.3 Hooks and bends. Minimum radii of reinforcement bends to NZS 3101.1, 8 and NZS 3109: table 3.1, Minimum radii of reinforcement bends. Do not rebend grade 500E bars. Where rebending is necessary for grade 300E bars, use a purpose built tool, proper preparation and preheating.

3.10 ADJUSTMENTS

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

3.11 TOLERANCES

Tolerances for reinforcement bending, bar spacing & position and concrete cover to NZS 3109, 3.9, Tolerances for reinforcement, unless tighter tolerances specified.

3.12 SECURE REINFORCEMENT

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

3.13 LAPPED SPLICES

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

3.14 REINFORCEMENT COVER TO NZS 3101.1

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101.1, table 3.6, Minimum required cover for a specified intended life of 50 years. Sub-soil cover to NZS 3101.1, to suit soil and groundwater conditions. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109, 3.9, Tolerances for reinforcement.

3.15 CASTING IN

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

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

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

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

3.16 EQUIPOTENTIAL BONDING REINFORCING

If required by AS/NZS 3000 clause 5.6, ensure that reinforcing is electrically equipotential bonded (or at least conductor cable attached) before the concrete is poured. For bonded reinforcing ensure all reinforcing is interconnected with good contact at joints and tight conductive ties.

Place concrete

3.17 CONSTRUCTION JOINTS

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

3.18 PRE-PLACEMENT INSPECTION

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

3.19 UNFAVOURABLE CONDITIONS

Do not place concrete in high winds or other unfavourable conditions in accordance with NZS 3109: 7.2 Unfavourable conditions

3.20 PROTECT CONCRETE WORK

Protect formwork, reinforcement, "build in" items and fresh concrete from damage, as the pour is placed, making good any damage if it occurs.

3.21 PREPARATORY WORK

Ensure at the time of placing, that surfaces to receive the concrete are clean, free of debris and with no free water present. Ensure reinforcement, cast-in items and hardened concrete against which fresh concrete is laid are free from any release agent or other deleterious surface deposit.

3.22 TRANSPORT CONCRETE

Transport concrete from agitator to final placement as quickly as possible using means that avoid segregation.

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3.23 PUMPING CONCRETE

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

3.24 PLACE CONCRETE

Place concrete to NZS 3109: clause 7.4, Handling and placing. Place in layers not more than 500mm deep, compacted and vibrated. Do not place fresh concrete against the preceding layer after more than 45 minutes, or such lesser time as required by the circumstances, to NZS 3109: clause 7.4, Handling and placing.

3.25 COMPACT CONCRETE

To NZS 3109: clause 7.6, Compaction. Compact by vibration of the concrete to expel entrapped air and until settlement of the concrete is visibly evident over all areas of the surface. Maintain vibration until settlement ceases and coarse aggregate at the surface is embedded. Do not continue vibration beyond reaching this condition.

Note: compaction by vibration is not required when using Self Compacting Concrete (SCC).

3.26 VIBRATORS

Use sufficient immersion vibrators, with one spare for emergency, to ensure that vibration is achieved throughout the entire volume of each layer of concrete, and until complete compaction is reached, to NZS 3109: clause 7.6, Compaction.

Finishing

3.27 SCREED THE SURFACE

Screed the concrete surface by straight edge or vibrating screed immediately after compaction and to tolerances in NZS 3109: table 5.2, Tolerances for in situ construction.

3.28 SURFACE FINISHES

To NZS 3114, Part 1 Off-the-form surface finishes, Part 2 Exposed aggregate surface and Part 3 Floors, exterior pavements, and inverts, for slabs and pavements. Refer SELECTIONS.

3.29 SAW CUTS

Cut slabs where indicated and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring.

3.30 CLEAN OUT SAWCUTS

Clean out saw cuts. Fill with cement grout where the floor will be covered with carpet or vinyl.

Curing

3.31 CURING PERIOD

Cure all concrete for a minimum of 7 days. Keep time between placing of concrete and the start of curing to an absolute minimum. Ensure curing is continuous.

3.32 CURING METHOD

Notify the curing method to be used for this work. Select from the following methods;

- Ponding
- Sprinkling
- Wet coverings - Do not use at times of freezing weather
- Plastic sheet
- Curing compound

3.33 SECURE COVERINGS

When covering with sheet materials, ensure that edges are well secured throughout the specified curing period, to prevent draughts passing over the surfaces of the concrete.

Defects

3.34 DEFECTS

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Reject concrete with structural defects. Immediately after stripping formwork, identify all defects and obtain direction. Do not carry out any repair work until directed and then only in accordance with the direction. Repair defects by cutting out, making good and replacing, or otherwise as directed.

3.35 SURFACE DEFECTS

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

Completion

3.36 COMPLETION MATTERS

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

4 SELECTIONS

4.1 DAMP-PROOF MEMBRANE

Location:	under slab
Brand/type:	Thermakraft Thermathene black
Thickness:	0.25

4.2 CELLULAR POLYSTYRENE INSULATION

Location:	under slab and foundation beams
Brand:	Expol
Type/grade:	X (XPS)
Thickness:	75mm
R-value:	R-2.7

4.3 SAW CUTS

Location:	refer to engineers drawings
Spacing:	refer to engineers drawings

4.4 LOCATION OF CONSTRUCTION JOINTS

Location:	refer to engineers drawings
Spacing:	refer to engineers drawings

4.5 REINFORCEMENT LAPS

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

Bar Diameter	Grade 300E deformed	Grade 500E deformed
10mm	400mm	650mm
12mm	500mm	750mm
16mm	650mm	1000mm
20mm	800mm	1250mm
25mm	1000mm	1600mm
32mm	1200mm	2000mm

4.6 WELDED WIRE FABRIC

Location:	within slab
Type:	SE72 with 30mm cover and SE82 with 40mm cover, refer to engineers drawings
Wire diameter:	varies, refer to engineers drawings
Pitch:	refer to engineers drawings

4.7 NORMAL CONCRETE (N)

Location:	slab and foundation beams
28 day strength:	refer to engineers drawings
Aggregate size:	Maximum coarse aggregate size of 37.5mm
Pigments:	none

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3114E EXPOL UNDERSLAB INSULATION

1 GENERAL

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

It includes:

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

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:

DPM	Damp proof membrane
EPS	Expanded polystyrene
XPS	Extruded polystyrene

Documents

1.2 DOCUMENTS

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

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Expol under slab / slab edge insulation brochures
Expol technical product guide
Expol technical data sheets
Expol ThermaSlab edge installation instructions
Expol BPIR

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years	For EPS insulation products
15 years	For XPS insulation products

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of installation

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

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1 year	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

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for 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.

2 PRODUCTS

Materials - under slab insulation

2.1 EXPOL-X

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

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

3.4 PRE-INSTALLATION REQUIREMENTS

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

Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 INSTALLATION - GENERAL

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

3.7 INSTALL UNDERSLAB INSULATION

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

Completion

3.8 COMPLETION MATTERS

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

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4 SELECTIONS

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

Materials - under slab insulation

4.1 EXPOL-X

Location:	under slabs and foundation beams
Brand:	Expol-X
Size:	2500mm x 600mm
Thickness:	75mm
Compressive resistance at 10%:	250kPa
R value:	R-2.7

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3130 PRECAST CONCRETE

1 GENERAL

This section relates to the off site manufacture and on site installation of precast panels for housing and small scale commercial projects.

1.1 RELATED WORK

Refer to the appropriate concrete section for concrete requirements.

1.2 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

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

ACRS Web site - www.steelcertification.com

1.3 DOCUMENTS

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

NZBC B1/VM1	Structure
NZBC D1/AS1	Access routes
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3112.1	Methods of test for concrete - Tests relating to fresh concrete
NZS 3114	Specification for concrete surface finishes
NZS 3121	Water and aggregate for concrete
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4672.1	Steel prestressing materials - General requirements
AS/NZS 4672.2	Steel prestressing materials - Testing requirements
AS/NZS ISO 9001	Quality management systems - Requirements
WorkSafe	Safe work with precast concrete: Handling, transportation and erection of precast concrete elements (Good Practice Guidelines).

Requirements

1.4 PREPLANNING

Prior to shop drawing/manufacture of the precast panels the Contractor, Precaster and other relevant parties, must liaise, to ensure handling, installation and on site requirements are coordinated with the panel production.

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:

- size, spacing and cover of reinforcement
- details, position and layout of cast in items, including those for, lifting, handling, fastening and connecting
- details of panel edges
- surface finish requirements and locations
- location and size of rebates, recesses and penetrations
- grout ducts
- concrete grade and other mix requirements
- concrete volume and weight of finished unit for lifting
- for insulated panels, details of insulation, low conduction connectors/ties, vapour barrier

if requested provide the following additional information:

Submit shop drawings for review to the **main contractor**.

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- 10 working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Do not commence fabrication of any panel before shop drawing review of the panel is complete.
- Shop drawing review (and subsequent fabrication) can be carried out on an agreed sectional/staged basis.

1.6 MANUFACTURERS STATEMENT OF COMPLIANCE

Provide a Manufacturer's Statement of Compliance from: Safe work with precast concrete: Handling, transportation and erection of precast concrete elements (Good Practice Guidelines).

1.7 PANEL SURFACE

Use appropriate mould materials, moulding systems and casting methods to achieve the specified surface finishes. Refer to SELECTIONS for surface finishes.

1.8 QUALIFICATION, PRECAST MANUFACTURE

Precast concrete panels manufactured by either;

- a Concrete NZ Certified Plant
- or an off-site precast manufacturer with, an established record of panel production to a similar standard, suitable plant and a quality assurance system to AS/NZS ISO 9001

Use only precast concrete workers skilled and experienced in precast panel production.

1.9 QUALIFICATION, ON SITE WORK

Use only concrete tilt up panel, crane and rigging, contractors skilled and experienced in the erection of tilt up panels.

Performance

1.10 STEEL REINFORCING COMPLIANCE

Steel reinforcing and steel prestressing materials for concrete to AS/NZS 4671 or AS/NZS 4672.1, respectively. Steel to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel.

Steel that fails to meet these requirements is not to be used (or ordered) without the contract administrators written approval, further proof and/or testing may be required.

1.11 CONFIRM STEEL REINFORCING COMPLIANCE

Certification from the supplier confirming that the steel reinforcing supplied complies with the grades specified on the drawings by producing test results to AS/NZS 4671 or AS/NZS 4672.1 and AS/NZS 4672.2. For overseas manufactured steel provide NZ S Mark or ACRS certificate details or approved equivalent.

1.12 TESTING - CONCRETE

Carry out sampling and concrete acceptance tests during construction to NZS 3109: section 9, Concrete acceptance tests during construction.
Conduct 7 day strength tests. After a 7 day test result of less than 60% of the specified strength, concrete placement to stop until it is shown the suspect concrete complies with the specification.

Carry out slump tests, yield tests and air content tests to NZS 3112.1, sections 4, 5 and 9, and evaluate to NZS 3104.2.15. Control tests and their evaluation. Make available all test records to the contract administrator on request.

1.13 QUALITY ASSURANCE

Carry out the whole of this work to the requirements of NZS 3109 and under the regime of a quality systems for quality assurance in production and erection.
Advise the name of the suitably experienced and qualified representative who is responsible for quality control of the concrete work. The representative is to sign a written quality control checklist for each concrete pour.

1.14 INSPECTION NOTIFICATION REQUIREMENTS

refer to engineers and councils requirements

1.15 INSPECTIONS BY CONSTRUCTION REVIEWER

refer to engineers and councils requirements

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1.16 INSPECTIONS BY BUILDING CONSENT AUTHORITY

refer to councils requirements

1.17 WEATHERTIGHTNESS SYSTEM

The weathertightness system is covered in the following section:
DULUX PAINTING EXTERIOR
To be done by others.

1.18 SITE LOADINGS, PERMANENT STRUCTURE

Prevent damage to supporting structure from stacking of precast items.

2 PRODUCTS

2.1 CONCRETE

To NZS 3104.
Refer to CONCRETE section for concrete supply and to SELECTIONS for concrete strength.

2.2 GRADE 300E STEEL

To AS/NZS 4671. Round bars are shown by symbol "R" and deformed bars by symbol "D", followed by the diameter in millimetres.

2.3 GRADE 500E STEEL

To AS/NZS 4671. Round bars shown by symbol "HR" and deformed bars by symbol "HD" followed by diameter in millimetres.

2.4 WELDED WIRE FABRIC

Hard drawn steel wire spot welded with correct gauge to AS/NZS 4671, smooth or deformed and to the spacing and dimensions either specified or shown on the drawings.

2.5 SPACERS AND CHAIRS

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

Components

2.6 LIFTING INSERTS

Proprietary lifting inserts to: Safe work with precast concrete: Handling, transportation and erection of precast concrete elements (Good Practice Guidelines). Minimum finish galvanized mild steel. Ensure all cast-in insert systems used are capable of allowing the insert void finish required in SELECTIONS.

2.7 CAST IN STEEL ITEMS

Cast in items as detailed and required. Ensure items are pre-finished where required.

2.8 LEVELLING SHIMS

Rigid plastic or other suitable levelling shims to: Safe work with precast concrete: Handling, transportation and erection of precast concrete elements (Good Practice Guidelines).

2.9 SEALANTS

Polysulphide, polyurethane or silicone gap filling proprietary sealants.

3 EXECUTION

Conditions

3.1 HANDLE, TRANSPORT AND STACK

Handle, transport and stack panels to ensure support that avoids distortion and stress and at the same time protects the finished surfaces from chipping, scoring, cracking or other disfigurement. Storage methods and packing between panels should minimise colour variations to exposed surfaces.
Arrange delivery and erection of precast panels to minimise handling, storage or restacking on site.

Manufacture

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3.2 TOLERANCES, OFF-SITE PRECAST, STANDARD

Manufacture panels with tolerances to NZS 3109, table 5.1, Tolerance for precast components.

3.3 SECURE REINFORCEMENT

Secure adequately with tying wire, spacers or other suitable means, and place accurately where detailed, supported and secured against displacement. Ensure minimum concrete cover is maintained.

3.4 CONCRETE PLACING

Carefully place concrete to ensure all parts of the mould are completely filled and full contact is made with the mould surface. Use appropriate compaction techniques to achieve the required finish.

3.5 CASTING IN ITEMS

Accurately cast in all embedded items and fixings as detailed, all securely located to avoid displacement during concrete placement and compaction. Where bolts are cast in, also provide the nut (free moving on the bolt).

3.6 CURING

Confirm in writing the system to be used for curing concrete. Cure panels, for a minimum of 7 days and until minimum strength is achieved for safe lifting, handling, transportation and erection.

Installation

3.7 INSTALLATION

Carry out work in accordance with: Safe work with precast concrete: Handling, transportation and erection of precast concrete elements (Good Practice Guidelines). Where proprietary lifting inserts are being used, ensure that lifting clutches are the correctly sized and from the same supplier. Prior to lifting any panels from the truck, check and make a record of any damage to the panels, and obtain approval from the Contract Administrator before incorporating a damaged panel into the work.

3.8 SETTING OUT

Confirm panel dimensions, set out and site conditions. Also check starter bars, grout tube positions and fixing points. Check all temporary support work is ready, correct and capable of taking imposed loads.

3.9 TOLERANCES, ON - SITE EXECUTION

Locate precast items to the following tolerances:

Plan:	± 10mm
Vertical:	± 1mm/metre
Panel Joint width:	± 1mm/metre; but no panel joint shall be less than 10mm, or more than 20mm (unless indicated otherwise on drawings)

3.10 LIFTING

Mobile crane positions to be arranged and prepared prior to panel delivery to provide safe lifting. Ensure that all cranes can provide safe and easy movement of panels, as well as careful positioning. Check that rigging, straps, etc, suit the panel design and lifting points. Panels are to remain attached to the crane until they are either fully fixed into their final position or adequately secured by temporary means.

3.11 PROPPING AND BRACING

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

3.12 PLACING

On positioning of the panel, check that all reinforcing and fixings line up with the appropriate items on the preceding work. Also check fixings will function as intended, in particularly fixings required to accommodate seismic movement. Ensure that there is no damage caused to the panel, surrounding surfaces or fixings during placing.

3.13 FINAL POSITION

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

3.14 GROUT DUCTS

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Fill grout ducts with expansive grout, ensure ducts are completely filled.

3.15 POST PLACING ADJUSTMENTS

After permanent placing check and adjust as necessary;

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

3.16 SEALANTS

Ensure at time of erection, that the limits of acceptable joint variation (from the manufacturer's requirements) for each product are maintained. Prepare joints, protect adjoining surfaces, seal joint surfaces, fit limiting rods and insert sealant to the manufacturer's requirements and temperature limits.

3.17 CLEAN AND DRESS

Clean and dress panels externally and internally to leave them to the standard of finish specified and without blemish, ensuring following work can be completed to the required standard. Refer SELECTIONS for insert void finish.

3.18 CLEAN UP

Clean up surrounding areas of trade waste and remove temporary works required for the installation of the precast concrete items.

3.19 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 PRECAST CONCRETE STRUCTURAL PANELS

Location:	refer to drawn documents
Supplier:	TBD
Aggregate size:	refer to engineers documents
Slump:	refer to engineers documents
Cement content:	refer to engineers documents
28 day strength:	refer to engineers documents
Admixture:	refer to engineers documents
Formed finish:	F5
Unformed finish:	U3

4.2 INSERT VOID FINISH

Lifting/cast-in insert voids to have the following finish.

Location:	where left exposed
Finish:	Flush fill void with grout, colour match to panel shade

Note: inserts must not permanently project beyond panel face unless stated otherwise and for any flush finishes inserts must be removable or recessed well back from the panel face.

4.3 LEVELLING SHIMS

Manufacturer:	refer to engineer or main contractor
Brand name:	refer to engineer or main contractor

4.4 FLASHINGS

to be evaluated

4.5 SEALANTS

Location:	concrete panels
Manufacturer/type:	Performance Solutions Water based masonry sealer

4.6 WEATHERTIGHTNESS SYSTEM

The weathertightness system is covered in the following section:
DULUX PAINTING EXTERIOR

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To be done by others.

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3410 STRUCTURAL STEEL

1 GENERAL

This section relates to the fabrication, erection and specialist coating of structural steelwork of a general nature, for Construction Category CC1 or CC2 (to AS/NZS 5131).

Refer to SELECTIONS for project Construction Category.

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:

AESS	Architecturally Exposed Structural Steelwork
CC	Construction Category
NDE	Non-Destructive Examination

1.2 DOCUMENTS

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

NZBC F5/AS1	Construction and demolition hazards
AS 1111.1	ISO metric hexagon bolts and screws - Product grade C - Bolts
AS 1111.2	ISO metric hexagon bolts and screws - Product grade C - Screws
AS 1112.1	ISO metric hexagon nuts - Style 1 - Product grades A and B
AS/NZS 1163	Cold-formed structural steel hollow sections
AS/NZS 1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
AS/NZS 1252.1	High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Technical requirements
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 1554.2	Structural steel welding - Stud welding (steel studs to steel)
AS/NZS 1554.3	Structural steel welding - Welding of reinforcing steel
AS/NZS 1554.4	Structural steel welding - Welding of high strength quenched and tempered steels
AS/NZS 1554.5	Structural steel welding - Welding of steel structures subject to high levels of fatigue loading
AS/NZS 1594	Hot-rolled steel flat products
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Abrasive blast cleaning
AS 1627.9	Metal finishing - Preparation and pretreatment of surfaces - Pictorial surface preparation standards for painting steel surfaces
AS/NZS 2312:2002	Guide to the protection of iron and steel against atmospheric corrosion by the use of protective coatings
NZS 3404.1	Steel Structures Standard
AS 3597	Structural and pressure vessel steel - Quenched and tempered plate
AS/NZS 3678	Structural steel - Hot-rolled plates, floorplates and slabs
AS/NZS 3679.1	Structural steel - Hot-rolled bars and sections
AS/NZS 3679.2	Structural steel - Welded I sections
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 13918	Welding - studs and ceramic ferules for arc stud welding
GANZ	Galvanizing Association of New Zealand - After-Fabrication Hot Dip Galvanizing. A practical reference for designers, specifiers, engineers, consultants, manufacturers and users

Requirements

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1.3 QUALIFICATIONS

Welding operators (and supervisors) to be experienced, competent workers, qualified to AS/NZS 5131, Table 7.4, to suit relevant Construction Category and weld category.

1.4 TOLERANCES

To AS/NZS 5131 Section 12 and Appendix F, Tolerance Class 1.

1.5 SHOP DRAWINGS

Generally to AS/NZS 5131, 4.4.
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, 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 1:10)
- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Co-ordination requirements with other work
- A full schedule of materials and finishes.

Submit shop drawings for review to structural engineer and main contractor.

- 10 working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication.

1.6 VERIFY DETAILS AND DIMENSIONS

Refer to drawings to ensure all required details and fixings are provided for in the structural steelwork. Verify dimensions against site measurements prior to fabrication.

1.7 TESTS

To AS/NZS 5131, Section 13, Inspection, Testing And Correction and AS/NZS 5131 Appendix I, Inspection of Welding and Bolting (New Zealand Only), as follows:

- Welds: Non-destructive examinations (NDE)

1.8 HOT WORK - FIRE SAFETY

Refer to section 1270 CONSTRUCTION

2 PRODUCTS

2.1 STRUCTURAL STEEL

Comply with New Zealand, Australian, British or Japanese Standards for steel as required by NZS 3404.1, section 2, including, type, category, and suppression of brittle fracture. Also to AS/NZS 5131, Section 5.

Steel members and sections steel grade table

Component	Conforming to	Grade
Hot rolled steel sections	AS/NZS 3679.1	300; 350; 300L0; 300S0; 350L0, 300L15; 350L15
Plates and flats	AS/NZS 3678; AS/NZS 1594;	250; 300; 350; 400; 450; WR350; 250L0, 300L0; 350L0; 300L15; 350L15
Plates and flats	AS/NZS 1594; TS 102	HA250; HA300; HA350; HA400; HW350
Circular hollow sections	AS/NZS 1163; TS 102	C250L0; C350L0; C450L0
Square hollow sections	AS/NZS 1163; TS 102	C350L0; C450L0
Rectangular hollow sections	AS/NZS 1163; TS 102	C350L0; C450L0
Welded beams and columns	AS/NZS 3679.2; TS 102	300; 400

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Quench & tempered plate	AS 3597	500; 600; 700; 900; 1000
Purlins and girts	AS 1397	G250; G300; G350; G450; G500; G550, Z350, Z450

2.2 WELDING CONSUMABLES

To comply with and be selected for grade of steel being welded as required by AS/NZS 1554 series of standards.

2.3 FLUX

Welding flux to be dry and from sealed containers.

2.4 BOLTS, NUTS AND WASHERS

Grade 4.6, screws AS 1111.2 and bolts to AS 1111.1. Grade 4.6 nuts to comply with AS 1112.1. Property Class 8.8 bolts and equivalent nuts and washers (high strength structural quality only) to comply with AS/NZS 1252.1. Hot-dip galvanize to AS/NZS 4680 (and AS/NZS 1214), bolts, nuts and washers forming a permanent part of a structure subject to a protective coating.

Bolt Categories and tensioning

Bolting category	Bolt standard	Property Class	Tension method	Tensioned joint type
4.6/S	AS 1111.1	4.6	Snug tight	
8.8/S	AS/NZS 1252.1	8.8	Snug tight	
8.8/TB	AS/NZS 1252.1	8.8	Full tension	Bearing
8.8/TF	AS/NZS 1252.1	8.8	Full tension	Friction

In bearing type connections where the thread position relative to the shear plane is to be controlled.
N - threads included in shear plane
X - threads excluded from shear plane
F - friction type joints - prepare faying surfaces

2.5 GROUT

To AS/NZS 5131, 5.8.

3 EXECUTION

Preparation, assembly and Fabrication

3.1 GENERALLY

To AS/NZS 5131, Section 6.

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 SURFACE FINISH

Grind off all burrs and sharp arrises.

3.5 CUTTING

To AS/NZS 5131, Section 6.5.

3.6 HOLING

To AS/NZS 5131, Section 6.7
Do not use slotted holes for connections, other than those documented.

Welding

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3.7 WELDING GENERALLY

To AS/NZS 5131, Section 7 and AS/NZS 1554.1. Equipment to comply with AS/NZS 1554.1, clause 1.8.2.
Site weld only when correct alignment and preset or camber have been achieved.
Weld types as documented elsewhere or on drawings
Weld categories not documented elsewhere or on drawings to be Category GP.

3.8 NON-DESTRUCTIVE WELD EXAMINATION

Non-destructive weld examination (NDE) to AS/NZS 5131, clause 13.6.2 and AS/NZS 5131 Appendix I, Inspection of Welding and Bolting (New Zealand Only).
If non-visual NDE is required, use a third party testing authority.
Repair any welds revealed as faulty by NDE and repeat the examination.

Mechanical fastening

3.9 MECHANICAL FASTENING GENERALLY

To AS/NZS 5131.
Connection contact surfaces to AS/NZS5131, 8.4.1.
Category 8.8/TF bolting to be clean, as rolled and free from applied finishes.
For washers, place one washer under the part rotated during tightening process (nut or bolt head).
Permanent bolt only when correct alignment and preset or camber have been achieved.

3.10 TENSIONING BOLTS

For tensioning of bolting categories 8.8/TB and 8.8/TF, use part-turn method or a direct tension indicator device. Ensure clear thread run out beneath the nut after tensioning is to New Zealand requirement of AS/NZS 5131, 8.2.2.

3.11 THREADS EXCLUDED FROM SHEAR PLANE

Select length of bolts such that the threaded portion does not occur within the shear plane between joined parts.

Erection of structural steel

3.12 ERECTION GENERALLY

To AS/NZS 5131, Section 11.
Make sure every part of the structure has sufficient design capacity and is stable under construction loads produced by the construction procedure.
Comply with NZBC F5/AS1: Construction and demolition hazards, and the WorkSafe publication: Guidelines for the provision of facilities and general safety in the construction industry.

3.13 BOLTS AND ANCHORAGES

For each group of anchor bolts, provide a template with set-out lines clearly marked for positioning the bolts when casting in.
Start erection only when the holding down bolts and anchorages have been cast-in-place long enough to achieve sufficient strength.

3.14 TEMPORARY WORK

Provide temporary bracing, propping and restraint as required to make structure safe. Fix any temporary members so as not to weaken or deface permanent steelwork. Leave temporary bracing and restraint in place until the erection is sufficiently advanced to allow safe removal of temporary bracing.

3.15 SITE WORK

Other than work shown on the shop detail documentation as site work, do not fabricate, modify or weld structural steel on-site.

3.16 GROUTING SUPPORTS

Before grouting steelwork supported by concrete or masonry, set steelwork on packing or wedges as follows:

- Permanent packing or wedges - Form with solid steel or grout of similar strength to the permanent grout.
- Temporary packing or wedges - Remove before completion of grouting.

Grout at supports before constructing supported floors, walls and roofing.

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Do not grout if the base plate or the footing surface temperature are outside the range 3°C to 35°C or to manufacturer's requirements.
Fill the space beneath the base plate with grout, if necessary hammered in tight to ensure complete filling of space.

3.17 DRIFTING

Use drifting only to bring members into position, without enlarging holes or distorting components.

3.18 EARTHING STRUCTURAL STEEL

If it is a project electrical requirement, ensure that any electrically at-risk, steel frames or isolated members, are earthed (or at least conductor cable attached) before the steel has any in-situ finishes applied or is enclosed.

3.19 TEMPORARY CONNECTIONS

Remove temporary elements on completion and restore the surface.

Completion & Commissioning

3.20 COMPLETION MATTERS

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

4 SELECTIONS

4.1 CONSTRUCTION CATEGORY

Construction category (to AS/NZS 5131)	Location
refer to engineers documents	refer to engineers documents

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3813 ENGINEERED WOOD PRODUCTS

1 GENERAL

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

- laminated veneer lumber (LVL)
- laminated timber members
- other types of engineered wood

1.1 RELATED WORK

Refer to 3821 TIMBER FRAMING for general timber framing and installation of engineered wood products.

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 B1/VM1	Structure
AS/NZS 1170	Structural Design Actions
NZS 1170.5	Structural Design Actions - Earthquake actions - New Zealand
AS/NZS 1328.1	Glue laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1491	Finger jointed structural timber
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 2754.1	Adhesives for timber and timber products - Adhesives for manufacture of plywood and laminated veneer lumber (LVL)
NZS 3602	Timber and wood-based products for use in buildings
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
AS/NZS 4364	Timber - Bond performance of structural adhesive

1.4 ABBREVIATIONS

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

LVL	Laminated veneer lumber

Requirements

1.5 QUALIFICATIONS

Fabricators to be experienced competent workers, familiar with the materials and the techniques specified.
Laminated timber fabricators to be certified to AS/NZS 1328.1.

1.6 LAYOUT DRAWINGS

Provide a layout drawing with each element identified by a unique identifier. Provide details of specific design bracing requirements

1.7 PRODUCER STATEMENT

Provide a signed producer statement showing the manufacturer details.

1.8 LAMINATED TIMBER DESIGN

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To NZS 3603 in general and in particular with chapter 8, Glue laminated timber. Complying with NZBC B1/VM1, AS/NZS 1170 and NZS 1170.5.

1.9 LAMINATED MEMBER SPECIFIC DESIGNS

Supply all the necessary drawings, calculations and other descriptive information to confirm the structural design of each laminated timber member. Submit, together with a producer statement signed by a chartered professional engineer, before commencing fabrication.

1.10 LAMINATED MEMBERS TEST

To AS/NZS 1328.1. Make laminated members 150mm over length to provide specimens for glue block shear tests. Mark specimens to identify member from which they are cut. Carry out normal quality control tests in addition to tests required. Provide results of normal control tests.

1.11 NON-COMPLIANCE LAMINATED MEMBERS

Where non-compliance with the tests is evident, load tests on completion will be required. Replace substandard members and retest.

1.12 LVL DESIGN

To NZS 3603 in general and in particular the manufacturer's technical information. Complying with NZBC B1/VM1, AS/NZS 1170 and NZS 1170.5 when installed.

1.13 LVL MEMBERS TEST

Laminated veneer lumber products are to be tested and the properties monitored to the requirements of the Plywood Association of Australasia.

2 PRODUCTS

Materials - LVL

2.1 LVL BEAMS, POSTS, JOISTS, RAFTERS

To AS/NZS 4357.0, to required sizes and lengths and the manufacturer design properties. Manufacture to AS/NZS 4357.0 and the manufacturer design properties.

Materials - laminated timber

2.2 LAMINATED BEAMS, LINTELS, POSTS AND FRAMING

To NZS 3602 to required lengths.

2.3 LAMINATED FLOORING

To NZS 3602 finger jointed and to required lengths.

Components - LVL

2.4 ADHESIVE, LVL

Veneers to be bonded with Type A marine bond (phenolic) to AS/NZS 2754.1.

2.5 ADHESIVE, LVL I-JOIST

I-Joist flange to web joint to be formed with resorcinol phenol adhesive (Type A bond to AS/NZS 2754.1 and Type 1 to AS/NZS 4364) permanent and durable structural bond.

2.6 TREATMENT, LVL EXTERIOR

Insecticide treatment to H3/H3.1 LOSP or H3/H3.2 CCA (preservative code 01 or 02) to NZS 3640 and AS/NZS 1604.1. Equivalent solvent based preservative for treating cut ends on site.
Refer to SELECTIONS.

2.7 TREATMENT, LVL INTERIOR

Treatment to H1/H1.2 to NZS 3640 and AS/NZS 1604.1. Equivalent solvent based preservative for treating cut ends on site.
Refer to SELECTIONS.

Components - glue laminated timber

2.8 ADHESIVE, INTERIOR

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To AS/NZS 4364, Type II adhesive for Service Class 1 (interior with timber equilibrium moisture content [EMC] of ≤ 12%)

2.9 ADHESIVE, HUMID INTERIOR

To AS/NZS 4364, Type I adhesive for Service Class 2 (interior with timber equilibrium moisture content [EMC] of ≤ 20%)

2.10 ADHESIVES, EXTERIOR AND CCA TREATED

To AS/NZS 4364, Type I adhesive for Service Class 3 (exterior non-protected).

2.11 TREATMENT, EXTERIOR

To AS/NZS 1604.1 and NZS 3640, clause 6.3, H3.2 CCA (preservative code 01 or 02).

2.12 TREATMENT, INTERIOR

To AS/NZS 1604.1 and NZS 3640, clause 6.1, H1.2.

Accessories

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

Manufacture - LVL

3.1 LAMINATED VENEER LUMBER, MANUFACTURE

To AS/NZS 4357.0 and the manufacturer's design properties.

Manufacture - laminated timber

3.2 MANUFACTURE AND MARKING

To AS/NZS 1328.1, except where modified by this specification.

3.3 MOISTURE CONTENT

Moisture content at time of glueing: 12-15%.
Moisture content variation between adjacent laminates: not exceeding 2%.

3.4 LAMINATIONS

Laminations to AS/NZS 1328.1.
Pre-joint laminates to full length required.

3.5 END JOINT LAMINATIONS

End joint laminations by the use of finger joints to AS/NZS 1491 for structural joints and show by test they have a strength at least equivalent to the strength of the grade of lamination.

3.6 ADHESIVE USE

To AS/NZS 1328.1 with regard to adhesive use, and to the requirements of the adhesive manufacturer, to ensure full strength bonding.

3.7 CAMBER

Provide upward camber as required by design. No camber required unless specifically shown.

3.8 SIZE OF FINISHED MEMBERS

Ensure size of finished members is within the tolerances set out in AS/NZS 1328.1, for the finish specified.

3.9 SURFACE FINISH

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Smooth finish all exposed surfaces by sanding, to produce the standard of finish to AS/NZS 1328.1. Fill knot holes and defects with neutral coloured filler or by the use of inserts. Do not use putty. Ease all corners.

3.10 PLANER FINISH

Planer finish to comply with tolerances and produce a utility finish to AS/NZS 1328.1.

3.11 APPLY SEALER

Apply one coat of approved water repellent sealer. Use two coats of the approved sealer on end grain to ensure adequate sealing against water absorption.
Check compatibility of sealer with proposed finishing coating before application.

3.12 WRAP

Wrap with protective film or kraft paper (not bitumen laminated) and tape seal before delivery. Maintain wrapping in place until the members are protected from the weather.

Delivery

3.13 DELIVER, HANDLE AND STORE

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

Application - LVL

3.14 ERECTION

Refer to the manufacturer's guidelines for the installation of laminated veneer lumber structural elements. Ensure all elements are correctly located, plumb and true to line and face.
Carry out the erection of LVL and associated support framing for houses and similar structures to the requirements of NZS 3604. Comply with NZBC B1/VM1, 6.0 Timber. Reseal cut ends, holes, notches and the like of treated LVL with a brush on solvent based preservative. Prop long length beams and lintels at the mid span until the moisture content has reached a suitable level for the application of internal linings.

3.15 TIGHTEN BOLTS

Check and tighten all fixing bolts after erection is completed.

3.16 HOLES AND PENETRATIONS

To manufacturers requirements.

Application - laminated timber

3.17 ERECTION

Prepare the member to suit the connectors being used. Cut slots and rebates for plates, drill holes for bolts, screws and rods.
Refer to the manufacturer's guidelines for installation. Ensure all elements are correctly located, plumb and true to line and face. Insert bolts and finger tighten nuts.
Provide any temporary support and bracing.

3.18 LAMINATED FLOORING

Check the floor framing meets the requirements of the flooring manufacturer, being level and flat.
Refer to the manufacturer's guidelines for installation.

3.19 TIGHTEN BOLTS

Check and tighten all fixing bolts after erection is completed.

Application - connectors

3.20 CONNECTORS

Refer to the manufacturer's guidelines for installation. Ensure all elements are correctly located, plumb and true to line and face. Ensure that the manufacturers recommended type and quantity of fixings are used.

Completion

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3.21 REPLACE

Replace or repair damaged elements.

3.22 REMOVE

Remove debris, unused materials and elements from the site.

3.23 LEAVE

Leave work to the standard required by following procedures.

4 SELECTIONS

4.1 LVL BEAMS

Location:	refer to drawn documents
Type:	LVL13 - verify with engineers documents
Size:	varies, verify with drawn documents
Treatment:	sealed clear, manufacturer to advise based on location
Connector type:	refer to engineers documents
Connector finish:	refer to engineers documents

4.2 GLUE LAMINATED POSTS

Location:	internal posts
Type:	GL8 Glulam
Size:	225x225
Treatment:	sealed clear, manufacturer to advise based on location
Connector type:	refer to engineers documents
Connector finish:	refer to engineers documents

4.3 CLT FLOORING

Location:	First and second floor structure, refer to drawn documents
Type:	CLT 5/210
Brand/name:	Red Stag
Size:	210mm
Treatment:	sealed clear, manufacturer to advise based on location
Connector type:	refer to engineers documents
Connector finish:	refer to engineers documents

4.4 CLT STAIRS

Location:	stairwell, refer to drawings
Type:	manufacturer to advise
Brand/name:	Red Stag
Size:	refer to drawn documents
Treatment:	sealed clear, manufacturer to advise based on location
Connector type:	engineer and manufacturer to advise
Connector finish:	engineer and manufacturer to advise

4.5 CLT WALLS

Location:	refer to drawn documents
Type:	CLT 5/210
Brand/name:	Red Stag
Size:	210mm
Treatment:	no treatment, GIB lined
Connector type:	refer to engineers documents
Connector finish:	refer to engineers documents

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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 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
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 DIMENSIONS

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

Requirements

1.5 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.

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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.

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

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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.

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.

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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 JAMB BATTENS

For walls with direct fix cladding, fit 20mm (nominal) jamb battens over the wall underlay, to the jambs of window and door rough openings, to NZBC E2/AS1, fig 72A. Cut around sill flashings. Fix with 60 x 2.8 flat head galvanized nails at 300mm centres.

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

Completion

3.24 COMPLETION MATTERS

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

4 SELECTIONS

4.1 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

4.2 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

4.3 CEILING FRAMING - RADIATA PINE

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Member	Species	Grade	Treatment
Ceiling joists:	Radiata pine	SG8	H1.2
Timber ceiling battens:	Radiata pine	SG8	H1.2

4.4 SPECIAL FRAMING ELEMENTS

refer to Engineered Wood Products Section

4.5 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

4.6 NAILS

Location	Type	Material
<600mm from ground	by contractor	304 Stainless steel
>600mm from ground	by contractor	Galvanised steel

4.7 SCREWS

Location	Type	Material
<600mm from ground	by contractor	304 Stainless steel
>600mm from ground	by contractor	Galvanised steel

4.8 BOLTS AND COACH SCREWS

Location	Type	Material
<600mm from ground	by contractor	304 Stainless steel
>600mm from ground	by contractor	Galvanised steel

4.9 NAIL PLATES

Location	Type	Material
<600mm from ground	by contractor	304 Stainless steel
>600mm from ground	by contractor	Galvanised steel

4.10 CONNECTORS

Location	Type	Material
<600mm from ground	by contractor	304 Stainless steel
>600mm from ground	by contractor	Galvanised steel

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4161T KINGSPAN THERMAKRAFT UNDERLAYS, FOILS, DPC, DPM, & TAPES

1 GENERAL

This section relates to the supply and installation of Kingspan's Thermakraft product range including DPC, DPM, Wall & Roof Underlays, Foils, Flashing Tapes, and accessories.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

DPC	Damp proof course
DPM	Damp proof membrane
EPDM	Ethylene propylene diene monomer

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

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
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4347	Damp-proof courses and flashings - Methods of test
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire

CodeMark BRANZ-CM-1002 (Rev 2) - Watergate Plus Wall Underlay
CodeMark CMNZ 30028 (Rev I) - Thermakraft Covertek 407 Roof and Wall Underlay
CodeMark CMNZ 30030 (Rev I) - Thermakraft Covertek 405 Roof and Wall Underlay
CodeMark CMNZ 30069 (Rev H) - Thermakraft Covertek 403 Roof and Wall Underlay

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Thermakraft's Product Data Sheets
Thermakraft's Installation Guides
BRANZ Appraisal 329 (2022) - Supercourse 500 Damp-Proof Course and Concealed Flashing - Amendment 29.08.2023
BRANZ Appraisal 651 (2019) - Thermakraft Covertek 407 Roof and Wall Underlay - Amendment 14.05.2024
BRANZ Appraisal 695 (2023) - Watergate Plus Wall Underlay - Amendment 14.05.2024
BRANZ Appraisal 743 (2019) - Thermakraft Covertek 405 Roof and Wall Underlay - Amendment 24.05.2024
BRANZ Appraisal 878 (2025) - Thermakraft Aluband Window Flashing Tape
BRANZ Appraisal 912 (2021) - Thermakraft 220 Synthetic Wall Underlay - Amendment 17.01.2025
BRANZ Appraisal 917 (2020) - Thermakraft Covertek 403 Roof and Wall Underlay - Amendment 14.05.2024
BRANZ Appraisal 942 (2022) - OneSeal Multi-fit Pipe and Cable Penetration Seals - Amendment 04.06.2024
BRANZ Appraisal 943 (2021) - Thermakraft Covertek 401 Roof and Wall Underlay - Amendment 25.11.2023
BRANZ Appraisal 1000 (2023) - Thermakraft Thermabar 397 Light Diffusing Reflective Underlay
BRANZ Appraisal 1029 (2023) - Thermakraft Ausnet Hexagonal Wire Mesh

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BRANZ Appraisal 1104 (2020) - Thermathene Orange Concrete Underlay - Amendment 06.09.2024
BRANZ Appraisal 1122 (2020) - Thermaflash Flashing Tape - Amendment 02.09.2024
BRANZ Appraisal 1229 (2023) - Thermakraft Covertek 215 Roof Underlay
BRANZ Appraisal 1277 (2025) - Thermakraft RainArmor Self Adhesive Roof Underlay and Wall Underlay

Manufacturer/supplier contact details

Company:	Kingspan Insulation NZ Ltd
Web:	www.thermakraft.co.nz
Email:	technical@kingspaninsulation.co.nz
Telephone:	0800 806 595

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Kingspan Thermakraft product range.

- 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.

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 - CodeMark certified

1.7 CODEMARK CERTIFICATE - THERMAKRAFT COVERTEK 405

Thermakraft Covertek 405 roof and wall underlay meets the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ 30030 (Rev I).

Compliance information - BRANZ appraised

1.8 BRANZ APPRAISED - THERMAKRAFT SUPERCOURSE 500

Thermakraft Supercourse 500 DPC has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 329

1.9 BRANZ APPRAISED - THERMAKRAFT COVERTEK 405

Thermakraft Covertek 405 roof and wall underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 743

1.10 BRANZ APPRAISED - THERMAKRAFT ONESEAL

Thermakraft OneSeal multi-fit pipe and cable penetration seal has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 942

1.11 BRANZ APPRAISED - THERMAKRAFT THERMAFLASH

Thermakraft Thermaflash flashing tape has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1122

2 PRODUCTS

DPC

2.1 THERMAKRAFT SUPERCOURSE 500

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BRANZ appraised, 0.5mm thick embossed black film DPC composed of recycled alloyed polyethylene. Tested to AS/NZS 4347 in accordance with AS/NZS 2904. Available in various width. Refer to SELECTIONS.

DPM

2.2 THERMAKRAFT THERMATHENE BLACK

0.25mm x 4000mm wide black DPM composed of recycled alloyed polythene. Membrane has a vapour flow resistance of at least 90MNs/g to NZS 3604 and NZS 4229, Damp-Proof Membranes. Refer to SELECTIONS.

Synthetic underlays - fire retardant

2.3 THERMAKRAFT COVERTEK 405

CodeMark certified and BRANZ appraised self-supporting synthetic roof and wall underlay, white with yellow logo print, composed of a water resistant vapour permeable film laminated to two layers of non-woven, spun bonded polyolefin sheet. Fire retardant, tested to AS 1530.2 and assigned a Flammability Index of ≤5. Available in 1250mm and 2550mm width. Refer to SELECTIONS.

Components - sealing

2.4 THERMAKRAFT WHITE GENERAL PURPOSE TAPE

60mm wide, white polypropylene general purpose tape with acrylic adhesive. Refer to SELECTIONS.

2.5 THERMAKRAFT ONESEAL

BRANZ appraised black multi-fit pipe and cable penetration seal composed of adhesive coated, 1.2mm thick flexible synthetic rubber material (EPDM) with pre-notched ring markings. Refer to SELECTIONS.

2.6 THERMAKRAFT CORNER MOULDS

Orange, flexible inert polythene moulded window corner flashing. Refer to SELECTIONS.

2.7 THERMAKRAFT THERMAFLASH

BRANZ appraised self-adhering synthetic flexible flashing tape, white on the top surface. Available in 75mm, 150mm and 200mm width. Refer to SELECTIONS.

Components - secure strapping/netting

2.8 THERMAKRAFT THERMASTRAP

19mm wide, rigid embossed polypropylene strap, colour blue. Refer to SELECTIONS.

2.9 THERMAKRAFT STUD STRAP

25mm wide, flexible woven and coated polythene strap, colour black. Refer to SELECTIONS.

Fixings

2.10 FIXINGS - TO TIMBER

Little grippers, staples, clouts or screws to suit application. Refer to SELECTIONS.

2.11 FIXINGS - TO STEEL

Construction grade double sided tape, adhesive or galvanized flat head screws to suit application. 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.

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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.

Installation/application - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Installation - DPC

3.5 INSTALL DPC

Ensure substrate's surface is smooth, flat and free from sharp ridges/projections that may puncture membrane. Install as a single layer with minimum 50mm overlap at joints to the Installation Guide.

Installation - DPM

3.6 INSTALL DPM - CONCRETE FLOOR

Install DPM over sand blinding below concrete floors, install in a neat fashion with a smooth surface as a single layer with minimum 150mm overlap at joints to the Installation Guide.

3.7 APPLY TAPE TO LAPPED DPM JOINTS

Ensure DPM is free of dust and contaminates, where required clean with a dry cloth. Apply tape to the Installation Guide centred over joint laps by firmly pressing down without stretching or pulling tape.

Installation - wall underlay

3.8 INSTALL WALL UNDERLAY

Install wall underlay to the Installation Guide horizontally and in true alignment over exterior face of wall framing including openings. Start by placing first sheet overlapping bearer or bottom plate by 35mm, draw taut and fix at maximum 300mm centres to wall framing members. Install additional sheets in row repeating the process for the first sheet with sheet end laps to be of at least 150mm and occurring over wall framing. Install sheets up to the top of the top plate repeating the installation process for the first row and overlapping higher over lower sheets by at least 150mm.

3.9 INSTALL WALL PENETRATION SEALS

Ensure wall underlay is free of dust and contaminates, where required clean with a dry cloth. Install penetration seal to the Installation Guide over pipe/conduit with a tight fit. Slide seal over pipe/conduit and place on underlay in a diamond shape. Remove backing release film and push firmly down to fix in place.

Installation - secure netting/strapping

3.10 INSTALL SECURE STRAPPING

Place straps on underlay, draw taut and fix to framing to the Installation Guide.

Preparation of wall underlay for window/door placement

3.11 FORM OPENINGS

Form openings in wall underlay to the Installation Guide. Cut underlay diagonally from corner to corner across the opening and tightly fold underlay flaps into opening over the full depth. Secure underlay to the back face of opening framing with staples. Trim excess underlay off at internal face. Remove dust and contaminates from underlay with a dry cloth.

3.12 INSTALL CORNER MOULDS

Install corner moulds with tight fit to sill/jamb corners to the Installation Guide.

3.13 FLASHING TAPE APPLICATION - GENERALLY

Install flashing tape to the Installation Guide. Fold tape back onto exterior wall surface by at least 50mm, cover opening depth in full and finish by lining up with inside edge of opening framing. Fix tape by applying even pressure by hand or a roller leaving no air bubbles beneath the tape.

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3.14 APPLY FLASHING TAPE TO SILL

Use 150mm wide tape for up to 100mm deep opening framing and 200mm wide tape for deeper framing. Cut tape to sill length plus 400mm. Remove release film from tape, align back edge of tape with interior sill edge allowing for at least 200mm tape upstand at jambs, apply tape to sill and jamb. Cut tape overhang at external sill/jamb corners, fold back onto and apply to exterior wall face.

3.15 CREATE PENETRATION SELF-SEAL AT SILL

Cut 75mm wide flashing tape to sill length. Apply along entire length of sill at window/door fixing location to ensure fixing penetration self-seal.

3.16 APPLY FLASHING TAPE TO HEADER

Use 150mm wide tape for up to 100mm deep opening framing and 200mm wide tape for deeper framing. Cut tape to 400mm length. Remove release film from tape, align back edge of tape with interior opening framing edge and apply 200mm along head and 200mm down jambs. Cut tape overhang at external head/jamb corners, fold back onto and apply to exterior wall face.

3.17 APPLY FLASHING TAPE ACROSS HEAD/JAMB CORNERS

Cut 75mm wide tape to 100mm length. Apply to exterior wall surface across head/jamb corners at 45°, overlap corners by 3mm to create a seal at corner junctions.

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

DPC

4.1 DPC - THERMAKRAFT SUPERCOURSE 500

Location:	between concrete and timber.
Manufacturer:	Thermakraft
Brand:	Supercourse 500
Type:	Damp proof course
Width:	to suit

DPM

4.2 DPM - THERMAKRAFT THERMATHENE BLACK

Location:	under slab
Manufacturer:	Thermakraft
Brand:	Thermathene Black
Type:	Damp proof membrane
Width:	4000mm
Joint tape:	White General Purpose Tape

Synthetic underlays - fire retardant

4.3 ROOF & WALL UNDERLAY - THERMAKRAFT COVERTEK 405

Location:	over exterior timber framing
Manufacturer:	Thermakraft
Brand:	Covertek 405
Type:	Synthetic roof and wall underlay
Width:	to suit
Fixings:	to be advised by contractor

Components for sealing wall underlay penetrations

4.4 PENETRATION SEAL - THERMAKRAFT ONESEAL

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Location: as required
Manufacturer: Thermakraft
Brand: OneSeal
Type: Pipe and service penetration seal
Size: to suit penetration

4.5 WINDOW CORNER FLASHING - THERMAKRAFT CORNER MOULDS

Location: as required
Manufacturer: Thermakraft
Brand: Corner Moulds
Type: Window corner flashing
Fixings: staples or clouts

4.6 75MM FLASHING TAPE - THERMAKRAFT THERMAFLASH

Location: as requiired
Manufacturer: Thermakraft
Brand: Thermaflash
Type: Flashing tape
Width: 75mm

4.7 200MM FLASHING TAPE - THERMAKRAFT THERMAFLASH

Location: openings as required
Manufacturer: Thermakraft
Brand: Thermaflash
Type: Flashing tape
Width: 200mm

Components for securing underlays

4.8 SECURE STRAPPING - THERMAKRAFT THERMASTRAP

Location: as required
Manufacturer: Thermakraft
Brand: Thermastrap
Type: Secure strapping
Width: 19mm
Fixings: min. 8mm staples

4.9 SECURE STRAPPING - THERMAKRAFT STUD STRAP

Location: as required
Manufacturer: Thermakraft
Brand: Stud Strap
Type: Secure strapping
Width: 25mm
Fixings: min. 8mm staples

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4239 SOFFIT CLADDING

1 GENERAL

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

- Fibre cement sheet
- Plywood
- Timber board
- Jointers
- Trim

1.1 RELATED WORK

Refer to painting section/s for the protective coating required to meet the NZBC durability requirements.

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

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
refer to manufacturer for warranty information

- 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

1.4 QUALIFICATIONS

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

1.5 HEALTH AND SAFETY

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

1.6 NO SUBSTITUTIONS

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

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:

Provide this information prior to practical completion.

2 PRODUCTS

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Plywood soffit cladding

2.1 APPEARANCE GRADE PLYWOOD SOFFIT CLADDING

Rotary cut, radiata pine veneer ply sheet to AS/NZS 2269.0. Treated H3.1 LOSP to AS/NZS 1604.1.
Refer to SELECTIONS.

Plywood soffit cladding fastener

2.2 NAILS - GALVANIZED

Refer to the plywood cladding manufacturer requirements. Use annular grooved or twisted shank nails for soffit cladding.
Refer to SELECTIONS.

2.3 NAILS - STAINLESS STEEL

Refer to the plywood cladding manufacturer requirements. Use annular grooved or twisted shank nails for soffit cladding.
Refer to SELECTIONS.

2.4 SCREWS - STAINLESS STEEL

Refer to the manufacturer's requirements for size and use; galvanized countersunk or stainless steel to NZS 3604, Table 4.1.

2.5 ADHESIVE

Adhesive for plywood soffit cladding, used in conjunction with mechanical fixings, as required by manufacturer / supplier documents. Refer to SELECTIONS.

Plywood soffit cladding edge treatment

2.6 PLYWOOD CUT EDGE TREATMENT

A solution of 12.5% copper naphthenate in white spirits, or mineral turpentine.

Timber profiles

2.7 TIMBER COVER BATTENS

To profiles detailed/scheduled with 6x6 mm weather grooves. Species and grading to the requirements of NZS 3602 , table 2, Requirements for wood-based building components to achieve a 15-year durability performance, treated H3.1 unless durable heart wood., Select appearance grades to NZS 3631 requirements, but with all knots excluded.

2.8 TIMBER TRIM

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

Flashing

2.9 SOFFIT CLADDING/WALL CLADDING JUNCTION FLASHING

Flashing as detailed with minimum 50 mm return behind soffit cladding and 35 mm cover to wall cladding, complete with hook and kick-out. Refer to SELECTIONS for flashing material.

3 EXECUTION

Conditions

3.1 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.

3.2 HANDLING

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Avoid distortion and contact with potentially damaging surfaces. Do not drag sheets across each other, or across other materials. Protect edges, corner and surface finish from damage. Reject all product with damaged faces or edges

3.3 SUBSTRATE

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

3.4 PLYWOOD CLADDING SUPPORT

Fully support all edges and joints.

3.5 EXPANSION PLYWOOD CLADDING

Provide 2-3mm gap at all edges of cladding for sheet expansion.

3.6 PLYWOOD CUT EDGE TREATMENT

Brush on surface treatment to all edges of plywood cut after treatment.

3.7 PENETRATIONS

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

Install plywood sheets

3.8 EXECUTION

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

3.9 PLYWOOD EDGE TREATMENT

Treat cut edges of plywood with edge treatment solution before fixing.

3.10 PLYWOOD SEALING

Seal cut edges of plywood before fixing with primer or sealer to suit the surface finish being used.

3.11 FIXING PLYWOOD SOFFIT CLADDINGS

Fit and fix to E2/AS1, 9.8 **Plywood sheet** and the plywood manufacturer's requirements with sheets and trim in square, true alignment and plane. Allow a 2-3 mm expansion gap between square edge sheets.

3.12 FIXING NAILS - PLYWOOD CLEAR FINISH

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

Install timber profiles

3.13 EXECUTION

To NZS 3604, except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.14 TIMBER TRIM

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

3.15 TIMBER COVER BATTENS

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

3.16 NAILING, PAINT FINISH

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

3.17 NAILING, CLEAR FINISH

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

Completion

3.18 COMPLETION MATTERS

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

4 SELECTIONS

Plywood soffit cladding

4.1 APPEARANCE GRADE PLYWOOD SOFFIT CLADDING

Brand/type:	TBD
Thickness:	12mm
Grade:	AD preferred, BD second preference
Treatment:	marine grade
Edge treatment:	Refer to products for cut edge treatment
Fixings:	Refer to the panel manufacturer's requirements
Joints:	5mm expressed joint, painted black behind
Finish:	Seal clear

Finishes - factory applied

4.2 MATERIALS SUPPLIED PRE-FINISHED (EXCEPT FINAL COAT)

Soffit:	sealed clear, to be advised by manufacturer

Finishes - cut edges

4.3 SITE FINISHES - CUT EDGES

Soffit:	to be advised by manufacturer

Finishes - applied on site

4.4 SITE FINISHES - FINAL FINISH COAT ONLY

Soffit:	Refer to appropriate painting section/s for finishes

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4251SA SYMONITE ALUCOBOND® PLUS ACP CLADDING SYSTEMS

1 GENERAL

This section relates to the design, fabrication, supply and installation of **Symonite Panels Limited** Alucobond® Plus aluminium composite panels to building envelopes including walls, parapets, fascia and soffits.
It includes;

- external wall cladding
- internal lining
- fixed to all types of structures including timber, concrete and light steel framing complete with all necessary anchors and fittings
- to provide a total installation.

Documents

1.1 DOCUMENTS

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

NZBC C/AS1	Protection from fire
NZBC C/AS2	Protection from fire
NZBC E2 / VM1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
AS 2848	Aluminium and aluminium alloys - Compositions and designations - Wrought products
NZS 3604	Timber-framed buildings
AS/NZS 4284	Testing of building facades
ISO 9705	Fire tests - Full-scale room test for surface products
AAMA 2605-11	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels
BS EN 13525-2	Coil coated metals. Test methods. Specular gloss

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Symonite Alucobond® Plus Cladding System product literature
Symonite System Technical Statement - Symonite Cladding Systems
Symonite Alucobond® Plus Technical Data Sheets
Symonite Alucobond® Plus Maintenance of Alucobond document
IANZ Accredited test report for AS/NZS 4284 and NZBC E2/VM1
BRANZ Appraisal 528 The Building Agency Alucobond® Cladding System (2024)

Manufacturer/supplier contact details

Company:	**Symonite Panels Limited**
Web:	www.symonite.co.nz
Email:	b.heald@symonite.co.nz
Telephone:	09 443 3896

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Symonite Alucobond® Plus materials

- Provide this warranty on the **Symonite Panels Limited** 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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1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
5 years For installation of Symonite Alucobond® Plus cladding system

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Installers to be approved / trained by **Symonite Panels Limited**. If requested provide evidence of qualification / experience prior to commencing work. Refer to 1270 CONSTRUCTION for additional 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 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

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

Performance - design

1.8 DESIGN REQUIREMENTS

Refer to SELECTIONS for requirements.

Performance - Wind (design by contractor)

1.9 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.

Performance - fire

1.10 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

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

Performance - general

1.11 FIXINGS, EARTHQUAKE

Use fixings and methods capable of sustaining the loads appropriate to the area as required by NZS 1170.5.

1.12 FABRICATION

All cladding panels are factory fabricated and assembled to **Symonite Panels Limited** Technical Data Sheets.

1.13 WEATHER-TIGHT PERFORMANCE

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

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2 PRODUCTS

Materials

2.1 WALL UNDERLAY

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

Alucobond® Plus

2.2 SYMONITE ALUCOBOND® PLUS ALUMINIUM COMPOSITE PANEL

Symonite Alucobond® Plus, a 4mm composite aluminium-faced solid; polyethylene core, comprised of polyolefin compound of mineral, halogen free flame retardant filler, factory finished on face side with fluoropolymer (PVDF) coating and rear face comprised of aluminium sheet left with a chemically cleaned mill finish.
Refer to SELECTIONS for width, length and colour options.

Components

2.3 JOINT SEALANT

Sika AT Facade or Dow Corning 688.

2.4 FIXING SECTIONS

Extruded aluminium fixing sections. Aluminium alloy AA 6063-T5 to AS 1866 (designated to AS 2848).

2.5 FIXINGS AND FASTENINGS

Designed, supplied and installed by ACP manufacturer.

2.6 SCREWS

Stainless steel with pan head square drive heads finished to match surrounding surfaces. Use concealed screws wherever practicable.

2.7 RIVETS

Aluminium alloy blind rivets of the same composition as the materials being joined.

2.8 COMPATIBILITY

All elements and accessories compatible on the electrochemical scale of metals so that no excessive sacrificial corrosion will occur. All elements and accessories of an appropriate quality, ensuring that no reduction in structural integrity or weathertightness occurs during the guaranteed life of the panel system.

Finishes

2.9 FLUOROPOLYMER COATING

Factory applied fluoropolymer (PVDF) high performance coating to BS EN 13523-2, ECCA Quality Label and Voluntary Specification AAMA 2605-11.

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.

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3.4 INSTALLATION

All work to be carried out by competent and experienced installers, who are currently trained and approved by Symonite Panels Limited, in accordance with the manufacturer's stated requirements and the approved shop drawings. Carry out all cladding manufacture and installation under the control and supervision of a **Symonite Panels Limited** Project Manager.

3.5 TOLERANCES

Refer to the panel manufacturer's literature for the permitted tolerances.

3.6 NON-FACTORY METAL FINISHES

Apply metal finishes using applicators currently approved in writing by the coating manufacturer.

3.7 TOUCH-UP

In situ touch-up of factory applied finishes is not permitted unless a trial repair is subsequently approved in writing. Replace all other panels with a damaged finish.

3.8 DO NOT USE

Do not use adhesive tape, film, papers, or sprayed protective coatings, or masking tape, which might become bonded after exposure to sun or weather. Remove any temporary protection after installation. Remove any protective coating residues immediately.

Assembly

3.9 FABRICATION

Do not start fabrication until the installation and shop drawings have been reviewed and material samples approved.

3.10 FABRICATE

Fabricate aluminium composite panels and elements in the workshop wherever possible, ready for assembly and erection on the building site.

3.11 DO NOT ALTER

No cutting, trimming, welding or brazing of component parts during erection in any manner that would damage the finish, decrease the strength or result in visual imperfection or failure in performance to be executed during erection. Return any component parts that require alteration to the shop for correction or replacement with new parts.

3.12 ANCHORAGE

Ensure anchorage of the cladding structure to the building structure is done to manufacturer's approved methods and requirements.

3.13 COMPONENTS

Ensure all components are level, true to line with uniform joints and reveals.
Ensure the maximum deviation for vertical members is to manufacturer's specifications.
Ensure the maximum deviation for horizontal members is to manufacturer's specifications.
Ensure the maximum offset from true alignment between the abutting members is to manufacturer's specifications.
Ensure the tolerance of width of the joints between two panels is to manufacturer's specifications.

Substrate preparation

3.14 SUBSTRATES

Check substrate for alignment, whether concrete, timber or steel framing, before commencing cladding installation. Notify the Contract Administrator in writing of any unacceptable conditions.

Fixing systems

3.15 FIX PANELS - FOR BUILDINGS GREATER THAN 2 STOREYS HIGH

Fix Symonite Alucobond® Plus panels for buildings greater than 2 storeys to "Typical Details" contained in Symonite Cladding System brochure.
For maximum wind pressure areas up to 3.6kPa (ULS), in medium to high wind zones.

Installation -general

3.16 PENETRATIONS

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

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

3.17 INSTALL PANELS

Install aluminium composite panels in accordance with the selected fixing system, and the stated design parameters (including joint size and design modules), reviewed shop drawings and installation details. Co-ordinate with related work. Consult and coordinate as necessary with installers of adjoining work, including window and door installations.

3.18 INSTALL PANEL JOINTS

Install panel joints in accordance with Symonite Alucobond® Plus detail sheets.

3.19 FIX SOFFITS

Suspend and fix aluminium composite soffits on a proprietary suspension system. Supply and fix all edge flashings and edgings as detailed.

3.20 APPLY SEALANTS

Clean joints with solvent, mask adjoining surfaces, install backing rod or breaker tape and install sealant in accordance with the reviewed shop drawings, sealant profiles and sealant manufacturer's instructions.

3.21 COMPLETE

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

Completion

3.22 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 SYMONITE ALUCOBOND® PLUS ALUMINIUM COMPOSITE PANEL

Location:	columns, spandrels, parapets and soffits, refer to drawings
Manufacturer:	**Symonite Panels Limited**
Panel type:	Alucobond® Plus
Panel thickness:	4mm
Panel width:	to suit
Panel length:	to suit
Fixing method	System for 2+ level buildings
Panel joint:	System for 2+ level buildings - 13mm-15mm
External surface finish:	PVDF Coating
Reverse side finish:	Wash Coat
Colour:	TBD

Components

4.2 SEALANT

Brand:	Sika AT Facade or Dow Corning 688
Colour:	Black, Grey or White
Tool off:	To be smooth and 2mm to 4mm negative to the panel face

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4257 STEEL CLAD INSULATED PANEL SYSTEMS

1 GENERAL

This section relates to the fabrication, supply and installation of prepainted steel clad, insulating panels and cladding system for ambient controlled temperature buildings using:

- insulated wall and ceiling panels
- insulated roof panels
- fire resistant insulated wall ceiling and roof panels

Related work

Documents

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC B2/AS1	Durability
NZBC C/AS1	Protection from fire
NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3404.1	Steel Structures Standard
AS 1366.3	Rigid cellular plastic sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 1530.4:2005	Methods for fire tests on building materials, components and structures - Fire-resistance test of elements of construction
AS/NZS ISO 9001	Quality management systems - Requirements

1.2 MANUFACTURER'S DOCUMENTS

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

Copies of the above literature are available from

Company:	Conqueror Insulated Panels
Web:	https://conqueror.co.nz/
Email:	Casey.Delaney@conqueror.co.nz
Telephone:	0800 799 923

Requirements

1.3 QUALIFICATIONS

All installation and sealing of the panels by an installer accredited by the panel manufacturers.

Warranties

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide Installer's warranty.
refer to manufacturer for warranty information

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide Manufacturer's warranty.
refer to manufacturer for warranty information

Refer to the general section 1237 WARRANTIES for additional requirements.

Performance

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1.6 DESIGN REQUIREMENTS

Structural design to be supported by a Producer Statement prepared by a Chartered Professional Engineer. Refer to the Manufacturer's Design Guide for information relating to panel spans. Loading parameters to comply with the methods described in NZS 3404.1, 3.3 and 3.4. Refer to SELECTIONS for design requirements.

1.7 FIXINGS, WIND

Design and use the fixings appropriate for the wind loads on various elements as given by AS/NZS 1170.2 Refer to SELECTIONS.

1.8 FIXINGS, EARTHQUAKE

Use fixings and methods capable of sustaining the loads appropriate to the area as required by NZS 1170.5.

1.9 FIRE SAFETY

The insulated panel systems:

- external panel systems to comply with NZBC C/AS1, 5.3 External cladding systems ,NZBC C/AS2, 5.8 External claddingsystems or NZBC C/VM2,
- internal panel systems to provide a Group Number to NZBC C/AS2, 4.17.2 Table 4.3 Surface finishes**,** to suit the appropriate fire Risk Group,
- fire rated panel systems to comply with AS 1530.4.

1.10 DURABILITY

The insulated panel comply with NZBC B2/AS1 when maintained to recommendations in the manufacturer's maintenance guide.

1.11 AIR LEAKAGE

The panel's tongue and groove joints to have an air leakage of less than 0.5m³/hr/m² at 15Pa.

1.12 QUALITY CONTROL

Maintain an approved quality control system in accordance with AS/NZS ISO 9001, covering all stages of design, fabrication, installation and completion of the panel structure.

2 PRODUCTS

Materials

2.1 PANELS GENERALLY

Tongue and groove-jointed structural EPS panels, with a bonded, pre-finished, steel skin to both faces. Panels to have an S-grade expanded polystyrene (rigid cellular polystyrene - moulded) core, made in accordance with AS 1366.3. Polystyrene to be kiln-dried to remove production moisture prior to fabrication. Steel faces to be coil-coated galvanized steel with a base metal thickness of 0.59 mm to AS 1397 grade G300, with a ZM²75 zinc coating class, cleaned and chemically treated before coil-coating.
Refer to SELECTIONS.

Components

2.2 WINDOWS

Refer to appropriate window section(s).

2.3 RIVETS

As specified by the panel manufacturer.

2.4 SUPPORT BOLTS

As specified by the panel manufacturer.

2.5 FLASHINGS

All primary flashings to match exterior panel skin in material and finish. Internal flashings of aluminium angle supplied by the manufacturer for joining panels together.

Accessories

2.6 ACCESSORIES

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Use only accessories approved and supplied by the manufacturer. All attachments and fasteners to be compatible with the other elements of the panel system.

2.7 SEALANTS

Neutral cure silicone with a minimum durability of 15 years.

2.8 FOAM

Polyurethane foam.

3 EXECUTION

Conditions

3.1 INSTALLATION

All work by competent and experienced installers, who are currently approved by the panel manufacturers in accordance with the manufacturer's stated requirements and the approved shop drawings. All panel manufacture and installation under the control and supervision of a nominated representative of the panel manufacturer.

3.2 METAL FINISHES

All metal finishes applied by applicators currently approved in writing by the coating manufacturer.

3.3 TOUCH-UP

In situ touch up of factory applied finishes is not to be permitted unless a trial repair is subsequently approved in writing. Replace all other panels with a damaged finish.

3.4 HANDLE AND STORE

Handle and store pre-finished panels and materials so that no damage will be done to the forms, materials, or finishes.

3.5 UNLOAD

Unload, handle and store preformed and pre-finished panels in accordance with the manufacturer's stated requirements. Use only polystyrene or other soft packing when stacking panels.

3.6 DO NOT DELIVER

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

3.7 PROTECTION

Avoid distortion of panels or elements during transit, handling and storage. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement, or with dissimilar metals.

3.8 DO NOT USE

Do not use adhesive tape, film, papers, or sprayed protective coatings, or masking tape, which might become bonded after exposure to sun or weather. Remove any temporary protection after installation. Remove any protective coating residues immediately.

3.9 RAW EDGES

Seal cut edges of panel skins using a proprietary brush on lacquer.

3.10 GALVANIC CORROSION

Avoid run-off from any copper or brass systems, or unpainted lead flashings. Electrically isolate any large areas of stainless steel from the panel surface. Where dissimilar materials might be in contact, provide a separation barrier.

Assembly

3.11 FABRICATION

Do not start fabrication until shop drawings and erection drawings have been reviewed.

3.12 FACTORY PRODUCTION

Do not start factory production before shop drawings have been reviewed.

3.13 FABRICATE

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Fabricate panels and elements in the workshop wherever possible, ready for assembly and erection on the building site.

3.14 CUTTING OF PANELS

Complete all cutting using a purpose-designed cutter to produce a slight rounding of panel edges or use a WC saw blade for profiled face. Do not use abrasive discs.

Application

3.15 INSTALL PANELS

Install panels in accordance with the drawings, stated design parameters, reviewed shop drawings and installation details. Co-ordinate with work of other sections. Consult and coordinate as necessary with installers of adjoining work, including door installations.

3.16 SEALING

Do not use metal implements for applying or tooling sealant. Extrude sealant into the joint, ensuring that all air is excluded. Tool the surface and remove any excess. All sealant joints to finish flush or slightly concave.

3.17 PENETRATIONS

Form penetrations to the manufacturer's details. Use neoprene, silicone rubber, EPDM, aluminium or soft zinc to form flashing around penetration.

3.18 WINDOW INSTALLATION

Install windows into formed opening to the manufacturer's details. Provide and fit flashings to NZBC E2/AS1.

Completion

3.19 PROTECTION

Protect all surfaces and finishes for damage as long as practicable, including the retention of all or any protective coatings provided by the panel manufacturer. Remove protective coatings, using only the methods required by the panel manufacturer.

3.20 CLEAN

Clean panel surfaces with soft, clean cloths and clean water and in accordance with the panel manufacturer's stated requirements. Finish with a clean squeegee. Do not use abrasive or alkaline materials, other than a mild abrasive cream used with a soft cloth to remove minor surface marking.

Remove all drilling swarf, rivet mandrels and any other metallic debris from the roof surface daily, using a soft bristle broom and/or hosing down with clean water.

3.21 ON COMPLETION

Trade clean all panel surfaces to remove all marks, dust and dirt to enable a visual inspection of all surfaces at completion of the installation and again at contract completion.

4 SELECTIONS

4.1 STEEL CLAD INSULATED PANEL FIXINGS, WIND

	Element
SLS (Serviceability limit state)	refer to manufacturer
ULS (Ultimate limit state)	refer to manufacturer

4.2 STEEL CLAD INSULATED PANELS GENERALLY

Panel manufacturer: Conqueror Insulated Panels

4.3 STEEL CLAD INSULATED WALL PANELS

Panel type:	Architectural wall panel
Panel width/thickness:	100 mm
Internal panel face finish/colour:	standard as not exposed
External panel face finish/colour:	Colour TBD
External skin profile:	wave or wave single rib

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4.4 STEEL CLAD INSULATED ROOF PANELS

Panel type:	Trapezoidal roof panel
Panel width/thickness:	150 mm
Internal panel face finish/colour:	standard as not exposed
External panel face finish/colour:	Colour TBD
External skin profile:	trapezoidal

4.5 STEEL CLAD INSULATED PANEL SUPPORT AND JOINTING ANGLES

Wall/ceiling junction internal:	40mm x 40mm prepainted steel or aluminium angle
Wall/ceiling junction external:	40mm x 40mm prepainted steel or aluminium angle

4.6 STEEL CLAD INSULATED PANEL PANEL CLOSERS

Prepainted steel or aluminium angle channel.

4.7 STEEL CLAD INSULATED PANEL FIXINGS

Type: Aluminium rivets to underside panel joints.

4.8 STEEL CLAD INSULATED PANEL FLASHINGS

Thickness:	0.59mm prepainted steel
Finish:	To match panel finish

4.9 STEEL CLAD INSULATED PANEL SEALANTS

Type: Neutral cure silicone supplied by the manufacturer

4.10 STEEL CLAD INSULATED PANEL VAPOUR SEAL

Type: Mastic sealant supplied by the manufacturer

4.11 STEEL CLAD INSULATED PANEL PANEL GAP FILLER

Type: EU expanding foam supplied by the manufacturer

4.12 STEEL CLAD INSULATED PANEL PANEL END STRIP

Type: EU expanding foam supplied by the manufacturer

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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 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

1.2 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

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
refer to manufacturer for warranty information

- 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.

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
refer to manufacturer for warranty information

- 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

1.5 QUALIFICATIONS WORKERS - INDUSTRY QUALIFICATION REQUIREMENTS

The work is to be carried out or supervised by a LBP licensed for Bricklaying and Blocklaying 1: Brick/Masonry Veneer. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.6 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.

1.7 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:

Samples to be decided on by client.

1.9 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

1.10 KEEP RECORDS

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

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

1.11 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.

1.12 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:
refer to manufacturer for operation and maintenance information

Provide this information prior to practical completion.

Compliance information

1.13 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

1.14 INSPECTIONS

refer to council and structural engineers documents as and where required

2 PRODUCTS

Materials - veneer

2.1 NATURAL STONE

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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.

2.2 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.

2.3 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.

2.4 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.

2.5 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.

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

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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.

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 - veneer

3.14 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.

3.15 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.

3.16 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.

3.17 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.

3.18 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.

3.19 INSTALLATION STEEL LINTELS

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

3.20 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.

3.21 INSTALLATION WEEP HOLES

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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.

3.22 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

3.23 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials - veneer

4.1 NATURAL STONE

Location:	street front facade, refer to drawings
Supplier:	TBD, local (Central Otago)
Type:	Schist
Thickness:	150mm
Size:	Refer to the natural stone manufacturer / supplier for information
Face finish:	Refer to the natural stone manufacturer / supplier for information
Compressive strength:	2.25MPa minimum unconfined compressive strength

4.2 MORTAR

Location:	joints
Type:	site mixed or bagged pre-mixed
Classification:	M3
Colour:	TBD
Compressive strength:	to follow the requirements of the natural stone manufacturer / supplier
Bond strength:	200kPa minimum 7 day masonry-to-mortar bond strength
Joint type:	TBD - between flush and overgrout - confirm with client

4.3 WALL TIES

Location:	as required
Supplier:	to be advised
Brand:	to be advised
Type:	refer to engineer
Classification:	R3
Material:	refer to engineer
Spacing:	refer to engineer
Embedment:	Embedment length to be at least half the width of the veneer
Fixings:	refer to engineer

4.4 STEEL LINTEL

Location:	arched joinery
Type:	EA
Size:	150, confirm with engineers

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4337E ECOPLY® ROOFING & DECKING

1 GENERAL

This section relates to the use of Carter Holt Harvey Plywood Ltd Ecoply® plywood sheets for:

- membrane roofs
- membrane decks
- membrane gutters
- substrate for roofing

1.1 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®

Documents

1.2 DOCUMENTS

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

NZBC B1/AS1	Structure
NZBC E2/AS1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1604.3:2012	Preservative-treated wood-based products - Part 3: Plywood
AS/NZS 2269.0	Plywood - Structural - Specifications
NZS 3604	Timber-framed buildings

1.3 MANUFACTURER'S DOCUMENTS

Carter Holt Harvey Plywood Limited documents relating to work in this section are:
Ecoply® Specification and installation guide December 2023

Manufacturer/supplier contact details

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

Requirements

1.4 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 NO SUBSTITUTIONS

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

2 PRODUCTS

Materials

2.1 ECOPLY® STRUCTURAL (SQUARE EDGE) F8/F5 GRADE

Radiata pine veneer ply manufactured to AS/NZS 2269.0, face sanded, grade as scheduled and H3.2 CCA treated to AS/NZS 1604.3, if required.

Components

2.2 SCREWS IN TIMBER

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Stainless steel, counter-sunk. Refer to Ecoply® Specification and Installation Guide requirements for size and use.
General:

7 - 9mm plywood:	No. 8 x 30mm
12 -15mm plywood:	No. 8 x 40mm
17mm plywood:	No. 10 x 40mm
19 - 21mm plywood:	No. 10 x 45mm
25mm plywood:	No. 10 x 50mm

Under membranes:

17 - 25mm plywood:	No. 10 x 50mm (to E2/AS1, 8.5.5.1)

2.3 ADHESIVE

Refer to SELECTIONS.

2.4 BRUSH ON TREATMENT

Soudal Metalex Ready to Use or Soudal Metalex Concentrated Timber Preservative. Clear or Green colour product.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Ensure support framing is completed to Ecoply® Specification and Installation Guide stated requirements as a minimum. Always refer to the roofing and decking system supplier for installation, plywood selection and surface preparation requirements for specific roofing and decking products or to specific design requirement.

Ensure all Ecoply® square edge sheet edges and joints will be fully supported with framing width of minimum 45mm at each Ecoply® sheet joint.

Ensure moisture content is:

Timber:	20% maximum

Application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 FIXINGS

150mm centres along edges, minimum 7mm, maximum 15mm from the edge and, 300mm maximum centres on intermediate supports, or 200mm centres under membranes

3.6 FIXING ECOPLY® PLYWOOD SHEETS

Fix sheets to Ecoply® Specification and Installation Guide (or specific design) stated requirements. Lay sheets in a staggered layout, face-grain of sheet at right-angles to support and with sheets in square, true alignment and plane with a 3mm expansion gap for square edge sheets. Nail or screw fix to Ecoply® Specification and Installation Guide requirements unless specified differently.

3.7 UNDER MEMBRANE ROOFING

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To NZBC E2/AS1, 8.5 Membrane roofs and decks. Screw and adhesive fix sheets with stainless steel screws for membrane type roofing to Ecoply® Specification and Installation Guide and membrane manufacturers' requirements. CD grade plywood with the C face up (or better). Provide a 5mm radius chamfer to external edges where the membrane is to be wrapped over. Fix internal corner fillets.
Provide whichever is the greater falls:

- as shown on the drawings
- to the membrane manufacturer's requirements
- minimum to NZBC E2/AS1, 8.5.1, - 1:30 for roofs, 1:40 for decks and 1:100 for gutters

3.8 TREAT

Treat cuts and holes in sheets with a brush on timber preservative treatment - Soudal Metalex Ready to Use or Soudal Metalex Concentrated Timber Preservative.

Completion

3.9 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 ECOPLY® STRUCTURAL (SQUARE EDGE)

Location:	as substrate for membranes
Manufacturer:	Carter Holt Harvey Plywood Ltd
Brand/grade:	Ecoply® Structural / CD
Stress grade:	F8/F5
Thickness:	min 17mm
Treatment:	H3.2 CCA
Fixings:	Screws stainless steel

4.2 SCREWS

Type/size/material:	10g x 50mm stainless steel screws required by NZBC E2/AS1 for membrane installations

4.3 ADHESIVE

Type:	to be advised by manufacturer / installer

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4381NJ NURAJACK DECK SUPPORT SYSTEM

1 GENERAL

This section relates to the supply and installation of **Nuralite Waterproofing Ltd** NURAJACK height adjustable support systems for floating timber and tile / stone paved decks.
It includes:

- support systems for self supporting natural stone/concrete pavers
- support systems for self supporting tiles
- support systems for timber plank and composite decking systems

Related work

1.1 RELATED SECTIONS

Refer to 4421N NURAPLY MEMBRANE ROOFING & DECKING for deck membrane specification and details.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following definition applies 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".

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

- NURALITE ACCESSORIES NURAJACKS & NURAPADS – Technical Brochure
- NURALITE Waterproofing Limited: CAD details
- NURAJACK Placement Graph
- NURAJACK Quantity Calculator
- NURALITE NURAJACK – Installation Video

Manufacturer/supplier contact details

Company:	**Nuralite Waterproofing Ltd**
Web:	www.nurajack.co.nz
Email:	info@nuralite.co.nz
Telephone:	09 579 2046

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years	For Nurajack deck pedestal support materials. Warranty applies only when installed over a Nuralite membrane system. When using other membrane systems contact Nuralite Waterproofing Ltd for confirmation of warranty details and conditions which may differ.

- Provide this warranty on Nuralite Waterproofing Ltd 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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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 GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

Compliance information

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -
- Manufacturer's, importer's or distributors warranty
- Installer's warranty

2 PRODUCTS

Deck support system

2.1 DECK SUPPORT SYSTEM

NURAJACK components comprised of high-density UV resistant polypropylene injection moulding, complying with NZBC B2/AS1 Durability requirements. Complete with all required accessories to complete installation. Refer to SELECTIONS.

Components - for timber deck

2.2 NURAPAD - LOW PROFILE

NURAPAD, a 12mm low profile deck pedestal. Not adjustable, but can be stacked on top of each other or alternatively, Nurapad Shims, in sizes 1, 2 or 3mm high, can be added to adjust for height.

Accessories - for timber deck

2.3 NURAPAD SHIM

NURAPAD Shim, in sizes 1, 2 or 3mm high. Used to accommodate a variance in the timber thickness when using Nurapads.

3 EXECUTION

Conditions - general

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 - GENERAL

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

Conditions - over waterproof membrane substrate

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3.4 PRE-INSTALLATION REQUIREMENT - OVER WATERPROOF MEMBRANES

Before commencing work obtain confirmation from contractor 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 Nuralite Waterproofing Ltd installation instructions.

3.6 PRIOR TO INSTALLATION

Sweep clean waterproof membrane and ensure it is clear of any foreign objects before commencing installation.

3.7 NURAJACK PLACEMENT GRAPH FOR TIMBER DECKS

Set out Nurajacks / Nurapads in accordance with Nurajack Placement Graph.

3.8 NURAJACKS - QUANTITIES

To determine the number of Nurajacks required refer to Nurajack Quantity Calculator at www.nurajack.co.nz. The number required is a function of the deck dimensions and the size and structure of the tile / timber decking.

Installation - with timber decking

3.9 SET OUT

Place pedestals on the substrate; the distance apart will depend on the supporting bearer/joist span, maximum load of pedestal and decking loading capacity.
A Nurajack is required at 600mm centres along a 90mm x 45mm joist. If joist is ripped to a thinner profile, more Nurajacks may be required, as per Nurajack Placement Graph.

3.10 FIX JOISTS

Fix joist to top of pedestals with self-drilling stainless screws through the plastic upstand of the joist head. Adjust the heights of the pedestals so that the joists are completely level.

3.11 INSTALL TIMBER DECKING

Fix timber decking to the joists using stainless steel screws or clips in accordance with manufacturer's requirements. Leave 12mm gap to edge of cladding in accordance with NZBC E2/AS1: 7.1.1 **Slatted decks**.

3.12 SMALLER DECK INSTALLATION

Use Nurajack system to support a ripped joist. Locate Nurapads at intervals in accordance with the Nurajack Placement Graph.

3.13 CLEAN OUT MANHOLES / HATCHES

Provide removable screw-fixed access panels at appropriate locations on the deck for cleaning out of sumps and other similar outlets that require servicing.

Completion

3.14 COMPLETION MATTERS

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

4 SELECTIONS

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

Deck support systems - for timber decks

4.1 NURAJACK DECK SUPPORT SYSTEMS FOR TIMBER

Location:	balconies
Manufacturer:	Nuralite Waterproofing Ltd

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Components:	to suit fall
Accessories:	Nurapad Shim as required

Timber decking

4.2 TIMBER DECKING

Refer to timber decking sections for specification of timber decking.

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4383 TIMBER DECKING

1 GENERAL

This section relates to the fabrication and installation of exterior timber

- spaced boarding to decks
- steps and landings

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

NZBC D1/AS1	Access routes
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
BRANZ BU 497	Stair construction

Performance - Slip resistance

1.3 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt from testing.

Requirements

2 PRODUCTS

Materials

2.1 SOLID TIMBER COMPONENTS

Selection to NZS 3602.

2.2 HARDWOOD SPACED BOARDING FOR EXTERIOR DECKS

Plantation-grown hardwood. Dressed four sides and with arrises, or specifically profiled decking.

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.

3.2 PREPARATION, PRE-COATING

For decking to be, stained, sealed or oiled, ensure underside face, edges and cuts of the decking are pre-coated prior to installation. Refer to SELECTIONS for finish.

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Application

3.3 LAYING TIMBER SPACED BOARDING - ENCLOSED DECKS

Confirm whether the grooved side of the boards are face up or face down. Avoid excessively short or long lengths, drill for all fixings, stagger end joints. Space boards a Minimum of 5mm apart in general conditions. Leave a 12mm minimum gap between the exterior wall and the adjacent decking board.

3.4 SCREW FIXING

Pre-drill for all fixings, where the screws allow, use a proprietary deck pre-drilling and countersinking tool.
Use decking screws and power drive into the deck surface to just slightly below the board surface (approx. 0.5mm). Take care to not overdrive the screw as this may result in the screw heads or the boards being damaged. Refer to SELECTIONS.

3.5 CORROSION RISKS

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel or silicon bronze, fixings and connectors, if decking or framing 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).

Completion

3.6 LEAVE

Leave work to the standard required by following procedures.

3.7 REMOVE

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

4 SELECTIONS

4.1 EXTERIOR DECKING - HARDWOOD SPACED BOARDING

Species:	Vitex preferred, Kwila second option
Size:	140mm x 19mm
Grooved face:	down
Finish:	stain to be decided

4.2 SCREW FIXING

Location:	deck
Screw type:	Stainless steel decking screw
Screw size:	min. 65 x 10g

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4422NT NURAPLY TPO ROOF & DECK MEMBRANE

1 GENERAL

This section relates to **Nuralite Waterproofing Limite**d 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
NZBC E2/AS1	External moisture
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
BRANZ Appraisal 1177 (2021) - Nuraply TPO Waterproofing Membranes - Amendment 1

Manufacturer/supplier contact details

Company:	**Nuralite Waterproofing 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 Nuralite Waterproofing Product Warranty standard form (to be supplied)
- 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:

5 years	For Nuraply TPO membrane when installed by Nuralite Waterproofing Limited approved applicator.

- 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 licensed by **Nuralite Waterproofing Limited**. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

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 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 FLOOD TESTING

Where possible, flood test all gutters with a maximum 50mm depth of water at the outlet or scuppers for 24 hours. Make good any lack of water tightness when the surface is completely dry.

1.12 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 Waterproofing Limited representative
- Contractor
- Principal
- Principal's consultant(s)

1.13 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.

2 PRODUCTS

Materials - Nuraply TPO single layer system

2.1 NURAPLY TPO SMOOTH BACK MEMBRANE

Nuraply TPO, a single ply, polyester fabric reinforced TPO fully bonded roofing and waterproofing membrane, to ASTM D6878.

Components

2.2 PRIMER - SOLVENT BASED

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50/50 mixture of solvent and Nuraply TPO Bonding Adhesive, a solvent based rubberised contact adhesive to bond the membrane.

2.3 NURAPLY TPO MEMBRANE BONDING ADHESIVE - SOLVENT BASED

Nuraply TPO Bonding Adhesive, a solvent based rubberised contact adhesive to bond the membrane.

2.4 NURAPLY TPO SOLVENT

Nuraply TPO Solvent is used to cut back Nuraply TPO Adhesive for use as a primer and for cleaning of equipment.

Accessories

2.5 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.

2.6 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.

2.7 NURAPLY TPO SEALANT

Nuraply TPO Sealant is an approved sealant compatible with Nuraply TPO and other accessories.

2.8 NURAPLY TPO MEMBRANE CLEANER

Nuraply Membrane Cleaner is used for lap preparation and removing marks from the membrane surface.

2.9 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

2.10 NURAPLY TPO DRAIN

Nuraply TPO Drains are a selected range of clamp ring drains in varying size and configurations.

2.11 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.

2.12 NURAPLY TPO SCUPPER OVERFLOW

Nuraply Aluminium Scupper Overflow is designed to be recessed into the substrate. 200mm high x 75mm wide x 300mm long.

2.13 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.

2.14 NURAPLY TPO DRIP EDGE

Nuraply Aluminium Drip Edge used for the drip edge into external gutters. 50mm x 50mm x 2.5 metres long

2.15 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.

2.16 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.

2.17 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.

2.18 DECK SUPPORT SYSTEMS - NURAJACKS & NURAPADS

Refer to 4381NJ NURAJACK DECK SUPPORT SYSTEM for specification.

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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.

Take delivery of Nuraply TPO membrane in undamaged rolls, and include for site handling facilities where required. Store rolls horizontally only, and no higher than two layers, one on top of the other. Provide dry storage for all products. Stack off the ground on a level surface and with accessories.

3.2 ROUTINE MATTERS

Refer to the general section 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

Work and materials to Nuralite Waterproofing Limited 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 the NZBC E2/AS1 for the relevant substrates and Nuralite Waterproofing Limited 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

Ensure the fall complies with NZBC E2/AS1 including correct fall to rainwater outlets to avoid ponding,

- Lay roofs to a minimum fall of 1:30 (2°) to NZBC E2/AS1, 8.5.1 a.
- Lay decks to a minimum of 1:40 (1.5°) to NZBC E2/AS1, 8.5.1 b.
- Lay gutters to a minimum fall of 1:100 (0.57°) to NZBC E2/AS1, 8.5.1 c.

3.8 PLYWOOD SUBSTRATE

Ensure plywood is:

- a minimum of 17mm thick and complying with AS/NZS 2269.0
- minimum CD structural grade with the sanded C side upwards
- hazard Class H3.2 with waterborne CCA treatment to AS/NZS 1604.1, and kiln dried after treatment
- laid with tight staggered joints (brick bond) with all edges of the sheets fully supported
- Chamfer all external edges with a minimum radius of 5mm
- fixed with 10 gauge stainless steel countersunk head screws
- fixed at 150mm centres on edges and 200mm in the body of the sheets.
- sheets supported at 400mm centre rafters and nogs for roofs unless detailed otherwise

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Plywood and the timber substructure to have a maximum moisture content of 18% when the membrane is adhered. Consult with plywood manufacturer's correct testing technique.

3.9 CROSS-LAMINATED TIMBER (CLT)

Fixed as per the manufacturer's instructions . Laid to falls, rigid, with joints flush, edges arrised, no lumps or hollows, smooth, clean, dry and free of debris. Minimum finished (constructed) falls to be 1:30 for roofs, 1:40 for decks, and 1:100 for gutters.

3.10 RIGID AIR BARRIER (RAB)

Fibre cement or Gypsum where they are placed behind cladding only.

Application - laying on plywood, cross laminated timber and strandboard

3.11 PLYWOOD, CROSS LAMINATED TIMBER AND STRANDBOARD SUBSTRATE PREPARATION

Substrate to be clean and dry before application of the Nuraply TPO waterproofing membrane.

3.12 POSITION MEMBRANE

Position Nuraply TPO membrane over acceptable substrate and fold membrane back to expose half of the underside.

3.13 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).

3.14 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.

3.15 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.

3.16 HOT-AIR WELD

Hot-air weld the adjoining **Nuraply TPO** membrane sheets with an automatic hot-air welding machine or using hand welding techniques.

3.17 PENETRATIONS

Form and finish up-stands, down-turns, penetrations, sumps and vents to conform with Nuralite Waterproofing Limited required details.

3.18 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

3.19 NURAJACK & NURAPAD INSTALLATION

Refer to 4381NJ NURAJACK DECK SUPPORT SYSTEM for details.

Finishing

3.20 FOOT TRAFFIC

Keep foot traffic to a minimum after laying the **Nuraply TPO** membrane. Lay protection at all traffic concentration points.

3.21 ACCESS BOARDS

Provide access boards for later operations and remove when no longer needed.

3.22 ACCEPTANCE

Arrange for an inspection of the completed work. Protect and maintain roofing until completion of the contract works.

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3.23 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.

3.24 FLOOD TESTING

Where practical, flood test gutters and outlets with a maximum 50mm depth of water for 24 hours. Make good any lack of water tightness when the surface is completely dry. Ensure that an overflow is incorporated during the flood testing and that there are no load limitations that might prevent testing.

Completion

3.25 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.

Nuraply TPO Membrane

4.1 NURAPLY TPO MEMBRANE - FULL ADHESIVE FIX

Location:	balconies and internal gutters, refer to drawn documents
Substrate:	plywood
Supplier:	Nuralite Waterproofing Limited
Membrane:	Nuraply TPO
Thickness:	1.5mm
Colour:	grey
Finish:	smooth
Adhesive:	Nuraply TPO Membrane Bonding Adhesive

Materials - detail membrane

4.2 NURAPLY TPO DETAIL MEMBRANE

Location:	balconies and internal gutters, refer to drawn documents
Supplier:	Nuralite Waterproofing Limited
Description:	Nuraply TPO Detail membrane
Size:	1.5mm thick x 1524m long x 610mm wide
Colour:	grey

Accessories

4.3 NURAJACK & NURAPAD DECK SUPPORT SYSTEM

Refer to 4381NJ NURAJACK DECK SUPPORT SYSTEM for details.

4.4 NURAPLY TPO MATERIAL ACCESSORIES

Location:	as required
Supplier:	Nuralite Waterproofing Limited
Type:	refer to drawings for accessories

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4521NR ALTUS RESIDENTIAL ALUMINIUM WINDOWS & DOORS

1 GENERAL

This section relates to fabrication, supply and installation of Altus aluminium window and door systems and componentry for residential housing.

1.1 RELATED WORK

Refer to glazing section(s) for glass types

1.2 ABBREVIATIONS AND TERMS

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

The following abbreviations apply specifically to this section:

AAMA	American Architectural Manufacturer's Association
PQAS	Powder Coating Quality Assurance System
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
NZBC E2/AS1	External moisture
NZBC E2/VM1	External moisture
NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1-AS2	Energy efficiency
NZBC H1/VM1-VM2	Energy efficiency
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1664.1	Aluminium structures - Limit state design
AS/NZS 1664.2	Aluminium structures - Allowable stress design
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4211	Specification for performance of windows
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
AAMA 2603	Performance requirements and test procedures for pigmented organic coating on aluminium extrusions and panels
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
TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)
BRANZ BU 636	Protecting glass from damage
WGANZ	Window Installation Guide

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work.
Altus product literature
Altus Windows & Doors Specifier's Guide

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Manufacturer/supplier contact details:

Company:	Altus Limited
Web:	www.altus.co.nz
Email:	technical@altus.co.nz
Telephone:	0800 397 263

Warranties

1.5 WARRANTY

Provide warranty for:

25/15 years:	For Dulux® Duratec® Intensity® powder coat finish for 25 years for durability and 15 years for chalk and colour fade
15 years:	For Dulux® Duralloy® +PLUS powder coat finish for durability and chalk and colour fade
15 years:	For Dulux® Protexture® powder coat finish for durability and chalk and colour fade
15 years:	For Dulux® Sublicoat® powder coat finish for durability and chalk and colour fade

- 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 - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years:	For Altus aluminium windows, doors and hardware

- 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:

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.

Requirements

1.8 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for 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 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:
Care and Maintenance Guide - Anodised & Powder Coated Joinery
Care and Maintenance Guide - Aluminium Windows & Doors

Provide this information prior to practical completion.

Compliance information

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1.11 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- 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

1.12 POWDER COATING CERTIFICATION

Certify on request, powder coating compliance with this specification and support with control and sampling records. Test for film thickness to AS/NZS 1580.108.1.

Performance - windows and doors

1.13 PERFORMANCE - GENERAL

Deflection, operation, air permeability, lateral displacement, water penetration, ultimate and torsional strength performance and testing and labelling of windows and doors to comply with NZS 4211.

1.14 PERFORMANCE - THERMAL, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix E, Table E1.1.1 Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

1.15 PERFORMANCE - THERMAL

Thermal performance of windows & doors to NZBC H1/AS1-AS2 & NZBC H1/VM1-VM2. The construction R-value of windows & doors determined in accordance with Appendix E, E1 Vertical windows and doors:

- Determine the thermal transmittance of window & doors in accordance with ISO 10077-1.
- Determine the thermal transmittance of framing in accordance with ISO 10077-2.
- Determine the thermal transmittance of glazing using BS EN 673.

Refer to SELECTIONS for construction R-values.

1.16 DESIGN PARAMETERS - WIND

Design the installation to the manufacturer requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

Quality control and assurance

1.17 INSPECTIONS

refer to council requirements	as required

2 PRODUCTS

Materials - aluminium

2.1 ALUMINIUM EXTRUSIONS

Designation, chemical composition, mechanical testing and manufacturing tolerances to AS/NZS 1866 for aluminium and aluminium alloy used for extruded rod, bar, solid and hollow shapes.

2.2 ALUMINIUM SHEETS & PLATES

Designation, chemical composition, mechanical testing and manufacturing tolerances to AS/NZS 1734 for aluminium and aluminium alloy used for flat sheets, coiled sheets and plates.

2.3 ALUMINIUM STRUCTURES

Aluminium structures limited state design to AS/NZS 1664.1, allowable stress design to AS/NZS 1664.2.

Window/door systems

2.4 ALTUS ALUMINIUM WINDOW/DOOR SYSTEMS

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Prefabricated and pre-finished window/door units made of aluminium frames with glazing, louvres, hardware/furniture and reveals readily installed and configured as per detailed shop and design drawings. Altus window and door systems can accommodate almost any combination of window and door types, such as fixed, awning, casement, sliding and bifold. Refer to SELECTIONS.

Components - window/door system

2.5 WINDOW/DOOR FRAMES

Aluminium window/door frames are powder coated or anodised to colour/texture of choice and come in various profiles with thermally broken and seismic frame options available (system dependent). Refer to SELECTIONS.

2.6 MULLIONS

Aluminium flat faced, external fin, internal box or split mullions. Refer to SELECTIONS.

2.7 HARDWARE AND FURNITURE

Stainless steel or aluminium window/door hardware and furniture such as hinges, catches, fasteners, latches, locks, operating gear, safety stays etc. Refer to SELECTIONS.

Components - reveal

2.8 TIMBER REVEALS

Pre-primed H3.1 Radiata Pine timber reveals, grooved for wall linings or flush finished for architraves, available in 19mm, 25mm and 30mm thickness. Refer to SELECTIONS.

2.9 ALUMINIUM REVEALS

Aluminium reveals fitted to frame via thermal break, anodised or powder coated to match joinery.

2.10 PVC REVEALS

19mm thick thermoplastic polyvinyl chloride (PVC) reveals grooved for wall linings.

Components - sill

2.11 SILL FLASHING SUPPORT BAR

Minimum 3mm thick extruded aluminium angle support bar. Size suited to project specific cladding and to detailed drawings.

2.12 JAMB BATTENS

20mm deep H3.1 radiata pine jamb batten, size to suit window/door jamb height and depth.

Components - flashing

2.13 FLASHINGS

Extruded aluminium window, head and sill flashing to NZBC E2/AS1, Flashings and suited to project specific application. Head flashing comes powder coated to match window/door joinery colour. Moulded polypropylene head and sill flashing end cap supplied for cavity installation.

Components - sealant

2.14 STRUCTURAL SEALANT

Single component silicone rubber base joint sealing compound formulated and tested or approved equivalent with not less than a ± 40% movement factor to US Federal Specification TT-S-001543A.

2.15 WEATHERING/INSTALLATION SEALANT

Single component, cold applied silicone rubber base joint sealing compound to US Federal Specification TT-S-001543A, or single component elastomeric type joint sealing compound of medium modulus (± 25% movement) to US Federal Specification TT-S-00230C.

2.16 BACKING PEF ROD

Compressible, cylindrical closed cell polyethylene foam rod. Size to suit application.

2.17 SELF-EXPANDING FOAM

Self-expanding aerosol polyurethane gun foam.

2.18 FOAM TAPE

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Closed cell PVC foam tape. Hardness, grade, compression, UV weathering to NZBC E2/AS1, Closed Cell Foam Tape.

Components - fixings

2.19 FIXINGS - WINDOW/DOOR FRAME

Minimum fixing size and type to NZBC E2/AS1, Windows and Doors.

To timber:	75 x 3.15mm galvanized jolt head nails, or 8g x 65mm stainless steel screws
To steel:	8g x 65mm stainless steel screws
To concrete:	8g x 65mm stainless steel screws driven into nylon plugs or similar

2.20 FIXINGS - SILL SUPPORT

Minimum fixing size and type:

To timber/steel:	10g x 50mm stainless steel screws
To concrete:	10g x 50mm stainless steel screws driven into nylon plugs or similar

2.21 FIXINGS - SILL TRAY FLASHING

Minimum fixing size and type:

To timber/steel:	8g x 50mm stainless steel screws
To concrete:	8g x 50mm stainless steel screws driven into nylon plugs or similar

2.22 BRACKETS

Designed by window/door manufacturer to specific design.

Accessories

2.23 PASSIVE VENTILATION

Window/door recessed inframe ventilation system consisting of aluminium strips with holes and insect proof mesh, incorporating opening and closing mechanism. Available powder coated in a range of colours. Refer to SELECTIONS.

2.24 FRAME PLATFORM COVER

Profiled aluminium strip window frame platform cover for flush frame finish.

Finishes - powder coating

2.25 COLOURSCAPE POWDER COAT FINISH

Thermosetting polyester powder in accordance with AS 3715, WGANZ and PQAS, formulated to meet AAMA 2603. Available in a range of colours with the option of a matt, gloss or satin finish. Refer to SELECTIONS.

3 EXECUTION

Conditions - general

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

- Confirm all window/door keys are accounted for and delivered separately to the site manager
- Store windows and doors on site in a clean and dry environment in such a manner as to prevent damage to pre-finished surfaces
- Stack the units in a vertical position resting on their sills, with layers interleaved between to prevent rubbing

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 PROTECTIVE COVERING - WINDOWS/DOORS

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Prevent marking of surfaces visible on completion and protect aluminium joinery from following trades with protective covering/coating, keep in place during fixing process, remove on completion. Refer to BRANZ BU 636.

Conditions - fabrication

3.4 FABRICATION - GENERAL

Confirm site measurements of openings prior to window/door fabrication. Fabricate and finish window/door units and components, and install glazing, louvres, hardware and furniture, operating gear, safety stays and reveals to detailed shop and design drawings, the specification and as scheduled. Punch drainage and fixing holes to sill supports complying with EM6, NZBC E2/VM1 tests and NZBC B2/AS1.

3.5 SAFETY STAYS - WINDOWS

Factory fit non-releasable safety stays to limit window openings as per NZBC F4/AS1, Opening Windows.

3.6 SAFETY STAYS - DOORS

Factory fit self-closing or self-latching device to doors where required by and to NZBC F9/AS1.

3.7 PROPRIETARY FRAME BLOCKS

Factory fit proprietary frame blocks as required for direct fixed wall cladding to block up windows/door off sill tray flashings.

3.8 FLASHINGS

Window, head and sill flashing material, profile and dimensions to NZBC E2/AS1, Flashings and suited to project specific cladding, framing and floor, and compatible with window frame materials and fixings.

Conditions - on site

3.9 PRE-INSTALLATION REQUIREMENTS

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

- Openings are prepared for window/door installation and have wall underlay dressed into opening, corner soakers installed and flashing tape applied
- Waterproof sealant is applied to concrete/masonry window and door sills, and for door sills a membrane is installed over sealant
- Window/door units have glazing, hardware and furniture, operating gear, safety stays/restrictors and reveals installed to and are finished as per detailed shop and design drawings and the specification

Installation/application - general

3.10 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.11 INSTALLATION/APPLICATION REQUIREMENTS

Ensure that all installers/applicators are familiar with the required substrate conditions and the manufacturer's or supplier's specified preparation, fixing and finishing techniques. Install/apply products in accordance with manufacturer's or supplier's technical literature, detailed shop and design drawings and to NZBC E2/AS1 and WGANZ Window Installation Guide.

3.12 CORROSION PROTECTION

Install/apply barriers of bituminous coatings, stops or underlays between dissimilar metals in contact and where aluminium is in contact with concrete/masonry.

3.13 SEALING REQUIREMENTS

To sealant manufacturer's requirements and instructions:

- Ensure joints are dry and remove loose material, dust and grease
- Prepare joints as required with solvents and primers recommended
- Mask off adjoining surfaces
- Apply back-up materials to depth no less than the minimum required
- Tool off sealant to form a smooth fillet with required profile and dimensions
- Remove excess sealant using cleaning materials recommended

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Preparation for fixing to concrete/masonry

3.14 INSTALL NYLON PLUGS

Drill fixing holes in concrete/masonry to suit nylon plug size and location of sill support and reveal fixings. Fill fixing holes with silicone sealant and install plugs into hole until flush with concrete surface.

Installation - sill flashings (direct fix cladding)

3.15 INSTALL SILL FLASHING SUPPORT BAR

Install support bar on exterior wall face centred to opening sill and with its upper edge lining up with the top edge of the sill trimmer or floor surface. Confirm the bar is level and in true alignment, fix to framing/concrete/masonry.

3.16 INSTALL SILL FLASHING

Install full width sill tray flashing centred to opening sill onto sill trimmer / floor surface as per design drawings, fitted 5mm short of studs. Confirm flashing is level and in true alignment and does not slope toward the interior. Fix through rear leg to floor.

3.17 INSTALL JAMB BATTENS

Prior to placing jamb battens apply a thin bed of sealant to opening jambs. Install full height jamb battens over wall underlay to window/door jambs as per NZBC E2/AS1, fig 72A with jamb battens cut around sill tray flashing. Fix with 60 x 2.8mm galvanized flat head nails at maximum 300mm intervals.

Installation - window/door units

3.18 PLACE WINDOW/DOOR UNIT

Prior to placing window/door unit in opening, drill two rows of pilot holes along window/door reveal, place holes 150mm from reveal ends and at maximum 450mm intervals as per NZBC E2/AS1, or to window/door manufacturer's specific requirements. Place window/door unit in opening complying with NZBC E2/AS1 and suited to project specific cladding, detailed shop and design drawings. Confirm correct exterior cladding cover, interior lining finish and placement of unit on sill support.

3.19 FIX WINDOW/DOOR UNIT

Insert flat packers between opening frame and reveal around fixing points. Confirm window/door unit is level and of true alignment and fix through reveal (not packers) to opening framing and floor. Remove packers from head.
For bifold windows/doors additionally fix at head with supplied brackets as per window/door manufacturer's instructions.

3.20 COMPLETE AIR SEAL

To comply with NZBC E2/AS1, Air Seals. Insert continuous backing PEF rod between opening frame and reveal at 10-20mm depth, apply self-expanding foam to manufacturer's instructions over PEF rod to fully fill gap. For windows/doors fixed directly to floor (no reveal) or seated in floor rebated apply sealant as per window/door manufacturer recommendations and detailed drawings.

3.21 INSTALL HEAD FLASHING

Cut head flashing to required length and install, fix and seal to wall framing above window/door head as per detailed design drawings, NZBC E2/AS1 and suited to project specific cladding and wind zones.

Post-cladding weather sealing of windows/doors

3.22 WEATHER SEALING

Seal exterior window/door frame and flashings to cladding weathertight complying with NZBC E2/AS1 and suited to project specific cladding and detailed design drawings. Install/apply sealing products in accordance with manufacturer's or supplier's technical literature.

Completion

3.23 COMPLETION MATTERS

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

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3.24 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.
~

3.25 TRADE CLEAN

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

4 SELECTIONS

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

Performance

4.1 THERMAL PERFORMANCE - VERTICAL WINDOWS & DOORS

Window /Door Number:	Construction R-value:
All Windows	R-0.46
All Doors	R-0.46

Fabrication/supply/installation

4.2 NOMINATED MANUFACTURER

Manufacturer(s) to be tendered for. Ensure Bradnams and Nebulite are included in tender.

4.3 SUPPLY AND INSTALLATION

Supply and installation of window/door systems and componentry by one of the following options:

Supply:	By manufacturer
Installation:	By main contractor

Window/door units - powder coated

4.4 ALTUS SOUTHERN41 THERMAL SYSTEM

Location:	all exterior windows and doors
Brand:	Altus Southern41
Type:	Thermal system
Frame:	Flat face
Mullion:	flat faced mullion
Finish:	ColourScape® Powder Coating
Powder coat:	to be advised by manufacturer considering harsh climate
Colour:	TBD
DFT:	Average of 80 microns with a minimum of 50 microns
Reveal:	timber reveal, thickness to be advised due to installation style

Components - window/door unit

4.5 FIXED SASH

Refer to window and door schedule

4.6 AWNING SASH

Refer to window and door schedule

4.7 HINGED DOOR PANEL

Refer to window and door schedule

Components - hardware/furniture

4.8 HARDWARE AND FURNITURE

Refer to window and door schedule - Hardware and furniture to be confirmed by client

Accessories

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4.9 PASSIVE VENTILATION

Brand/type:	Altus Aluvent® passive inframe ventilation
Location:	to be advised and confirmed by client
Finish:	ColourScape® Powder Coating
Powder coat:	to be advised by manufacturer considering harsh climate
Colour:	TBD
DFT:	Average of 80 microns with a minimum of 50 microns

4.10 FRAME PLATFORM COVER

Brand/type:	Altus Kleenline® window frame platform cover
Location:	to be advised and confirmed by client

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4711 THERMAL INSULATION

1 GENERAL

This section relates to materials installed, laid, hung or fitted as thermal insulation to the building fabric.

1.1 RELATED WORK

Refer to 4721 ACOUSTIC INSULATION for acoustic insulation.
Refer to 4161 UNDERLAYS, FOIL AND DPC for wall underlays, roofing underlays, foils and films.
Refer to roofing sections for roofing underlays.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BIB	Building Insulation Blanket (term used by some manufacturers)
EPS	Expanded polystyrene sheets

Documents

1.3 DOCUMENTS

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

NZBC H1/AS1-AS2	Energy efficiency
NZBC H1/VM1-VM2	Energy efficiency
AS/NZS 3000	Electrical installations (Known as the Australian/New Zealand Wiring Rules)
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
Health and Safety at Work Act 2015	

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Warranties

1.5 MANUFACTURER/SUPPLIER ENVIRONMENTAL DOCUMENTS

Environmental documents relating to products and/or systems included in this work section are listed below:

Expol

1.6 WARRANTY - MANUFACTURER/SUPPLIER

refer to manufacturer for warranty information

- 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.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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2 PRODUCTS

Materials

2.1 CELLULAR POLYSTYRENE INSULATION

Proprietary expanded polystyrene (EPS) foam board.

Components

2.2 NAILS

Galvanized steel clouts, 25mm gauge.

2.3 STAPLES

Stainless steel gauge and length to suit application and to manufacturer's requirements.

2.4 WIRE NETTING

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting used to support the insulation.

2.5 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 9.1.8.5 **Wall framing behind cavities**.

2.6 ADHESIVE TAPE

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

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 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

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.

3.5 INSPECTION

Before starting installation of blankets and pads, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, netting, underlays and vapour barriers are in place.

Application

3.6 INSTALL INSULATION - GENERAL

Lay, install, fit and fix insulation without gaps, tucks, folds and over compaction to NZBC H1/AS1 or AS2 and insulation manufacturer's requirements. For all housing and buildings up to 300m², install in accordance to NZS 4246 sections 5 Walls, 6 Ceilings & Roofs, 7 Underfloor - Suspended Framed Floors and 10 Concrete Slab-on-Ground Insulation, for residential light timber or steel framed buildings. 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.

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3.7 INSULATION CLEARANCES GENERALLY

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

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

LIGHT FITTINGS

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

INBUILT RECESSED HOT APPLIANCES

Appliance	Minimum insulation clearance	Comments
Electrical heaters	100mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Gas appliance exposed flame	200mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Excludes uncommon appliances, refer NZS 4246.
Gas appliance flues	75mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation. Excludes uncommon appliances refer NZS 4246.
Oil-fired appliances and flues	230mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.

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Open fireplace opening	200mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Brick masonry chimneys	50mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Metal chimneys & flues	75mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Solid fuel appliance	600mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Solid fuel appliance flue	600mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.

EXTRACTS, VENTS, PIPES & ROOF UNDERLAY

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

3.8 LAY WIRE NETTING - OVER PURLINS

Lay at right angles across the purlins with enough slack to allow insulation to retain its nominal thickness between. Tie edges of netting together with galvanized wire clips.

3.9 LAY WIRE NETTING - UNDER JOISTS / PURLINS

Lay at right angles across the rafters/roof joists (under purlins). Pull tight and fix.

3.10 LAY PLASTIC STRAPPING TAPE

Lay at right angles across the framing at a minimum of 300mm centres, staple tape to each framing member with stainless steel staples.

3.11 ADHESIVE TAPES

Fully seal all laps and all penetrations with adhesive tape.

3.12 FIT CELLULAR PLASTIC RIGID BOARD (EPS)

Friction fit EPS board after roof and wall claddings have been installed. Cut oversize lengthways for a tight compression fit between framing. Leave no gaps between, and maintain full thickness of the insulating segments over the whole of the installation. Fit EPS between floor joists and timber framing using proprietary fixings. Ensure separation from electric cabling. In windy locations secure floor insulation with proprietary support brackets. For ceilings check with manufacturer for clearances to recessed light fittings and flues.

3.13 FIT EPS INSULATION - UNDER CONCRETE FLOORS

Lay EPS on damp proof membrane before pouring the concrete floor slab.

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Completion

3.14 COMPLETION MATTERS

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

3.15 CHECK WALL AND ROOF UNDERLAYS

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

4 SELECTIONS

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

4.1 EXPANDED POLYSTYRENE INSULATION

Location:	against concrete wall panels
Brand/type:	Expol Platinum
R Value:	R-2.81
Thickness:	90mm

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4711P PINK® BATTS® THERMAL INSULATION

1 GENERAL

This section relates to Comfortech Building Performance Solutions™ Pink® Batts® thermal insulation materials for walls, floors, ceilings and roofs.

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting, wall underlays and roofing underlays
Refer to 4721P Pink® Batts® Acoustic Insulation for acoustic insulation.

1.2 ABBREVIATIONS AND DEFINITIONS

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

Documents

1.3 DOCUMENTS

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

NZBC H1/AS1-AS2	Energy efficiency
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS/NZS 3000	Electrical installations (Known as the Australian/New Zealand Wiring Rules)
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:
Comfortech H1. Done - Insulation Guide
Comfortech Pink® Batts® Insulation - Safety Data Sheet.
Comfortech Pink® Batts® Thermal Solutions - Product Guide
Comfortech Pink® Superbatts® Thermal Solutions - Installation Guide
Comfortech Pink® Batts® - Product Data Sheets
Comfortech Pink® Batts® - Installation Instructions
BRANZ Appraisal 238 (2023) - Pink® Batts® Insulation - Amended 04 November 2024
BRANZ Appraisal 632 (2023) - Pink® Batts® SnugFloor® Insulation - Amended 12 August 2024
BRANZ Appraisal 767 (2023) - Pink® Batts® Skillion Roof Insulation - Amended 04 November 2024

Manufacturer/supplier contact details

Company:	Tasman Insulation NZ Ltd
Trading as:	Comfortech Building Performance Solutions™
Web:	www.pinkbatts.co.nz
Telephone:	0800 746 522

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years	For Pink® Batts® thermal insulation products

- Provide this warranty on the manufacturer/ supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

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Provide an installer/applicator warranty:

refer to installer	For Pink® Batts® insulation products

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

Compliance information

1.9 BRANZ APPRAISAL

Pink® Batts® Insulation meets the requirements of the NZBC when used in accordance with the conditions and limitations listed in the following Branz Appraisal:
BRANZ Appraisal 238 - Pink® Batts® Insulation
BRANZ Appraisal 632 - Pink® Batts® SnugFloor® Insulation
BRANZ Appraisal 767 - Pink® Batts® Skillion Roof Insulation

Performance - Fire

1.10 FIRE PROPERTIES

Pink® Batts® insulation products, with the exception of Pink® Batts® R2.6 Wall Insulation and Pink® Batts® R2.8 Wall Insulation products, are classified as non-combustible when tested to NZS/AS 1530.1 and achieve a Group Number of 1-S.

1.11 FIRE HAZARD TESTING

Pink® Batts® insulation products withstand the 30s Needle Flame test in accordance with AS/NZS 60695.11.5, that is required for insulation abutting or covering recessed downlights intended to be in contact with IC, CA 80, CA 135 luminaires.

2 PRODUCTS

Materials

2.1 PINK® BATTS® SKILLION ROOF INSULATION

Pink® Batts® Skillion Roof Insulation (Pink® Batts® Skillion Roof and Pink® Superbatts®) rectangular bio-soluble fibrous glass wool slabs manufactured from up to 80% recycled window glass and bonded with thermosetting resin. Coloured Pink for identification. Available in different R-values, sizes and thicknesses. Refer to SELECTIONS.

Components

2.2 FASTENERS

Insulation anchors complete with retaining washer.

2.3 WIRE NETTING

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting used to support the insulation.

2.4 PLASTIC STRAPPING TAPES

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

2.5 ADHESIVE TAPE

Pressure sensitive adhesive tape.

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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. Check that framing is free from moisture. Check cavities are not interconnected. Check required wire netting, roof/ underlays are in place and are dry, clean and homogeneous before installing insulation. Ensure main power is isolated and tagged prior to installation.

3.4 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Refer to Pink® Batts® Insulation - Safety Data Sheet.

Installation

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 INSULATION CLEARANCES

Install Pink® Batts® insulation with clearances to mechanical and electrical services and equipment, including ducts, chimneys and other heat sensitive materials in accordance with tables below based on NZS 4246, or to equipment manufacturers requirements if they require larger clearances. Installed clearances not to be more than 50mm larger than the required clearance. Smaller clearances that are required by manufacturer can be used for equipment specifically manufactured with heat shielding or similar (excludes light fittings).
The following installation clearances tables are subject to:

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

(1) CLEARANCES TO LIGHT FITTINGS :

Type of fitting	Minimum insulation clearance	Comments
Recessed, marked NON-IC, or unmarked	100mm (increase if over 100W)	NON-IC fittings and new or old unmarked & unknown fittings, and/or insulation. Secure insulation.
Recessed, CA 80, CA 90 or CA 135	Abut fittings	Do NOT cover the fittings
Recessed, IC, IC-F or IC-4	Abut & cover fittings	Ensure insulation complies
Recessed, marked Do-Not-Cover	Manufacturer clearances	Do not cover the fittings

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Independent control gear	Place on top of insulation & 50mm from fitting	If not on top allow 50mm clearance to insulation, do not cover. Includes, transformers, ballasts & drivers etc.
Surface fittings not exposed to insulation	Nil	Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.
Surface fittings & exposed insulation	200mm	This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Secure insulation.

(2) CLEARANCES TO RECESSED HOT APPLIANCES:

Appliance	**Minimum insulation clearance**	**Comments**
Electrical heaters	100mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Gas appliance exposed flame	200mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Excludes uncommon appliances, refer NZS 4246.
Gas appliance flues	75mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation. Excludes uncommon appliances refer NZS 4246.
Oil-fired appliances and flues	230mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Open fireplace opening	200mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Brick masonry chimneys	50mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Metal chimneys & flues	75mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Solid fuel appliance	600mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Solid fuel appliance flue	600mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.

(3) CLEARANCES TO EXTRACTS, VENTS, PIPES & ROOF UNDERLAY:

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

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3.7 RECESSED LIGHT FITTINGS - NON-RESIDENTIAL

Non-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, NON-IC or Do-not Cover

Refer to clause INSULATION CLEARANCES GENERALLY for clearances.

3.8 LAY WIRE NETTING - UNDER JOISTS / PURLINS

Lay at right angles across the rafters/ roof joists (under purlins). Pull tight and fix. Continue with installing Pink® Batt® insulation under purlins.

3.9 LAY WIRE NETTING - OVER PURLINS

Lay at right angles across the purlins with enough slack to allow insulation to retain its nominal thickness between. Tie edges of netting together with galvanized wire clips. Continue with installing Pink® Batt® insulation over purlins.

3.10 LAY PLASTIC STRAPPING TAPE

Lay at right angles across the framing at a minimum of 300mm centres, staple tape to each framing member with stainless steel staples.

3.11 PREPARATION

Before installation, gently agitate the insulation by gentle shaking or bouncing to assist recovery to the nominal thickness stated on the product label. Ensure the product is installed dry.

3.12 INSTALL INSULATION - GENERALLY

Install Pink® Batts® insulation in a dry protected environment. Lay, fit and fix insulation without gaps, tucks, folds and over compaction to NZBC H1/AS1-AS2 and Pink® Batts® installation requirements. For all housing and buildings up to 300m², install in accordance to NZS 4246 sections 5 Walls, 6 Ceilings & Roofs, 7 Underfloor - Suspended Framed Floors and 10 Concrete Slab-on-Ground Insulation, for residential light timber or steel framed buildings. Insulate around vents (not over them) to allow unhindered ventilation. Confirm with fireplace manufacturer for clearances; Pink® Batts® insulation is non-combustible and need not be separated except if used in conjunction with, or attached to other heat sensitive materials. Lift up electrical wires, lighting transformers/ controllers and lay the insulation underneath.

3.13 INSTALL PINK® BATTS® SKILLION ROOF INSULATION

Friction fit Pink® Batts® Skillion Roof Insulation slabs between framing. Ensure that the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Insulate around vents (not over them) to allow unhindered ventilation. Fit insulation slabs beneath electrical wiring and plumbing. Install to the outer edge of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

Completion

3.14 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 PINK® BATTS® SKILLION ROOF INSULATION

Location:	Internal Gutters
Brand/ Type:	Pink Batts Skillion Roof
R-value:	R-5.0
Nominal stabilised thickness:	180mm

4.2 PINK® BATTS® INSULATION

Location:	Balconies
Brand/ Type:	Pink Batts Skillion Roof and Pink Batts Ultra Ceiling

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R-value:	R-3.2 & R-4.0
Nominal stabilised thickness:	115mm & 195mm

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4811S SIKA SEALANTS

1 GENERAL

This section relates to the selection of Sika sealants/adhesives and appropriate application methods for sealants nominated in other work sections.

It includes:

- Sika sealants
- Sika fire rated sealants
- Sika adhesives
- All required associated primers, cleaners and accessories necessary for installation.

1.1 ABBREVIATIONS

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

VOC	Volatile Organic Compound

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
AS 1530.4:2005	Methods for fire tests on building materials, components & structures. Part 4: Fire resistance test of elements of construction
ASTM C719	Standard test method for adhesion and cohesion of elastomeric joint sealants under cyclic movement
EN 1366.4	Fire resistance tests for service installations. Linear joint seals.
ISO11600	Building construction - Jointing products - Classification and requirements for sealants

1.3 MANUFACTURER'S DOCUMENTS

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

Relevant Sika Product	Technical Data Sheets
Relevant Sika Product	Safety Data Sheets
CETEC Test Certificates	For VOC content of selected Sika sealants
CSIRO Test certificates	For fire rating of various Sika sealants
EXOVA Test certificates	For fire rating of various Sika sealants
BRANZ Appraisal 311 [2024]	Sikaflex® MS (Building Sealant)
BRANZ Appraisal 613 [2024]	Sikaflex® AT - Facade Sealant

Manufacturer/supplier contact details:

Company:	Sika (NZ) Ltd
Web:	nzl.sika.com
Email:	info@nz.sika.com
Telephone:	0800 SIKA NZ, 0800 745 269

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years:	For Sika sealants and adhesives

- Provide this warranty on the Sika standard form. (For materials only. Warranty excludes application)

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- Commence the warranty from the date of practical completion of the contract works.
- **Sika** (NZ) Ltd will warrant that Sika sealant products will perform in accordance with the information stated in **Sika** (NZ) Ltd current Technical Data Sheets.
- Refer to **Sika** (NZ) Ltd for further information on warranty.

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 the 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.

Sealant work, including preparation, to be carried out by competent and experienced sealant applicators.

1.7 SEALANT SELECTION

Refer to the **Sika** (NZ) Ltd current Technical Data Sheet before commencing sealant installation. Ensure that the correct sealant has been selected for the intended application and substrates. Check that the joint design allows for movement and or substrate thermal expansion and contraction, and is within the sealants range of service.

1.8 NO SUBSTITUTIONS

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

1.9 MAINTENANCE CONTRACT PROPOSAL

Provide a priced proposed maintenance contract for annual inspection, cleaning and repairing of sealant joints.

2 PRODUCTS

Joint Substrate Primers & Accessories

2.1 NON-POROUS SUBSTRATE CLEANER - TO IMPROVE SEALANT ADHESION

Sika Aktivator-205, a transparent, alcohol based, one component cleaner with adhesion promoters for cleaning and activating non-porous substrates prior to the application of Sika sealants. For use with Sika products only.

2.2 POROUS SUBSTRATE PRIMER - TO IMPROVE SEALANT ADHESION

Sika Primer-3N, transparent solvent based, one component, reactive epoxy resin primer for use on a wide range of porous substrates. For use with Sika products only.

2.3 BACKING ROD - TO CONTROL DEPTH OF JOINT SEALANT

Sika PEF Backing Rod is a closed cell polyethene foam backing rod used to fill the base of a joint to control depth of applied sealant. Available in a range of diameters.

2.4 BOND BREAKER TAPE

A pressure sensitive self-adhesive polyethylene or PVC bond breaker tape. Masking tape is not permitted.

Facade sealants for concrete / masonry brickwork - non-fire rated

2.5 FACADE SEALANT - HIGHEST MOVEMENT, POLYURETHANE, PAINTABLE

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SikaHyflex®-250 Facade, is a durable, low VOC, one component, solvent free, moisture curing elastic polyurethane sealant with a joint movement capacity of +100/-50% and elongation at break of 800%. Conforms to: ISO 11600 Type F, Class 25LM.
Can be over-painted with a range of paints and coatings.

Facade sealants for concrete / masonry brickwork - fire rated

2.6 FACADE SEALANT - PU, FOR FIRE RATED JOINTS, UP TO 4 HOURS

Sikaflex®-400 Fire is a one component, fire rated, polyurethane, moisture curing, paintable, elastic joint sealant with a movement capacity of +/-35%. For internal and external applications. Up to 4 hour fire resistance (depending on tested joint configuration) in accordance with AS 1530.4 and EN1366.4.

Facade sealants for aluminium composite panel systems and metal profiled sheet

2.7 FACADE SEALANT - HIGHEST MOVEMENT, POLYURETHANE, PAINTABLE

SikaHyflex®-250 Facade is a durable, low VOC, one component, solvent free, moisture curing elastic polyurethane sealant with a joint movement capacity of +100/-50% and elongation at break of 800%. Conforms to ISO 11600, Type F, class 25LM.
Can be over-painted with a range of paints and coatings.

Facade sealants for timber / fibre cement sheets and boards

2.8 FACADE SEALANT - HIGHEST MOVEMENT, POLYURETHANE, PAINTABLE

SikaHyflex®-250 Facade is a durable, low VOC, one component, solvent free, moisture curing elastic polyurethane sealant with a joint movement capacity of +100/-50% and elongation at break of 800%. Conforms to ISO 11600, Type F, class 25LM.
Can be over-painted with a range of paints and coatings.

Window and door sealants - aluminium / timber / PVC

2.9 WINDOW & DOOR SEALANT - HIGHEST MOVEMENT, POLYURETHANE, PAINTABLE

SikaHyflex®-250 Facade is a durable, low VOC, one component, solvent free, moisture curing elastic polyurethane sealant with a joint movement capacity of +100/-50% and elongation at break of 800%. Conforms to ISO 11600, Type F, class 25LM.
Can be over-painted with a range of paints and coatings.

Concrete Floor Sealant - control joints / seismic and wide joints

2.10 CONCRETE FLOOR - CONTROL JOINTS / CRACK REPAIR

Sikaflex® PRO-3 Purform, is a one component, low VOC, moisture curing polyurethane floor joint sealant with a joint movement capacity of +/-50% to ASTM C719. Good chemical and mechanical resistance. Conforms to ISO 11600 Type F, Class 25HM.
Can be over-painted with a range of paints and coatings.

Roofing sealants

2.11 ROOFING SEALANT - METAL ROOFING PROFILES & FLASHINGS

Sikasil® Roofing and Plumbing, a one component neutral curing silicone sealant with movement joint capacity of +/-25%. Non-corrosive to metals and has excellent adhesion to many substrates including copper and zinc. Conforms to ISO 11600 Type F, class 25LM.

Gypsum plasterboard - fire rated joints

2.12 FIRE-RATED SEALANT - PU, FOR FIRE RATED JOINTS UP TO 4 HOURS

Sikaflex®-400 Fire is a one component, fire rated, polyurethane, moisture curing, paintable, elastic joint sealant with a movement capacity of +/-35%. For internal and external applications. Up to 4 hour fire resistance (depending on tested joint configuration) in accordance to AS 1530.4 and EN 1366.4.

Interior sealants / adhesives

2.13 BATHROOM SEALANT - ACRYLIC BATHWARE

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Sikasil ® NG, a one component, neutral curing silicone sealant formulated for use with acrylic, ASB and polycarbonate bathware.

2.14 INTERIOR GENERAL SEALANT - WALL PANELS, MOULDINGS ETC

Sikasil ® Wet Areas is a one component, neutral curing wet area silicone sealant with joint movement capacity of +/-25%. Good durability and adhesion to a wide range of substrates including standard wet area substrates. Conforms to ISO 11600 Type F & G, class 25LM.

2.15 INTERIOR SOLVENT BASED ADHESIVE - BONDING WALL PANELS

Sika® Nailbond® SB is a one component, solvent based, general purpose, rubber adhesive for bonding internal lining panels including wet area internal lining panels such as seratone or hardiglaze to substrates. Can use on LOSP or CCA treated timber.

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 CONDITIONS FOR APPLICATION

Ensure conditions for application are clean, dry and dust free as possible. Avoid dust, dirt, water and other contamination settling on the cleaned and prepared joint substrate.

Ensure adequate ventilation is maintained during the preparation and application of sealant work and all relevant health and safety equipment is utilised.

Ensure application of Sika products occurs when the ambient and substrate temperature is in accordance with the appropriate Product Data Sheet.

3.5 JOINT DESIGN

Ensure that joints to be filled are in accordance with the current best practice such as BRANZ Bulletin 584 and in accordance to joint requirements stated in the relevant Product Data Sheet.

Unless stated otherwise in relevant Product Data Sheet, a typical joint should be configured on a 2:1 width to depth ratio. Minimum joint width should be not less than 10mm and should not exceed 50mm.

A Sika PEF backing rod should be applied to the base of all open backed joints and a generic bond breaker tape should be adhered to the base of all shallow joints to prevent 3-sided adhesion.

3.6 COMPATIBILITY

Ensure compatibility by using only Sika branded sealants with Sika branded products including cleaners, primers, sealants, adhesives, filler and backing rods. Products should not be substituted without the prior approval of the specifier.

3.7 SUBSTRATE STAINING

Note that some sealants can cause staining on porous substrates such as concrete, masonry and natural stone. If in doubt, compatibility testing should be undertaken to confirm suitability prior to application.

3.8 SEALANT PAINTABILITY

Ensure that a paintable sealant is selected when the sealant joint requires painting. The overpainting of sealant will reduce its flexibility at the coating interface. If in doubt about the sealant / over-coating compatibility, testing should be undertaken to confirm suitability prior to application.

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NOTE: This excludes silicon based sealants which are not paintable.

3.9 COLOURS

Refer to SELECTIONS for colour option/s. Where colour is not specified, choose sealant colours from the **Sika** standard/special colour ranges.

3.10 LIMITATIONS

All relevant and current Sika Technical Data Sheets must be consulted prior to application, to ensure that the specified product is suitable based on the actual site / joint conditions observed. All current technical literature is available on nzl.sika.com or by phoning 0800 SIKANZ.

Installation/application

3.11 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Preparatory work

3.12 PRE-COMMENCEMENT CHECK

Ensure that joints to receive Sika sealants are suitable for the proposed application and are within the specified width to depth ratios in accordance with the relevant and current Product Data Sheet.

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.

3.13 TEST SUBSTRATES

If in doubt about the suitability of substrate, test the affected substrate for indications of poor adhesion, staining and contamination.

If poor adhesion is evident from initial tests, consult **Sika** about the application of a suitable cleaning and preparation process and the application of a primer. Only use combinations of sealants and substrates for which favourable adhesion and compatibility have been confirmed.

3.14 SUBSTRATE CLEANING & PREPARATION

Prepare and clean joint substrates in accordance with the relevant and current Product Data Sheet. Protect adjacent surfaces from abrasion or other damage.

Typically concrete surfaces should be ground to remove concrete laitance and other surface contaminates. Non-porous surfaces such as metal to be cleaned with a Sika approved cleaner / activator to remove any contaminating films or barriers.

Apply a suitable masking tape to the adjacent surfaces along the length of joints to prevent contamination during application. 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.

Application - sealants / adhesives

3.15 INSTALLATION BACKING ROD

Insert a Sika PEF backing rod to the specified depth within the cleaned and prepared joint to provide a solid base for the sealant application.

The diameter of the Sika PEF backing rod should be 25% larger than the gap width and compressed evenly into the joint using a blunt instrument to avoid puncturing or damaging the rod. Do not twist the rod during application. Punctured rod may lead to 'out-gassing' which can cause the bubbling during sealant curing.

The rod should be consistently and evenly installed without any gaps. The midpoint of the installed rod should be sitting at the specified depth for each joint.

3.16 INSTALLATION BOND BREAKER TAPE

Adhere a suitable bond breaker tape to the base of the cleaned and prepared joint. The width of the tape needs to be slightly narrower than the width of the joint and must be adhered in a manner that avoids adhesion to either side of the joint.

3.17 PRIMING - POROUS SUBSTRATES

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Confirm the porous primer selection with the selected sealant current Product Data Sheet. Generally, porous substrates such as concrete, masonry or unpainted timber, apply by brush a uniform, thin film of Sika Primer 3N to the substrate. The primer seals, densifies and increases the surface area of substrate to promote adhesion of the selected sealant.

Allow primer to dry for the recommended time, at least 30 minutes before the application of sealant and should be left no more than 8 hours. Do not prime more than can be sealed in one day. Primed joints that have been left for more than specified time (or overnight) or have become contaminated will need to be cleaned and re-primed prior to sealant application.

Do not contaminate the bond breaker tape or backing rod with primer.

3.18 PRIMING - NON-POROUS SUBSTRATES

Confirm the non-porous primer selection with the selected sealant current Product Data Sheet. Generally, non-porous substrates such as aluminium (coated / anodised), stainless steel, galvanised steel, powdercoated metals, zinc, glazed tiles and paint/epoxy coatings, should be cleaned and treated using Sika Aktivator-205.

Wipe on Sika Aktivator-205 with a clean cloth and allow to dry for minimum 15 minutes and a maximum of 6 hours prior to sealant application. Primed joints that have been left for more than 6 hours (or overnight) or have become contaminated will need to be cleaned and re-treated.

Do not allow primer to contaminate other surfaces as a slight discolouration on some finishes may occur.

For substrates not mentioned above, refer to the relevant and current Sika Sealant Product Data sheet for priming requirements.

3.19 SEALANT APPLICATION

Sika sealants are supplied ready to use, insert the cartridge / uni-pack into a sealant pressure gun. After the necessary substrate / joint preparation and priming, extrude uniformly the selected sealant into the joint cavity.

Apply sealant to ensure full contact with the substrate on each side of the joint with no voids or pockets of entrapped air. There should be a minimum amount of overfill.

3.20 SEALANT TOOLING & FINISHING

Tool sealant as soon as practical after application and prior to the sealant surface forming a skin. Tool sealant face firmly to compact into the joint to form a smooth, flat or concave profile, to give the desired effect when cured.

Tooling must be carried out carefully, ensuring that the sealant minimum depth profile is not compromised.

A compatible tooling agent or fresh clean water can be used sparingly to assist with the smoothing of the tooled surface. Do not use products containing solvent, alcohol or fuel, as these products will inhibit the curing of the sealant.

Remove masking immediately after tooling and remove excess sealant from adjoining surfaces before sealant surface starts to skin. Refer to the relevant and current Product Data Sheet for information on curing times. Note skinning times are temperature dependent.

Any cured sealant can only be removed mechanically and care must be taken to avoid damage of surrounding surfaces.

3.21 ADHESIVE APPLICATION

Apply selected Sika adhesive for bonding shower liners and wall panels such as seratone and hardiglaze in accordance with Sika NZ Ltd instruction and the relevant and current Product Data Sheets.

3.22 SURROUNDING WORK

Leave surrounding surfaces in a neat, clean condition with no evidence of spill over.

Completion

3.23 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to nzl.sika.com.
Substitutions are not permitted to the following, unless stated otherwise.

Facade joints - concrete, masonry & brickwork - non-fire rated

4.1 SIKAHYFLEX®-250 FACADE - FACADE SEALANT FOR CONCRETE, MASONRY, BRICK

Location:	as required
Application detail:	Exterior or interior sealing of facade joints
Product:	SikaHyflex®-250 Facade
Product colour:	Concrete Grey
Joint width	10mm minimum to 50mm maximum
Substrates:	Pre-cast concrete, insitu concrete, blockwork, brickwork and adjacent substrates
Primer/cleaner:	Sika Primer 3N - for porous substrates
Backing:	Sika PEF Backing rod - (diameter - 25% wider than joint)

Facade joints - concrete, masonry & brickwork - fire rated

4.2 SIKAFLEX®-400 FIRE - FIRE RATED FACADE SEALANT FOR CONCRETE / MASONRY

Location:	as required
Application detail:	Exterior or interior sealing of horizontal or vertical control joints requiring fire rating
Product:	Sikaflex®-400 Fire
Product colour:	Grey
Joint width:	10mm minimum to 50mm maximum
Substrate:	Pre-cast concrete, insitu concrete, blockwork, stone, gypsum plaster
Primer/cleaner:	Sika Primer 3N - for porous substrates
Backing:	Sika PEF Backing rod - (diameter - 25% wider than joint)

Facade joints - aluminium composite panels and metal profiles sheets

4.3 SIKAHYFLEX 250 FACADE - FACADE SEALANT FOR ALUMINIUM COMPOSITE PANELS / METAL PROFILED SHEET

Location:	as required
Application detail:	Exterior or interior sealing of facade joints
Product:	SikaHyflex®250 Facade
Product colour:	Concrete Grey
Joint width:	10mm minimum to 50mm maximum
Substrates:	Profiled metals, coated or painted metals, aluminium composite panels and adjacent substrates
Primer/cleaner:	Sika Aktivator 205 - for non-porous substrates
Backing:	Sika PEF Backing rod - (diameter - 25% wider than joint)

Facade joints - Timber, fibre-cement sheets & boards

4.4 SIKAHYFLEX 250 FACADE - FACADE SEALANT FOR TIMBER / FIBRE CEMENT

Location:	as required
Application detail:	Exterior or interior sealing of facade joints in timber or fibrecement sheets or boards
Product:	SikaHyflex®250 Facade
Product colour:	Concrete Grey
Joint width:	10mm minimum to 50mm maximum
Substrates:	Timber or fibre cement. Any adjacent substrates
Primer/cleaner:	Sika Primer 3N - for porous substrates

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Backing: Sika PEF Backing rod - (diameter - 25% wider than joint)

Window & Door Sealant - Aluminium / PVC / Timber

4.5 SIKAHYFLEX®-250 FACADE - WINDOW & DOOR SEALANT

Location:	as required
Application detail:	Exterior or interior sealing of window / door joints
Product:	SikaHyflex®-250 Facade
Product colour::	Concrete Grey
Joint width:	10mm minimum to 50mm maximum
Substrate:	Aluminium / Timber / or PVC Windows and adjacent substrates
Primer/cleaner:	Sika Aktivator 205 - for non-porous substrates or Sika Primer 3N - for porous substrates
Backing:	Sika PEF Backing rod - (diameter - 25% wider than joint)

Concrete floor sealant - control joints / over-sized & seismic joints

4.6 SIKAFLEX® PRO-3 PURFORM - CONCRETE FLOOR CONTROL JOINTS

Location:	as required, refer to engineers drawings
Application detail:	Exterior or interior control joints in concrete floor slabs
Product:	Sikaflex® PRO-3 Purform
Product colour:	Concrete Grey
Joint width:	8mm minimum to 40mm maximum
Substrate:	Concrete
Primer/cleaner:	Sika Primer 3N - for porous substrates
Backing:	Sika PEF Backing rod

Roof sealant

4.7 SIKASIL® ROOFING AND PLUMBING - METAL ROOFING PROFILES & FLASHINGS

Location:	as required
Application detail:	Use for roofing and plumbing applications
Product:	Sikasil® Roofing and Plumbing
Product colour:	Translucent
Substrates:	Suitable for most types of metal roofing systems
Primer/cleaner:	None

Gypsum plasterboard - fire rated joints

4.8 SIKAFLEX®-400 FIRE - FIRE RATED SEALANT FOR GYPSUM PLASTERBOARD

Location:	as required
Application detail:	Exterior or interior sealing of horizontal or vertical control joints requiring fire rating
Product:	Sikaflex®-400 Fire
Product colour:	Grey
Joint width:	10mm minimum to 50mm maximum
Substrate:	Pre-cast concrete, insitu concrete, blockwork, stone, gypsum plasterboard
Primer/cleaner:	Sika Primer 3N - for porous substrates
Backing:	Sika PEF Backing rod - (diameter - 25% wider than joint)

Interior sealants and adhesives

4.9 SIKA® NAILBOND® SB - ADHESIVE FOR BONDING WALL PANELS, SOLVENT BASED

Location:	as required
Application detail:	Use for bonding wall panels
Product:	Sika® Nailbond® SB
Product colour:	Biege
Substrates:	A wide range of wall panels
Primer/cleaner:	None

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4.10 SIKASIL® NG - SEALANT FOR ACRYLIC BATHWARE

Location:	as required
Application detail:	Use for sealing around acrylic, basins and adjacent components
Product:	Sikasil® NG
Product colour:	Arctic White or Translucent
Substrates:	Acrylic, ABS and polycarbonate bathware / ceramics, glass, powdercoated aluminium, coated and painted metals, metal, timber, hardiglaze, seratone etc
Primer/cleaner:	None

4.11 SIKASIL WET AREAS - GENERAL INTERIOR SEALANT

Location:	as required
Application detail:	Use for general purpose silicone in wet areas
Product:	Sikasil ® Wet Areas
Product colour:	White or Translucent
Substrate:	Porcelain whitewear & fittings, painted surfaces, ceramic tiles, glass, plastic laminates, stainless steel, rigid PVC , acrylics, polycarbonate, metal, copper, brass, powdercoated aluminium, concrete etc
Primer/cleaner:	None

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5113G GIB® PLASTERBOARD LININGS

1 GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber and steel framed walls and ceilings to form:

- standard systems
- superior finish quality systems
- bracing systems
- fire rated garage boundary wall systems
- wet area systems
- GIBFix® Framing systems

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section:
GIB® Site Guide (April 2024)
GIB® Noise Control Systems (September 2017)
GIB® Fire Rated Systems (September 2024)
GIB® Wet Area Systems (February 2021)
GIB Toughline® Aqua (July 2018)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIB Ezybrace® for Light Steel Frame Systems (March 2017)
GIBFix® Framing System (August 2016)
GIB Rondo® Metal Batten System (September 2024)
GIB-Cove®
GIB RocTape®
GIB® Goldline™ Platinum Tape-on Trims
GIB® UltraFlex high impact corner mould
GIB® Tough Systems (November 2014)
BRANZ Appraisal 289 (2024) GIB® Fire Rated Systems
BRANZ Appraisal 394 (2017) GIB® Noise Control Systems
BRANZ Appraisal 427 (2021) GIB® Wet Area Systems
BRANZ Appraisal 928 (2021) GIB EzyBrace® Systems
BRANZ Appraisal 940 (2022) GIB® Intertenancy Barrier Systems for Terrace Homes

Manufacturer/supplier contact details

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Company: Winstone Wallboards
Web: www.gib.co.nz
Telephone: 0800 100 442

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
- before applying finish coatings or decorative papers,

so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

1.7 FIRE RATING REQUIREMENTS

Provide the GIB® fire resistant rated garage boundary wall systems. Refer to SELECTIONS for system/FRR.

1.8 SOUND INSULATION REQUIREMENTS

Provide the GIB® Noise Control Systems. Refer to SELECTIONS for system/STC. Include for forming and treating of perimeters of openings and penetrations in the elements to ensure the specified performance. Ensure absence of adjoining flanking paths.

Performance

1.9 SURFACE FIRE PROPERTIES - UNFINISHED BOARD

All GIB® unfinished plasterboard sheet materials achieve a Group Classification of, Group 1-S to NZBC C/AS2, Table 4.3, following testing in accordance with ISO 5660.1 and ISO 5660.2.

2 PRODUCTS

Materials

2.1 GIB® PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS/NZS 2588. Refer to SELECTIONS for location, type, thickness and finish.
GIB® Standard plasterboard
GIB Wideline® plasterboard
GIB Ultraline® high quality surface plasterboard
GIB Fyreline® fire resistant plasterboard
GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard
GIB Aqualine® wet area plasterboard
GIB Toughline®
GIB Toughline® Aqua

Components

2.2 SCREWS

GIB® Grabber® drywall type screws as follows:

Grabber® type	Used for fixing:
High Thread	GIB Ezybrace® or Standard systems to timber
Self Tapping	Standard systems to light gauge steel or timber
Dual Thread Screws	GIBFix®, GIB Ezybrace®, or Standard systems, to light gauge steel or timber
Wafer Head Needle Tip	Light gauge metal to timber not directly under plasterboard

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Pancake Head Drill Tip	Light gauge metal to light gauge metal directly under plasterboard

Refer to GIB® requirements for appropriate details.

2.3 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims
GIB® UltraFlex® high impact corner mould
GIB® Levelline® Tape on Trim

2.4 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.5 CONTROL JOINTS

GIB® Rondo® P35 control joints.
GIB® Goldline™ tape-on trims
GIB® plastic W-profile control joints.

Accessories

2.6 ADHESIVE

Timber frame and/or steel frame:
GIBFix® One ultra low VOC water based wallboard adhesive
GIBFix® All-Bond solvent based wallboard adhesive

2.7 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®, GIB Trade Finish® Multi
Cove:	GIB-Cove® Bond

2.8 JOINTING TAPE

GIB® jointing tape.

2.9 ACOUSTIC SEALANT

GIB Soundseal® ultra low VOC water based highly flexible acoustic sealant.

2.10 FIRE/ACOUSTIC SEALANT

GIB Fire Soundseal® ultra low VOC, mulit use acoustic sealant that resists passage of smoke and fire.

2.11 GAP FILLER

GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.

3.4 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

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

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Framing substrates shall be in accordance to AS/NZS 2589, GIB® Site Guide and GIB X-Block® Radiation Shielding Systems literature.

Check timber framing moisture content is in accordance with requirements of AS/NZS 2589. Refer to NZBC E2/AS1 and GIB® Site Guide.

Timber framing:	18% maximum for fixing plasterboard to timber (8-12% recommended for fixing plasterboard to timber framing if air conditioning and/or central heating are to be installed)

If GIB EzyBrace® systems are used in conjunction with GIBFix® Framing System, ensure that the positioning of the GIB HandiBrac® panel hold-down brackets are to the manufacturers recommended placements for the GIBFix® Framing System.

3.5 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 GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to **AS/NZS** 2589.

3.6 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide.

Application

3.7 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide. Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.8 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.9 FORM FIRE RATED SYSTEMS

Form to GIB® Fire Rated Systems requirements.

3.10 FORM NOISE CONTROL SYSTEMS

Form to GIB® Noise Control Systems requirements.

3.11 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.12 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide requirements.

3.13 INSTALL TAPE-ON TRIMS

Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

3.14 FINISHING GENERALLY

To GIB® Site Guide and AS/NZS 2589.

Completion & Commissioning

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3.15 COMPLETION MATTERS

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

4 SELECTIONS

Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
typical wall and CLT walls	GIB® Standard plasterboard	10mm	Level 4

4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
wet areas	GIB Aqualine® plasterboard	13mm	Level 4

4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
as noted	GIB® Standard plasterboard	13mm	Level 4

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
wet areas	GIB Aqualine® plasterboard	13mm	Level 4

4.5 GIB® SOUND RATED SYSTEMS

Refer to GIB® Noise Control Systems

Location	Plasterboard type / Lining requirements	STC / System specification	Finish Level
intertenancy walls	to be advised by manufacturer	to suit	Level 4

4.6 GIB® FIRE RATED SYSTEMS

Refer to GIB® Residential Garage Boundary Walls.

Location / Type	Plasterboard type / Lining requirements	FRR / System specification	Finish Level
as noted, refer to fire report	2 layers 19mm Fyreline	GBUW120	Level 4

Accessories

4.7 GIB® TAPE ON EDGE OR CORNER TRIMS

Brand/type: to suit

4.8 GIB® EDGE PROFILES

Brand/type: to suit

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5122 PLYWOOD LININGS

1 GENERAL

This section relates to the use of plywood sheets for:

- interior lining
- installed as bracing (as lining or under lining)
- specialist plywood panelling

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC B1/AS1	Structure
NZBC E2/AS1	External moisture
AS/NZS 2269.0	Plywood - Structural - Specifications
AS/NZS 2270	Plywood and blockboard for interior use
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.

Performance

1.3 BRACING REQUIREMENTS

Provide wall/ subfloor/ floor/ ceiling systems to meet the requirements of NZS 3604, section 5, **Bracing design**, and roof systems to meet the requirements of NZS 3604, section 10, **Roof framing**.

Building wind zone	High (refer to NZS 3604, table 5.4)
Earthquake zone:	Zone 3 (refer to NZS 3604 figure 5.4)

2 PRODUCTS

Materials

2.1 PLYWOOD BRACING

Rotary cut, Radiata Pine veneer ply sheet to AS/NZS 2269.0.
Bracing system tested to NZS 3604.5 **Bracing design**, NZS 3604.6.2 **Subfloor systems**, NZS 3604.8.3 **Systems to resist horizontal loads**, to meet NZBC B1/AS1.

Components

2.2 PANEL PINS

Refer to the plywood manufacturer's requirements and use 30mm, 40mm and 50mm plated panel pins for interior linings.

2.3 NAILS

Refer to the panel manufacturer's requirements. Galvanized or stainless steel for H3 CCA treated sheets. Use annular grooved or twisted shank nails for roof sarking.

2.4 SCREWS

Refer to the manufacturer's requirements for size and use.

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Accessories

2.5 ADHESIVE

Use only multi-purpose water or solvent based wallboard adhesives required by the plywood manufacturer.

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 FRAMING

To NZS 3604 and the plywood manufacturer's requirements.

Maximum moisture content:	18% to 16%

Application - General

3.4 SUPPORT

Fully support all edges and joints, except where tongue and groove is used.

3.5 EXPANSION

Allow a 2-3mm gap at edges of linings for sheet expansion; and

2 - 3mm	at each sheet joint; or
6 - 9mm	at 3.6 metres; or
8 - 12mm	every 4.8 metres

In areas with an expected high level of internal moisture, allow a gap of 4 - 6mm every 1.2 metres.

3.6 FIXING PLYWOOD BRACING

Ensure required hold down, strapping, angles, or bolts are in place, and that framing centres are correct.
Fit and fix to NZS 3604 and the manufacturer's bracing requirement with sheets and trim all in plumb, true alignment and face.

Application - linings

3.7 FIXING GENERALLY

A combination of panel pins and glueing.

Completion & Commissioning

3.8 COMPLETION MATTERS

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

4 SELECTIONS

4.1 BRACING PLYWOOD

Location:	raked ceilings, refer to arch and engineers drawings
Bracing system:	plywood diaphragm
Ply Brand/type:	structural ecoply
Thickness:	12 mm
Grade:	AD preferred, BD okay
Treatment:	untreated

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End/edge profile:	square edge
Face/back grade:	AD
Finish:	seal clear

4.2 FIXINGS, BRACING

Lining:	12mm ecoply
Fixing type/finish:	M8 screws
Centres:	150crs @ edges, 300crs internally

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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 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)

Requirements

Performance - doorsets

1.4 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.

Materials - doors general

2.2 TIMBER

To NZS 3602. Moisture content 10-14%. To NZS 3610. Solid or hollow core.

Materials - doorsets

2.3 STANDARD DOORSETS, SIDE HUNG DOOR

Frames to profile as detailed and dimensioned, fitted with solid or hollow core door.

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Refer to SELECTIONS.

2.4 STANDARD DOORSETS, SLIDING

Frames to profile as detailed and dimensioned, fitted with solid or hollow core door.
Refer to SELECTIONS.

Components

2.5 WINDOW AND DOOR FURNITURE

Refer to 5521 HARDWARE for type and finish.

2.6 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.

2.7 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.

2.8 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

2.9 INTERIOR SLIDING DOOR GEAR

To suit door size and weight and as detailed.

2.10 DOOR SKIN (FACINGS)

Doors skins as detailed and dimensioned.

Finish

2.11 TIMBER - PAINT FINISH

Factory applied coating system.

2.12 TIMBER - CLEAR FINISH

Factory applied coating system.

2.13 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

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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.

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 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.

3.15 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.

3.16 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.

3.17 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.

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3.18 INSTALL FURNITURE

Install latches, locks and door furniture as scheduled.

3.19 CHECK

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

Application - windows

Completion

3.20 PROTECTION

Protect all finishes against damage from adjacent and following work.

3.21 REPLACE

Replace damaged, cracked or marked elements.

3.22 TRADE CLEAN

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

3.23 LEAVE

Leave work to the standard required for following procedures.

3.24 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

Frames

4.1 DOOR FRAMES - TIMBER

Location:	refer to drawings
Door reference:	refer to drawings
Timber species:	radiata pine
Grade:	clears
Treatment:	H1.2
Finish:	paint finish
Leaf size:	varies, refer to door schedule
Thickness:	to suit

Doors

4.2 STANDARD DOORS

Manufacturer:	to be advised by contractor
Door type:	refer to door schedule
Material:	timber
Door leaf size:	varies, refer to door schedule
Edge clashing:	38/5 sides
Door finish:	paint finish
Hinge type/finish:	to suit

Finish

4.3 PAINT FINISH

Brand:	Dulux
System name:	refer to Dulux
Finish/colours:	TBD

4.4 POWDER COATING

Refer to 6746D DULUX POWDER AND INDUSTRIAL COATINGS for powder coating products.
Refer to 6746IP INTERPON POWDER COATINGS for powder coating products.

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Hardware

4.5 HARDWARE SCHEDULE

refer to door schedule for handle hardware

4.6 HARDWARE

Refer to 5521 HARDWARE section.

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5231C CS FOR DOORS®

1 GENERAL

This section relates to the supply and installation of **CS FOR DOORS®** product range.
It includes;

- cavity sliders
- wardrobe sliders
- track systems
- door leaves
- CaviLock® handle hardware

1.1 RELATED WORK

Refer to glazing section/s for glazing for timber doors.

Documents

1.2 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 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3602	Timber and wood-based products for use in building
NZS 4223.3	Glazing in buildings - Human impact safety requirements

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
CS FOR DOORS® Specifiers Guide
BIA Accreditation #93/006A.
BRANZ Appraisal 900 - CS Cavity Sliders

Manufacturer/supplier contact details

Company:	CS FOR DOORS®
Web:	www.csfordoors.co.nz
Email:	info@csfordoors.co.nz
Telephone:	0800 754 337 09 276 0800 Auckland 07 928 0800 Waikato/Bay of Plenty 03 348 6158 South Island

Warranties

1.4 WARRANTY

Provide the following CS FOR DOORS® warranties

10 Years on the following product categories:
Cavity Sliders, Wardrobe Sliders, Pre- Hung Jambs, Track Systems.

5 Years on the following product categories:
CS manufactured Door Leaves, Automatic Units

2 Years on the following product categories:
CaviLock® Handle Hardware

12 Months on the following product categories:
Electrical components and parts

Provide this warranty on the manufacturer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements. Refer to www.csfordoors.co.nz for guarantee terms and conditions.

Requirements

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1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

2 PRODUCTS

Materials - general

2.1 TIMBER

Solid timber to NZS 3602 to profiles detailed. Moisture content approximately 16% ex factory.

2.2 GLASS

Refer to SELECTIONS for frameless glass cavity slider doors.
Refer to glazing section/s for glazing to timber and aluminium doors.

2.3 INTERIOR TIMBER

To NZS 3602. Moisture content approximately 10-14%.

Materials - Cavity Slider units

2.4 CAVITY SLIDER UNITS

CS For Doors® cavity slider units to profile as scheduled, detailed and dimensioned. Refer to SELECTIONS.

Components

2.5 DOOR FURNITURE

CS CaviLock® architectural handles and locks as scheduled.

2.6 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.

2.7 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.

2.8 SLIDING DOOR GEAR

CS CavitySliders® track to suit door size, weight and application. Stainless steel carriages and mount plates are available for the CS240 kg and CS500 kg systems.

Finish

2.9 FINISH

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

3.3 GENERALLY

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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).

3.4 FABRICATE DOORSETS

Fabricate doorsets in the **CS FOR DOORS®** factory with doors hung, provision for furniture made, finishes applied and fully operable.

3.5 FABRICATE DOORS

Fabricate doors in the factory, with provision for door furniture.

3.6 CHECK ALL OPENINGS

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 or NZS 1170.5.

Assembly

3.7 FABRICATION GENERALLY

Manufacture and fabricate frames and doors as detailed. Install running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

Application - generally

3.8 FIXING FRAMES

Fit to frame as required. Fix and assemble frames rigidly in place, plumb, level and true to line and face without distortion. Fit facings, scribers, draught-stopping and sealants.

3.9 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.

3.10 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

3.11 PROPRIETARY ELEMENTS

Fix in accordance with **CS FOR DOORS®** requirements.

3.12 INSTALLATION GENERALLY

Frames finished to match the width of lined walls. Wedge frames into opening and nail through into the studs making sure you have one fixing in the vicinity of the lock.
Hang doors on sliding gear as specified and to operate freely. Fit all hardware and door furniture to CS FOR DOORS® instructions.

3.13 TIMBER STUD WALLS - TIMBER FRAMES

Fix direct to opening and pack, with one fixing in the vicinity of the lock.

3.14 STEEL STUD WALLS - STEEL FRAMES

Using a pilot hole in the frame, fix to steel studs with countersunk self-drilling corrosion proof screws. Fix direct to opening and pack, with one fixing in the vicinity of the lock.

3.15 STEEL STUD WALLS - TIMBER FRAMES

Drill the timber frame and fix to steel studs with countersunk self-drilling corrosion proof screws. Fix direct to opening and pack, with one fixing in the vicinity of the lock.

3.16 BOTTOM CLEARANCE

Provide for specified floor coverings plus a minimum of 5mm clearance at any point of slide. When floor covering is not specified, allow 25mm total.

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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 MANIFESTATIONS

To comply with NZS 4223.3.

3.20 INSTALL FURNITURE

Install latches, locks and door furniture as scheduled.

3.21 CHECK

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

Completion & Commissioning

3.22 COMPLETION MATTERS

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

4 SELECTIONS

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

CS Cavity Sliders Standard Range

4.1 CS CAVITYSLIDERS® EASYOPEN® COMPLETE DISABLED ACCESS TOILET DOORS

Location:	cavity sliders
Leaf dimensions:	1990mm x 910mm minimum
Door type:	standard cavity slider 38mm
Door finish:	paint finish
Single or Biparting:	Single only
Jamb type/finish:	timber flat
Framing/size:	90mm
Lining thickness:	13mm
Track finish:	Natural anodised
Handle type:	CL100 LaviLock or CL400 ADA by CaviLock®

Aluminium door leaves

4.2 CS FOR DOORS® ALUTEC®

Location:	cavity sliders
Leaf Type:	AluTec®
Leaf dimensions:	1990mm x 910mm, refer to door schedule
Finish/colour:	TBD
Handle type:	CL100 LaviLock or CL400 ADA by CaviLock®

Hardware

4.3 CAVILOCK® SLIDING-DOOR HANDLE HARDWARE

Provide the following CS CaviLock® specialised handle hardware:

Location	Handle Type	Finish	Fitting Height to centre	Door Thickness	Comments
toilets	CL400 ADA Privacy	to suit	990mm	34 - 52mm	

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5241 FIRE & ACOUSTIC INTERIOR DOORS & WINDOWS

1 GENERAL

This section relates to the manufacture, supply and installation of fire, smokestop and acoustic:

- windows
- doors, frames
- doorsets

1.1 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:

FRR	Fire-resistance rating
FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification
Sm	Smoke stopping capability level
STC	Sound transmission class

Documents

1.2 DOCUMENTS

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

NZBC C/AS1-AS2	Protection from Fire
NZBC F8/AS1	Signs
AS 1191	Acoustics - method of laboratory measurement of airborne sound transmission insulation of building elements.
AS 1530.4:2005	Methods for fire tests on building materials, components and structures - Fire-resistance test of elements of construction
NZS 3602	Timber and wood-based products for use in building
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4232.2	Performance criteria for fire resisting enclosures - Fire resisting glazing systems
NZS 4520	Fire resistant doorsets
AS/NZS 4666	Insulating glass units
ISO 717.1	Acoustics - rating of sound insulation in buildings and of building elements - airborne sound insulation.
ISO 2063	Thermal spraying - Metallic and other inorganic coatings - Zinc, aluminium and their alloys

Warranties

1.3 WARRANTY

Provide warranty for:

5 years	Materials
5 years	Execution

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

Requirements

1.4 QUALIFICATIONS

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

1.5 NO SUBSTITUTIONS

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

1.6 CERTIFY COATINGS

Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to AS 3894.3, and retest where any dispute arises as to the thickness provided.

Performance

1.7 CERTIFY PERFORMANCE

Provide certificate of compliance with the requirements of this specification for fire and/or acoustics.

Performance - fire - doorsets and windows

1.8 FIRE REQUIREMENTS

To NZBC C/AS1 Appendix E3 and NZBC C/AS2 Appendix C: 6.1: Fire doors and smoke control doors. Provide doorsets of the scheduled fire resistance rating, tested to NZS 4520.

1.9 VARIATIONS FROM STANDARD

Submit before manufacture a written opinion from a registered testing laboratory, that any variation from a production model satisfies the criteria laid down in NZS 4520.

1.10 FIRE DOORSETS REGISTER

Manufacturer to list doorsets in their "Register of Doorsets" to NZS 4520. Supply to building owner at practical completion.

1.11 EVIDENCE OF COMPLIANCE

When installation is completed provide written confirmation to NZS 4520, 6.4.2.

1.12 FIRE AND SMOKE SEALS

To NZBC C/AS1 Appendix E3 and NZBC C/AS2 Appendix C: 6.1: Fire doors and smoke control doors.

2 PRODUCTS

Materials - general - fire

2.1 FIRE DOORS

To comply with NZS 4520, supplied with frame. Refer to SELECTIONS for details.

2.2 FIRE DOORSETS

To comply with NZS 4520. Frames to profile as detailed and dimensioned. Refer to SELECTIONS for details.

Make provision for the scheduled fire-rated hardware to be supplied and fitted. Make arrangements on delivery to the site, for the installer's certificate to be returned to the manufacturer.

2.3 SMOKESTOP DOORSETS

To comply with NZS 4520 and NZBC C/AS1, Appendix E4 and NZBC C/AS2, C6.1.2 Smoke Control Doors. Frames to profile as detailed and dimensioned.
Refer to SELECTIONS for details.

2.4 FIRE RATED HARDWARE

Make provision for the scheduled fire-rated hardware to be supplied and fitted. Make arrangements on delivery to the site, for the installer's certificate to be returned to the manufacturer.

Components

2.5 WINDOW AND DOOR FURNITURE

Refer to 5521 HARDWARE for hardware selections and/or to SELECTIONS for type.

2.6 SCREWS

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Zinc plate, zinc chromate, nickel plate or stainless steel. 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.

2.7 INSERTS, BOLTS AND FASTENERS

Items to be built into corrosive environments, to be hot-dip galvanized to AS/NZS 4680.

2.8 DOOR HINGES

Tested and approved with size and gauge to carry door size and weight. Refer to SELECTIONS for details.

2.9 FIRE AND SMOKE SEALS

PVC or silicone, suitable for plain or rebated frames.

Finishes - Steel

2.10 THERMAL METAL SPRAY

85/15 Zinc/aluminium to ISO 2063 applied to achieve a minimum average thickness of 150 microns when measured to AS 3894.3 Refer to SELECTIONS for details.

2.11 ZINC METAL SPRAY

Steel frame to be abrasive blasted prior to application of 75 - 100 microns minimum coating thickness when measured to AS 3894.3 Refer to SELECTIONS for details.

2.12 POWDER COATING

Refer to 6746D DULUX POWDER AND INDUSTRIAL COATINGS
Refer to 6746IP INTERPON POWDER COATINGS
for powder coating products.

Finishes - General

2.13 PAINT FINISH PRIMER

Steel to be abrasive blasted prior to application of Epoxy Primer to paint manufacturers recommendations. Refer PAINT section for details.

2.14 PAINT FINISH

Refer PAINT section for details.

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 CHECK ALL OPENINGS

Check all openings prior to manufacture for size and standard of execution before installing frames.

3.3 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 manufactures requirements.
Reject and replace goods that are damaged or will not provide the required finish

3.4 CONFIRM PREPARATION OF WALL OPENINGS

Confirm that 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.

3.5 PROTECT

Protect all elements against damage to arrises and glazing beads. Store frames and doors flat on pallet or upright at an angle no greater than 15 degrees from perpendicular, and away from moisture or direct sunlight.

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Assembly

3.6 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.

3.7 FABRICATE DOORSETS

Fabricate doorsets in the factory with doors hung and provision for furniture made as required.

3.8 FABRICATE DOORS

Fabricate doors in the factory, with provision for door furniture.

3.9 ANCHORAGES

Install all required anchorages to the manufacturers requirements, for the fire rated windows and doors, including sleeves, concrete inserts, anchor bolts and items with integral anchors that are to be embedded in concrete and/or masonry.

3.10 HARDWARE GENERALLY

Make provision for the scheduled fire-rated hardware to be supplied and fitted either in the factory or on site. Key alike all lockable hardware able to be keyed alike, including other interior doors. Account for all keys and deliver separately to the site manager.

Make arrangements on delivery to the site, for the installer's certificate to be returned to the manufacturer.

3.11 HINGES

Fit hinges to doors to support the door size and weight with a minimum of:

3 hinges	Doors up to 2.1 metres
4 hinges	Doors 2.1 - 2.4 metres
5 hinges	Doors 2.4 - 3.0 metres

3.12 FACTORY FINISHING

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

Installation - generally

3.13 INSTALL FIRE WINDOWS, DOORS AND DOORSETS

Install and fix to comply with NZS 4520, NZS 4232.2, the stated fire rating requirements and the manufacturer installation details.

3.14 FIXING FRAMES

Fix and assemble frames rigidly in place, plumb, level and true to line and face without distortion to the manufacturer requirements.

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 ANCHORAGES

Install all required anchorages to the manufacturers requirements, for the fire rated windows and doors, including sleeves, concrete inserts, anchor bolts and items with integral anchors that are to be embedded in concrete and/or masonry.

3.17 TOLERANCES

Install the finished prehung door to a dimensional accuracy of ± 2mm.

Installation - fire and acoustic doorsets and windows

3.18 INSTALL FIRE, SMOKESTOP AND ACOUSTIC FRAMES

Fix in accordance with NZS 4520 and the manufacturer instructions.

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3.19 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. Frames must be filled with plasterboard.

3.20 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. Insert intumescent backing rod between back of frame and concrete. Frames must be plaster or grout filled.

3.21 STEEL STUD WALLS - STEEL FRAMES

Using a pilot hole in the frame, fix to steel studs with countersunk self-drilling corrosion proof screws. Fix at hinges and opposite, with one fixing in the vicinity of the lock. Frames must be filled with plasterboard.

3.22 HANG DOORS

Hang doors on hinges as specified and to operate freely.

3.23 BOTTOM CLEARANCE

Provide for specified floor coverings plus 7mm clearance at any point of swing. When floor covering is not specified, allow 25mm total.
For fire and smokestop doorsets, this clearance above finished floor coverings must not exceed 10mm. Jambs to be cut down to suit if necessary.

3.24 REMOVE DOORS

Remove doors from the frames prior to, or on installation, and immediately seal on all 6 sides. Finish as required, store safely and near completion refit to avoid any damage.

3.25 INSTALL FURNITURE

Install to NZS 4520. Install latches, locks and door furniture as scheduled.

Finishing

3.26 CHECK

Check and adjust operation of all doors.

3.27 MARKING OF FIRE-RATED DOORSETS

The marking of fire-rated doorsets to be according to NZS 4520, 6 **Marking and Documentation**.

3.28 FIRE-RATED DOORSET SIGNS

To NZBC F8/AS1, 5.2,**Fire and smoke control doors**.

3.29 SAFETY

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

Completion

3.30 ROUTINE CLEANING

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

3.31 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.

3.32 REMOVE

Remove safety indicators and protective coverings, and wipe down all joinery thoroughly to leave it perfectly clean. Remove debris, unused materials and elements from the site.

4 SELECTIONS

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Where there is a NO SUBSTITUTIONS clause in GENERAL, no substitutions are permitted to any of the specified systems, components and associated products listed in the following SELECTIONS.

Fire

4.1 DOORSET - FIRE AND SMOKESTOP DOORS

Door Reference:	refer to door schedule
Manufacturer:	TBD
Door function:	single hinged
Type:	glazed
FRR/Sm:	-/-/- Sm and -/60/30 Sm
Leaf size:	2390mm high x 860mm wide
Thickness:	to suit
Leaf material:	glazed with steel frame
Leaf core:	glazed
Leaf frame finish:	powdercoated to match other joinery
Edge clashing:	Clashed 2 vertical edges
Frame material:	steel
Frame finish:	powdercoated to match other joinery
Seals:	as required
Glass:	to be advised by manufacturer

Hardware

4.2 HARDWARE

Refer to 5521 HARDWARE section.

4.3 HINGES

Type:	Radius
Size:	to suit
Pin:	Loose pin
Material:	to be advised by manufacturer

Finishes

4.4 PAINTING

Refer to painting section/s for painting.

4.5 POWDER COATING

Refer to 6746D DULUX POWDER AND INDUSTRIAL COATINGS for powder coating products.
Refer to 6746IP INTERPON POWDER COATINGS for powder coating products.

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5571 TIMBER STAIRS

1 GENERAL

This section relates to the fabrication and installation of interior timber stairs and landings.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

NZBC D1/AS1	Access routes
AS/NZS 1860.1	Particleboard flooring - Specifications
BRANZ BU 497	Stair construction

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Manufacturer/supplier contact details

Company:	Red Stag
Web:	https://redstag.co.nz/
Email:	https://redstag.co.nz/

2 PRODUCTS

Materials

2.1 SOLID TIMBER COMPONENTS

Refer to SELECTIONS/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.

Application

3.2 FABRICATE AND INSTALL TIMBER STAIRS

Fabricate and install stair flights and landings to comply with NZBC acceptable solution D1/AS1:4.0 Stairways, and unless detailed otherwise to BRANZ BU 497. House and wedge treads and risers 15mm into strings, all glued, wedged and blocked. Form nosing overhangs of 25mm by splaying risers forward to finish flush with the front of the treads.

Completion

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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

4.1 TIMBER STAIRS

Treads:	310mm
Risers:	180mm
Finish:	seal clear, to be advised by manufacturer

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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:

NZBC C/AS2	Protection from fire
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

Warranties - tiling

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
refer to manufacturer for warranty information

- 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 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.

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Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY - TILING SYSTEMS

Refer to 1270 CONSTRUCTION for 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.

1.9 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).

Performance

1.10 SURFACE FIRE PROPERTIES FOR LININGS

Ceramic tiles have been assigned a Group Number of 1-S, as determined by NZBC C/AS2 Appendix C, Table C1.2.

2 PRODUCTS

Materials

2.1 TILES

Refer to SELECTIONS.

Materials - adhesive and grout

2.2 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.

2.3 PROPRIETARY GROUT

Proprietary grout to suit particular location/use. To AS ISO 13007.3 and BS EN 13888.1. Refer to SELECTIONS.

Accessories

2.4 MOVEMENT JOINT SEALANT

Neutral cured or acid-cured sealant to AS 3958.1, 2.7.5 Sealant. Refer to SELECTIONS.

2.5 TILE EDGE TRIMS

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

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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.

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.

Application -tiling

3.12 FITTING TILES

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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.

3.13 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.

3.14 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.

3.15 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.

3.16 APPLY GROUTING

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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

3.17 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.

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.

3.18 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

3.19 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

3.20 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials - Tiles

4.1 WC TILES

Location:	WC and accessible bathroom backsplash
Supplier:	Tile Space
Tile type:	Magma - EQU095
Tile colour:	White matt
Tile size:	65mm x 200mm
Grout colour:	to match tile
Grout width:	to suit application
Sealant colour:	to match tile

4.2 KITCHENETTE TILES

Location:	WC and accessible bathroom backsplash
Supplier:	Tile Depot
Tile type:	City
Tile colour:	Cloud gloss
Tile size:	100mm x 300mm
Grout colour:	to match tile
Grout width:	to suit application
Sealant colour:	to match tile

Materials - adhesive and grout

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4.3 TILE ADHESIVE

Location:	under tiles
Substrate:	GIB plasterboard
Primer:	Check selected tile adhesive for primer requirements
Tile adhesive:	to be advised by installer

4.4 GROUT

Location:	between tiles
Grout type:	to be advised by installer
Colour:	Refer to relevant tile selection for grout colour
Grout width:	Refer to relevant tile selection for grout joint width

Accessories

4.5 MOVEMENT JOINT SEALANT

Location:	to be advised by installer
Brand/type:	to be advised by installer
Colour:	Refer to relevant tile selection for sealant colour

4.6 TILE EDGE TRIMS

Location:	around exposed tile edges
Brand/type:	edge trims
Dimensions:	to suit tile
Finish/colour:	powdercoated to match tile colour

Spares & maintenance products

4.7 SPARES & MAINTENANCE PRODUCTS

Refer to the general section 1270 CONSTRUCTION for details of how spares and maintenance products will be handled. Provide the following spares and maintenance products:

Item:	tiles
Quantity:	allow for additional 5%
Location:	Refer to 1270 CONSTRUCTION

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6411J JACOBSEN VINYL SURFACING

1 GENERAL

This section relates to the supply and installation of Jacobsen vinyl surfacing complete with skirtings, nosings, trims and edgings and including static control sheet to floors.
It includes:

- PVC sheet
- PVC tiles
- Luxury Vinyl Tiles (LVT)

Related work

Documents

1.1 DOCUMENTS

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

NZBC C/AS2	Protection from fire
NZBC D1/AS1	Access Routes
NZS/AS 1884	Floor coverings - Resilient sheet and tiles - Installation practices
IEC 61340.4.1	Electrostatics - Part 4.1: Standard test methods for specific applications - Electrical resistance of floor coverings and installed floors
EN 1081	Resilient Floor Coverings - Determination of the Electrical Resistance
EN 13501-1	Fire classification of construction products and building elements, Classification using data from reaction to fire tests
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)

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

- Technical datasheet
- Installation instructions
- Maintenance instructions
- Jacobsen Aspecta LVT Flooring & NZ Building Code E3 Independently Tested Alternative Solution

Manufacturer/supplier contact details

Company:	Jacobsen
Web:	www.jacobsen.co.nz
Email:	support@jacobsen.co.nz
Freephone:	0800 800 460

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For 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.

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year	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

1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS

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

Performance

1.7 TEST - STATIC CONTROL

Test static control flooring to IEC 61340.4.1 or EN 1081 and provide a certificate of compliance.

1.8 SURFACE FIRE PROPERTIES FOR FLOORING

Flooring to meet the fire performance requirements of NZBC C/AS2, 4.17.3, by:
Either,
Flooring is tested and achieved the minimum Critical Radiant Flux requirements of NZBC C/AS2, Table 4.5. Provide certificates or other evidence that the flooring will comply.
or,
Critical Radiant Flux not required if area of non-conforming products have an aggregate surface area of not greater than 5m² within a firecell, to NZBC C/AS2, 4.17.6.a.

1.9 SURFACE FIRE PROPERTIES FOR WALL LININGS

Wall vinyl tested to ISO 5660-1 Refer to SELECTIONS for group numbers.
Tarkett Protectwall tested to EN 13501-1 achieves a Class B and smoke production rating S2 equating to a Group Number 1-S to NZBC C/AS2 Table C1.1.

Performance - Slip resistance

1.10 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt from testing.

1.11 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

The following walking surfaces have previously been tested for slip resistance, and comply with NZBC D1/AS1 requirements.
to be verified.

1.12 TEST - SLIP RESISTANCE

Test walking surfaces for slip resistance, refer to SELECTIONS for test condition.

2 PRODUCTS

Materials

2.1 VINYL SHEET

Tarkett vinyl sheet, with factory applied PUR (polyurethane) to ensure a low maintenance system requiring no sealers or polish.

2.2 COVINGS

Form commercial coving using pencil cove method, with butterfly mitres to external and internal corners. Form domestic coving using either pencil cove or fillet cove method.

2.3 FINISHING TRIM & TRANSITION BARS

Jacobsen Tredsafe's aluminium finishing trims, transition bars and reducer strips.

2.4 COVE CAPPING

Jacobsen PVC top cap to top of coved vinyl.

2.5 WALL AND FLOOR VINYL JOINING STRIP

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Jacobsen white PVC floor to wall finishing strip.

Accessories

2.6 ADHESIVE

J-SYSTEM 11 Vinyl Floor & Wall Acrylic Adhesive or J-SYSTEM 13 High Moisture Acrylic Adhesive.

2.7 PRIMER

J-SYSTEM 21 Concrete Primer.

2.8 FLOOR LEVELLING COMPOUND

J SYSTEMS floor levelling compound and smoothing of substrates, available in fine finish, self-levelling, and low slump solutions, Refer to SELECTIONS.

2.9 THERMOWELDING

Manufacturer supplied colour matched weld rod using the Tarkett weld nozzle.

2.10 THINLINE MDF UNDERLAY

Customwood medium density fibreboard.

2.11 MASONITE UNDERLAY

CSR Masonite underlay, 5.5mm thick.

3 EXECUTION

Conditions

3.1 GENERALLY

To manufacturer's requirements and NZS/AS 1884.

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 PRE-INSTALLATION REQUIREMENTS

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

3.5 PREPARATION

Check that each colour supplied is from the same batch. Follow the vinyl manufacturer's requirements for preparatory conditioning of rolls and working temperatures and conditions before, during and after laying the selected vinyl. Protect work from solar heat gain and switch off under-floor heating during and for 48 hours either side of the work period.

3.6 DO NOT START

Do not start work before the building is enclosed, wet work is complete, doors are hung and lockable, finishes and trim complete and good lighting is available.

3.7 LAYING GENERALLY

Carry out the whole of this work to NZS/AS 1884, and the flooring manufacturer's requirements.

3.8 TECHNIQUE

Before beginning the installation confirm the proposed layout of material, location of seams and other visual considerations of the finished work.

Application - substrate preparation

3.9 PREPARING EXISTING TIMBER BOARD OR PARTICLEBOARD

Strip off existing floor coverings, machine sand to remove adhesive and surface contaminants. Then vacuum to remove all dust prior to installing underlay sheets.

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3.10 TIMBER BOARD OR PARTICLEBOARD, LAYING THINLINE MDF UNDERLAY

Lay underlay sheets with joints staggered, with a 0.5mm gap between sheets and 2mm gap at all 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 joins level.

3.11 TIMBER BOARD OR PARTICLEBOARD, LAYING MASONITE UNDERLAY

Underlay using 5.5mm Masonite with joints staggered and with a 0.4mm gap between sheets and 3mm gap at all perimeters. Use 22mm narrow crown staples at 150mm centres throughout the whole sheet and 75mm apart, 10mm in from the edges of the sheets. Punch staples 0.4mm below the surface and sand joins level.

3.12 APPLYING PRIMER OR SEALER FOR VINYL SHEET

Prime and/or seal porous plaster, concrete and timber substrates using J-System 21 Primer.

Application - laying floors

3.13 APPLICATION OF ADHESIVE

Apply J-SYSTEM 11 or J-SYSTEM 13 Adhesive at the required spread rate, without leaving trowel marks after setting. Follow requirements for open time, taking note of the substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using required techniques.

3.14 LAYING FLOOR SHEET

Roll out, cut, leave to condition and install sheet vinyl to Tarkett's recommended installation procedure, ensuring there are no air bubbles or twisting, the seams are kept clear of adhesive and immediately the sheet is adhered it is rolled with a 68 kg roller.

3.15 THERMOWELDING

Machine groove and thermoweld seams in designated areas, using the Tarkett weld nozzle, heating the sheet and weld rod to a sufficient temperature to melt and fuse them together in a single mass. Trim the weld to leave a smooth, flush surface with the sheet.

3.16 CROSS JOINS

Plan and allow cuts to avoid cross joins. Obtain written approval before proceeding if cross joins are unavoidable. Cross joins are not acceptable in wet areas.

3.17 COVING VINYL

Pencil cove flooring to the specified height and finish off as detailed.

3.18 COMPLETE MITRES

Perform butterfly method to internal and external mitres, allowing to thermoweld mitres.

3.19 FIT VINYL EDGING

Fit tapered vinyl edging to borders, except where abutting carpet.

3.20 LAYING STATIC CONTROL SHEET

Lay out and adhere to the substrate to Tarkett's required installation procedures. Roll out, cut, leave to condition and install static control sheet with approved adhesive, ensuring there are no air bubbles or twisting and the seams are kept clear of adhesives. Immediately the sheet is adhered, roll with a 68 kg roller. Tarkett Granit SD should give average resistance readings of 1 x 106 to 1 x 108 ohms.

Application - to walls

3.21 APPLYING PRIMER OR SEALER FOR VINYL SHEET

Prime and/or seal porous plaster, concrete and timber substrates using J-System 21 Primer.

3.22 FLOOR TO WALL FINISHING STRIP

Adhere to walls in a true, straight line using water-based contact adhesive or permanent double sided tape. Roll immediately using a seam roller to ensure maximum bond strength is achieved.

Application - general

3.23 INSTALLING ACCESSORIES

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Scribe fit, adhere or otherwise fix true to line and face to the sheet manufacturer's requirements for each particular location.

Completion & Commissioning

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

4.1 JACOBSEN VINYL SHEET FLOORING

Product:	Tarkett Granit Safe.T
Colour/number:	Dark Sand 508 (special order)
Thickness:	2mm
Seam welding:	Thermowelding

4.2 COVINGS

Height:	min. 100mm
Type:	continuation of the floor sheet

4.3 JACOBSEN ADHESIVE

Adhesive:	J-System 11 Vinyl Floor & Wall Acrylic Adhesive

4.4 COVE CAPPING

Type:	Jacobsen PVC top cap.

4.5 PRIMER

Type:	Uzin PE460 Two component epoxy blocking primer

4.6 FLOOR LEVELLING COMPOUND

Type:	J-SYSTEM 31 Self Levelling Compound

4.7 FINISHING TRIM & TRANSITION BARS

Location:	transitions
Brand:	Tredsafe
Profile number:	to be advised by manufacturer to suit situation
Profile colour:	to match one side of transition
Insert colour:	to match one side of transition

4.8 THINLINE MDF UNDERLAY

Thickness:	to be advised by manufacturer to suit situation

4.9 CSR MASONITE UNDERLAY

Thickness:	to be advised by manufacturer to suit situation

4.10 SILICONE SEALANT

Location:	To perimeter joints and penetrations in vinyl floor coverings
Type:	MS Silicone
Brand:	refer to manufacturer

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6612AM ADVANCE ENTRY MATS & CARPET

1 GENERAL

This section relates to the supply and installation of **Advance Flooring Systems Ltd** entry mats and carpet.
It includes:

- modular / custom-made entrance matting systems
- custom-made entrance carpets (in sheet and tile format)
- associated trims and frames

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:

Advance	Advance Flooring Systems Ltd.
CRF	Critical radiant flux

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
ISO 9239.1	Reaction to fire tests for floorings - Determination of the burning behaviour using a radiant heat source.

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Advance Technical Product Literature including Installation instructions and data sheets.

Manufacturer/supplier contact details

Company:	Advance Flooring Systems Ltd
Web:	www.advanceflooringsystems.com
Email:	info@advanceflooringsystems.com
Telephone:	0508 238 262

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	Limited warranty for Advance Architectural Series – Axis, Shuttle, CoralTread, ExtraTread, MasterTread, EverTread. Refer to Advance for conditions
10 years:	Limited warranty for Advance Classic Series - StarTread, Orbit. Refer to Advance for conditions.
5 years:	Limited warranty for Symphony 2, WaterHog Eco Elite. Refer to Advance for conditions
2 years:	Limited warranty for ScrapeRIB and Bross Entry Carpet. Refer to Advance for conditions
10 years:	Limited warranty for Gecko Entry Tile. Refer to Advance for conditions
10 years:	Indoor warranty for DecoRIB and WideRIB entry carpet. Refer to Advance for conditions
3 years:	Limited outdoor warranty for DecoRIB and WideRIB entry carpet. Refer to Advance for conditions
2 years:	Limited warranty for DuraTap Coir Matting. Refer to Advance for conditions.

- Provide this warranty on Advance standard form (if unavailable, use the 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.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer warranty:
1 year: For installation

- Provide this warranty on the installer standard form (if unavailable, use the 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 NO SUBSTITUTIONS

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

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 QUALIFICATIONS

Entrance matting and carpet installers to be competent, experienced workers familiar with the Advance materials and techniques specified.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of Advance Maintenance Instructions - Advance Entrance Matting Systems as electronic PDF format documents:

Provide this information prior to practical completion.

Performance

1.10 SURFACE FIRE PERFORMANCE

Products tested to ISO 9239.1 and achieve the minimum critical radiant flux requirements of NZBC C/AS2, Table 4.5, **Critical radiant flux requirements for flooring**.
Critical radiant flux achieved is as follows:

Axis entry mat	5.4kW/m²
ExtraTread entry mat	7.8kW/m²
Shuttle entry mat	8.8kW/m²
Coral Tread entry mat	7.0kW/m²
MasterTread entry mat	7.8kW/m²
EverTread entry mat	8.2kW/m²
Symphony 2	4.5kW/m²
Connection entry carpet	4.9kW/m²
ScrapeRIB entry carpet	5.2kW/m²
Bross entry carpet	5.2kW/m²
Dimension entry tile	8.0kW/m²
Gecko entry carpet tile	8.6kW/m²
DecoRIB entry carpet	8.7kW/m²
WideRIB entry carpet	8.7kW/m²
DuraTap coir matting	6.4kW/m²
Orbit entry mat	3.0kW/m²
StarTread entry mat	8.0kW/m²

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1.11 INSPECTIONS

2 PRODUCTS

Materials - entry mat

2.1 MASTERTREAD ENTRY MAT

MasterTread entry mat, custom-made aluminium/carpet strip mat with **Symphony 2** polyamide in-fills with a low profile 10mm high frame providing an overall height of 13mm . Supplied with shock absorbing vinyl cushion feet. Aluminium strips and in-fills available in a range of finishes and colours. Refer to SELECTIONS.

Components

2.2 MATWELL ALUMINIUM FRAME AND RAMPING

Proprietary **Advance** matwell frame and ramping. Refer to SELECTIONS for options.

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 the general section 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 LAYOUT

Plan the general layout to:

- conform with pattern orientation requirements as specified
- maximize perimeter and mat/carpet/tiles sizes

3.4 TEMPERATURE

Floor temperature:	Minimum 16°C.
Concrete pH:	No more than 10.0.

3.5 HANDLE AND STORE

Keep matting dry. Protect from damage.

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Installation - substrate preparation

3.7 PREPARE FLOOR SUBSTRATE

Refer to 6192 FLOORING SUBSTRATE PREPARATION for preparation of flooring substrate. Ensure base is smooth and level before commencing installation.

Installation - entry mat

3.8 INSTALL ENTRY MAT

Install proprietary frame and entry mat in accordance with **Advance** details and requirements.

Completion

3.9 COMPLETION MATTERS

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

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4 SELECTIONS

For further details on selections go to www.advanceflooringsystems.com
Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 ADVANCE ENTRY MAT SYSTEM

Location:	GF main entry points
Manufacturer:	Advance Flooring Systems
Matwell size:	1800W x 1000D (1700mmW @ D05)
Carpet range:	Mastertread
Carpet colour:	Sand SY11
Install type:	surface mounted
Matwell frame:	ALF3510 low profile
Matwell ramping:	ALR4010 low profile
Rail/grid finish:	dark bronze

Spares & maintenance products

4.2 SPARES & MAINTENANCE PRODUCTS

Refer to the general section 1270 CONSTRUCTION for details of how spares and maintenance products will be handled. Provide the following spares and maintenance products:

Item:	as recommended by supplier/installer
Quantity:	as recommended by supplier/installer
Location:	Refer to 1270 CONSTRUCTION

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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
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
NZBC H1/AS1-AS2	Energy Efficiency
AS 1432	Copper tubes for plumbing, gas fittings and drainage applications
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2345	Dezincification resistance of copper alloys
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.1	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) General
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2537.3	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) fitness for purpose of system
AS/NZS 2537.4	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) Guidance for the assessment of conformity
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe 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 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
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

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AS 4032.2	Water supply - Valves for the control of heated water supply temperatures - Tempering valves and end-of-line temperature actuated devices
AS/NZS 4129	Fittings for polyethylene (PE) pipes for pressure applications.
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4606.1	Storage water heaters. General requirements
NZS 4606.2	Storage water heaters. Specific requirements for water heaters with single shells.
NZS 4606.3	Storage water heaters. Specific requirements for water heaters with composite shells.
NZS 4607	Installation of thermal storage electric water heaters: valve vented Systems
NZS 4617	Tempering (3-port mixing) valves
AS 4809	Copper pipe and fittings. Installation and commissioning
AS 5200 part 053	Plumbing and drainage products, Stainless steel pipes and tubes for pressure applications.
AS/NZS 5601.1	Gas installations - general installations
AS/NZS 60335.2.35	Household and similar electrical appliances. Safety - Pat 2.35 Particular requirements for instantaneous water heaters

Gas (Safety and Measurement) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006

NZ Backflow Testing Standard:	NZ Backflow Testing Standard 2019, Field testing of backflow prevention devices and verification of air gaps

Warranties

1.3 WARRANTY

Provide warranty for:

2 years:	For the supply and installation of the plumbing system and fixtures

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

Requirements

1.4 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.5 PIPEWORK LAYOUTS

Sub trade to provide diagrammatic pipework layout prior to installation

1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

1.7 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.

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For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

Performance

1.8 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.

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 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.

2.4 DE-ZINCIFICATION RESISTANT WATER SUPPLY SYSTEM COMPONENTS

All copper alloy components to comply with G12/AS1 clause 2.2.3 and AS 2345.

2.5 WATER METER

To the requirements of the network utility operator.

2.6 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1.

2.7 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to AS/NZS 2845.1 where it is possible for water or contaminants to backflow into the potable water supply. Refer to NZBC G12/ AS1 3.4 Backflow protection, 3.5 Containment Backflow protection, table 2, Selection of Backflow Protection and table 2A Containment Backflow Protection.

2.8 TEMPERING VALVE

Tempering valve to NZS 4617 or AS 4032.2 to NZBC G12/AS1.

Materials - Hot water heating appliances

2.9 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.

Components

2.10 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

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3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/AS1 or AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3.

3.2 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing

3.10 JOINTING COPPER PIPE

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to NZBC G12/AS1 and AS 4809.

3.11 JOINTING 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 POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to NZBC G12/AS1 and AS/NZS 2033.

Application - Pipework installation

3.13 WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1.

3.14 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

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From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.15 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 9 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings.

Lag all pipes with rigid insulation to the manufacturer's requirements and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1.

3.16 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) to NZBC G12/AS1, 9.0.

3.17 IN-LINE FILTER

Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

3.18 PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Application - Hot water systems

3.19 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.

3.20 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.

3.21 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.

3.22 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.23 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

Installation - valves

3.24 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.

3.25 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.

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3.26 INSTALLING BACKFLOW PREVENTION DEVICE

Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or NZ Backflow Testing Standard.

Completion

3.27 LABEL

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.28 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.29 REPLACE

Replace damaged or marked elements.

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

Water main

4.1 POLYETHYLENE WATER MAIN

Size:	25mm outside diameter (i.e. DN 25 in AS/NZS 4130)

Pipework

4.2 COPPER PIPE

Nominal bore:	15mm
Wall thickness:	1.02mm

4.3 PVC-U PIPE

Manufacturer/Brand:	sub trade to select

4.4 POLYETHYLENE PIPE

Manufacturer/Brand:	sub trade to select
Size:	Nominal Bore / OD Size (mm)

4.5 ALTERNATIVE PIPE PRODUCT

Type:	Rehau Rautitan Pex

Hot water systems

4.6 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

Brand:	Rinnai
Model size:	90L

Valves and accessories

4.7 MAIN ISOLATING VALVE

Location:	to be verified on site
Brand/type:	Standard cast iron valve box & marked with 'V' to NZS4404

4.8 FLOOR/ZONE ISOLATING VALVES

Location:	to be verified on site
Brand/type:	Standard cast iron valve box & marked with 'V' to NZS4404

4.9 APPLIANCE ISOLATING VALVES - CONCEALED

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Appliance: to be advised by sub trade
Brand/type: to be advised by sub trade

4.10 TEMPERING VALVE

Location: to be advised by sub trade
Brand/type: to be advised by sub trade

4.11 BACKFLOW PREVENTION DEVICE

Location: refer to drawings
Brand/type: Watts Stainless Steel Double Check Valve Assembly Backflow Preventers - SS007

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7126RH RINNAI HOT WATER SYSTEMS

1 GENERAL

This section relates to the supply and installation of Rinnai New Zealand Limited hot water systems. It includes:

- Rinnai continuous flow gas water heating units
- Rinnai continuous flow electric water heaters
- Rinnai storage and electric water heaters
- Rinnai supplied storage and electric water heaters
- Rinnai hot water heat pumps.

1.1 RELATED WORK

Refer to the hot and cold water system section for pipe systems
Refer to 7211 GAS SYSTEM UTILITY NETWORK for piped gas supply
Refer to 7212 GAS SYSTEM LPG CYLINDERS for cylinder gas supply
Refer to 7554RS RINNAI SPACE HEATING SYSTEMS for space heating

Documents

1.2 DOCUMENTS

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

NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS/NZS 1596	Storage and handling of LP Gas
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
AS/NZS 5125.1	Heat pump water heaters - performance assessment - part 1: air source heat pump water heaters
AS/NZS 5149	Refrigerating systems and heat pumps - safety and environmental requirements - part 1: definitions, classification and selection criteria
AS/NZS 60335.1	Household and similar electrical appliances - Safety - Part 1: General requirements
NZS 4305	Energy efficiency - domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4607	Installation of thermal storage electric water heaters: valve vented systems
AS/NZS 5601.1	Gas installations Part 1: General installations

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).
Gas (Safety and Measurement) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to work in this section are:
Rinnai Operation and Installation Guides

Manufacturer/supplier contact details

Company:	Rinnai New Zealand Limited
Web:	www.rinnai.co.nz
Email:	info@rinnai.co.nz
Telephone:	0800 RINNAI (0800 746 624)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
refer to manufacturer for warranty information

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The manufacturer/supplier warranty period will depend on the type, model, parts, labour and application of the selected product. Refer to Rinnai New Zealand Limited for confirmation of appropriate warranty details.

- Provide this warranty on the Rinnai New Zealand Limited standard form.
- Commence the warranty from the date of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer warranty:
refer to installer for warranty information
The installer warranty period will depend on the type, model, parts, labour and application of the selected product. Refer to Rinnai New Zealand Limited for confirmation of appropriate warranty details.

- Provide this warranty on the installer standard form.
- Commence the warranty from the date of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 NO SUBSTITUTIONS

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

1.7 COMPLY

Comply with the Gas (Safety and Measurement) Regulations 2010, Electricity (Safety) Regulations 2010 and the network utility operator's requirements. Give notices for inspections and carry out tests as required.

1.8 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.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

1.10 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.

Performance

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1.11 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 manufacturer's specification.

2 PRODUCTS

Materials - hot water electric heating units

2.1 ELECTRIC HOT WATER STORAGE CYLINDER, MAINS PRESSURE

Rinnai vitreous enamel mains pressure hot water cylinder constructed from enamel inner and galvanized steel outer casing, complete with fittings, to NZS 4305. Refer to SELECTIONS for element sizes, configurations and thermostat options.

Hot water heat pumps

2.2 HYDRAHEAT INTEGRATED HOT WATER HEAT PUMP

Rinnai HydraHeat™, an integrated hot water heat pump made up of a heat pump unit installed on top of a mains pressure enamel storage cylinder, to AS/NZS 5149 and tested to AS/NZS 60335.1. Water temperature electronically preset by digital controllers. Refer to SELECTIONS.

2.3 ENVIROFLO INTEGRATED HOT WATER HEAT PUMP

Rinnai Enviroflo™, an integrated hot water heat pump on a 265 L mains pressure enamel storage cylinder, to AS/NZS 5149. Water temperature electronically preset by digital controllers. Refer to SELECTIONS.

3 EXECUTION

Installation - general

3.1 HANDLE AND STORE

Handle and store units, cylinders, 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 according to manufacturer's instructions.

3.2 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.

3.3 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.

3.4 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.

3.5 PIPE SIZE

Plumber to check and confirm adequate pipe size, incoming mains and meter on site as a part of the installation. Pipe sizing calculation to NZBC G12/AS1, table 4 Tempering valve and nominal pipe diameters or AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3.

Installation - general, hot water cylinders

3.6 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 AS/NZS 3500.4 as modified by NZBC G12/AS3 or to NZS 4607 for Valve-vented systems.

3.7 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

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Non-gas (electric, wet-back, solar etc.) water heating appliances 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.

3.8 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.9 INSTALL TEMPERING VALVE

Install one metre minimum from outlet of hot water cylinder and to manufacturer's instructions.

Installation - hot water heat pumps

3.10 INSTALL HOT WATER HEAT PUMP

Install hot water heat pump to the manufacturer’s installation requirements, to NZBC/AS1, 6.11, in a location that complies with AS/NZS 5149 with clearance around outdoor units for condenser air flow and maintenance access. For equipment at ground level, mount on 100mm high concrete plinth or equivalent impervious material. Where property damage can occur as a result of water leakage, install with a safe tray and drain to AS/NZS 3500.4.

Installation - hot water electric heating units

3.11 INSTALL ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

Install where shown complete with all the necessary fittings to Rinnai requirements and in accordance with NZBC G12/AS1: 6.11. Valve-vented systems to NZS 4607.

Completion

3.12 REPLACE

Replace damaged or marked elements.

3.13 LEAVE

Leave work to the standard required by following procedures.

3.14 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

Hot water heat pumps

4.1 RINNAI – HOT WATER HEAT PUMP

to be advised by manufacturer to suit situation

Electric hot water units

4.2 RINNAI ELECTRIC HOT WATER VITREOUS ENAMEL CYLINDER, MAINS PRESSURE

Location:	refer to drawings
Construction:	Vitreous enamel inner, corrosion resistant outer casing with polyurethane foam insulation
Brand:	Rinnai
Capacity/element /model:	90L, 3kW - ME090488E30
Thermostat range:	60° - 75°C

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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

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
refer to manufacturer for warranty information

- 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.

1.4 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.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 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.

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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.

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

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.

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.

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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 INSTALLATION TAPWARE

In accordance with the manufacturer's requirements. Maintain safe water temperatures to comply with NZBC G12/AS1, 6.14 Safe water temperatures.

3.8 EARTHING OR EQUIPOTENTIAL BONDING METALLIC FIXTURES

Before enclosing, ensure equipotential bonding is provided 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.

Completion & Commissioning

3.9 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.

4.1 TOILET

Location:	WC
Toilet pan:	Levivi York Comfort Rimless Toilet Suite - LEVYORKCOMF

4.2 ACCESSIBLE TOILET

Location:	Accessible bathroom
Toilet pan:	Levivi York Care Rimless Toilet Suite - LEVYORKCARE

4.3 BASIN

Location:	WC
Basin:	Waterware wall hung basin - WDHY8039
Basin taps/mixer:	Waterware Smartec sensor tap - GTPLUS1000BM

4.4 ACCESSIBLE BASIN

Location:	Accessible bathroom
Basin:	Caroma Liano Nexus wall basin - 665615W
Basin taps/mixer:	Waterware Smartec sensor tap - GTPLUS1000BM

4.5 KITCHEN SINK

Location:	Kichenette
Sink model:	Burns & Ferrall R15 bowl undermount
Mixer:	Waterware Rivet Straight Neck, brushed nickel - FWK03SNBN

4.6 SANITARY ACCESSORIES

Location:	WC, Accessible bathroom & Kitchenette
Roll holder:	Waterware single toilet roll holder - FW8089BS
Pull-out waste bin:	Hideaway Compact 2 x 20L, base mount handle pull white - KCF220SCH-W

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7382 FIRE STOPPING SYSTEMS

1 GENERAL

This section relates to fire rated service penetration systems and control joint fire stopping systems and includes:

- fire resistant barrier for seismic and other movement gaps
- formulated compound of incombustible fibres
- fire-stop composite sheets
- fire-stop collars, grilles and dampers
- fire-stop wraps and pillows
- fire-stop sealants and foams
- fire-stop mortars
- cavity construction intumescent barriers

Documents

1.1 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
BSEN 1366.4	Fire resistance tests for service installations. Linear joint seals
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS 1530.4:2005	Methods for fire tests on building materials, components and structures - Fire resistance test of elements of construction
AS 1668.1	The use of ventilation and airconditioning in buildings - Fire and smoke control in buildings
AS 4072.1	Components for the protection of openings in fire-resistant separating elements - Service penetrations and control joints
AS 1682.1	Fire dampers Specification
AS 1682.2	Fire dampers Installation
NZS 4520	Fire resistant doorsets
ASTM C1519 - 10	Standard Test Method for Evaluating Durability of Building Construction Sealants by Laboratory Accelerated Weathering Procedures

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
refer to manufacturer for warranty information.

- 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.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
refer to installer for warranty information.

- 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

1.4 QUALIFICATIONS

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

1.5 NO SUBSTITUTIONS

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

1.6 MANUFACTURERS INFORMATION

Submit type test certificates for each combination of fire stopping system, application, type of service, and substrate and penetration orientation. Include drawings of tested details.

- Submit report to AS 4072.1 appendix C.
- Submit evidence that systems specified without reference to brand conform to specified requirements.
- Submit copies of relevant manufacturers' instructions, for systems specified without reference to brand.
- Material data sheets (MSDS): Submit MSDS for systems specified without references to brand.
- Give notice if substrate or penetrations or both are not suitable for fire stopping.

1.7 LABELLING OF FIRE RATED SERVICES PENETRATIONS

All service penetrations to fire cells and fire separation systems are required to comply with all the designed fire integrity of the specified systems. Label all fire rated service penetrations to AS 4072.1 using the Certified Identification System provided by CID International Ltd.
Each fire stopping installation to have a permanently fixed tag or label containing the following information:

- Manufacturer's name
- Name and address of installer
- Date of installation

Refer to CID International Ltd at www.cidcert.com to record all service penetrations.

1.8 INSPECTIONS

Give sufficient notice so that inspections may be made of the following:

- Service penetrations completed and ready for fire stopping.
- Finish fire stopping, before being concealed.

Compliance information

1.9 FIRE STOPPING SYSTEM COMPLIANCE

To NZBC C/AS2, 2.3 **Fire resistance ratings**, NZBC C/AS2, 4.4 **Fire stopping**, and NZBC C/AS2, 4.5 **Fire cell construction** for interior elements, and NZBC C/AS2, 5.7.14 for exterior wall cavities.

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

1.11 CERTIFICATION

Submit evidence of compliance, to the recommendations of AS 4072.1 Appendix B.
Submit a certification document for installed fire stopping penetration and control joints.

- Form: To figure B1 of AS 4072.1

Schedule: Submit a schedule of installed fire stopped penetrations and control joints.

- Form: To figure B2 of AS 4072.1

2 PRODUCTS

Materials

2.1 FIRE COLLARS

Consists of intumescent material encased in a steel collar with fixing tabs, tested to AS 1530.4, and AS 4072.1. Refer to SELECTIONS for type.

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3 EXECUTION

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 manufactures requirements.
Reject and replace goods that are damaged or will not provide the required finish.

3.2 GENERAL PREPARATION

Fire stopping after services have been installed through penetrations and properly spaced and supported, after sleeving where appropriate, and after removal of temporary lines, but before restricting access to the penetrations, including before dry lining.

Supply ventilation for non-aqueous solvent-cured materials. Apply fire stopping material to uniform density. Finish surfaces to a uniform and level condition. Maintain cable separation. Protect adjacent surfaces from damage arising through installation of fire stopping.

Allow for thermal movement for the pipes and ducts. Reinforce or support fire stopping materials with non combustible materials when:

- The unsupported span of the fire stopping materials > 100mm.
- The fire stopping materials are non-rigid.

To large openings provide fire stopping capable of supporting the same loads as the surrounding element or provide similar structural support around the opening.

Fire collars

3.3 INSTALLATION OF FIRE COLLARS

Ensure substrate around pipe penetration is flat and free from obstructions.
Face fix fire collars with structural fixings to each exposed side of the fire rated plasterboard lined wall to solid in-wall blockings.

Face fix fire collars to only the underside of concrete floor penetrations using appropriate size masonry anchors.

Seal around pipes with acoustic fire rated sealant to provide smoke and acoustic seal.

Installation of penetrations through fire walls

3.4 INSTALLATION OF MULTI-CABLE TRANSITS

Encase and separate cables with fire rated sleeve system. Fill remaining space with the sleeves and seal with water repellent UV resistant fire sealant to a depth of 20mm each face. Hollow structures to have a metal cavity constraint system to constrain sealing product.

3.5 INSTALLATION OF CABLE TRAY PENETRATIONS

Separate cables from each other with appropriate size flame retardant rubber sheets. Fill remaining space with flame retardant rubber sheets. If gas and water tightness is required, seal with water repellent UV resistant fire sealant to a depth of 10mm to each exposed face of the sheets. Hollow structures to have a metal cavity constraint system to constrain sealing product.

3.6 INSTALLATION OF MULTI-MIX TRANSITS FOR CABLES AND PIPES

Sleeve cables and pipes with fitting intumescent sleeves Plastic pipes to be sleeved with crushing material. Fill remaining space with filler sleeves and seal with water repellent UV resistant fire sealant to a depth of 20mm each face. Hollow structures to have a metal cavity constraint system to constrain sealing product.

3.7 INSTALLATION OF CABLE, STEEL, COPPER AND PLASTIC PIPE PENETRATIONS

Fit fire resistant plugs to each end of the penetration. Plug to form a tight fit to pipes and cables and to wall of penetration.
Oversized holes or out of line conduit or pipes to be wrapped with intumescent (crushing for plastic pipe) material with excess space filled with fire retardant rubber and sealed with water repellent UV resistant fire sealant to a depth of 20mm.

Completion

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3.8 ROUTINE CLEANING

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

3.9 DEFECTIVE OR DAMAGED WORK

Repair damaged elements. Replace damaged where repair is not possible or will not be acceptable. Leave fire stopping system to the standard required for following trades.

4 SELECTIONS

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

Fire grilles, dampers, collars and wraps

4.1 FIRE COLLARS

Location:	as required where services penetrate through the floor structure, refer to mech and fire report.
Type/Brand:	to suit application, specific product to be advised by contractor/installer.
Note:	Contractor to provide PS3 upon completion to confirm compliance with building code.

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7411 RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to rainwater disposal systems including spouting and downpipes in:

- metal
- PVC

1.1 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

1.2 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

Warranties

1.3 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.

1.4 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
Form:	Installers standard warranty form

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

Requirements

1.5 QUALIFICATIONS

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

Performance

1.6 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.

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2 PRODUCTS

Materials - metal

2.1 DOWNPIPES

Complete with stand-off brackets, screw fixed. Refer to SELECTIONS for type.

Components

2.2 DROPPERS

Metal or uPVC droppers, compatible with spouting material and sized to fit inside the downpipe.

2.3 FASTENERS GENERALLY

Minimum Class 4 durability and not less than the roofing material being fixed.

2.4 RIVETS

Sealed aluminium, minimum diameter 4mm.

2.5 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 - metal

3.5 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.

3.6 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.

3.7 INSTALL RAINWATER HEADS

Install rainwater heads where required to NZMRM CoP, clause 5.8.1, **Rainwater Heads**.

3.8 INSTALL OUTLETS AND OVERFLOWS

Install outlets and overflows where required to NZMRM CoP, clauses 5.8.2, **Outlets and Overflows.**

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Completion

3.9 REPLACE

Replace damaged or marked elements.

3.10 LEAVE

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

3.11 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 DOWNPIPES

Brand:	to be advised
Profile/size:	varies, refer to drawings
Material:	Steel with Zincalume® coating
Thickness:	0.55mm
Coating system:	Prepainted Coloursteel
Colour:	to match ACP column cladding

4.2 DOWNPIPE BRACKETS

Type:	to suit
Material:	to match

Miscellaneous items

4.3 RAINWATER HEADS

Brand/type:	Custom made - to be advised
Material:	Steel with Zincalume® coating
Thickness:	0.55mm
Finish/colour:	to match downpipes and roofing

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7431 DRAINAGE COMMON REQUIREMENTS

1 GENERAL

This section relates to common requirements to do with the supply and laying of gravity subsoil, surface water and foul water drains.

1.1 RELATED WORK

Refer to 7441 GROUNDWATER DRAINAGE for subsoil drainage
Refer to 7451 SURFACE WATER DRAINAGE for storm/surface water 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 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
WorkSafe	Good Practice Guidelines - Excavation Safety

Plumbers, Gasfitters and Drainlayers Act 2006
Health and Safety at Work Act 2015
Health and Safety at Work (Hazardous Substances) Regulations 2017

Requirements

1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.4 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance manual information to requirements set out in the general section 1239 OPERATION & MAINTENANCE.

1.5 AS BUILT DOCUMENTS

Supply as-built drawings to requirements set out in the general section 1238 AS BUILT DOCUMENTATION.

Performance

1.6 SITE MEETING

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.

1.7 CHECK LOCATION

Check the location of existing on and off-site, private and public services with the network utility operator. Follow their requirements for safety and protection where laying drainage.

1.8 SITE CONDITIONS

Before starting work check on site the drainage layout, dimensions, levels and invert levels and ensure that line, level, falls and cover are correct.

1.9 ADJOINING PROPERTIES

Take precautions to protect adjoining property from damage or risk of damage arising from excavation and drainage work.

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1.10 SAFETY

To the Health and Safety at Work Act 2015.
Carry out excavation and trenching to WorkSafe, Good Practice Guidelines - Excavation Safety.
Prevent material rolling into trenches.

1.11 EXPLOSIVES

Do not use explosives except with the written approval of the territorial authority / WorkSafe.
Comply with their safety requirements and use construction blasters holding a current, appropriate Approved Handler Certificate and Controlled Substance Licence issued by WorkSafe, to the Health and Safety at Work (Hazardous Substances) Regulations 2017.

1.12 TESTS

Using the method agreed with the territorial authority inspector, test and inspect pipelines before backfilling to ensure required acceptance levels are achieved. Test again after backfilling to confirm acceptance levels and for final acceptance of the works.
Refer to RELATED WORK sections for specific requirements.

1.13 RECORDS

Records to be kept of all tests.

2 PRODUCTS

2.1 PRODUCTS

Refer to the RELATED WORK sections for products.

3 EXECUTION

Application

3.1 EXCAVATION

Open not more than 120 metres of trench at any one time. Excavated trench to a minimum width of pipe diameter plus 300mm. Do not batter or cut the trench wider above the top of the pipe.
For deep excavation, trench width to be sufficient to provide safe access and to accommodate shoring to WorkSafe, Good Practice Guidelines - Excavation Safety. Width of bottom of trench up to 300mm above top of pipe to be pipe diameter plus 300mm.
Maintain free of water and free of all falling material.

3.2 TEMPORARY BRIDGES

Provide temporary bridges over trenches to prevent heavy construction traffic damaging pipes after backfilling.

3.3 CLEAN

Clean and flush out the whole installation and remove all silt and debris before handing over.

Completion

3.4 REPLACE

Replace damaged or marked elements.

3.5 LEAVE

Leave work to the standard required by following procedures.

3.6 REMOVE

Remove debris, unused materials and elements from the site.

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7451AL ALLPROOF LEVEL THRESHOLD DRAINAGE SYSTEMS

1 GENERAL

This section relates to **Allproof Industries** level threshold drainage systems suitable for residential and commercial applications.
It comprises of an in-ground drainage channel complete with a range of grate options and fittings including connection to the network utility operators system.
It includes:

- Allproof Perimeter Drain
- Allproof Cantilever Bracket (CB) level threshold drainage system
- Allproof Cast-In Cantilever Bracket (CCB) level threshold drainage system
- Allproof Threaded Leg (TL) level threshold drainage system

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters
Refer to 7441 GROUNDWATER DRAINAGE for sub-soil drainage
Refer to 7461 FOUL WATER DRAINAGE for waste/foul water drainage

Documents

1.2 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC E2/AS1	External moisture
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
Plumbers, Gasfitters and Drainlayers Act 2006	

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Allproof Industries Level Threshold Brochure
Allproof Industries Level Threshold Technical Details
Allproof Industries Level Threshold Installation Details

Manufacturer/supplier contact details

Company:	**Allproof Industries**
Web:	www.allproof.co.nz
Email:	info@allproof.co.nz
Telephone:	09 481 8020

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Allproof Industries Level Threshold Drainage System components. For warranty conditions and details refer to Allproof Industries.

- Provide this warranty on Allproof Industries Ltd standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS

Drainlayers / contractors to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.6 ORDERING REQUIREMENTS

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Allow manufacturing / delivery lead time after on-site measurement for the following custom products:

- Allproof Cantilever Bracket (CB) System
- Allproof Cast-In Cantilever Bracket (CCB) System
- Allproof Threaded Leg (TL) level threshold drainage System

1.7 SITE CONFIRMATION

Meet with the territorial authority drainage inspector to confirm the drainage layout in relation to site conditions. Confirm changes resulting and seek written site instruction before carrying out any work.

1.8 SITE CONDITIONS

Before starting work check on site the drainage layout, dimensions, levels and invert levels and ensure that line, level, falls and cover are correct.

1.9 NO SUBSTITUTIONS

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

Performance

1.10 TECHNICAL APPLICATION

Refer to Allproof Industries for technical support on grate performance and engage a hydraulics engineer for hydraulic performance, run layout and scheduling, ponding analysis and information on the chemical resistance of the trench and grate materials.

1.11 COMPLIANCE WITH NZ BUILDING CODE

All work to comply with:

- NZBC E2/AS1: Level Threshold, 7.3.2.1 system materials and construction.
- NZBC E1/AS1: Surface water, 3.0 Drainage system materials and construction.

2 PRODUCTS

Materials - Allproof level threshold drainage systems

2.1 ALLPROOF PERIMETER DRAIN

Perimeter Drain level threshold drainage system, complies with NZBC E2/AS1, 7.3.2.1 **Concrete slab**, Figure 17B, a) iv), and is comprised of the following:

- L Shaped pre-cast polymer concrete channel 200mm wide x 195mm high (internal depth 180mm) with two standard and alternative grate options.

Refer to SELECTION for options.

3 EXECUTION

Conditions

3.1 GROUND CONDITIONS

Specific ground conditions or contaminated ground may require an increase in the concrete surround dimensions or the addition of reinforcement.

3.2 TEMPORARY INSTALLATION

Allproof Industries level threshold drainage channels are not trafficable until fully installed. During site work and after the trench run is laid, route site traffic away from the trench. If temporary crossings are required lay base course of minimum 1 metre wide either side of the trench for protection and install temporary protective cover or timber infill for support.

Installation

3.3 GENERAL

All work to NZBC E2/AS1: Level Threshold, 7.3.2.1 system materials and construction, AS/NZS 3500.3 as modified by NZBC E1/AS2 : and Allproof Industries Installation Details.

3.4 INSTALL ALLPROOF PERIMETER DRAIN

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Install Allproof Perimeter Drain in accordance with Allproof Industries Level Threshold Technical Details, and as follows:

- Set channel up against building line. Level channel and make any cuts that are required working from the centre outwards.
- Install grates or insert timber into channel. This will reduce any movement when pouring the concrete.
- Pour concrete.
- Lay screeding towards the outlet to create a 1:200 fall in accordance with NZBC E2/AS1, 7.3.2.1 Concrete slab, Figure 17B, a) iv).
- Install grates. Cut down grates and place into the bracket keeping a 12mm distance between the bracket and the building line.

Installation - connection

3.5 CONNECT TO SURFACE WATER DRAIN

Connect Allproof level threshold drainage system to stormwater drain to the requirements and satisfaction of the network utility operator.

3.6 CLEAN

Clean and flush out the whole installation and remove all silt and debris before handing over.

Completion

3.7 REPLACE

Replace damaged or marked elements.

3.8 LEAVE

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

3.9 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

Materials - Allproof level threshold drainage systems

4.1 ALLPROOF PERIMETER DRAIN

Location:	GF streetfront thresholds
Manufacturer:	Allproof Industries
Grate code:	PC180LGFN
Grate type:	1m length of perimeter drain with glass filled nylon grate
Grate width:	Adjustable up to 185mm on selected grates
Grate finish:	glass filled nylon
Threshold finish:	exposed aggregate
Load rating:	A - Pedestrian (330kg nominal wheel load)

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7702 ELECTRICAL STANDARD

1 GENERAL

This section relates to the wiring for complex/large residential and medium scale commercial/industrial installations, including:

- supply - national grid
- supply - electricity generation systems
- distribution & protection
- switches & sockets
- lighting circuits - residential
- light fittings
- exterior light fittings, switches, & sockets
- alarms - residential
- heating systems
- mechanical
- electrical automation system
- security system
- fire rated sealers and liners
- fire rated accessories

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AFDD	Arc Fault Detection Device
ELV	Extra Low Voltage
GLS	General Lighting Service
IP	International (ingress) Protection classification
NUO	Network Utility Operator
PCB	Printed Circuit Board
PIR	Passive InfraRed
RCBO	Residential current operated Circuit Breaker with Over-current protection
RCCB	Residential Current operated Circuit-Breakers with integral overcurrent protection for household and similar uses
RCD	Residual Current Device
SIA	Security Integration Architecture
TCF	Telecommunications Carriers' Forum
FFL	Finished Floor Level
TPS	Tough Plastic Sheathed

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC F6/AS1	Visibility in escape routes
NZBC F8/AS1	Signs
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2053.2	Conduits and fittings for electrical installations - Rigid plain conduits and fittings of insulated material
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

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AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3100	Approval and test specification-general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
AS/NZS 3190	Approval and test specification - Residual current devices (current-operated earth-leakage devices)
AS/NZS 3439.1	Low voltage switchgear and controlgear assemblies - Type-tested and partially type-tested assemblies
AS/NZS 3439.3	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
AS 3786	Smoke alarms using scattered light, transmitted light or ionization
NZS 4219	Seismic performance of engineering systems in buildings
NZS 4514	Interconnected smoke alarms for houses
NZS 4246	Energy efficiency - installing bulk thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 5139	Electrical installations - Safety of battery system for use with power conversion equipment
AS/NZS 60335.1	Household and similar electrical appliances - Safety - General requirements
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
AS/NZS 61439.1	Low-voltage switchgear and controlgear assemblies - Part 1: General rules.
AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61643	Low-voltage surge protective devices

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).
TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services

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

Warranties

1.3 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

1.4 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services 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. Pay all fees.

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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

1.6 CONFIRM SELECTIONS

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

1.7 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

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.

1.8 ELECTRICAL CERTIFICATE OF COMPLIANCE

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

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

1.9 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

1.10 PRODUCER STATEMENTS

Provide a 'producer statement - design' and 'producer statement - construction' to the satisfaction of the Building Consent Authority, for the complete electrical installation.

1.11 COMPLIANCE SCHEDULES

Provide compliance schedules for the installation to the satisfaction of the territorial authority, in accordance with the New Zealand Building Code requirements for the complete electrical installation.

Quality control and assurance

1.12 INSPECTIONS

refer to Council and consultant requirements	as required

2 PRODUCTS

Supply, distribution, and protection

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 CABLE LADDERS

Fabricated from galvanized steel and/or aluminium with rungs at 300mm centres and complete with ladder manufacturer standard bends, risers, curves and reducers and of sufficient strength for the envisaged cabling without deflection. Size 20% over width for designed cable loading including spaces between to avoid de-rating cables. Form fixing holes and slots before galvanizing. Allow for expansion joints where necessary.

2.3 HEAVY DUTY RIGID PVC CONDUIT

For underground wiring to AS/NZS 2053.2, with corrosion proof fittings and accessories, brand matched to the conduit manufacturer requirements.

2.4 RIGID PVC CONDUIT

High impact, cold setting medium duty to AS/NZS 2053.2, jointed together and to fittings with solvent cement to the conduit manufacturer requirements. Fittings and accessories brand matched to the conduit manufacturer requirements.

2.5 CABLES

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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).

2.6 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.
Refer to SELECTIONS

2.7 SWITCHBOARDS - GENERAL

General arrangement, door access, and signage to comply with AS/NZS 3000.

2.8 SWITCHBOARD - NON-RESIDENTIAL

To AS/NZS 3439.1 or AS/NZS 61439.1 and manufactured from heavy gauge steel with baked enamel finish in approved colour. Switchboards to have 20% spare capacity for future additions and alterations.

- Main switchboard: form 3
- Distribution boards: form 1

Fault rating graded to suit maximum prospective fault from network utility operator

- minimum 22kA, 1.0 seconds for main switchboards
- minimum 20kA, 0.1 seconds for distribution switchboards.

Complete, fully wired, factory tested of sizes to suit space allocated, designed to give easy access to and removal of component parts and constructed to contain equipment to the approval of the network utility operator and/or independently qualified person.

Design the installation for full discrimination between switchboards.

For emergency lighting provide test facilities to AS 2293.1.

Refer to SELECTIONS

2.9 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A minimum. Residual current protection 30mA, ensure RCD and RCCB meet Type A and comply with AS/NZS 3190. MCBs to 4.5kA domestic or 6kA for commercial.

2.10 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

Switches & sockets - interior

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2.11 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.

2.12 SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 Volt a.c. polycarbonate flushplate units.
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.

2.13 SWITCH PANELS

To accommodate switches to separate circuits and phases and flush mounted within a metal wall box with selected colour powder coated flush plate 2.5mm thick. Switches individually secured within a mounting plate behind the flush plate. Engrave the flush plate to indicate the use of each switch. Permanently label circuit numbers on back of plate.

2.14 SWITCHED SOCKET-OUTLETS - RESIDENTIAL

10 amp minimum, 230 Volt a.c., flat 3 pin socket outlets fitted with safety shutters to AS/NZS 3112 clause 3.12. Socket-outlet manufactured, tested, and approved to AS/NZS 3112, and AS/NZS 3100. Single or multi-gang as detailed.
For mounting height and orientation, refer to SELECTIONS.

2.15 SWITCHED SOCKET-OUTLETS - INDUSTRIAL/NON-RESIDENTIAL

Socket outlets manufactured, tested, and approved to AS/NZS 3123, and AS/NZS 3100.
For mounting height and orientation, refer to SELECTIONS.

2.16 SWITCHES AND SOCKET-OUTLETS - PERSONS WITH DISABILITIES

In addition to clause SWITCH UNITS and SWITCHED SOCKET OUTLETS, units shall comply with NZBC G9/AS1, clause 2.0.

Light fittings - interior

2.17 LIGHT FITTINGS

Fluorescent and High Intensity Discharge fittings with low loss control or electronic gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 240V rated, bayonet cap; Linear fluorescent triphosphor and CFL - 2700K (domestic) and 4,000K (commercial); halogen ELV 12V dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.

2.18 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.

2.19 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.20 RECESSED LIGHT FITTINGS - NON-RESIDENTIAL

Non-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 - NON-IC, Do-not Cover, CA 80, CA 90, CA 135, IC, IC-4, and IC-F.

Refer to clause INSULATION & GENERAL CLEARANCES for clearances from insulation and other elements.

2.21 EMERGENCY LIGHT FITTINGS

Emergency escape lighting and exit signs for buildings to AS 2293.3 and NZBC F8/AS1. Fittings may be, ceiling or wall mounted or recessed, refer to SELECTIONS.
Note: Photoluminescent exit signage requires adequate charging to NZBC F8/AS1, 4.5.4, for the required time to NZBC F6.

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Switches & sockets - exterior

2.22 SWITCHES & SOCKETS - EXTERIOR

Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. 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.

Light fittings - exterior

2.23 LIGHT FITTINGS - EXTERIOR

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

Alarms - residential

2.24 FIRE & SMOKE ALARM SYSTEM

Refer to SELECTIONS.

Heating systems

2.25 SPACE HEATERS

Fixed wired room heaters radiant or convector, and compliant with AS/NZS 60335.1. Flush or surface mount, fitted with safety cut-outs.

2.26 HEATED TOWEL RAILS

Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with AS/NZS 60335.1, scratch resistant powdercoated or chrome finish.

2.27 HAND DRYERS

Fixed wired hand dryers, wall mounted scratch resistant welded steel enclosure with baked polymer finish, infra red operation and high performance blower.

Mechanical

2.28 SUPPLY AND EXHAUST FANS

Ceiling, wall or duct mounted supply/exhaust fans for ventilation to NZBC G4/AS1, and compliant with AS/NZS 60335.1.

Fire rated sealers and liners

2.29 FIRE RATED SEALERS AND LINERS

Sealants, collars, wraps, expanding foam, mortars and liners, used to seal around pipe, conduit and sleeve penetrations through fire and acoustic walls and floors. Refer to appropriate fire stopping section for type.

Fire rated accessories

2.30 WALL BOXES AND SWITCH UNITS - FIRE RATED

Proprietary intumescent pad for plastic electrical sockets installed in plasterboard lined fire rated partitions providing an acoustic barrier and fire protection. Refer to SELECTIONS for type.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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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 CONNECTIONS TO ELECTRICAL EQUIPMENT

To AS/NZS 3000, Section 4.3, connections between installation wiring and electrical equipment must be as close as practicable, and protected against mechanical damage or interference. Electrical accessories to AS/NZS 3015, AS/NZS 3122, or AS/NZS 3199 are not permitted for connecting equipment wiring to installation wiring.

Installation

3.5 MAINS SUPPLY

Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.

3.6 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 fig 69. Arrange for meter installation and connection.

3.7 SWITCHBOARD

Location and installation to AS/NZS 3000 and board manufacturer requirements. Recess into wall, surface or floor mount plumb and level, with seismic restraints to NZS 4219. Ensure fire containment properties of the enclosure are maintained.

3.8 CIRCUIT PROTECTION

Install MCBs at switchboard to AS/NZS 3000 to protect each final sub circuit.

3.9 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

3.10 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.

3.11 MAIN EARTH

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

3.12 EARTH LEAKAGE PROTECTION

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Install RCD protection to AS/NZS 3000.

3.13 RCD - SPECIFIC INSTALLATIONS

Install fixed wired RCD protected outlets (SRCD) in the following higher risk areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

3.14 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.15 CABLING

Install wiring systems to AS/NZS 3000. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings run cabling attached to catenary wires.

3.16 CABLING CIRCUITS

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of, 8 light switch units or 8 amps, or 4 double or single switched socket-outlets, on any circuit. Minimum 2 lighting circuits per domestic floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits. Dedicated circuits for security systems, fire panels, data panels etc.

3.17 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.

3.18 SWITCHES AND SOCKET-OUTLETS

Fit all switch units and socket-outlets to the manufacturer requirements with heights and mounting directions as indicated in SELECTIONS.

3.19 SWITCHES AND SOCKET-OUTLETS - PERSON WITH DISABILITIES

Fit all switch units and socket-outlets to the manufacturer requirements with heights (& mounting direction) and location to NZBC G9/AS1 and SELECTIONS.

3.20 PERMANENTLY CONNECTED EQUIPMENT

Supply and set into position. Install an isolating switch of the correct current rating, weatherproof flush mounted in a metal wall box, flush plate or protected type surface mounted to suit the location, with conductors between conduit and equipment enclosed in PVC flexible conduit.

3.21 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

3.22 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer requirements. Fix fittings through lining into framing.

3.23 EXTRA-LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

3.24 INSULATION & GENERAL CLEARANCES

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

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

3.25 LIGHT FITTINGS TO INSULATION

Type of fitting	Minimum insulation clearance	Comments
Recessed, marked NON-IC, or unmarked	100mm (increase if over 100W)	To NZS 4246. NON-IC fittings and new or old unmarked & unknown fittings, and/or insulation. Insulation to be secured.
Recessed, CA 80, CA 90, or CA 135.	Abut fittings	To NZS 4246. Do not cover the fittings.
Recessed, IC, IC-F, or IC-4.	Abut & cover fittings.	To NZS 4246. Ensure insulation complies.
Recessed, marked Do-Not-Cover	Manufacturer clearances	To NZS 4246. Do not cover the fittings.
Independent control gear	Place on top of insulation & 50mm from fittings	To NZS 4246. If not on top allow 50mm clearance to insulation, do not cover. Includes, transformers, ballasts & drivers etc.
Surface fittings not exposed to insulation	Nil	To NZS 4246. Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.
Surface fittings & exposed insulation	200mm	To NZS 4246. This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Insulation to be secured.

3.26 RECESSED LIGHT FITTINGS TO COMBUSTIBLE BUILDING ELEMENTS

Type of recessed fitting	Minimum building element clearance**	Comments
Marked NON-IC, or unmarked, ≤100W	100mm, vertical & horizontal	To AS/NZS 3000:2018
Marked NON-IC, or unmarked, >100W	200mm, vertical & horizontal	To AS/NZS 3000:2007
CA 80, CA 90 or CA 135	100mm, vertical & horizontal	To AS/NZS 3000:2018

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IC, IC-F or IC-4	100mm, horizontal NA, vertical	To AS/NZS 3000:2018 To be NA vertical, fitting must be covered by insulation. If not covered use 100mm clearance.
Marked Do-Not-Cover	100mm, vertical & horizontal	To AS/NZS 3000:2018. Manufacturer clearances if greater than 100mm

**Combustible building elements exclude metal elements, but include timber framing or other timber based elements, and normal linings etc. Highly flammable materials & those likely to melt will need more clearance.

3.27 INBUILT RECESSED HOT APPLIANCES TO INSULATION

Appliance	Minimum insulation clearance	Comments
Electrical heaters	Manufacturer clearances	To NZS 4246.
Electrical heaters	100mm	Manufacturer clearances not known. To NZS 4246. Clearance may be able to be reduced with non-combustible insulation. Insulation to be secured.
Heat producing appliances & equipment	Manufacturer clearances	To NZS 4246.
Heat producing appliances & equipment	50mm	Manufacturers clearances not known. To NZS 4246. Clearance may be able to be reduced with non-combustible insulation. Insulation to be secured.

Note - Appliances and equipment excludes cables, junction boxes, light switches & power sockets etc

3.28 EXTRACTS, VENTS & ROOF UNDERLAY TO INSULATION

Appliance	Minimum insulation clearance	Comments
Ducted fan motors	50mm	To NZS 4246. Includes ducted rangehoods, extractors etc. Applies to the motor unit and electrical enclosures (not the ducts).
Ducted fan ducts	Abut	To NZS 4246. Excludes motor unit and electrical enclosures.
Unducted fan motors usually discharging to ceiling space	200mm	To NZS 4246. Includes unducted, rangehoods, extractors etc, discharging into roof space. To prevent debris falling into motor. Clearance may be able to be reduced, by providing a fixed barrier around the vent.
Roofing material/underlay	25mm	To NZS 4246. Maintain clearance from underside of roofing or flexible roofing underlay, to prevent wicking.

3.29 EMERGENCY LIGHTING

Emergency escape lighting and exit signs for buildings to AS 2293.1 and NZBC F6/AS1. Fit emergency light fittings to manufacturer specifications. Refer to plans for position of fittings.

3.30 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

Heated towel rails:	Install to manufacturer requirements and installed in accordance with AS/NZS 3000.
Mirror demisters:	Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
Exhaust fans:	Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.
Hair dryers:	Install to manufacturer requirements.
Hand dryers:	Install to manufacturer requirements.

3.31 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer recommendations:

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

Use the appropriate rated fittings for power control and power supply. Weather protected switches and sockets to IP56. 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. RCDs are recommended for visible awareness of protection.

Refer to SELECTIONS

3.32 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

3.33 SEISMIC RESTRAINT

Seismically restrain electrical service equipment, including recessed light fittings, switchboards, cabinets, machinery and racks to NZS 4219.

Fire rated sealers and liners

3.34 SEAL ALL PENETRATIONS

Seal all penetrations, including in and around conduits and sleeves, in accordance with manufacturer instructions. For fire and/or acoustic rated elements, maintain the rating with the seal systems.

3.35 PROVIDE CABLE SLEEVES

Provide PVC sleeves formed from pipe sections, unless fire and/or acoustic systems require sleeves for other building elements and/or different material for the sleeve.

Fire rated accessories

3.36 INSTALL WALL BOXES AND SWITCH UNITS - FIRE RATED

Install proprietary fire rated wall boxes and switch units in accordance with manufacturer instructions.

Completion & Commissioning

3.37 COMPLETION MATTERS

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

3.38 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

Certificate of Compliance:	To Electricity (Safety) Regulations 2010; Verification Records to AS/NZS 3000, clause 8.4.
Submit results to:	main contractor and client.

3.39 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

Certificate of Compliance:	To Electricity (Safety) Regulations 2010; Verification Records to AS/NZS 3000, clause 8.4.
Submit results to:	main contractor and client.

4 SELECTIONS

Materials

4.1 METER BOX

Location:	to be verified on site with electrician

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Brand / type:	Zinc plated powder coated metal box, colour to match cladding
IP and IK rating:	electrician to advise

4.2 SWITCHBOARD

Location:	refer to drawn documents
Brand / type:	DBF flush or DBS surface mount
MCB:	By Electrician
RCCB:	By Electrician
RCBO:	By Electrician
RCD	By Electrician
RCD-AFDD	By Electrician
AFDD	By Electrician
Surge protectors:	By Electrician
Modular contactors:	By Electrician
Main switch:	By Electrician
Timers:	By Electrician
Enclosure type:	By Electrician

4.3 FIRE & SMOKE ALARM SYSTEM

Refer to fire report

Fire rated sealers and liners

4.4 FIRE RATED SEALERS AND LINERS

Refer to fire report.

Switch & socket-outlets - fittings

4.5 SWITCHES & SOCKET-OUTLETS - INTERIOR

Item	Height to centre of unit	Orientation	Location
Switch	1000mm above FFL	vertical	Refer to drawings
Switch narrow	1000mm above FFL	vertical	Refer to drawings
Socket outlet	400mm above FFL	horizontal	Refer to drawings
Socket outlet	150mm above bench top	horizontal	Refer to drawings

Item	Brand / type
Switch / socket outlets:	PDL Iconic (office outlets to have USB integrated)
Coverplate colour:	white
Switch module colour:	white

Item	Brand / type
Light dimmers:	to be verified by client
Timer switch:	to be verified by client
Push button switch:	to be verified by client
Symbol switch:	to be verified by client
PIR sensor switch:	to be verified by client
Toggle switch:	to be verified by client

Item - RCD	Brand / type
Socket outlet:	PDL Iconic

4.6 SWITCHES & SOCKET-OUTLETS - INTERIOR (PERSONS WITH DISABILITIES)

In addition to clause INTERIOR OUTLETS, unit set out shall comply with NZBC G9/AS1, 2.0.1. Switches and door handles to align.

Item	Height to centre of unit	Orientation	Location
Switch	1000mm above FFL	vertical	Refer to drawings
Switch narrow	1000mm above FFL	vertical	Refer to drawings

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Socket outlet	600mm above FFL	horizontal	Refer to drawings
Socket outlet	150mm above bench top	horizontal	Refer to drawings

Item:	Brand / Type
Switch / socket outlets:	PDL Iconic
Coverplate colour:	white
Switch module colour:	white

Note:

- Light switches to be horizontally aligned with door handles.
- Bedrooms to have at least one light switched from bedside.
- Socket outlets shall be at least 500mm from internal corners.

4.7 SWITCHES & SOCKET-OUTLETS - INTERIOR (DAMP/WET CONDITIONS)

Interior damp/wet conditions - heights of units with restrictions subject to exclusion zones and/or protected unit/equipment, to AS/NZS 3000, 6.0 Damp Situations.

Item	Height to centre of unit	Orientation
Switch	1000 mm above FFL	vertical
Socket outlet	400 mm above FFL	horizontal
Socket outlet	150 mm above bench top	horizontal

Item:	Brand / type / protection:
Switch / socket outlets:	PDL Iconic
Coverplate colour:	white
Switch module colour:	white

Item:	Brand / type / protection:
Light dimmers:	to be verified by client
Timer switch:	to be verified by client
Push button switch:	to be verified by client
Symbol switch:	to be verified by client
PIR sensor switch:	to be verified by client

Item - RCD:	Brand / type / protection:
Socket outlet:	PDL Iconic

4.8 LIGHT FITTINGS - INTERIOR

Fittings	Brand / type	Controls
Pendant lights:	TBD	to suit application
Ceiling lights:	TBD	to suit application
Recessed ceiling lights:	Switch SLDL221F prismatic 55o lens, white	to suit application
Recessed offset ceiling lights:	Switch SLDL351T prismatic 40o lens, white	to suit application
Surface mount ceiling lights:	TBD	to suit application
Wall lights:	TBD	to suit application
Strip lights:	LS114WW24 with LEDCHAN110OL	to suit application
Emergency lights:	refer to emergency lighting documents	to suit application

4.9 SWITCHES AND SOCKET-OUTLETS - EXTERIOR

Item	Brand / type / protection	Height (centre of unit)
Weatherproof socket outlets:	single PDL 56 Series flat pin 15amp switched outlet IP66	500mm

4.10 LIGHT FITTINGS - EXTERIOR

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Fitting	Brand / type / protection	Controls
Wall lights:	TBD	to suit application
Soffit lights:	Switch Zela Decor SLDL280F, 30o, clear glass, bronze	to suit application
Surface mounted Ceiling:	TBD	to suit application
Security sensor lights:	TBD	to suit application

4.11 MISCELLANEOUS ITEMS

Item	Brand / type
Extractor fan:	refer to mechanical engineers docs
Air supply:	refer to mechanical engineers docs

4.12 MIRROR DE-MISTERS

Location:	Brand:	Size:	Wattage:
bathroom mirrors	to be advised	to suit	to suit

4.13 BATHROOM FANS AND HEATERS

Location:	Brand / type
Bathroom Extract	refer to mechanical engineers docs