SPECIFICATION

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

Korokoro School Reroof

(project name)

79 Korokoro Road
Korokoro

(project address)

Korokoro Board of Trustees

(owner's name)

BUILDING CONSENT and CONSTRUCTION ISSUE
Revision -

Job number:	16014
Date:	October 2016

RESOLVE iT ARCHITECTS

1012 TABLE OF CONTENTS

Appendicies

1220 PROJECT

1. GENERAL

This general section describes the project including:
- A description of the work
- 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.

Description of the work

1.2 SCOPE OF THE WORK
Reroof of main school buildings as indicated on drawings

1.3 NO RESTRICTED BUILDING WORK
This project does not include Restricted Building Work.

Site

1.5 SITE
as shown on drawing no. R1551/000

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

1.7 EXISTING BUILDINGS
Existing buildings consist of:
Refer to drawing(s) no(s): Location plan 16014/000

Site environment - Wind

1.10 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN
The design wind pressures are to NZS 3604, Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.
Building wind zone Very High (refer to NZS 3604, table 5.4)

Site environment - Durability

1.11 EXPOSURE ZONE
The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.
The site zone is: D

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: 3

1222 PROJECT PERSONNEL

1. GENERAL

This general section provides a list of the parties who are involved with the project. Communications to these personnel are to be sent to them at the address as listed. Refer to the construction contract for:
- the roles that they have under the contract; and
- address details for notices being given under the contract.

Principal

1.1 PRINCIPAL

Name:	Korokoro School Board of Trustees
Postal:	c/o IR Group Ltd
Represented by:	Martin Hookhan
Email:	principal@korokoro.school.nz

Contractor

1.2 COMPANY

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

Consultants

1.5 CONTRACT ADMINISTRATOR

Practice:	IR Group Ltd
Postal:	PO Box 40-65, Upper Hutt 5140
Street:	716 Main Road North, Upper Hutt 5018
Telephone:	04 526 7711
Represented by:	Ian Rattray
Mobile:	021 427 347
Email:	ian@irgroup.co.nz

1.6 ARCHITECT

Practice:	Resolve It Architects
Postal:	PO Box 9792, Wellington
Street:	171 Vivian St
Telephone:	04 972 7066
Represented by:	Mark Ansell
Mobile:	021 479 706
Email:	marka@resolveitarchitects.co.nz

Territorial Authority

1.7 BUILDING CONSENT AUTHORITY

Name:	Hutt City Council
Postal:	Private Bag 31-912, Lower Hutt 5040
Street:	30 Laings Road, Lower Hutt 5040
Telephone:	04 570 6666

1231 CONTRACT

1. GENERAL

This GENERAL section refers to contract related matters.

1232 INTERPRETATION & DEFINITIONS

1. GENERAL

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

Definitions

1.1 DEFINITIONS

Required:	Required by the documents, the New Zealand Building Code or by a statutory authority.
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.
Review:	Review by the contract administrator 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

Owner:	The person defined as "owner" in the New Zealand Building Code.
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
BRANZ	Building Research Association of New Zealand
BS	British Standard
COP	Code of practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HERA	Heavy Engineering Research Association
LBP	Licensed Building Practitioner
MBIE	Ministry of Business, Innovation and Employment
MPNZA	Master Painters New Zealand Association Inc
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NZTA	New Zealand Transport Agency
NUO	Network Utility Operator

PCBU	Person Conducting a Business or Undertaking (under Health and Safety at Work Act 2015)
OSH	Occupational Safety and Health
TA	Territorial Authority
TNZ	Transit New Zealand(Transit New Zealand is now New Zealand Transport Agency NZTA - some specifications are still prefixed TNZ)
RBW	Restricted Building Work
SARNZ	Scaffolding and Rigging New Zealand Inc
SED	Specific Engineering Design

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.

1233 REFERENCED DOCUMENTS

1. GENERAL

1.1 REFERENCED DOCUMENTS

Throughout this specification, reference is made to various New Zealand Building Code Compliance Documents (NZBC __), acceptable solutions (__ AS_) and verification methods (__ VM_) for criteria and/or methods used to establish compliance with the New Zealand Building Code.

Reference is also made to various standards produced by Standards New Zealand (NZS, AS/NZS, NZS/AS), overseas standards and to listed Acts, Regulations and various industry codes of practice and practice guides. The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise.

It is the responsibility of the contractor to be familiar with the materials and expert in the techniques quoted in these publications.

Documents cited both directly and within other cited publications are deemed to form part of this specification. However, this specification takes precedence in the event of it being at variance with the cited documents.

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

NZBC F4/AS1	Safety from falling
NZBC F5/AS1	Construction and demolition hazards
AS/NZS 1170.2	Structural design actions - Wind loads
AS/NZS 3012	Electrical installations - Construction and demolition sites
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3404:1997	Steel structures standard
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 6803	Acoustics - Construction Noise
Building Act 2004	
Building Regulations 1992	
Health and Safety at Work Act 2015	
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016	
Health and Safety in Employment Regulations 1995 (reprint 4 April 2016)	
New Zealand Building Code	
Heritage New Zealand Pouhere Taonga Act 2014	
Resource Management Act 1991	
Smoke-free Environments Act 1990	
WorkSafe NZ	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe NZ	Good Practice Guidelines - Excavation Safety
SARNZ	Best practice guideline for scaffolding in New Zealand

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

Building Consent Authority documentation

1.1 BUILDING CONSENT
Obtain the building consent forms and documents from the owner and keep them on site. Liaise with the BCA 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.

1.4 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.

Compliance information

1.5 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 - Construction from the applicator / installer
- Producer Statement - 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.

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

Where specifically stated in a section, substitutions are not permitted to any of the specified systems, components and associated products listed in that section.

1.8 PROPOSED SUBSTITUTIONS

A substitution may be proposed where specified products are not reasonably available. A substitution may also be proposed by the contractor where the contractor considers a proposed substitution to be an alternative to the specified product. Except where a specified product is not available, the contract administrator is not bound to accept any substitutions. Where branded work sections are included in this specification, substitution of those products or systems will not be allowed.

1.9 NOTIFICATION OF SUBSTITUTIONS

Notify 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

The Contract administrator must advise of acceptance of substitutions in writing.

Variations to issued Building Consent

1.11 CONTRACTOR VARIATION 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 variation.
- Pay all fees and other costs associated with this amendment.

- Where the amendment affects other approved plans, also amend those plans.

1.12 PRINCIPALS VARIATION TO BUILDING CONSENT

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

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

Manufacturer's documents

1.13 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

Manufacturers and supplier's requirements, instructions, specifications or details means those issued by them for their particular material, product 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 WORK SECTIONS

Branded sections may be included in this specification relating to specific products and systems to be installed as part of the contract works. Where branded sections are included, substitutions to the branded products and systems will not be allowed.

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.

1237 WARRANTIES

1. GENERAL

This general section refers to the requirements for warranties/guarantees as listed in this section, as referred to within the body of this specification, and as referred to within separate specifications/documents relating to this project. 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.

Warranties

1.1 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.

1.2 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.

1.3 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

1.4 REVIEW BY CONTRACTOR
Obtain the warranties from the installers, applicators, manufacturers and suppliers at the earliest possible date and review to ensure that they are correctly filled out and executed. Where

warranties are executed as a deed, ensure that a duplicate copy is provided for execution by the owner/principal. Keep safe and secure until required for submission.

1.5 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.

1.6 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)"

1.7 WARRANTIES - SUBMISSION NZS3910:2013 CONTRACT
Refer to NZS 3910 Conditions of Contract for building and civil engineering construction, clauses 11.5 and 11.6 for requirements relating to the time for submission of warranties and guarantees. Submit all warranties/guarantees to the engineer no later than the date that the contractor notifies that it believes the contract works qualify for practical completion.

2. SELECTIONS

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.

3. SCHEDULES

Schedule of work section warranties

3.1 SCHEDULE OF WORK SECTION WARRANTIES
Refer to the following sections :

Schedule of additional items

3.2 SCHEDULE OF ADDITIONAL ITEMS
The following documents have warranty and guarantee requirements, refer to these documents for details:
~

1237WA WARRANTY AGREEMENT

1. WARRANTY AGREEMENT

Contract for: Korokoro School reroof
(the contract works)

Contractor: ~
(the contractor)

Principal: Korokoro School Board of Trustees
(the principal)

Warrantor: ~
(name of contractor, subcontractor or materials supplier)

Warranted works: ~
(the warranted works)

Warranted materials: ~
(the warranted materials)

Warranty period: ~ years from the date of practical completion of the contract works.

The principal has entered into a contract (the contract) with the contractor for carrying out the contract works. The warranted works / materials are part of the contract works.

The contractor has agreed to arrange for the provision of a warranty in respect of the warranted works / materials for the warranty period on the terms set out in this warranty.

The warrantor has agreed to provide a warranty in respect of the warranted works / materials for the warranty period on the terms set out in this warranty.

2. IT IS HEREBY AGREED

The warrantor warrants to the principal that the warranted work performed /materials supplied shall be as required in the contract. If not specified the work shall be of good trade practice with materials and fittings of merchantable quality.

This warranty shall be in addition to and shall not derogate from any manufacturer's warranty or any warranty implied by law, attaching to any part of the warranted works.

2.1 WARRANTOR'S OBLIGATIONS
The warrantor agrees that if the warrantor is advised by the principal in writing of any defect in the warranted works / materials within the warranty period for which the warrantor is liable under the terms of this warranty, the warrantor will promptly take steps to remedy the defect / replace defective materials.

2.2 REMEDIAL WORK / REPLACEMENT OF DEFECTIVE MATERIALS
Any remedial work / replacement of defective materials which the warrantor is liable to undertake / provide under this warranty shall be carried out:
- to the standard required by the contract; and
- in a prompt and timely manner; and
- without unnecessary inconvenience to any occupants; and
- at the warrantor's cost; and
- subject to reasonable access being provided to the warrantor for the purpose of carrying out the remedial work.

2.3 REPAIR, REPLACEMENT AND/OR COMPENSATION

Where the cost of replacement of work and/or materials is out of all proportion to the consequences of the defect, or where the defect may not be reasonably capable of rectification without substantial expense which is out of all proportion to the cost of the contract works, the warrantor may:

- where the defect or defective material is reasonably rectified by repair rather than by replacement, the warrantor's obligation under this warranty shall be only to repair or otherwise make good the defect or
- propose reasonable monetary compensation in lieu of remedying the defect or
- propose a combination of both repair and compensation.

The principal must consider the warrantor's reasonable proposals and the parties must endeavour in good faith to reach agreement. Where agreement cannot be reached the dispute shall be resolved in accordance with the disputes clause in this warranty.

2.4 FAILURE BY WARRANTOR TO PERFORM REMEDIAL WORK

If the warrantor fails to promptly, adequately and satisfactorily carry out the remedial work or to propose acceptable repair/compensation, the principal may then arrange for the remedial work to be carried out by others.

If the warrantor fails to promptly, adequately and satisfactorily provide replacement materials or to propose acceptable repair/compensation, the principal may then arrange for the replacement materials to be supplied by others.

The principal must first give the warrantor 10 working days notice to carry out and complete the remedial work / supply replacement materials. If the warrantor does not complete this work / supply replacement materials within the time, the principal must then advise the warrantor in writing that the work will be carried out / materials will be supplied by others.

In such event the warrantor is not released from obligations under this warranty, which continues in full force and effect, except in respect of the defect remedied / materials supplied by the principal or by another person contracted by the principal. The reasonable cost of the remedial work carried out / materials supplied by such other persons including all reasonable costs of the principal is to be paid to the principal by the warrantor on demand.

2.5 EXCLUSIONS

The principal agrees that the warrantor is not liable for any defect or damage caused by:

- wilful act or negligence of the principal or any person other than the warrantor; or
- fire, explosion, earthquake, war, subsidence, slips, faulty materials or workmanship other than caused by the defect in the warranted work; or
- any force of nature which the warrantor could not reasonably foresee; or
- any neglect or unnecessary delay by the principal in giving notice to the warrantor of a defect in the warranted works becoming apparent; or
- design faults, errors or discrepancies, unless the warrantor undertook the design of the part of the warranted works the subject of the defect; or
- unintended use of the warranted works by the principal or any occupant thereof; or
- failure by the principal or any occupant thereof to maintain the warranted works in accordance with good practice and any manufacturer's stated or recommended instructions or requirements.

2.6 ASSIGNMENT

The principal may assign the benefit of this warranty to any person.

2.7 DISPUTES

Any dispute or difference between the principal and the warrantor arising out of or in connection with this warranty, or the subject matter of this warranty, including any question about its existence or validity, will be referred to arbitration by a sole arbitrator to be agreed upon by the parties. If the parties are unable to agree upon the identity of an arbitrator within 10 working days from the date upon which notice of the dispute is given, then the arbitrator will be

appointed by the Registrar of the Building Disputes Tribunal (NZ) Ltd upon the application of either party.

2.8 NOTICES

Notices given to the warrantor are deemed to have been effectively served on the warrantor if given in accordance with the contract.

3. EXECUTED BY

Signed by the warrantor: ……..

on this: …….day of ……20……
(day) (month) (year)

(And where required to be executed as a deed) signed in the presence of:

Witness signature ……..

Name: ……..
(print)
Address: ……..
(print)
Occupation: ……..
(print)

Signed by the principal: ……..

on this: …….day of ……20……
(day) (month) (year)

(And where required to be executed as a deed) signed in the presence of:

Witness signature ……..

Name: ……..
(print)
Address: ……..
(print)
Occupation: ……..
(print)

NOTE - Where the warrantor is not the contractor the warranty agreement must be executed by the warrantor and the principal in the manner required for execution of a deed.

Any of these parties which are a company must execute the warranty by having it signed, under the name of the company, by two or more directors. If there is only one director, it is sufficient if the warranty agreement is signed under the name of the company by that director, but the signature must be witnessed by another person. The witness must not only sign but must also add his or her occupation and address. Alternatively, companies may execute under power of attorney. Any party which is a body corporate (other than a company) must execute by affixing its seal, which must be attested in the manner provided for in the rules of, or applicable to, the body corporate.

In the case of a party who is an individual, the party must sign and the signature must be witnessed by another person. The witness must not only sign but must also add his or her occupation and address.

1238 AS BUILT DOCUMENTATION

1. GENERAL

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

1.1 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.

1.2 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.

1.3 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.

1.4 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.

1.5 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

2. SCHEDULES

Schedule of as built documents

2.1 SCHEDULE OF AS BUILT DOCUMENTS
Refer to the following sections :

Schedule of additional items

2.2 SCHEDULE OF ADDITIONAL ITEMS
The following documents have as built requirements, refer to these documents for details:
~

1239 OPERATION & MAINTENANCE

1. GENERAL

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

Operation and maintenance documents

1.1 OPERATION AND MAINTENANCE INFORMATION

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

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

1.2 MAINTENANCE REQUIREMENTS

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

- Details of suggested building washing programme.
- Details of suggested re-painting programme.
- Overflow relief gully location and means of keeping charged.

1.3 EQUIPMENT AND APPLIANCE MANUALS AND OPERATING INSTRUCTIONS

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

1.4 SELECTIONS INFORMATION

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

- Light fitting type and supplier details.
- Aluminium joinery system and finish.
- Paint type and colours used.

Include brochures and other information included with the items supplied.

1.5 SELECTIONS INFORMATION - SUBSTITUTIONS

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

Documentation format

1.6 O&M DOCUMENTATION FORMAT

Unless otherwise specified in a work section,

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

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

Submission and review

1.7 O&M DOCUMENTATION SUBMISSION & REVIEW

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

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

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

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

The reviewer may advise that:

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

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

Final documentation

1.8 SUBMISSION OF FINAL DOCUMENTATION

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

1.9 FINAL O&M DOCUMENTATION - HARDCOPY

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

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

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

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

1.10 FINAL O&M INFORMATION - ELECTRONIC COPY
Provide a copy of all hardcopy information in PDF format arranged in logical named folders. In addition provide DWG files of documentation if available.

1.11 REVIEW OF FINAL DOCUMENTATION
The contract administrator may review the final documentation and require alteration and resubmission.

2. SELECTIONS

O&M Documentation

2.1 FINAL DOCUMENTATION - INFORMATION FOR OPERATION AND MAINTENANCE
Provide a complete electronic copy to the contract administrator.

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

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

2.2 FINAL DOCUMENTATION - OPERATION AND MAINTENANCE MANUALS
Provide a complete electronic copy to the contract administrator.

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

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

3. SCHEDULES

Schedule of information for operation and maintenance

3.1 SCHEDULE OF INFORMATION FOR OPERATION AND MAINTENANCE
Refer to the following sections :

1240 ESTABLISHMENT

1. GENERAL

This general section relates to site establishment including:
- Notices and approvals
- Inspections
- Site preparation
- Signage

Notices and approvals

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

Inspections

1.4 CARRY OUT INSPECTIONS
~

Site preparation

1.5 SITE ACCESS
Access to the site is limited to: Korokoro road gated entrances

1.6 WORKING AREA
Limited to the following designated working areas on the site:
to be agreed

Existing buildings

1.8 ALTERATIONS
Control access and working areas within existing buildings. Liaise with building owner to establish site limitations.

1.9 TEMPORARY ACCESS
Liaise with the building owner to arrange access to areas of the existing building which are not normally part of the contract.

Signage

1.10 SITE SIGN
Obtain approval for, provide and erect a timber framed sign board ~mm x ~mm fully painted and displaying:
- Title of contract
- Principal's name
- Contractor's name
- Consultants as listed in general section 1222 PROJECT PERSONNEL
- If the contractor wishes, names of contractor and subcontractors.

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 and shoring
- General care and protection

Temporary works

1.1 COMPLY WITH NEW ZEALAND BUILDING CODE
Refer to New Zealand Building Code clauses and approved document paragraphs for the criteria and/or methods that must be used in this section to establish compliance with the code.

1.2 COSTS RELATING TO TEMPORARY WORKS
Pay all rates/fees in respect of temporary works.

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

1.4 SAFEGUARD THE SITE, THE WORKS AND MATERIALS
Take all 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.

1.5 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

1.7 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

Temporary works - Existing Buildings

1.10 OCCUPIED BUILDINGS
Buildings which remain occupied during the construction must have temporary works agreed with the occupier/owner in advance.

Temporary services

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

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

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

Scaffolding and shoring

1.16 GENERAL SCAFFOLDING
Provide as necessary general scaffolding for the efficient execution of the works. Placement, erection and structure to be by certified suppliers/erectors and approved by the WorkSafe NZ inspectors before being used. Comply with the SARNZ publication: "Best practice guideline for scaffolding in New Zealand."

Care and protection

1.17 PROTECT EXISTING BUILDINGS
Protect existing buildings and other designated features which are to remain in position during the execution of the works.

1.18 PROTECT ACCESS ROUTES
Protect access routes through the building and areas adjacent to the work area that are to remain in place. These include lifts and stairs. Comply with all fire egress requirements at all times.

1.19 MAKE GOOD EXISTING SERVICES
Make good all damage to existing roads, footpaths, grounds, sewers or other services, caused in carrying out the contract works.

1.20 EXISTING FIRE SYSTEMS
Maintain the integrity of the systems at all times. If work requires de-activation of a system, give notice to the ~ fire service
Follow their instructions and reinstate the system to their requirements.

1.22 TEMPORARY STORAGE
Provide temporary storage areas and protective covers and screens. Fillet stack and protect all framing and structural members from moisture and contamination. Completely protect finishing materials from the weather and damage and store in accordance with the manufacturer's requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers' requirements.

1.24 PERIODIC SITE CLEANING
Carry out periodic site cleaning during the contract period. Place waste material in appropriate storage pending removal from the site.

1.26 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. Keep food waste separate from construction waste.

1260 PROJECT MANAGEMENT

1. GENERAL

This general section relates to project management requirements including:
- Meetings
- Cost control
- Communicating and recording
- Programming
- Health and safety

Site Meetings

1.1 SITE MEETINGS
Meetings to normally be held: Fortnightly

The following persons to attend:
- Principal
- Contract administrator
- Contractor
- Architect
- Subcontractors when needed (contractor to inform them).

Meeting place:	tbc
Time:	tbc
Day:	tbc

1.2 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
- General business
- Site health and safety
- Payment claim processing including costing variations

Communicating and recording

1.3 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

1.4 DELIVERY OF COMMUNICATIONS
Communications must be: -
- delivered to the addressee by hand; or
- posted to the postal address stated in the Project Directory; or
- delivered to the street address as stated in the Project Directory; or
- sent by email to the email address stated in the Project Directory; or

The Principal, Contractor and the Contract administrator must notify the others if they change their address for delivery or transmission of communications.

1.5 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.

Programming

1.6 CONTRACT 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
Architect	1
Owner	1

Monitor the contract 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.

Health and safety

1.7 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, each separate contractor named in the contract documents in relation to the Contract Works, 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.

1.8 HEALTH AND SAFETY REGULATIONS, CODES AND GUIDES

Comply with:

- 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.
- WorkSafe NZ 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.

1.9 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.

1.10 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.

1.11 SITE SAFETY PERSON

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

1.12 HEALTH AND SAFETY PLAN

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

- identification of existing and potential construction hazards and risks
- if required in section 1220 PROJECT, any items listed in the Design Construction Safety Report or under the clause Design Construction Safety Matters
- 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 contract administrator of unusual or atypical features in the Plan (exclude any features already identified in the design construction safety report or design construction safety matters (if they are required in 1220 PROJECT).

Keep a copy of the plan in the site office

1.13 MAINTAIN HEALTH AND SAFETY PLAN

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

1.14 COMPLY WITH SITE SAFETY PLAN

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

1.15 INFORM WORKERS OF HAZARDS AND RISKS

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.

1.16 EXPLOSIVES

Do not use explosives except with the written approval of the territorial authority/WorkSafe NZ. Comply with their safety requirements and use construction blasters holding a current certificate of competence issued under the Health and Safety in Employment Regulations 1995.

1.17 POWDER-ACTUATED FASTENING TOOLS

Powder-actuated fastening tools to be used only by workers holding current certificates of competence in their name, issued under the requirements of the Health and Safety in Employment Regulations 1995.

1.18 SMOKE FREE REQUIREMENTS

Do not smoke on site except in a designated location, in accordance with the Smoke Free Environments Act 1990. This location to be determined by the contractor with the agreement of the contract administrator.

1.19 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.

1270 CONSTRUCTION

1. GENERAL

This GENERAL section relates to common requirements for construction issues including: -
- Quality assurance
- Noise and nuisance
- Set out
- Common execution requirements
- Common materials requirements
- Supply of spare materials
- Common requirements for samples and tests
- Final presentation and cleaning
- Commissioning

Quality control and assurance

1.1 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.

Noise and nuisance

1.2 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 clause 11.

1.3 ACCEPTABLE NOISE LEVELS

Refer to NZS 6803 Tables 2 and NZS 6803, tables 3 for the upper limits of construction work noise in residential and industrial areas over the various time periods, particularly 0730 to 1800 hours. Note also the allowed adjustments and exemptions in NZS 6803, 6. Do not exceed these limits.

1.4 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, tables 2 and NZS 6803, tables 3, cease the noise generating operation and remedy the problem.

1.6 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.

1.7 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.

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

Set-out and tolerances

1.9 USE OF SET-OUT INSTRUMENTS
Permit without charge, the use of instruments already on site for checking, setting out and levels.

1.10 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.

1.11 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:

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

1.12 EXAMINE PREVIOUS WORK
Before commencing any part of the work carefully examine the previous work on which it may depend. Report in writing to the contract administrator defects that may affect the quality of the proposed work and obtain instructions. Commencing work on any part means that previous work is accepted as being satisfactory for work of the required standard.

1.13 WORKER QUALIFICATIONS
All work to be level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

Materials

1.14 NEW PRODUCTS AND MATERIALS
Materials and products to be new unless stated otherwise, of the specified standard, and complying with all cited documents.

1.15 COMPATIBILITY OF MATERIALS AND FINISHES
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.

1.16 STORING PRODUCTS AND MATERIALS
Take delivery of and store products, materials and components in accordance with codes of practice and the product manufacturer's or supplier's stated requirements. Maintain the proper

condition of any protective packaging, wrappings or supports during delivery, unloading and storage.

1.17 HANDLING PRODUCTS AND MATERIALS
Handle products, materials and components in accordance with codes of practice and the manufacturer's or supplier's stated guidelines. Avoid distortion and any contact with potentially damaging surfaces or conditions.

1.18 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.

1.19 INSTALLING PRODUCTS AND MATERIALS
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.

1.20 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.

1.21 CONDITION OF MATERIALS AND COMPONENTS
To be in perfect condition when incorporated into the work.

1.22 INCOMPATIBLE MATERIALS AND METALS
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.

Spares

1.25 SPARES
Collect, protect and store safely all spare materials required under the contract. Give the contract administrator an inventory of all spares.

Final presentation and cleaning

1.26 REMOVE TEMPORARY PROTECTION
Remove all temporary markings, coverings, labels and protective wrappings unless instructed otherwise.

1.27 REPLACE DAMAGED MATERIALS
Replace all materials or component damaged during the works to the standard of and integral with the original.

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

1.29 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.
- 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

1.30 CLEANING BY COMMERCIAL CLEANER

Use a commercial cleaning firm 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.
- Vacuum or polish all floor finishes.
- Clean and polish all glass, both sides.

Commissioning

1.31 MOVING PARTS

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

1.33 SECURITY AT COMPLETION

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

2112 PARTIAL DEMOLITION

1. GENERAL

This section relates to the partial demolition of existing buildings and structures, to the extent necessary to carry out the contract works.

Documents

1.2 DOCUMENTS REFERRED TO

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
NZDAA	Best practice guidelines for demolition in New Zealand
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.

Requirements

1.3 QUALIFICATIONS

Carry out demolition

- only under the supervision of a suitably experienced person, using only operators and drivers trained for this work
- calling upon engineering expertise in those areas of demolition required by the NZDAA Best practice guidelines for demolition in New Zealand.

1.4 HEALTH AND SAFETY

Comply with the Health and Safety at Work Act 2015 in general, NZBC F5/AS1 and NZDAA Best practice guidelines for demolition in New Zealand, Section 5 Demolition safety

1.5 FIRE SAFETY SYSTEMS

Existing fire safety systems must be maintained and appropriate parts progressively deactivated and removed as demolition advances.

1.6 DEMOLITION WORKING TIMES

Times during which demolition may be carried out is not restricted. Comply with territorial authority consent conditions and noise and nuisance controls.

1.7 DEMOLITION TIME RESTRICTIONS

Times during which demolition work may be carried out is restricted. Refer to 4. SELECTIONS for times.

2. PRODUCTS

Materials

2.1 REMAINING ELEMENTS

Store all elements not scheduled for salvage or re-use on site until convenient for removal.

2.2 MATERIAL AND ELEMENTS FOR DISPOSAL

Remove demolished material and elements continually from the site through the period of the demolition.

3. EXECUTION

Conditions

3.1 EXISTING SERVICES

Disconnect and seal off services before work commences. Protect services adjacent to the area being demolished.

Maintain services to occupied areas of the building, particularly fire services.

3.2 SITE INSPECTION

Visit and check the site, the building or structural work being demolished and any contents for likely hazards.

3.3 PLANS AND DESCRIPTIONS

Carefully examine all available plans of the building, including those of the territorial authority and the network utility operators, all descriptions and past uses, and become totally familiar with the past and present condition and use of the building and its services.

3.4 EXAMINE STRUCTURE

Examine roofs, walls, cantilevered structures and basements as required by the NZDAA Best practice guidelines for demolition in New Zealand and follow their requirements.

3.5 PROTECTION

Erect approved temporary screens and shelter to protect from weather and damage, and to prevent dust and dirt penetrating those parts of the existing building, other buildings and the remainder of the site being retained in their present condition.

3.6 SAFETY DURING DEMOLITION

Refer to NZBC F5/AS1 and NZDAA Best practice guidelines for demolition in New Zealand. Carry out the requirements laid down in Section 5 Demolition safety in respect of:

- instability
- supervision
- plant, tools and equipment
- personal protective equipment
- protection of the public
- unauthorised access to site.

3.7 DEMOLITION PROCEDURES

Refer to the NZDAA Best practice guidelines for demolition in New Zealand Carry out the requirements laid down in section 6 Methods of demolition including:

- scaffolding
- health
- disposal of debris and waste material
- fire protection.

Application

3.8 CARRY OUT DEMOLITION

Carry out all demolition to the requirements of NZDAA Best practice guidelines for demolition in New Zealand.

Completion

3.9 REINSTATE

Reinstate where any damage is caused by this demolition to those parts of the existing building, other buildings and the remainder of the site being retained.

3.10 LEAVE

Leave work to the standard required by following procedures.

3.11 TAKE AWAY

Take away from the site all plant, tools and equipment, temporary access works, and demolished materials and elements, to leave the site completely clean and tidy.

4. SELECTIONS

4.1 Refer to existing/demolition drawings for scope of demolition/removal work

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:
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 NZ	Guidelines for the provision of facilities and general safety in the construction industry.
BRANZ BU 582	Structurally fixed cavity battens

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

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

2. PRODUCTS

Materials

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

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

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

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

2.4 DPC
Refer to 4161 UNDERLAYS, FOIL AND DPC section

Components

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

2.6 BOLTS AND SCREWS
Bolts and screws of engineering and/or coach type complete with washers, to the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10.

2.7 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.

2.8 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.

2.9 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.

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

2.11 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 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.

3.2 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).

3.3 SEPARATION
Separate all timber framing timbers from concrete, masonry and brick by: -
- a full length polyethylene damp-proof membrane overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space

3.4 FRAMING MOISTURE CONTENT
Maximum allowable equilibrium moisture content (EMC) for non air-conditioned or centrally heated buildings, for framing to which linings are attached.
- At erection: 24% EMC maximum

- At enclosure: 20% EMC maximum
- At lining: 16% EMC maximum

3.5 TOLERANCES

Permissible deviations from established lines, grades and dimensions equal to or less than the following. Multiples of given limits are not cumulative.

- Deviation in plan, up to 10 metres, 5mm
- Deviation in plan, over 10 metres, 10mm total

- Deviation from horizontal, up to 10 metres, 5mm
- Deviation from horizontal, over 10 metres, 10mm total

- Deviation from vertical position per 3 metres, 3mm

- Deviation from horizontal and vertical, within openings, 3mm.

Application

3.6 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. Set back nogs 12.5mm from face of studs where required for back-blocking of plasterboard non-tapered ends or edges.

3.7 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.

3.8 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.

3.9 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.

3.10 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.

3.11 CUTTING

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

3.12 EXPOSED TIMBER CONNECTORS AND FIXINGS

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

3.13 POWDER ACTUATED AND MECHANICALLY POWERED FIXING

Comply with the WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry, part 5, section 5.7. To be operated by a licensed applicator.

3.14 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.

3.15 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.

3.16 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.

3.17 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.

3.18 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.

3.19 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.

3.20 DPC TO LOSP TREATED TIMBER
Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.21 DPC TO TIMBER
Refer to 4161 UNDERLAYS, FOIL AND DPC section

Completion

3.22 CLEAN UP
Clean up timber framing as the work proceeds so no offcuts, chips, sawdust or any other matter or items remain behind the claddings or linings.

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

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

4. SELECTIONS

4.1 Refer drawings

3897 REPLACEMENT & TREATMENT OF DECAYED TIMBER

1. GENERAL

This section relates to identification and testing of decayed timber and for its replacement and/or treatment to NZBC B1 and NZBC B2. It includes;
- Decay due to rot from fungal and mould growth
- Decay due to insect attack

1.1 RELATED WORK
Refer to the appropriate timber framing section for additional timber work.

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:

BAE	Boric acid equivalent

Documents

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

MBIE	Dealing With Timber In Leaky Buildings - A guide for Builders and Building Professionals
NZBC B1/AS1	Structure
NZBC B2/AS1	Durability
NZS 3604	Timber-framed buildings
MBIE	Workplace Health Bulletin No. 17 - Risks to Health from Moulds and Other Fungi

Health and Safety at Work Act 2015

Note;
- MBIE (Ministry of Business, Innovation and Employment) document, Dealing With Timber In Leaky Buildings, was a DBH document and is available at: www.building.govt.nz/assets/Uploads/building-code-compliance/e-moisture/e2-external-moisture/guide-timber-in-leaky-buildings.pdf
- The Workplace Health Bulletin No. 17 is an archived document available at: http://web.archive.org/web/20130210081950/http://osh.govt.nz/order/catalogue/pdfs/healthi017.pdf

Requirements

1.4 QUALIFICATIONS
Work to be carried out by trades people experienced and familiar with identifying, treating and replacing decayed timber. Workers to be familiar with the health and safety requirements relating to this work.

1.5 COMPLIANCE INSPECTIONS - BCA
Where (fungi and mould) decayed timber has been identified as part of the Building Consent, arrange for required inspections. Where the decayed timber is identified after the Building Consent has been issued, agree with the BCA inspector the required identification, testing and replacement required.

1.6 COMPLIANCE INSPECTIONS - SEPARATE CONSULTANT
Where (fungi and mould) decayed timber has been identified and a specialist consultant is engaged or the building consent requires inspection and certification by separate consultants, arrange for and co-ordinate these inspections.

1.7 PHOTOGRAPHIC RECORD
Take a photographic record of all stages of the work including before work commences, after the decayed material has been removed and after replacement.

1.8 PROVIDE TEMPORARY PROTECTION
Provide temporary protection from weather and water for all interior parts of the building exposed by the work.

2. PRODUCTS

Materials

2.1 BRUSH ON TIMBER TREATMENT
Boron glycol type treatment, to a minimum concentration of 20% bae. For concealed timber, add coloured dye to help with even application.

3. EXECUTION

Removing fungi and mould affected timber

3.1 TAKING SAMPLES FOR TESTING
Take samples as required for testing. Samples must be of the required size and labelled to identify the source.

3.2 HEALTH AND SAFETY WHEN DEALING WITH MOULD
To Health and Safety at Work Act 2015.
Where moulds and fungi have to be removed as part of the repair, comply with relevant Health and Safety requirements. Ensure workers removing moulds and fungi in the building wear suitable protective equipment including disposable overalls, appropriate breathing masks and gloves. Refer to MBIE Workplace Health Bulletin No. 17 and WorkSafe NZ for further information.

Disturb moulds and fungi as little as necessary.

3.3 HEAVY MOULD GROWTH
Where materials have heavy mould growth on them, replace them rather than attempting to clean off mould. Wrap the materials in polythene or put in polythene bags, and seal to prevent them drying out. Clean mould from smaller isolated areas where it would be difficult or impractical to remove materials. This should be done by thorough washing and rinsing, and collecting the cleaning solution and rinse water for disposal. A wet dry vacuum cleaner is useful for this. If areas of mould need to be cleaned, this should be done before they dry out.

3.4 PROVIDE TEMPORARY COVERS
Once suitable temporary covers are in place, cladding can be removed with the linings still in place. This avoids any potentially dangerous moulds being released into the building. The lining also acts as a wind barrier reducing the wind load on the covers.

3.5 AVOID CONTAMINATION OF OTHER AREAS
Where internal remediation work is needed, avoid contaminating other areas of the house with mould. Advice should be sought from a specialist on how to keep the work area separate from the rest of the dwelling (for example with polythene sheets and taped joints and using a negative pressure environment). The work environment must be kept well-ventilated.

3.6 REMOVING DECAYED TIMBER
If a specialist consultant is engaged, follow their recommendations for timber removal, otherwise generally as follows.

Err on the side of caution when replacing untreated timber framing. If the timber has been adequately preservative treated, then it may be possible to remove less timber.

Particular care is needed where several pieces of timber are fixed together. The timber faces exposed after the cladding is removed may appear sound but there could be fungal decay on the hidden faces of the timber which can be difficult to detect. Examples of these are multiple studs, doubling or jack studs, boundary joists and lintels.

Where the timber shows obvious signs of failure (Refer MBIE Dealing With Timber In Leaky Buildings, photos 3 and 4) there is typically no need to test the decayed portions before removal. Testing should focus on identifying where the timber is sound. Cut out any timber at least one metre beyond the last visual signs of fungal decay on any individual piece of timber (Refer MBIE Dealing With Timber In Leaky Buildings, Figures 1 and 2).

Removed timber and debris, to be disposed of offsite.

3.7 DIFFICULT TO REACH TIMBER

Where timber members are difficult to replace such as floor joists running back into a building, it may be possible to reduce the recommended one metre distance by taking samples of timber at 150mm, 300mm and 600mm distances from the visible signs of decay and getting them analysed in a laboratory. The timber will only need to be removed as far back as the first sample that has no decay present.

Treating timber

3.8 REMOVE EXISTING COATINGS

Remove any existing coatings, paint, applied finishes etc, that will inhibit the absorption of the treatment into the timber.

3.9 TREATING SOUND TIMBER

Sound timber uncovered during repairs that is untreated or has a preservative treatment that does not meet B2/AS1, must be treated, where practical, with a brush-on preservative treatment.

To maximise the surface area of framing that can be treated, it is important to apply brush-on timber treatments after decay-affected timber has been removed, but before new treated timber is installed. Where localised repairs are carried out, any timber in the area of the repair should be treated.

3.10 BRUSH ON TREATMENT

Apply brush on timber preservative treatment to areas affected.

3.11 INJECTING TREATMENT

These methods apply to all fungi and mould treatment, but would only apply to major active insect infestation.

For studs where three faces cannot be accessed, a combination of two coats applied by brush and injection of boron glycol into holes drilled into the interface between studs is recommended. The holes to be 6mm in diameter and 80mm deep, sloping downwards (at approximately 30 degrees to the horizontal) at 300mm intervals (Refer MBIE Dealing With Timber In Leaky Buildings Figure 7). 10ml of treatment solution to be injected into the holes followed by a second 10ml injection 30 minutes later.

For double lintels, two coats of boron glycol to be applied by brush followed by injection of boron glycol into 6mm by 45mm deep holes drilled into the outer lintel 10mm below the top edge. A drill hole spacing of 100mm is recommended starting 75mm from the end of the lintel (Refer MBIE Dealing With Timber In Leaky Buildings, Figure 8). 15ml of treatment solution to be injected into the holes followed by a second 15ml injection 30 minutes later.

Temporarily clamp the lintel timbers together if there is a large gap between them. Apply adhesive tape to the bottom of the joint before injecting the treatment to minimise treatment running out the bottom of the lintel.

Because of the variability associated with the boron injection process, use his remediation method only where there is a high degree of confidence that there is no fungi or mould decay present between studs or lintel members.

While boundary joists have some similarities to lintels, this method of treatment cannot be relied on to achieve adequate levels of site preservative treatment because of more limited access to the timber surfaces. In addition, as boundary joists have less drying potential than lintels, hidden and difficult to find decay can occur. Accordingly, the removal of the boundary joist as shown in (Refer MBIE Dealing With Timber In Leaky Buildings, Figure 5) is required, which allows for preservative application and for any timber with decay to be identified and removed.

Replacing timber

3.12 REPLACING TIMBER

- Replacement of timber work must be done in dry conditions under cover.
- Existing timber framing must be supported and protected as necessary until the new framing is installed.
- Replacement timber must be preservative-treated to B2/AS1 to at least H1.2 for timber framing and H5 for ground contact.
- Dry storage must be provided on site for replacement timber before it is installed.

3.13 WALL FRAMING

For framing, select the most cost-effective technique to replace decayed timber in a particular area either;

- remove and replace the timber framing
- or cut out the decay and flitch in new framing.

Note, NZS 3604 does not allow the jointing of studs, so replace studs as necessary.

Where more than 40% of the timber in a particular section of the framing has to be removed, replace all framing.

3.15 CLOSING IN

Do not close in timber framing until the moisture content is less than 20%. Note, some brush-on timber treatments can cause resistance moisture meters to read higher than the actual timber moisture content.

4. SELECTIONS

4.1 CONSULTANT INSPECTOR

Company: Central-Adjusters
Person: Haydon Millar
Contact details:

4161T THERMAKRAFT UNDERLAYS, FOILS & DPC

1. GENERAL

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

NZMRM	New Zealand Metal Roofing Manufacturers Inc.

The following definitions apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

NZBC C/AS1-AS7	Protection from fire
NZBC E2/AS1	External moisture
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays - Materials
NZS 4214	Methods of determining the total thermal resistance of parts of buildings
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Thermakraft documents relating to work in this section are:
Thermakraft product manual and technical data sheets.
BRANZ Appraisal 329 - Supercourse 500 Damp-Proof Course and Concealed Flashing
BRANZ Appraisal 651 - Thermakraft Covertek™ 407 Fire Retardant Self Supporting Roof Underlay
BRANZ Appraisal 695 - Watergate-Plus Fire Retardant Wall Underlay
BRANZ Appraisal 743 - Thermakraft Covertek 405 Plus fire Retardant Self-Supporting Roof Underlay
BRANZ Appraisal 867 – Thermakraft Steelwrap 290 Wall Underlay
BRANZ Appraisal 878 - Thermakraft Aluband Window Flashing Tape
BRANZ Appraisal 917 - Thermakraft Covertek 403 Plus Roof Underlay

Code Mark Certificate 30069 - Thermakraft Covertek 403 Plus Absorbent Breathable Roof Underlay
Code Mark Certificate 30030 - Thermakraft Covertek 405 Absorbent Breathable Roof Underlay
Code Mark Certificate 30028 - Thermakraft Covertek 407 Absorbent Breathable Roof Underlay

Manufacturer/supplier contact details

Company:	Thermakraft Industries (NZ) Ltd
Web:	www.thermakraft.co.nz
Email:	info@thermakraft.co.nz

Telephone: 0800 806 595

Warranties

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

Requirements

1.6 NO SUBSTITUTIONS
Substitutions are not permitted to any specified materials, or associated products, components or accessories.

1.7 INSTALLATION SKILL LEVELS
Installers to be experienced in the installation of Thermakraft products and familiar with Thermakraft Industries technical literature and the related documents listed in this design i.e. NZMRM CoP NZ metal roof and wall cladding Code of Practice.

2. PRODUCTS

Materials

Roofing underlays

2.2 SYNTHETIC NON-WOVEN SELF SUPPORTING ROOFING UNDERLAY
CoverTek™405, a non-woven self-supporting roofing underlay, consisting of two spun-bonded polyolefin fabric layers bonded to a micro porous inner layer, designed for use as a water absorbent, breathable, water resistant roofing underlay for sloped roofs. Covertek™ 405 has a flammability Index of ≤ 5 tested to AS 1530.2, to NZBC C/AS1-AS7, meets the requirements for suspended fabrics, BRANZ Appraisal 743 and Code Mark Certificate 30030. Can be used in areas exposed to view in occupied spaces.

Accessories

2.4 AUSMESH SAFETY MESH
Ausmesh 300**,** 2mm x 150 x 300mm galvanized or PVC coated safety mesh to AS/NZS 4389.

2.5 GUTTER AND UNDER FLASHINGS
Thermakraft 215™, bituminous breather type underlay to NZS 2295 cut to width for use under valley, apron flashing and internal gutters.
Soffit liner cut to width from Thermakraft 215™ bituminous breather type underlay. Refer to SELECTIONS.

2.6 TAPE
Thermakraft tapes to compliment the underlay. Pressure sensitive aluminium foil tapes for joining foil insulation and vapour barriers. These include:
- Thermakraft White General Purpose Underlay Tape
- Thermakraft Foil Tape 150
- Thermakraft Window Sealing Tapes, used to repair damaged bituminous underlays

2.7 DRAINAGE MATT
Thermakraft Drainage Matt, an extruded 3 dimensional synthetic black mesh, used as an air separation layer between fully sarked roof and roof cladding. Used in wall applications to allow air passage and drainage where no other cavity is provided.

3. EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS
Design application and installation of Thermakraft Building products to NZBC E2/AS1, BRANZ Appraisals, Thermakraft Technical Literature and Industry Codes of Practice.

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

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

3.4 METAL CLADDING ON TIMBER CAVITY BATTENS
Fix strip of Thermakraft DPC as a separator between the timber and metal cladding.

Application - roofing underlay

3.5 SAFETY MESH
Lay Ausmesh 300 safety mesh over exposed roof areas fixed in accordance with AS/NZS 4389 and NZMRM CoP.

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

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

3.7 GUTTER AND UNDER FLASHINGS
Lay Thermakraft 215™ bituminous breather type underlay cut to width by manufacturer for use as an underlay to valley, apron flashings, and internal gutters. Lap under flashings with adjoining underlays. Fix Thermakraft 215™ bituminous breather type underlay soffit liner from top plate down 150mm past ribbon plate.

Completion

3.8 CLEAN UP
Clean up as the work proceeds.

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

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

4. SELECTIONS

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

Refer drawings

4231X PACIFIC BUILD XPRESSCLAD NEGATIVE DETAIL CLADDING

1. GENERAL

This section relates to the supply, fixing and jointing of **Pacific Build Supply Ltd** fibre cement cladding with a drained cavity. It may incorporate bracing panels.

To achieve the required durability the system may be coated with a paint system. A light reflectance value of not less than 40% may be required where a screw fixed system is specified. Check with Pacific Build Supply Ltd where a colour with a light reflectance value of less than 40% is proposed.

1.1 RELATED WORK
Refer to painting sections for the required finishing paint system.

Documents

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 1170.2	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings

BRANZ Appraisal 705 - Bostik SAFETECH SAFE Seal Sealant
BRANZ Appraisal 613 - Sikaflex® AT-Façade Sealant

1.3 MANUFACTURER/SUPPLIER DOCUMENTS
Manufacturer's and supplier's documents relating to this part of the work:
Pacific Build Supply Ltd: Wall cladding XpressClad details: Series XP.3
XpressClad Quality Assurance checklist
XpressCladMaintenance schedule
XpressCladInstallation guide
XpressClad Deed of Warranty in the form of a site specific Producer Statement

BRANZ Appraisal 594 -XpressClad Ventilated Cavity System - Residential
BRANZ Appraisal 595 - XpressClad Ventilated Cavity System - Commercial
BRANZ Opinion BDO 98/3 Durability of Eterpan.
Les Boulton & Assoc. Report No. 08864: Durability Appraisal of XpressClad System.
Producer Statement PS1 Design: Panel Tack Adhesive System
Producer Statement PS1 Design: Xpressclad Cladding System

Manufacturer/supplier contact details

Company:	**Pacific Build Supply Ltd**
Web:	www.pbs.co.nz
Email:	nick@pbs.co.nz
Telephone:	0800 22 55 727

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER
Pacific Build Supply Ltd warrant the XpressClad cladding system under normal environmental and use conditions against failure of materials.

15 years:	For XpressClad Facade Cladding and accessories

- Provide the completed and signed XpressClad quality assurance check sheet to Pacific Build Supply Ltd in order for the XpressClad warranty to be issued. Provide the warranty in the XpressClad standared form "Producer Statement" site specific.
- Commence the warranty from the date of practical completion of the contract works.

Modify or expand the clause to suit project or manufacturer/supplier requirements, options include:

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty.

10 years: For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 NO SUBSTITUTIONS

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

1.7 QUALIFICATIONS

Carry out the cladding work with experienced, competent installers who have attended the XpressClad Cladding Systems training programme or as approved by Pacific Build Supply Ltd.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide ongoing maintenance instructions required to meet the performance requirements of the NZBC B2/AS1 Durability.

Compliance information

1.9 DURABILITY

The work covered by this part of the specification has been designed and constructed to achieve a durability of 15 years when un-coated and which may be extended to 50 years when coated with a continuous waterproof coating system maintained over the service lifetime so that it remains impervious to water.

Refer to the following; BRANZ Opinion BDO 98/3.

Performance

1.10 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604 and the wind loads on various wall areas as given by AS/NZS 1170.2.

1.11 EXTERNAL MOISTURE

No water penetration beyond the inner surface of the framing at the calculated test pressures. The total system to comply with an ULS wind pressure of ±2700 Pa. Refer to ASL Ltd Report 06/10 for verification method. A wall underlay may be used as a non rigid air barrier where the ULS is up to ± 1550 Pa. Where wind pressures exceed ± 1550 Pa and are less than ± 2700 Pa use a rigid air seal of Eterpan Base or Eterpan Base Sealed 4.5mm thick.

Contact Pacific Build Supply Ltd for specific design information where wind pressures exceed ± 2700Pa.

2. PRODUCTS

Materials

2.1 WALL UNDERLAY
Synthetic wall underlays to NZBC E2/AS1, table 23: Properties of roof underlays and wall underlays.

2.2 BATTENS
All extruded mill finish aluminium.
XpressClad vertical runner XVR 20mm deep x 40mm wide.
XpressClad horizontal runner XHR 20mm deep x 40mm wide.
XpressClad Z rail XZR 20mm deep x 40mm wide.
XpressClad vertical external corner XEC 20mm deep x 40mm wide
XpressClad vertical internal corner XIC 20mm deep x 40mm wide
XpressClad XHR horizontal 90°c external corner 298mm x 298mm
XpressClad XHR horizontal 90°c internal corner 298mm x 298mm
Exposed faces to be pre-finished in geothermal and sea spray exposure zones.

2.3 COMPRESSED SHEETS
To AS/NZ 2908.2; Compressed fibre cement high density autoclaved sheets, Europan 1200mm wide, with machine ground square edges and pressed smooth finish on both faces.

Components

2.4 SCREWS, STAINLESS STEEL
304 / 316 Stainless steel 40 x 10 gauge T17 pan head screws for fixing XpressClad rails to timber framework at 250mm centres.

304 / 316 Stainless steel 19 x 10 gauge T17 self drilling countersunk screws for fixing Eterpan sheet to XpressClad rails at nominal 300mm centres. Refer to the Eterpan technical literature for the use requirements.

2.6 FLASHINGS
XpressClad perforated mesh closer.
XpressClad external soaker flashing where joining the XHR section.
XpressClad stop end plug when terminating the XHR section.
XpressClad pocket filler to close the XVR and XIC sections.
50mm x 50mm internal or external corner flashing
Proprietary meter box aluminium flashing kit.
Exposed faces to be pre-finished in some exposure zones.

2.7 NAILS, STAINLESS STEEL
304 / 316 stainless steel 40mm clout for fixing the Eterpan Base or Eterpan Base Sealed rigid air barrier to timber framing. Refer to the Eterpan technical literature for the use requirements.

2.8 POLYPROPYLENE TAPE
10mm wide polypropylene tape to support non rigid air barriers.

2.9 FOAM TAPE
1.6mm x 18mm x 61m compressible foam tape for behind sheet edges for screw fix applications.

2.10 SEALANT
Bostik SAFETECH SAFE Seal building sealant to BRANZ Appraisal 705.
Sikaflex® AT-Façade Sealant to BRANZ Appraisal 613.

Finishing materials (paint finish)

2.15 PAINT FINISH
Paint system to manufacturer's recommendations. Refer painting section/s for details.

3. EXECUTION

Conditions

3.1 STORAGE
Take delivery of sheets dry and undamaged in pallets and lay horizontally on a smooth level surface. Protect edges and corners from damage and cover to keep dry until fixed.

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

3.3 SUBSTRATE
Do not commence work until the substrate is of the standard required by the sheet manufacturer for the specified finish; plumb, level and in true alignment. Moisture content of timber framing to NZS 3602 moisture content maximums, to minimise shrinkage and movement after sheets are fixed.

Application - generally

3.4 THERMAL BREAK
Install insulation strips to steel framing, to comply with the manufactures technical information.

3.5 BRACING SYSTEM
Fix bracing sheets to Eterpan technical information.

3.6 FIX WALL UNDERLAY
Run and fix wall underlay in full height rolls to wall framing, with fixing and end laps to NZS 3604 and the wall underlay manufacturer's requirements. Repair all tears and cuts with duct tape or replace with new wall underlay. To retain the wall insulation from bulging the wall underlay into the cavity staple 19mm polypropylene tape vertically between the studs or horizontally between the nogs.

3.7 PENETRATIONS
Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:
- wall underlay taped to openings, finished and dressed off ready for the installation of window and door frames and other penetrations. Refer to guidelines for preparation of openings.
- cladding neatly finished off to all sides of openings.
- installation of flashings (those required to be installed prior to installation of penetrating elements).
- Install VentClad meter box flashing kit to manufacturer's details.

3.8 XPRESSCLAD EXTRUSIONS
Install horizontal XHR rails to intermediate panel joints, inter-storey panel joints, window and door heads and sills. Fit stop end plugs and external soakers to all XHR extrusions as required.
- Cut and fit vertical XVR rails at all sheet joints
- Cut and fit XIC rails to all internal corners
- Cut and fit XEC rails to all external corners
- Cut and fit XZR horizontal closer between XVR vertical rails and corners at top and bottom plates
- Cut and fit XZR intermediate vertical rails at 600mm centres
- Fix with 40mm x 10swg pan head stainless screws at 250mm centres
- Fit pocket fillets, mesh closers

Completion

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

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

Materials

4.1 Refer drawings

4311D DIMOND PROFILED METAL ROOFING

1. GENERAL

This section relates to the supply and fixing of **Dimond** profiled roofing and includes:
- Metal roofing
- accessories

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

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

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
MS	Modified silicone

Documents

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

NZBC E2/AS1	External Moisture
AS/NZS 1170.2	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
ISO 9223	Corrosion of metals and alloys - Corrosivity of atmosphere - Classification determination and estimation
NZMRM CoP	NZ Metal Roof and Wall Cladding - Code of Practice

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

1.4 MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:
Web only based: **Dimond** Roofing and Cladding Systems Manual

Available from: **Dimond** web site

Web:	www.dimond.co.nz
Telephone	0800 346 663 (0800 DIMOND)

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER
Provide a material manufacturer/supplier warranty:.

~ years:	for failure of coating adhesion
~ years:	for weatherproofing by material penetration

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR
Provide an installer/applicator warranty:

5 years from the date of completion of the roof

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

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

Provide all relevant **Dimond** maintenance information on completion of the roofing work, as required by the GENERAL sections.

Requirements

1.7 NO SUBSTITUTIONS
Substitutions are not permitted to any specified system, or associated components and products.

1.8 QUALIFICATIONS
Roofers to be Dimond Recommended Installer, or experienced, competent roofers familiar with **Dimond** products. And for Restricted Building Work, shall also be an LBP or supervised by an LBP. Carry out work with experienced, competent installers familiar with the products being used and with appropriate qualifications such as the National Certificate in Metal Roofing and Cladding

Performance - Wind

1.9 DESIGN PARAMETERS - NON SPECIFIC DESIGN
Building wind zone: Very High
~ / ~kPa ULS(refer to NZS 3604, table 5.4)
Refer to Dimond for "Wind Load Span Capacity charts".

1.10 FIXINGS, WIND
Design and use the fixings/fixing pattern appropriate for the wind design parameters. Refer to **Dimond** Technical Information for load span tables and fixing charts for the selected profile. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Fixing pattern to also take into account fixing method and purlin spacings.

Performance - General

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

1.12 PERFORMANCE
Select installation method of the roof materials and accept responsibility for the weather-tight performance of the completed roofing system including penetrations through the roof and junctions with walls and parapets.

2. PRODUCTS

Materials

2.1 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC/MAGNESIUM COATED STEEL
Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.

Fixings

2.2 FASTENERS GENERALLY

Fixings and fasteners are to be compatible with all materials, the environment and meeting the requirements of the NZ Building Code. Installation is to be in accordance with E2/AS1 and/or the NZ Metal Roof and Wall Cladding - Code of Practice and Dmond requirements.
For fixing patterns refer to **Dimond** Fixing Charts for the selected profile.

2.3 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by Dimond and with a minimum Class 4 or 5 durability and not less than the material being fixed. Screw into timber to penetrate by minimum 30mm. Screw fasteners to be head stamped identifying the manufacturer and class. Use Alutite or stainless steel with aluminium based sheets. Refer to SELECTIONS.

2.4 RIVETS

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

Components

2.5 FLASHINGS GENERALLY

To NZBC E2/AS1, 4.0 **Flashings**.
Formable grade 0.55 BMT for galvanized, aluminium/zinc, aluminium/zinc/magnesium - coated and pre-painted steel, and 0.90 for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

2.6 FLASHINGS TO VERGE, RIDGE AND HIP

Supplied by the roofing manufacturer to match or to suit the roofing in the same material as the roof.

2.7 BOOT FLASHINGS

Generally to E2/AS1, 8.4.17 **Roof penetrations**(note; E2/AS1, Figure.54 **Soaker flashing for pipe penetration**, has an error, use as guide only)
EPDM proprietary pipe flashing laid on 45° bias to roofing, with over-flashing (soaker flashing) if required.
A boot flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided use an over-flashing back to the ridge and fix the boot flashing to that.

2.8 NATURAL LIGHTING

Refer to 4312D DIMOND PROFILED GRP NATURAL LIGHTING.

Accessories

2.9 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.10 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC

2.11 SEALANT

Neutral curing MS sealant or polymer sealant as required by the roofing manufacturer and used as directed.

2.12 CLOSURE STRIPS

Non-bituminous compressible, profiled foam strips to fit the sheet profile.

2.13 LAP SEALING TAPE

Closed cell self adhesive nitrile tape.

3. EXECUTION

Conditions

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

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

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

3.4 HANDLING
Avoid distortion and contact with damaging substances, including cement. Do not drag sheets across each other and other materials. Protect edges and surface finishes from damage. Use soft, flat sole shoes when fixing and for all other work on the roof. Walk along the purlin line whenever possible.

3.5 SEPARATION
Isolate dissimilar materials in close proximity as necessary by painting the surfaces or fitting separator strips of compatible or inert materials. Place isolators between metals and treated timber, cement based materials, and mixing aluminium sheet and steel mesh. Do not use unpainted lead sheet or copper in contact with or allow water run-off onto galvanized or aluminium/zinc coated steel.

Application

3.6 FIX INSULATION
Refer to Thermal Insulation sections.

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

3.8 END LAPS
End laps should be avoided, except where specifically detailed.

3.9 THERMAL MOVEMENT
For sheet lengths more than 18 metres, make provision for thermal expansion where required

3.10 FIXING GENERALLY
Install and fix in accordance with the Dimond required fixing patterns and details for each area of the building roofing. Use only screws as required by the roofing manufacturer. Paint colour matched fixings and accessories before installation.

3.11 MARKING AND CUTTING

Use chalk line, Chinagraph pencils or coloured pencil for marking roof sheets prior to cutting. Do not use lead pencil for marking Zincalume®, ZAM®, Colorsteel® and Colorcote®. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof.

3.12 FIX SHEETS

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

3.13 STOP ENDS AND DOWNTURNS

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

3.14 FLASHINGS

Flash roof to parapets, walls and penetrations to detail. Flashings to be installed on timber framing with moisture content of less than 18%. Where no detail is provided flash to NZMRM CoP NZ metal roof and wall cladding Code of Practice recommendations and Dimond requirements. Cut accurately and fix using sealant and rivets to detail and to Dimond requirements to form a weatherproof cover. For highly visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.15 SEPARATION

Separate metal sheeting from CCA treated timber with an inert isolation material such as flashing tape, underlayment mat or similar. Contact Dimond for other options.

3.16 USE OF SEALANTS

Select and use sealants only as recommended by Dimond. Remove any swarf and clean down, apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

3.17 FLASHING PENETRATIONS

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

Completion

3.18 REPLACE

Replace damaged or marked elements.

3.19 LEAVE

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

3.20 REMOVE

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

4. SELECTIONS

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

Coating system

4.1 COATING SYSTEM - EXPOSURE ZONE D (CAT 4)

Project Exposure Zone D to NZS 3604, C 4 to ISO 9223.
Profile/location: Refer drawings

Coating system: Colorsteel Endura
Paint colour: tbc

Roofing

4.2 DIMOND STYLELINE ROOFING
BMT/material 0.55/steel
Fixing pattern: Refer to Dimond Styleline literature for details

Accessories

4.3 Refer drawings

4521TS THERMOSASH COMMERCIAL WINDOWS AND DOORS

1. GENERAL

This section relates to the design, development, manufacture, testing, supply, glazing and installation of **Thermosash Commercial Ltd** commercial aluminium windows and doors.
It includes:
- Overhead glazing
- Flashings and sealants

1.1 RELATED WORK
Refer to appropriate glazing sections for glass types.

1.2 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WANZ	Windows Association of New Zealand
PQAS	Powder Coating Quality Assurance System

Documents

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

NZBC E2/AS1	External moisture
NZBC F4/AS1	Safety from falling
NZBC H1/VM1	Energy efficiency
NZBC H1/AS1	Energy efficiency
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
AS/NZS 4284	Testing of building facades
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
WANZ Installation Guide	The WANZ Guide to Window Installation as described in E2/AS1 Amendment 5
WANZ PQAS	Powder Coating Quality Assurance System
WANZ SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)
BRANZ BU 337	Protecting Window Glass from Surface Damage
AAMA 501.2-03	Quality assurance and diagnostic water leakage field check of installed storefronts, curtain walls. and sloped glazing systems
AAMA 502.2	Voluntary specification for field testing of windows and sliding glass doors.
AAMA 2604.05	Performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
US Federal Specification	
TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work.
Thermosash Commercial Limited Product Literature and data sheets

Manufacturer/supplier contact details

Company:	Thermosash Commercial Limited
Web:	www.thermosash.co.nz
Email:	info@thermosash.co.nz
Telephone:	09 444 4944 Auckland
	04 939 4500 Wellington
	03 348 4004 Christchurch

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/fabricator warranty:

10 years:	For design, engineering, quality of materials, fabrication, installation, weathertightness and performance

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

Requirements

1.6 FACADE SUBCONTRACTOR

The facade subcontractor is responsible for the design, engineering and procurement, prototyping, testing, fabrication, installation, and certification of the facade system, including interfacing with the structure and other trades work. In addition the facade subcontractor shall provide Professional Indemnity Insurance for the design.

The facade subcontractor shall undertake design responsibility for compliance with NZBC B1, NZBC B2, and NZBC E2. The principal/architect shall be responsible for coordination of fire, acoustic, mechanical, thermal and structural movement during the working drawing approval stage of the project.

The facade contractor shall be responsible for providing producer statements PS1 (Design) with submission of working drawings and PS3 (Construction) once work has been completed on-site prior to practical completion.

1.7 QUALIFICATIONS - FACADE SYSTEM

Manufacturer, structural engineer, facade engineer and installer to be certified, qualified and experienced in the design, testing, fabrication, installation, and certification of the facade system. If requested provide evidence of qualification / experience prior to commencing work.

1.8 NO SUBSTITUTIONS

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

1.9 QUALIFICATIONS

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

1.10 COMPLIANCE

Specific design to comply with AS/NZS 1170.2 Structural design actions - Wind loads, and AS/NZS 1170.5 Structural design actions - Earthquake actions - New Zealand.

1.11 CERTIFICATION
Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of NZS 4211 and AS/NZS 4284.

Performance - general

1.12 PERFORMANCE - WINDOWS AND DOORS
To NZS 4211, AS/NZS 4284, and NZS 1170.2, including:
- installation and all fixings
- deflection, opening sashes, air infiltration, water penetration, ultimate strength, torsional strength of sashes, marking.

Refer to SELECTIONS.

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

Finishes

1.17 CERTIFY COATINGS - POWDER COATINGS
Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to BS 3900, part C5, method No. 4, using method (b) or to AS/NZ 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided.

The coating should be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

2. PRODUCTS

2.3 OVERHEAD GLAZING SYSTEMS
Refer to SELECTIONS for type and finish.

Materials

2.4 ALUMINIUM EXTRUSIONS
Alloy designation to comply with AS/NZS 1866. Branded and extruded for anodising or powder coating.

2.5 ALUMINIUM SHEET AND STRIP
Complying with AS/NZS 1734 of suitable thickness. Rolled for anodising or powder coating.
Alloy designation: 5251 - H16 or 5005 - H16

2.7 GLASS
Refer to the glazing section for glass types and installation.

Materials - air barrier

2.8 AIR BARRIER
All curtain wall and panel wall systems to incorporate an air barrier.

Reveals

2.9 REVEALS - ALUMINIUM
Aluminium reveals fitted to frame. Refer to SELECTION for specific design requirements.

Accessories

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

Materials - overhead glazing systems

2.12 OVERHEAD STRUCTURAL GLASS OR ALPHA FRAMED GLAZING SYSTEM
Refer to SELECTIONS for type and finish.

Components

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

2.20 FIXING BRACKETS
Designed by manufacturer to specific design.

Sealants

2.21 STRUCTURAL SILICONE SEALANT
Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a ± 40% movement factor complying with US Federal Specification TT-S-001543A.

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

Finishes

2.23 DURALLOY® GENERATION 2 POWDER COATING
Polyester powder organic coating in accordance with WANZ Powder Coating Quality Assurance System and AS 3715. Refer to SELECTIONS for finishes and colours.

3. EXECUTION

Conditions - generally

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

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

3.3 AVOID DISTORTION
Avoid distortion of elements during transit, storage and handling.

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

3.5 PROPRIETARY ELEMENTS
Fix in accordance with the window manufacturer's requirements.

3.6 PROTECTIVE COVERINGS

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

3.7 ADDITIONAL PROTECTION

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

Conditions - fixings and fastenings

3.8 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS. Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless steel, or if not exposed to the weather they may be Type 304 stainless steel, or hot-dip galvanized steel with a coating weight of 610 g/m² complying with AS/NZS 4680.

Assembly

3.9 FABRICATION

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

Installation - overhead glazing system

3.23 INSTALL OVERHEAD GLAZING SYSTEMS

Check that the trimmed openings are formed and constructed to suit the required units. Do not proceed until roof and structural openings are properly formed. Install flashings and over flashings as detailed and as required to make the installation completely weatherproof. Install and fix the overhead glazing units strictly in accordance with the overhead glazing manufacturer's requirements, details and installation instructions.

3.24 OVERHEAD GLAZING ACCESSORIES AND OPERATING SYSTEMS

Install selected accessories and hardware. Install and complete all operating systems.

Application - jointing and sealing

3.25 PREPARE JOINTS

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

3.26 BACK UP

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

3.27 SEALANT FINISH

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

Completion - cleaning

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

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

Completion

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

3.31 REPLACE
Replace damaged, cracked or marked elements.

3.32 PROTECTION
Protect finishes against damage from adjacent and following work.

3.33 IN - SITU TOUCH-UP TO POWDER COATED ALUMINIUM
In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted to minor surface scratching. Otherwise replace all damaged material.

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

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

4.1 NOMINATED FABRICATOR
Thermosash Commercial Ltd is the nominated fabricator for this section of work.

4.2 SUPPLY AND INSTALLATION
Supply and installation of the specified aluminium joinery system to be by Thermosash Commercial Ltd only.

Performance

4.3 THERMAL PERFORMANCE
R-value: ~ (as determined from NZBC H1/VM1 or H1/AS1)

4.4 AIR INFILTRATION
For NZS 4211, table 3 **Air infiltration**.
Non-air conditioned zones: ~
Air conditioned zones: ~

Performance - Wind (design by contractor)

4.5 DESIGN PARAMETERS - SPECIFIC DESIGN
The design wind pressures are to AS/NZS 1170.2.
SLS ~ Pa
ULS ~ Pa

Finishes

4.10 POWDER COAT FINISH

Manufacturer: Dulux Powder & Industrial Coatings
Brand/type: ~
Thickness: ~
Finish: ~
Colour: ~

Glazing

4.11 GLASS

Type/thickness: Refer to appropriate glazing sections for type / thickness / shading co-efficient / light transmission / U value / STC rating / colour / barrier loading classification.

Overhead glazing systems - stick systems

4.19 THERMOSASH - ALPHA SUITE SKYLIGHT SYSTEMS OVER 5O SLOPE

Manufacturer: Thermosash Commercial Limited
Location/reference: ~
Type: ~
Frame size: ~
Glazing system: ~
Overhead glazing No: ~
Hardware: ~

4554VS VELUX OPENING & FIXED SKYLIGHTS

1. GENERAL

This section relates to the manufacture, supply, and installation of VELUX opening and fixed skylights and roof windows:
It includes;
- accessories
- proprietary flashings

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 2208	Safety glazing materials in buildings
NZS 3604	Timber-framed buildings
NZS 4223.4	Code of practice for glazing in buildings - Wind, dead, snow and live actions

1.3 MANUFACTURER/SUPPLIER DOCUMENTS
Manufacturer's and supplier's documents relating to this part of the work:
Sales Brochure April 2014
Installation instructions for GGU/GGL Roof Window and Flashing
Installation instructions for VS/E Skylight
Installation instructions for FS Skylight
Installation instructions for VCM/E curb mounted Skylight
Installation instructions for FCM curb mounted Skylight
Installation instructions for EDW flashing
Installation instructions for EDL flashing

Manufacturer/supplier contact details

Company:	VELUX New Zealand Limited
Web:	www.velux.co.nz
Email:	info@velux.co.nz
Telephone:	0800 650 445

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER
Provide a material manufacturer/supplier warranty:
10 years: For VELUX Skylights

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR
Provide an installer/applicator warranty:
2 years: For installation of VELUX Skylights
- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

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

1.7 NO SUBSTITUTIONS
Substitutions are not permitted to any of the specified VELUX systems, components and associated products listed in this section.

Performance

1.8 PERFORMANCE, WIND, DEAD, SNOW, AND LIVE ACTIONS
The design wind pressures and snow loads to NZS 3604. Live loads and glazing design, for glass or equivalent plastics, to NZS 4223.4.

2. PRODUCTS

2.1 LOW PITCH SKYLIGHTS
VELUX Low Pitch Skylights, either top hinged with electric or manual opening or fixed, for roof pitches between 0° to 60° manufactured from internal ABS frame in white high quality treated timber, prefinished frame and sash in white, semi-gloss paint. External composite cappings in umber grey manufactured of Kynar 500 coated aluminium. Refer to SELECTIONS for type, finish and accessories.

Components

2.2 FIXINGS
VELUX proprietary fixings and brackets compatible with the skylight/roof window.

2.3 GLAZING - FIXED SKYLIGHTS
VELUX proprietary toughened double glazing with Argon gas fill and low E^3 coating.

2.4 HARDWARE
Fasteners, stays, locks, vents and other hardware as supplied with the unit.

2.5 FLASHINGS
VELUX proprietary flashing solutions to VELUX instructions. Refer to SELECTIONS for type.

Accessories

2.8 INSTALLATION ACCESSORIES
VELUX installation accessories as supplied with the unit. Refer to SELECTIONS for type.

Finishes

2.9 FINISH
VELUX proprietary finishes.

3. EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING
Avoid distortion of elements during transit, handling and storage. Deliver in original containers, dry, undamaged with seals and labels intact. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement. Do not deliver to site any elements which cannot be immediately unloaded into suitable conditions of storage.

3.2 PRE-INSTALLATION REQUIREMENTS
Confirm framed openings on site for dimensions, to suit the VELUX proprietary Skylight / Roof Window. Unit dimensions are overall finished frame dimensions. For framing purposes refer to supplied installation instructions.

3.3 EXECUTION GENERALLY
Check that the preparation of the opening is to NZBC E2/AS1, 8.4.17, Roof penetrations.

3.4 HARDWARE GENERALLY
Factory fit all required and scheduled hardware.

3.5 RETAIN PROTECTIVE COVERINGS
Retain protective coverings and coatings in place during fixing wherever possible. Provide additional protection to prevent marking of surfaces visible in the completed work. Remove protection on completion.

Installation

3.6 GENERALLY
Check that the trimmed openings are formed and constructed to suit the required units. Do not proceed until roof and structural openings are properly formed.

3.7 INSTALL UNITS
Install and fix the units strictly in accordance with manufacturer's requirements and installation instructions. Repack any thermal insulation around rough openings where disturbed by the installation to maintain continuity of thermal barriers. Install proprietary flashings (EDW, EDL)as detailed by VELUX to make the installation completely weatherproof.

3.8 ACCESSORIES AND OPERATING SYSTEMS
Install selected VELUX accessories and hardware and complete all operating systems.

Completion

3.9 CLEAN FRAMES AND GLAZING
On completion clean down both sides of unit frames, using the methods required by the manufacturer. Remove any manufacturer's stickers and clean glass. Ensure all installed units are adequately protected from damage and adverse weather during construction.

3.10 CONFIRM
Confirm the proper operation of hardware and operating systems on completion of the installation and again at completion of the contract works.

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

Low pitch skylights

4.1 VELUX - FCM - LOW PITCH FIXED SKYLIGHT

Location:	Refer drawings
Brand:	VELUX
Model:	FCM Low Pitched Fixed
Type/size:	Refer drawings
Glazing:	Pre installed. VELUX proprietary toughened double glazing with Argon gas fill and low E^3 coating.
Colour:	Greyfriars
Roof type/pitch:	refer drawings

Components

4.2 VELUX FLASHING SYSTEM

Brand:	VELUX
Roofing type:	refer drawings
Roof pitch:	Refer drawings
Flashing type:	~, to match unit/roof type
Colour:	Greyfriars

4821 FLASHINGS

1. GENERAL

This section relates to the fabrication and installation of flashing systems not forming part of a proprietary system.

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries - General requirements and mechanical properties
NZS 3604	Timber-framed buildings
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

Requirements

1.3 QUALIFICATIONS

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

1.4 VERIFY DIMENSIONS

Verify dimensions against site measurements prior to fabrication.

Standards of performance

1.5 DURABILITY REQUIREMENTS

Design and install the flashings appropriate for the durability applications in accordance with NZBC B2/AS1. The Building Code B2, 3.2 requires that all hidden elements have at least the same durability as that of the element that covers it. Refer to NZBC B2/AS1 Table 1: Durability Requirements of Nominated Building Elements and NZBC E2/AS1 Table 20 Material selection.

1.6 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with NZBC E2/AS1 Table 20 to minimise corrosion. Refer to either NZS 3604 Clause 4.2 or AS/NZS 2728 for the relevant exposure conditions. For compatibility of materials in contact and subject to run-off, refer to NZBC E2/AS1 table 21 and NZBC E2/AS1 table 22.

1.7 DESIGN

For flashings where there are no specific details or drawings, provide a full size mock-up of the flashing to integrate components into the weathertight system. Co-ordinate with the trades affected by the installation.

2. PRODUCTS

2.1 FLASHING MATERIALS

Acceptable materials for flashings are described in NZBC E2/AS1, 4.0. Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the building and cladding materials and their fixings.

2.2 FLASHING FABRICATION

Fabricate flashings generally to NZBC E2/AS1, 4.0, from a ductile grade of metal designed for lateral strength by folding, stiffening or ribbing on external edges, having a maximum un-

stiffened width of 300mm. Provide all hooks, hems, kick outs, bird's beaks, stop ends, soft edges and turn downs etc. to NZBC E2/AS1, 4.0, or as shown on the drawings.

2.3 FIXINGS

Rivets, screws, nails and cleats to be compatible with the materials being fastened. Fasteners complying with the corrosion requirements of AS 3566 are suitable for use with ZINCALUME® steel products. Use only low carbon non-conductive sealing washers.

2.4 JOINTS - SEALANTS

Neutral Curing silicone or MS polymer sealant as required, with low resistance to compression and be-able to withstand large temperature variations. MS polymer sealant to be used where the sealant is exposed and the surrounding surfaces are to be subsequently painted or coated.

3. EXECUTION

Conditions

3.1 DELIVERY

Keep flashings dry in transit. Take delivery of flashings in an undamaged condition. Reject all damaged materials.

3.2 STORAGE

Store materials and accessories on a level, firm base, in dry conditions, well ventilated, out of direct sunlight and completely protected from weather and damage. Ensure storage areas are away from current work areas. Cover to keep dry until fixed.

3.3 HANDLING

Avoid distortion and contact with potentially damaging surfaces/substances. Do not drag flashings across each other, or across other surfaces. Protect edges, corners and surfaces from damage.

3.4 SUBSTRATE

Do not commence work until the substrate is of the standard required by the installer for the specified flashings, level and in true alignment.

3.5 PROTECT

Protect surfaces, window and door joinery, and finishes already in place, from the possibility of damage during the installation process.

3.6 CONFIRM LAYOUT

Before commencing work confirm the proposed installation of the flashings and expansion joints and other visual considerations of the finished work.

3.7 CO-ORDINATE INSTALLATION

Co-ordinate installation of flashings with associated trades.

Application

3.8 INSTALLATION

Install flashings in accordance with NZMRM CoP and in compliance with NZBC E2/AS1, 4.0 Flashings. For very high wind zones and where the pitch of the roof is below 15° the flashing joint laps shall be sealed with sealant at each end of the lap to prevent the ingress of water.

Refer to NZBC E2/AS1 Table 7 for general dimensions of flashings.

3.9 FIXINGS

Fix flashings with fasteners appropriate to the situation. For fixing flashings with proprietary brackets or clips ensure they are aligned to allow for movement and are compatible with the flashing material.

Fix screws with the shank perpendicular to the surface of the flashing with the washer fitted firmly against the flashing. Screws to be compatible with the flashing material.

Rivets 'blind' or 'pop' are to be sealed when used. Aluminium rivets are compatible with zinc or AZ coated steel. Monel and stainless steel rivets can be used to fix galvanized steel flashings. Minimum diameter of rivet to be used is 4.0mm. Drill hole 1mm larger than the rivet size. Seal head of rivet with neutral cured silicone.

3.10 JOINTING - SEALANTS

Clean surfaces to be lapped using a solvent ensuring all traces of the solvent are removed with a clean rag. Apply sealant by gun in a continuous bead of approximately 5mm diameter. Width of sealant when compressed should not exceed 25mm. Sealant joints shall be mechanically fixed for strength. Refer to NZMRM CoP for details.

3.11 FINAL INSPECTION

A final inspection by the installer to take place after completion of the flashing work. Any defects or subsequent damage to be made good.

Completion

3.12 PROTECT

Protect new work from damage.

3.13 REPLACE

Replace all damaged or marked elements.

3.14 LEAVE

Leave work to the standard required for following procedures.

3.15 REMOVE

Remove debris, unused materials and elements from the site.

4. SELECTIONS

4.1 Refer to drawings/details

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

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:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

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-AS6	Protection from fire
NZBC E2/AS1	External moisture
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
AS/NZS 4600	Cold-formed steel structures
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)
NASH	Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria

1.4 MANUFACTURER/SUPPLIER DOCUMENTS
Manufacturer's and supplier's documents relating to this part of the work:
- GIB® Site Guide (Dec 2014)
- GIB® Noise Control Systems (March 2006)
- GIB Aqualine® Wet Area Systems (March 2007)
- GIB® Ezybrace® Systems (2016)
- GIB Ezybrace® Bracing Software (2016)
- GIB Ezybrace® Systems (June 2011), with amendments (Dec 2014)
- GIB® Rondo® Metal Ceiling Batten Systems

BRANZ Appraisal 294 (2011) - GIB Ezybrace® Systems
BRANZ Appraisal 427 (2007) - GIB Aqualine® Wet Area Systems
BRANZ Appraisal 928 (2016) - GIB Ezybrace® Systems 2016

GreenTag Certification WWLCG001-001-A-2015 - GreenTag™ GreenRate/Level C for:
- GIB® Standard (10mm & 13mm)
- GIB Fyreline®(10mm, 13mm, 16mm &19mm)
- GIB Braceline® (10mm & 13mm)

Copies of the above literature are available at

Company:	Winstone Wallboards
Web:	www.gib.co.nz
Telephone:	0800 100 442

Requirements

1.5 NO SUBSTITUTIONS
Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.6 INSTALLER WORK SKILLS AND QUALIFICATIONS
GIB® plasterboard fixers and plasterers to be experienced competent workers, familiar with GIB® plasterboard lining systems installation and finishing techniques. Submit evidence of experience on request. For example:
- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance

1.7 INSPECTIONS AND ACCEPTANCE
Allow for inspection of the finished plasterboard surface:
- before applying sealer and
- before applying finish coatings or decorative papers,

so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

2. PRODUCTS

Materials

2.1 GIB® PLASTERBOARD
Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS/NZS 2588. Refer to SELECTIONS for location, type, thickness and finish.
GIB® Standard plasterboard

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
Pancake Head Drill Tip	Light gauge metal to light gauge metal directly under plasterboard

Refer to GIB® requirements for appropriate details.

2.4 TAPE ON TRIMS AND EDGES
GIB® Goldline™ tape-on trims

2.5 METAL ANGLE TRIMS
GIB® galvanized steel slim angle trims.

2.6 CONTROL JOINTS
GIB® Rondo® P35 control joints.

Accessories

2.7 ADHESIVE
Timber frame and/or steel frame:

GIBFix® One ultra low VOC water based wallboard adhesive
GIBFix® All-Bond solvent based wallboard adhesive

2.8 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®, GIB Trade Finish® Multi

2.9 JOINTING TAPE
GIB® paper jointing tape.

2.10 GAP FILLER
GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3. EXECUTION

Conditions

3.1 STORAGE
Store GIB® plasterboard sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks on either an impervious plastic sheet or clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material. Refer to GIB® Site Guide (Dec 2014).

3.2 LEVELS OF PLASTERBOARD FINISH
Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.

3.3 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.

3.4 SUBSTRATE
Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (Dec 2014).

3.5 TIMBER FRAME MOISTURE CONTENT
Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to NZBC E2/AS1 and GIB® Site Guide (Dec 2014).

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 (Dec 2014).

Application

3.7 LINING WALLS AND CEILINGS GENERALLY
Form to GIB® Site Guide (Dec 2014). 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 CONTROL JOINTS
Form control joints to GIB® Site Guide (Dec 2014) requirements.

3.10 INSTALL TAPE-ON TRIMS
Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

3.11 FINISHING GENERALLY
To GIB® Site Guide (Dec 2014) and AS/NZS 2589.

Completion

3.12 REPLACE
Replace damaged sheets or elements.

3.13 CLEAN DOWN
Clean down completed surfaces to remove irregularities and finally sand down with fine paper to the sheet manufacturer's requirements, to leave completely smooth and clean.

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

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

4. SELECTIONS

Plasterboard

4.1 refer drawings

6700R RESENE PAINTING GENERAL

1. GENERAL

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

1.1 RELATED WORK
Refer to 6721R RESENE PAINTING INTERIOR
Refer to 6711R RESENE PAINTING EXTERIOR

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

The following abbreviations apply specifically to this section:

MPNZA	Master Painters New Zealand Association Inc.
SIPDS	Surface Information & Preparation Data Sheets

Documents

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

Health and Safety at Work Act 2015	
AS/NZS ISO 9001	Quality management systems - Requirements
MPNZA	Specification Manual

1.4 MANUFACTURER/SUPPLIER DOCUMENTS
Manufacturer's and supplier's documents related to this section are:

Resene	Surface Information & Preparation Data Sheets (SIPDS) (hard copy or at www.resene.co.nz)
Resene	Product Data Sheets (hard copy or at www.resene.co.nz)
Resene	Putting your safety first

Copies of the above literature are available from Resene

Telephone:	0800 RESENE (0800 737 363)

Warranties

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

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

1.6 NO SUBSTITUTIONS
Substitutions are not permitted to any specified Resene coating system, or associated components and products. Do not combine paints from different manufacturers in a paint system.

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

1.7 QUALIFICATIONS

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

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

Painters to be selected from the Resene Eco.Decorator programme. The Resene Eco.Decorator programme is designed to recognise a nationwide network of environmentally responsible, quality focussed painting contractors.
Refer to www.resene.co.nz/ecodecorator.htm for a list of Eco.Decorators in your area.

1.8 PRIOR TO WORK COMMENCING

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

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

1.10 HEALTH AND SAFETY

Refer to and comply with the requirements of the Health and Safety at Work Act 2015 including the obligation to:

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

1.11 SAFETY DATA SHEETS

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

Performance

1.12 RESENE INSPECTION

Permit representatives of Resene to inspect the work in progress and to take samples of their products from site if requested. Resene will take care when inspecting the work, but does not accept any responsibility for the proper completion of the work before or after such inspection.

1.13 INSPECTION OF THE WORK

Inspection of the whole of the work at each of the stages set out in SELECTIONS may be made. Agree on a programme that will facilitate such inspection, including notification when each part and stage of the work is ready for inspection.

2. PRODUCTS

Materials

2.1 MATERIALS GENERALLY

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

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

2.2 DARK COLOURS

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

2.3 THINNERS/ADDITIVES

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

Accessories

2.4 ACCESSORIES

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

3. EXECUTION

Conditions

3.1 EXECUTION

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

3.2 TREATED SURFACES

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

3.3 ANCILLARY SURFACES

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

3.4 HARDWARE

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

3.5 PROTECTION

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

Application - preparatory work

3.6 SURFACE PREPARATION

Refer to the Resene Surface Information & Preparation Data Sheets (SIPDS) and product data manual for surface preparation sheets (or obtain them by phoning 0800 RESENE, or at

www.resene.co.nz) listed in the materials systems schedule clauses. Carry out the preparatory work required by them for each of the substrates.

3.7 SHARP EDGES, CRACKS AND HOLES

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

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

3.8 REMEDIAL WORK

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

3.9 GAP FILLING

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

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

3.10 OFF-SITE WORK

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

3.11 PRIMING JOINERY

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

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

3.12 CONCEALED JOINERY SURFACES

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

3.13 CONCEALED METAL SURFACES

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

3.14 EXTERNAL DOORS

Prime or seal and paint bottom edges before hanging.

3.15 BEAD GLAZING

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

3.16 PUTTY FRONTING - LINSEED GLAZING PUTTIES

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

Application - generally

3.17 PAINTING GENERALLY

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

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

3.18 MIXING

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

3.19 ENVIRONMENT

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

3.20 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

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

3.21 APPLICATION

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

3.22 LIGHTLY SAND

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

3.23 DEFECTIVE WORK

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

3.24 EACH COAT

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

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

Completion

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

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

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

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

3.29 DISPOSAL OF PAINTS AND THINNERS
Note: The use and disposal of paint and thinners represents a significant environmental hazard. Ensure all paint and thinners are disposed of in the following manner:
- When requested hand over part used paint containers to client for maintenance touch ups.
- Recycle leftover paint at a Resene ColorShop as part of the Resene "Paintwise programme". Contact your local Resene ColorShop for details or view information online at www.resene.co.nz/paintwise.htm.
- Donate left over paint to local community groups.
- Solvent based paints, paint thinners, turpentine, mineral spirits and solvents require special disposal procedures. Do not pour down sewer or stormwater drains, sinks or into the ground. If they cannot be recycled they must be disposed of in a refuse dump licensed to take toxic waste.

3.30 MAINTENANCE
Good maintenance of coating systems involves a routine of regular cleaning as well as regular inspections. Regular inspections of the coating systems are recommended to identify breakdown, accidental damage to or undesirable deterioration of the paint.
Wash down of exterior coatings should be undertaken on an annual basis using Resene Paint Prep and Housewash (see Data Sheet D812).

Refer the Resene Caring for your paint finish brochure and the Resene website, www.resene.co.nz/comn/services/maintenance.htm.

4. SELECTIONS

4.1 SELECTIONS
Refer to 6711R RESENE PAINTING EXTERIOR and 6721R RESENE PAINTING INTERIOR for selections.
Refer to 6711RE RESENE ENVIRONMENTAL PAINTING EXTERIOR and 6721RE RESENE ENVIRONMENTAL PAINTING INTERIOR for selections.

6711R RESENE PAINTING EXTERIOR

1. GENERAL

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

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

2. PRODUCTS

Materials

2.1 PAINT TYPES GENERALLY/ THINNERS AND ADDITIVES
Refer to 6700R RESENE PAINTING GENERAL for product clauses.

3. EXECUTION

Conditions

3.1 EXECUTION
Refer to 6700R RESENE PAINTING GENERAL for execution clauses.

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

Resene exterior paint systems

Exterior timber - existing

4.4 RESENE EXISTING EXTERIOR TIMBER, PLYWOOD, WEATHERBOARDS

Surface Prep:	Resene SIPDS No2 and Spec Sheet 2: 1/3
Spot Prime:	Resene Quick Dry D45, Waterborne Acrylic Primer Undercoat
1st coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic
2nd coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic

Exterior fibre cement cladding - new

4.5 RESENE NEW EXTERIOR FIBRE CEMENT CLADDING

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 4/1
1st coat:	Resene Concrete Primer D405, Acrylic Concrete Primer (NEC)
2nd coat:	Resene Lumbersider D34, Low Sheen Acrylic
3rd coat:	Resene Lumbersider D34, Low Sheen Acrylic

6721R RESENE PAINTING INTERIOR

1. GENERAL

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

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

2. PRODUCTS

Materials

2.1 PAINT TYPES GENERALLY/ THINNERS AND ADDITIVES
Refer to 6700R RESENE PAINTING GENERAL for product clauses.

3. EXECUTION

Conditions

3.1 EXECUTION
Refer to 6700R RESENE PAINTING GENERAL for execution clauses.

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

4.2 HARDWARE
Hardware for removal: ~

Resene interior paint systems

Plasterboard - new

4.3 RESENE NEW INTERIOR PLASTERBOARD, WALLS - DRY AREAS (LEVEL 4 FINISH)

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1: 1/1
Fire rating:	Group 1-S. Test Report FH4967
1st coat	Resene Broadwall D403, Waterborne Wallboard Sealer
2nd coat:	Resene Zylone Sheen D302, Waterborne Low Sheen
3rd coat:	Resene Zylone Sheen D302, Waterborne Low Sheen

4.4 RESENE NEW INTERIOR PLASTERBOARD, CEILINGS - DRY AREAS (LEVEL 4 FINISH)

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1: 1/1
Fire rating:	Group 1-S, Test Report FH4967
1st coat:	Resene Broadwall D403, Waterborne Wallboard Sealer
2nd coat:	Resene Ceiling Paint D305, Waterborne Flat
3rd coat:	Resene Ceiling Paint D305, Waterborne Flat

Where durable easily cleaned coating is required substitute 2nd & 3rd coats with:

Plasterboard - existing

4.5 RESENE EXISTING INTERIOR PLASTERBOARD, WALLS - DRY AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1: 1/3
Spot Prime:	Resene Broadwall D403, Waterborne Wallboard Sealer
1st coat:	Resene Zylone Sheen D302, Waterborne Low Sheen
2nd coat:	Resene Zylone Sheen D302, Waterborne Low Sheen

4.6 RESENE EXISTING INTERIOR PLASTERBOARD, CEILINGS - DRY AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1: 1/3
Spot Prime:	Resene Broadwall D403, Waterborne Wallboard Sealer
1st coat:	Resene Ceiling Paint D305, Waterborne Flat
2nd coat:	Resene Ceiling Paint D305, Waterborne Flat

7411D DIMOND RAINWATER SPOUTING SYSTEMS

1. GENERAL

This section relates to Dimond rainwater disposal systems including spouting and downpipes, in metal.

1.2 ABBREVIATIONS

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

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.3 DOCUMENTS

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

NZMRM CoP	NZ metal roof and wall cladding Code of Practice

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

1.4 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:
Dimond, Roofing and Cladding Systems Design Manual, (web based Manual with dated update pages)

Copies of the above literature are available from:
Web: www.dimond.co.nz

Warranties

1.5 WARRANTY

Warrant this work under normal environmental and use conditions against:
Failure of coating adhesion: 5 year manufacturer's standard warranty
Weatherproofing by material penetration: 5 year manufacturer's standard warranty
Weatherproofing by substandard workmanship: 3 years
From: Date of completion of installation

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

Requirements

1.6 NO SUBSTITUTIONS

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

1.7 QUALIFICATIONS

Installers to be experienced competent gutter installers, familiar with the **Dimond** materials and the techniques specified.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide one copy of all relevant **Dimond** maintenance information on completion of the roofing work.

Performance

1.9 TEST
Test the completed rainwater disposal system with water to ensure spoutings are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in spoutings.

2. PRODUCTS

Materials

2.1 SPOUTING
Complete with matching brackets to suit the spouting and screws. Refer to SELECTIONS for type.

2.2 DOWNPIPES
Complete with stand-off brackets, galvanized screw fixed. Refer to SELECTIONS for type.

Components

2.3 DROPPERS
Steel or plastic droppers, sized to fit inside the downpipe.

2.4 DOMES
Wire mesh in round form with legs to clip inside the outlet opening to the downpipe.

3. EXECUTION

Conditions

3.1 HANDLE AND STORE
Handle and store downpipes, spouting and accessories to avoid damage. Store on site under cover, on a clean level area, stacked to eliminate movement and away from work in progress. Avoid exposure to sunlight if strippable film is still on the product.

3.2 SUBSTRATE
Check that fascia, barges or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are suitable to fix 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 12 metres in length for steel gutter.

3.4 CORROSION
Separate metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

Check compatibility of metals used for rainwater goods, against the materials being used for roofing and flashings.

Application - metal

3.5 INSTALL METAL SPOUTING
Establish minimum falls necessary (minimum 1:500) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum or 600mm centres maximum when using profile option Box 300. In areas where snow fall is possible and or high wind areas, the centres should be reduced to 450mm. Lap spouting joints in direction of flow, a minimum of 40mm to seal between and over the top of joint and seal with silicone sealant and fix with rivets. Ensure the joint is fixed over its full girth. Cut out neatly for and fit the pre-formed downpipe dropper

and rivet and seal around the joint. All installation to **Dimond** details and NZMRM CoP NZ metal roof and wall cladding Code of Practice recommendations.

3.6 INSTALL METAL DOWNPIPES

Form downpipes complete with cast zinc 115 degree angle bends as needed with all joints lapped and silicone sealed and fixed with 2-4mm diameter aluminium blind rivets. Galvanize screw fix with galvanized steel pipe clips to rigidly stand 40mm off the wall plumb and discharging into stormwater gully or inlet pipe. All installation to **Dimond** details and NZMRM CoP NZ metal roof and wall cladding Code of Practice recommendations.

3.7 INSTALL PROTECTION

Fit wire mesh domes to downpipe outlets and plastic mesh to spouting to the spouting manufacturer's requirements.

Completion

3.8 REPLACE

Replace damaged or marked elements.

3.9 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.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4. SELECTIONS

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

4.1 Refer drawings

Appendicies

Roof Logic	RL-RECOVER – Korokoro School.v1
	RL-FIBRETITE (plywood) – Korokoro School.v1

SPECIFICATION

RL-RECOVER –Korokoro School.v1

ROOFLOGIC
INTELLIGENT ROOFING SOLUTIONS

General Guide Specification for Installation of RoofLogic Recover system with FiberTite membrane. *RL-RECOVER – Korokoro School* is provided as a specification detailing the overlay of existing plywood sarked membrane roofs.

Client: **Korokoro School.**
Architect: **Resolve It Architects.**
Project: **Korokoro School – membrane roof replacement.**

PART 1 – SYSTEM COMPONENTS AND INSTALLATION

1.0 SUMMARY

This specification is for substrate preparation of existing plywood sarked membrane roofs and associated gutters, incorporating EPS tapered board, RL Securock Re-Cover board and fully adhered FiberTite single ply KEE Roofing Membrane.

1.1 SCOPE

1. Install RL Recover system in accordance with this specification and with all relevant project documentation and details.
2. The roofing contractor shall be responsible for substrate preparation and the installation of the Recover system, including the FiberTite roofing membrane.
3. Construction details relevant to the application of the FiberTite membrane have been agreed and approved by the system supplier (RoofLogic.) These agreed details along with all general provisions of this specification are to be complied with by the Roofing Contractor.
4. A RoofLogic Pre-Installation Notice (RL-PIN) must be completed, signed by the authorised roofing contractor, submitted to and approved by RoofLogic prior to commencement of work on site.

1.2 SYSTEM COMPONENTS

All components for the RoofLogic Recover system shall be supplied by RoofLogic. Components other than those manufactured and/or supplied by RoofLogic shall be submitted for review, prior to ordering, and may only be used with the consent of RoofLogic.

The following system components will be supplied and installed by the roofing contractor on this project and collectively these components are referred to as the UltraTherm Recover System over plywood within this specification:

a) RL High Density EPS tapered board.
b) RL Securock Roof Board (10mm.)
c) Fasteners and Load Distribution Plates.
d) FiberTite Membrane and associated FiberTite flashing materials, adhesives and accessories.

1.3 CO-ORDINATION

1. Prior to installation of materials, a pre-roofing conference shall be held with the roofing contractor, and main contractor/owner's representative(s) to discuss the specified roofing system, coordinate its proper application and the expectations of all parties involved.
2. Plan and coordinate the installation of the roofing system with other trades in such a manner to avoid membrane damage, keeping the complete installation weather tight and in accordance with all approved details and warranty requirements.
3. RoofLogic shall be available to make recommendations necessary to ensure compliance with project specifications and specification alternatives due to unforeseen job conditions.

1.4 ULTRATHERM RECOVER: SUBSTRATE PREPARATION

Section 1.4 outlines the requirements for the preparation of the existing substrate including the existing metal roofing.

1. Substrate Preparation – Existing Plywood
   a) All existing plywood linings and sub-framing must be assessed to establish whether there is any damaged, wet or rotten timber. If the substrate is found to be defective in any way repairs must be undertaken to provide a substrate of sufficient integrity to receive the RoofLogic Recover system.
   b) Establish that the existing roofs have fall to existing outlets. Falls can be nominal but should be sufficient to avoid standing water on roofs and in gutters so as not to impose increased loading on the existing structure. (NB: Nominal falls and standing water does not affect the Fibertite membrane and will not void a Fibertite warranty.)
   b) Fastener withdrawal tests must be carried out on all substrates to substantiate that the proposed method and pattern of attachment and fastener selection will provide the required wind uplift resistance.
   d) Carry out all necessary remedial work to the existing substrates prior to the installation of the Recover system.
      i) Clean down existing membrane roofing thoroughly with moss and mould solution and fresh water to remove all residues, salt deposits, dirt, debris, moss, mould and lichen.
   c) Inspect all outlets and overflows as to their condition and integrity. Damaged or suspect outlets should be replaced. All outlets and overflows must have the ability to mechanically terminate the Fibertite membrane. All outlets and overflows must be designed to ensure that, when the Recover system is complete, water cannot penetrate behind or beneath the outlets and overflows and compromise the performance of the Recover system.

1.5 ULTRATHERM RECOVER: INSTALLATION OF HIGH DENSITY EPS TAPERED BOARD AND RL SECUROCK ROOF BOARD

1. Install High Density EPS Tapered Board

   Where required to create additional fall to the existing plywood substrates install tapered high density EPS Board.
   a) Refer to architectural details in respect to required board thicknesses and confirm on site.
   b) Polystyrene board shall be minimum H grade EPS polystyrene (density 24kg/m3, compressive strength 135KPa.)
   c) Polystyrene shall be tightly butted. Damaged corners shall be cut out and replaced with 300mm x 300mm section of polystyrene of matching thickness.
   d) Install two fixings per board to maintain sheets in alignment prior to installation of the RL Securock Roof Board.

e) Install no more EPS Board than can be covered with RL Securock in the same day.

3. Install RL Securock Roof Board

a) Install RL Securock Roof Board over the High density tapered polystyrene and mechanically attach Securock Roof Board to the existing plywood substrate and,where applicable, to internal gutters.

b) Consult project documentation for requirement to install RL Securock to base and sides of internal gutters. RL Securock can be installed as a Recover board over existing gutter membranes and must be installed in accordance with project specific fixing pattern.

c) Mechanically attach Securock in accordance with project specific fixing pattern using the specified mechanical fasteners.

d) All fasteners and stress plates for mechanical attachment of Securock and PIR board are as listed in para. 4 below

e) Install no more Securock roof board than can be covered with FiberTite membrane in the same day.

4. Fasteners and Load Distribution Plates

The following fasteners and plates shall be used as part of the RoofLogic Recover system:

a) For installation of Securock and PIR board to existing plywood substrate Trufast EHD #15 fasteners must be used in conjunction with Trufast 70mm recessed load distribution plates. Length of Trufast EHD fastener to be sufficient to provide minimum 15mm penetration through the plywood substrate

1. 6 ULTRATHERM RECOVER: FIBERTITE MEMBRANE - PRODUCTS AND INSTALLATION

1. The following FiberTite membranes and ancillary products shall be used as part of the completed FiberTite installation:-

a) FiberTite-FB Membrane

FiberTite 1.2mm membrane with fleece back for adhered roofing. FiberTite-FB membranes have a heat bonded 120 gm/m2 polyester backing. Manufactured by Seaman Corporation and conforming to the physical properties as outlined in FiberTite FB TDS, FiberTite exceeds the physical property requirements and definitions as outlined in ASTM D7654 Standard Specification for Ketone Ethylene Ester (KEE) Sheet.

FiberTite-FB membrane will be used for main horizontal surfaces.

b) FiberTite-SM Membrane

FiberTite-SM 1.2mm ketone ethylene ester (KEE) membrane, reinforced with a 140 grams/m2 knitted polyester fabric. Manufactured by Seaman Corporation, conforming to the physical properties as outlined in FiberTite TDS, FiberTite-SM exceeds the physical property requirements and the surface compound meets the polymer content definitions as outlined in ASTM D 6754 Standard Specification for Ketone Ethylene Ester (KEE) Sheet Roofing.

FiberTite-SM membrane will be used for vertical applications and detailing.

c) Flashing Membrane

FiberTite non-reinforced membrane 1.5mm is to be used for all respective roofing system flashing requirements to match the roofing membrane and warranty expectations selected for the roofing system. The 1.5mm FiberTite non-reinforced membrane is to be used for all detailing, e.g. downpipe and overflow detailing, internal and external corners of gutters.

d) Ancillary Products

i) RL E-101 Sealant – a single component gun grade polyether sealant to seal flashing terminations.

ii) Fiberclad Metal – to fabricate metal flashings, manufactured from aluminium zinc steel laminated with a polymeric coating.

iii) RL Termination Bar – For the restraint and termination of membrane flashings, 2mm x 25mm x 3.000m extruded aluminium bar with pre-punched holes at 200mm centres.

2. Adhering of FiberTite membrane

The authorised roofing contractor shall assume full responsibility for any and all irregularities defects or quality issues that arise due to failure to follow published installation guidelines for the proper installation of adhered FiberTite membrane roofing systems.

a) General

i) Work shall be coordinated to ensure that sequencing of the installation promotes a 100% watertight installation at the end of each day

ii) Restrictions regarding outside ambient air temperature are relative only to the exposure limits of the workers and/or adhesives when necessary.

iii) When using adhesives outside ambient air temperature shall be above 4°C. Curing or drying time of the adhesive will be affected by ambient temperatures and must be taken into consideration.

iv) Humidity can affect the drying time of solvent borne adhesives and/or cause condensation to form on the newly applied adhesive.

v) No moisture may be present on the adhesive(s) prior to mating or application of FiberTite membranes.

b) FiberTite Fleece Back Membrane Adhered in FTR-490 Adhesive

For FB membranes - Unroll approximately 10 metres of the FiberTite-FB membrane and position the roll over the properly installed/prepared substrate. Pull the tail back over the roll to expose a workable area (approx. 10 metres) of substrate.

i) Apply a 100% continuous coat of adhesive to the substrate

ii) The amount of substrate that can be coated with a workable amount of adhesive will be determined by application method, ambient temperature, humidity, and available technicians.

iii) To ensure proper application and curing of the adhesive, the outside air temperature shall be above 5°C and rising.

iv) FTR-490 adhesive is to be applied by spraying and back rolling or just rolling. Do not dump adhesive or pour from the cans.

v) Roller applied adhesive shall utilize a solvent resistant 10mm nap roller.

vi) Adhesive must be rolled out to ensure a smooth, even 100% coverage of the substrate with no voids, skips, puddles, or similar irregularities.

vii) Allow the adhesive to set up only to the point that the adhesive is slightly cured but still wet. Do not allow adhesive to skin or dry out.

viii) Water borne adhesives (FTR-490) can be directly affected by moisture. Water based adhesives shall not to be installed over/on substrates that are moist or wet or on systems or substrates that have residual moisture.

ix) Broom the adhered portion of the membrane to ensure full contact and complete the bonding process by firmly pressing the bonded membrane into place with a weighted roller.

x) Repeat the process for the remaining un-bonded portion of the membrane, lapping subsequent, adjacent rolls of membrane a minimum of 75mm, ensuring correct lapping of the membrane to shed water along the laps.

xi) No adhesive shall be applied to the lap "seam" areas of the membrane. Areas contaminated with adhesive are difficult to clean, will impair proper welding of the seams and require a membrane patch or strip.

c) FiberTite Membrane (without Fleece Backing) Adhered with FTR-190e Bonding Adhesive

i) Position the FiberTite Membrane and fold the sheet to allow a workable exposure of the underside of the sheet.

ii) Apply a 100% continuous coat of bonding adhesive to the exposed bottom side of the membrane and a mirrored area of the substrate.

iii) The amount of membrane and substrate that can be coated with adhesive will be determined by application method, ambient temperature, humidity and available manpower.

iv) Adhesive may be applied by spraying and back rolling or just rolling. Do not dump adhesive or pour from the cans.

v) Roller applied adhesive shall utilize a solvent resistant 10mm nap roller, spreading the adhesive to ensure a smooth, even 100% coverage of the substrate and membrane.

vi) Spray applied adhesive must be spread out by roller to ensure a smooth, even 100% coverage of the substrate and membrane with no voids, skips, globs, puddles similar irregularities.
Note: a squeegee can be used to "flatten" or spread globs and puddles of adhesive.

vii) Adhesive coverage should average 2.5 square metres per litre of applied adhesive with a 1.25 square metres per litre net coverage (± 10%) for the membrane and substrate combined.

viii) Allow the adhesive to dry or cure to a point of being tacky, but not stringy to the touch on both surfaces. Do not allow adhesive to completely dry out on either surface.

ix) When sufficiently cured, carefully maneuver the glued portion of the membrane onto the glued substrate surface, avoiding any wrinkles or air pockets.

x) Broom the adhered portion of the membrane to ensure full contact and complete the bonding process by firmly pressing the bonded membrane into place with a weighted, foam-covered, lawn roller.

xi) Repeat the process for the remaining unbonded portion of the membrane, lapping subsequent, adjacent rolls of membrane a minimum of 75mm, ensuring proper shingling of the membrane to shed water along the laps.

xii) No adhesive shall be applied to the lap seam areas of the membrane. Contaminated areas will inhibit proper welding of the seams requiring a membrane patch or strip.

xiii) Do not use bad or marginal adhesives. Contact RoofLogic if the quality of the adhesive is suspect.

3. Welding of FiberTite Membrane

a) General

i) All field seams exceeding 3 metres in length shall be welded with an approved automatic welder.

ii) All field seams must be clean and dry prior to initiating any field welding. Remove foreign materials from the seams (dirt, oils, etc.) with acetone or authorized alternative

iii) All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.

iv) Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.

v) Contaminated areas within a membrane seam will inhibit proper welding and will require a membrane patch or strip.

b) Hot Air Hand Welding

i) The lap or seam area of the membrane may be intermittently tack welded to hold the membrane in place.

ii) The back interior edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.

iii) The nozzle of the hand held hot air welder shall be inserted into the lap at a 45° angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be used to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 38mm wide nozzle, to create a homogeneous weld, a minimum of 38mm in width.

iv) Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 25mm weld.

c) Automatic Hot Air Machine Welding

i) Proper welding of the FiberTite Membrane can be achieved with a variety of automatic welding equipment.

ii) Follow all manufacturers' instructions for the safe operation of the automatic welder.

iii) Properly welded seams shall utilize a 38mm wide nozzle, to create a homogeneous weld, a minimum of 38mm in width

4. Flashing of FiberTite Membrane

a) Flash all penetrations according to approved details.

b) Flash all upstands, parapets and interior walls in strict accordance with approved RoofLogic details

c) All flashing shall be adhered to properly prepared, approved substrate(s) with FTR-190e adhesive.

d) The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond mechanically attached flanges a maximum width of 200mm

e) Vertical flashing shall be terminated no less than 150mm above the plane of the deck with approved termination bar or metal cap flashing.

f) Complete all inside and outside corner flashing details with FiberTite pre-formed corners or an approved field fabrication detail.

g) Probe all seams with a dull, pointed probe to ensure the weld has created a homogeneous bond.

h) Install penetration accessories in strict accordance with approved details. Ensure penetration accessories have not impeded in any way the working specification.

5. Sealants

a) Apply authorized RL E-101 sealant to all surface mounted reglets as per project requirements. Sealant(s) are to shed water. Follow manufacturer's instructions and installation guides.

b) Use primer when recommended by the manufacturer.

c) Sealants will require periodic maintenance by the building owner's maintenance personnel.

PART 2 – PROJECT AND QUALITY MANAGEMENT

2.1 QUALITY MANAGEMENT

1. It is the responsibility of the roofing contractor to initiate and maintain a Quality Control Programme which governs all aspects of the installation of the RoofLogic Recover System.
2. The RoofLogic Recover System shall be installed only by a roofing contractor, authorized by RoofLogic to install all parts of the system. The roofing contractor's key personnel shall have received specialised training in the installation of the complete system.
3. All system components shall be installed in accordance with current guide specifications, details and technical data sheets. There shall be no deviations from approved contract specifications or detail drawings without prior written approval by RoofLogic.

2.2 QUALITY CONTROL OF FIBERTITE INSTALLATION

1. FiberTite roofing membranes shall be installed only by a roofing contractor, authorized by RoofLogic to install FiberTite roof systems. The roofing contractor's key personnel shall have received training in the installation of FiberTite membranes by RoofLogic.
2. Roofing contractors shall be familiar with and have the following publications available for their reference:-
   a) FiberTite Construction Details
   b) FiberTite Installation Manual
3. The roofing contractors site foreman shall:
   a) Ensure that all aspects of the installation (sheet layout, attachment, welding, flashing details) are in strict accordance with specifications and details.
   b) Initiate daily inspections of all completed work which shall include, but is not limited to, the probing of all field welding with a dull pointed instrument to assure the quality of the application and ensure that any equipment or applicator deficiencies are immediately resolved.
   c) If inconsistencies in the quality of the application of the FiberTite membrane are found, all work should cease until corrective actions are taken to ensure the continuity of installation

PART 3 – GENERAL

3.1 DELIVERY AND STORAGE

1. Deliver all materials to the job site in manufacturer's original, unopened containers, with legible labels and in sufficient quantity to allow for continuity of work.
2. All rolls of membrane shall be stored, lying down, elevated above the roof deck and completely protected from moisture with tarpaulins. Manufacturer's packaging is not considered adequate for outdoor storage.
3. Insulation and cover board materials shall be elevated on pallets and fully protected from moisture with tarpaulins. Manufacturer's packaging is not considered adequate protection from moisture.
4. All adhesives and sealants shall be safely stored between 5°C and 28°C prior to use.
5. Flammable materials shall be stored in a cool, dry area away from sparks and open flames.
6. Follow all precautions as outlined in manufacturer's Material Safety Data Sheets.

3.2 JOB CONDITIONS

1. Protection
   a) Schedule installation sequence to limit access and utilization of the newly installed membrane for material storage, construction staging, mechanical and/or excessive foot traffic.
   b) Provide proper protection on all newly completed roofing to avoid damage to the new roofing system.
   c) Traffic should be minimized on a freshly laid roof.
   d) Protect building walls, rooftop units, windows and other components during installation.

3.3 INSPECTION AND WARRANTY

1. Inspection
   a) Upon completion of the project, the authorized roofing contractor shall complete and submit the RoofLogic Notice of Completion to RoofLogic.
   b) Upon receipt of the notice of completion, a RoofLogic representative will schedule an inspection with a representative of the authorized roofing contractor to thoroughly review the installation and verify compliance with specifications.
   c) All field seams shall be visible and available to RoofLogic at the time of final inspection.
   d) Any corrections or modifications necessary for compliance with the specifications and acceptance for warranty will be noted on the Final Inspection for Warranty Form.
2. Warranty
   Upon completion of all remedial items and final acceptance of the installation, RoofLogic shall issue a system warranty for a period of 20 (twenty) years. The warranty provides the building owner protection against the cost of repairing leaks that are a result of defects in the membrane.
3. Maintenance
   Along with the issuance of the warranty, a set of instructions shall be included detailing preventative maintenance requirements on the part of the building owner and noting a list of harmful substances which may damage the FiberTite roofing membrane.

SPECIFICATION

RL - FIBERTITE (plywood)
Korokoro School, v.1

Client: **Korokoro School**

Architect: **Resolve-it Architects**

Project: **Korokoro School membrane roof replacement**

PART 1 – SYSTEM COMPONENTS AND INSTALLATION

1.0 SUMMARY

This specification is for the installation of FiberTite single ply KEE membrane over plywood, **Korokoro School, 79 Korokoro Road, Lower Hutt.** The FiberTite membrane is to be installed in accordance with this specification, project details and drawings.

1.1 SCOPE

1. Furnish and install an adhered FiberTite Roofing Membrane as manufactured by Seaman Corporation and supplied by RoofLogic Limited.
2. FiberTite membrane to be installed over structural timber decking (i.e. H3 treated plywood.)
3. Construction details relevant to the application of the FiberTite membrane have been agreed and approved by the membrane supplier (RoofLogic.) These agreed details along with all general provisions of this specification are to be complied with by the Membrane Installer.
4. This specification is applicable to only those roofs and gutters that are proven to have sufficient structural integrity, and are capable of supporting a FiberTite Roofing Membrane according to the guidelines below.
5. A RoofLogic Pre-Installation Notice (RL-PIN) must be completed, signed by an authorised roofing contractor, submitted to and approved by RoofLogic prior to commencement of work on site.

1.2 SYSTEM COMPONENTS

1. The following system components will be supplied and installed by the roofing contractor on this project:-
   a) FiberTite-SM Membrane (Colour Slate Grey/Energy Grey.)
   b) FiberTite Flashing Membrane (Colour Slate Grey/Energy Grey.)
   c) FTR-190e Bonding Adhesive.
   d) FTR-490e Adhesive
   e) FTR 101 Sealant
   f) Fiberclad Metal, laminated 1.5mm aluminium (Colour Slate Grey/Energy Grey.)

2. Technical Data Sheets for all system components are available from RoofLogic Technical.

1.3 CO-ORDINATION

1. Prior to installation of materials, a pre-roofing conference shall be held with the roofing contractor, and owner/owner's representative(s) to:
   a) Discuss the specified roofing system, coordinate its proper installation and the expectations of all parties involved;
   b) Plan and coordinate the installation of the roofing system with other trades in such a manner to avoid membrane damage, keeping the complete installation weather tight and in accordance with all approved details and warranty requirements.
2. RoofLogic shall be available to make recommendations necessary to ensure compliance with project specifications and specification alternatives due to unforeseen job conditions.

1.4 SUBSTRATE – NEW PLYWOOD

1. Plywood must be treated to H3 (CCA treated.) LOSP plywood must not be used.
2. Plywood must comply with NZBC Acceptable Solution E2/AS1, Paragraph 8.5.3 and 8.5.5.
3. Where specific design is used (i.e. outside scope of E2/AS1) the plywood thickness and fixing size may increase and centres may decrease to meet specific wind loadings.
4. Plywood is to be installed to provide positive slope for roof drainage. 1:30 fall is required for roof areas, 1:40 for deck areas and 1:100 for associated gutters.
5. Prepared substrate shall be smooth, dry, and free of debris and/or any other irregularities which would interfere with the proper installation of the FiberTite Roofing membrane.
6. Do not proceed with any part of the application until all defects and preparation work have been corrected and complete.
7. Adhesives will not bond to wet or damp timber substrates. For structural plywood substrates the moisture content must be less than 20% and dry at time of application.

1.5 FIBERTITE MEMBRANE: PRODUCTS AND INSTALLATION

1. The following FiberTite membranes and ancillary products shall be used as part of the completed FiberTite installation:

   a) FiberTite-SM Membrane
   FiberTite-SM is a nominal 1.2mm ketone ethylene ester (KEE) membrane, reinforced with a 140 grams/m2 knitted polyester fabric as manufactured by Seaman Corporation, under the trade name FiberTite-SM, conforming to the physical properties as outlined in the associated data sheet. FiberTite-SM exceeds the physical property requirements and the surface compound meets the polymer content definitions as outlined in ASTM D 6754.

   b) Flashing Membrane
   1.5mm FiberTite non-reinforced membrane shall be used for all respective roofing system flashing requirements to match the gutter membrane and warranty expectations selected for the roofing system. The 1.5mm FiberTite non-reinforced membrane is to be used for all detailing, e.g. downpipe and overflow detailing, internal and external corners of gutters.

   c) Ancillary Products
      i) RL E-101 Sealant – a single component gun grade polyether sealant to seal flashing terminations.
      ii) Fiberclad Metal – to fabricate metal flashings, manufactured from aluminium zinc steel laminated with a polymeric coating.
      iii) RL Termination Bar – For the restraint and termination of membrane flashings, 2mm x 25mm x 3.000m extruded aluminium bar with pre-punched holes at 200mm centres.

2. Adhering of FiberTite Membrane

The authorized roofing contractor shall assume full responsibility for any and all irregularities, defects or quality issues that arise due to failure to follow published installation guidelines for the proper installation of adhered FiberTite membrane roofing systems.

a) General

i) Work shall be coordinated to ensure that sequencing of the installation promotes a 100% watertight installation at the end of each day.

ii) Restrictions regarding outside ambient air temperature are relative only to the exposure limits of the workers and/or adhesives when necessary.

iii) When using adhesives outside ambient air temperature shall be above 4°C. Curing or drying time of the adhesive will be affected by ambient temperatures and must be taken into consideration.

iv) Humidity can affect the drying time of solvent borne adhesives and/or cause condensation to form on the newly applied adhesive.

v) No moisture may be present on the adhesive(s) prior to mating or application of

b) FiberTite Membrane (Without Fleece Backing) Adhered with FTR-190e Bonding Adhesive

i) Position the FiberTite Membrane and fold the sheet to allow a workable exposure of the underside of the sheet.

ii) Apply a 100% continuous coat of bonding adhesive to the exposed bottom side of the membrane and a mirrored area of the substrate.

iii) The amount of membrane and substrate that can be coated with adhesive will be determined by application method, ambient temperature, humidity and available manpower.

iv) Adhesive may be applied by spraying and back rolling or just rolling. Do not dump adhesive or pour from the cans.

v) Roller applied adhesive shall utilize a solvent resistant 10mm nap roller, spreading the adhesive to ensure a smooth, even 100% coverage of the substrate and membrane.

vi) Spray applied adhesive must be spread out by roller to ensure a smooth, even 100% coverage of the substrate and membrane with no voids, skips, globs, puddles similar irregularities.
Note: a squeegee can be used to “flatten” or spread globs and puddles of adhesive.

vii) Adhesive coverage should average 3 square metres per litre of applied adhesive with a 1.5 square metres per litre net coverage (± 10%) for the membrane and substrate combined.

viii) Allow the adhesive to dry or cure to a point of being tacky, but not stringy to the touch on both surfaces. Do not allow adhesive to completely dry out on either surface.

ix) When sufficiently cured, carefully maneuver the glued portion of the membrane onto the glued substrate surface, avoiding any wrinkles or air pockets.

x) Broom the adhered portion of the membrane to ensure full contact and complete the bonding process by firmly pressing the bonded membrane into place with a weighted, foam-covered, lawn roller.

xi) Repeat the process for the remaining unbonded portion of the membrane, lapping subsequent, adjacent rolls of membrane a minimum of 75mm, ensuring proper shingling of the membrane to shed water along the laps.

xii) No adhesive shall be applied to the lap seam areas of the membrane. Contaminated areas will inhibit proper welding of the seams requiring a membrane patch or strip.

xiii) Do not use bad or marginal adhesives. Contact RoofLogic if the quality of the adhesive is suspect.

3. Welding of FiberTite Membrane

a) General
   i) All field seams exceeding 3 metres in length shall be welded with an approved automatic welder.
   ii) All field seams must be clean and dry prior to initiating any field welding. Remove foreign materials from the seams (dirt, oils, etc.) with acetone or authorized alternative
   iii) All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.
   iv) Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.
   v) Contaminated areas within a membrane seam will inhibit proper welding and will require a membrane patch or strip.

b) Hot Air Hand Welding
   i) The lap or seam area of the membrane may be intermittently tack welded to hold the membrane in place.
   ii) The back interior edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
   iii) The nozzle of the hand held hot air welder shall be inserted into the lap at a 45° angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be used to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 38mm wide nozzle, to create a homogeneous weld, a minimum of 38mm in width.
   iv) Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 25mm weld.

c) Automatic Hot Air Machine Welding
   i) Proper welding of the FiberTite Membrane can be achieved with a variety of automatic welding equipment.
   ii) Follow all manufacturers' instructions for the safe operation of the automatic welder.
   iii) Properly welded seams shall utilize a 38mm wide nozzle, to create a homogeneous weld, a minimum of 38mm in width

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4. Flashing of FiberTite Membrane
   a) Flash all penetrations according to approved details.
   b) Flash all upstands, parapets and interior walls in strict accordance with approved RoofLogic details.
   c) All flashing shall be adhered to properly prepared, approved substrate(s) with FTR-190e adhesive.
   d) The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond mechanically attached flanges a maximum width of 200mm.
   e) Vertical flashing shall be terminated no less than 150mm above the plane of the deck with approved termination bar or metal cap flashing.
   f) Complete all inside and outside corner flashing details with FiberTite pre-formed corners or an approved field fabrication detail.
   g) Probe all seams with a dull, pointed probe to ensure the weld has created a homogeneous bond.
   h) Install penetration accessories in strict accordance with approved details. Ensure penetration accessories have not impeded in any way the working specification.

5. Sealants
   a) Apply authorized RL E-101 sealant to all surface mounted reglets as per project requirements. Sealant(s) are to shed water. Follow manufacturer's instructions and installation guides.
   b) Use primer when recommended by the manufacturer.
   c) Sealants will require periodic maintenance by the building owner's maintenance personnel.

6. Bearing Pads
   a) Where timber supports or pedestals are going to be installed over the FiberTite membrane bearing pads are required to separate the FiberTite membrane from the joist or pedestal.
   b) Bearing pads shall be fabricated from FiberTite membrane and should be oversized by 20mm to all sides of the pedestal or loose laid timber support.
   c) Supports are not to be fixed to the deck by penetrating the membrane. Consult RoofLogic for guidance and detailing if plinths need to be mechanically attached to the deck substrate.

PART 2 – PROJECT AND QUALITY MANAGEMENT

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   b) Provide proper protection on all newly completed roofing to avoid damage to the new roofing system.
   c) Traffic should be minimized on a freshly laid roof.
   d) Protect building walls, rooftop units, windows and other components during installation.

3.3 INSPECTION, WARRANTY AND MAINTENANCE

1. Inspection
   a) Upon completion of the project, the authorised roofing contractor shall complete and submit the RoofLogic Notice of Completion to RoofLogic.
   b) Upon receipt of the notice of completion, a RoofLogic representative will schedule an inspection with a representative of the authorised roofing contractor to thoroughly review the installation and verify compliance with specifications.
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