Staff Accommodation

Architectural Specification

90-94 Thompson Street, Queenstown, New Zealand

Project Ref: THOP

Date: 12 June 2026



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

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1013 DOCUMENT CONTROL

1 DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

Company:	Hallion Architects Ltd
Postal Address:	PO Box 47595, Ponsonby
Street Address:	60m Surrey Crescent, Ponsonby
City:	Auckland
Telephone:	09 940 8974
Email:	jeremyc@hallion.co.nz

1.2 DOCUMENT DETAILS

Project Name:	90-94 Thompson Street Queenstown
Project Number:	THOP
Client:	Coherent Hotels Ltd
Client Contact:	Mike Gibbon at PDM Services

1.3 REVISION CONTROL

2Issue:	Building Consent
Revision:	A
Amendment Details:	N/A
Issued to:	PDM Services
Date of Issue:	5th June 2026
Reviewed by:	Jeremy Craig
Approved by:	Jeremy Craig

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1220 PROJECT

1 GENERAL

This general section describes the project including:

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

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK

Proposed 58 bedroom, 2 and 3 storey, staff accommodation facility, with a concrete and masonry block foundations, prefabricated, off-site construction of wall and roof panels, CLT floors, with aluminium external cladding, longrun metal roofing and uPVC door and window joinery, and external sprinkler valve room and landscape retaining.

1.3 NO RESTRICTED BUILDING WORK

This project does not include Restricted Building Work.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY

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

Principal's Health & Safety Matters

1.5 PRINCIPAL'S KNOWN SITE HAZARDS

Site hazards known to the principal are:

TBC by Project Manager.

1.6 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

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

Site

1.7 SITE

The site is as shown on drawing: A101

1.8 LEGAL DESCRIPTION

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

Site environment - Durability

1.9 EXPOSURE ZONE

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

The site zone is: B

Site environment - Wind

1.10 WIND DESIGN PARAMETERS - SPECIFIC DESIGN

The design wind pressures are to AS/NZS 1170.2:2011

SLS Refer to Structural Engineers Wind Maps

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ULS	Refer to Structural Engineers Wind Maps

Site environment - Seismic

1.11 EARTHQUAKE - SPECIFIC DESIGN

The earthquake design is to NZS 1170.5, in particular the intent of NZS 1170.5, 1.2 **Determination of earthquake actions**.

3	Building type, importance level (to AS/NZS 1170.0, table 3.2)

Archaeological discovery

1.12 REPORT FINDING ANY ANTIQUITIES AND ITEMS OF VALUE

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

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

Post-1900 items remain the property of the owner, pre-1900 items may remain the property of the owner or the Crown subject to what is found.

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1222 PROJECT PERSONNEL

1 GENERAL

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

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

Principal

1.1 PROJECT MANAGER

Name:	PDM Services
Postal:	-
Street:	-
Telephone:	-
Represented by:	Mike Gibbon
Mobile:	021 223 5343
Email:	mike@pdmservvices.co.nz

Contractor

1.2 COMPANY

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

1.3 CONTRACT MANAGER

Person:	TBC
Mobile:	TBC
Telephone:	TBC
Email:	TBC

1.4 SITE FOREMAN

Person:	TBC
Mobile:	TBC
Telephone:	TBC
Email:	TBC

Consultants

1.5 ARCHITECT - PROJECT LEAD DESIGN

Practice:	Hallion Architects Ltd
Postal:	PO Box 47595, Ponsonby, Auckland
Street:	60m Surrey Crescent, Ponsonby, Auckland
Telephone:	09 940 8974
Represented by:	Jeremy Craig
Mobile:	027 2713570
Email:	jeremyc@hallion.co.nz

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Territorial Authority

1.6 BUILDING CONSENT AUTHORITY

Name:	TBC
Postal:	TBC
Street:	TBC
Telephone:	TBC
Mobile:	TBC
Email:	TBC

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1232 INTERPRETATION & DEFINITIONS

1 GENERAL

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

Definitions

1.1 DEFINITIONS

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

1.2 PERSONNEL

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

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

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

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

1.4 DEFINED WORDS

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

1.5 WORDS IMPORTING PLURAL AND SINGULAR

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

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1232S1 EXPLANATION OF SCHEDULE SECTIONS

1 GENERAL

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

1.1 EXPLANATION OF SCHEDULE SECTIONS

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

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

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

1.2 SCHEDULE SECTIONS

The following Schedule sections are contained within the specification:

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

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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 F5/AS1	Construction and demolition hazards
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 3012	Electrical installations - Construction and demolition sites
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 4781	Code of Practice for Safety in Welding and Cutting
AS/NZS 5131	Structural steelwork - Fabrication and erection
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 at Work (Hazardous Substances) Regulations 2017
Health and Safety in Employment Regulations 1995
New Zealand Building Code
Heritage New Zealand Pouhere Taonga Act 2014
Resource Management Act 1991
Smoke-free Environments Act 1990

WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Good Practice Guidelines - Excavation Safety
WorkSafe	Scaffolding in New Zealand - Good Practice Guidelines
WorkSafe	Managing Work Site Traffic - Good Practice Guidelines

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1235 SHOP DRAWINGS

1 GENERAL

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

1.1 SCHEDULE SECTION

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

1.2 SHOP DRAWING FORMAT

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

1.3 PROGRAMME FOR SHOP DRAWINGS

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

1.4 COMMUNICATION WITH SHOP DRAWING DETAILER

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

1.5 CONTRACTOR COORDINATION OF SHOP DRAWINGS

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

1.6 COORDINATION WITH SITE MEASURE

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

1.7 SHOP DRAWING REVIEW

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

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

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

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

1.8 RESPONSIBILITY

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

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1.9 RESUBMISSION OF SHOP DRAWINGS

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

1.10 WORK MAY PROCEED

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

1.11 BIM MODEL

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

2 SELECTIONS

2.1 SHOP DRAWING FORMAT

Submit the shop drawings in the following format

	Format/Size
Hardcopy	~
Electronic copy	PDF
CAD file	~

2.2 BIM (BUILDING INFORMATION MODEL) FORMAT

~

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1235S1 SCHEDULE OF SHOP DRAWINGS

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Shop drawings

1.2 SHOP DRAWINGS

Refer to the following sections:

3410	Structural Steel
3811	Prefabricated Structural Timber Framing
3813CL	XLAM CLT Panel Systems
3813NE	NelsonPine LVL Lintels Beams & Mass Timber Components
4522VL	Ventuer Performance Louvres
4541SU	Starke Ambiance Inline uPVC Window System
4824SG	Seismic Guys - Expansion Joint Systems
4933	Aluminium Metalwork
5231	Interior Doors & Windows
7352	Automatic Fire & Smoke Alarm System
7372	Fire Hydrant Systems for Buildings
7910	Lift - Low Speed or Platform

1.3 SHOP DRAWINGS - ADDITIONAL ITEMS

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

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1237 WARRANTIES

1 GENERAL

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

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

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

1.1 SCHEDULE SECTION

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

Warranties

1.2 PROVIDE WARRANTIES

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

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

1.3 WARRANTIES - INSTALLER/APPLICATOR

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

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

1.4 WARRANTIES - MANUFACTURER/SUPPLIER

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

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

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Submission

1.5 REVIEW BY CONTRACTOR

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

1.6 WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY

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

1.7 WARRANTIES - REQUIRED BY CONTRACT

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

1.8 WARRANTIES - SUBMISSION NZS 3910 CONTRACT

Refer to NZS 3910 Conditions of Contract for building and civil engineering construction, for requirements relating to the time for submission of warranties and guarantees. Submit all warranties/guarantees to the Contract Administrator no later than the date that the contractor notifies that it believes the contract works qualify for practical completion or any other time stated in the Specific Conditions of Contract.

1.9 GUARANTEES - SUBMISSION NZS 3915 CONTRACT

Refer to NZS 3915 Conditions of contract for building and civil engineering construction (where no person is appointed to act as engineer to the contract), clause 11.5 for requirements relating to the time for submission for guarantees. Submit all guarantees to the principal before or at the time of the issue of the provisional defects liability certificate, after the end of the defects liability period.

1.10 WARRANTIES/GUARANTEES - SUBMISSION NZS 3916 CONTRACT

Refer to NZS 3916 Conditions of contract for building and civil engineering – Design and construct, clauses 11.5 and 11.6 for requirements relating to the time for submission of warranties and guarantees respectively. 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

Project warranties / guarantees

Guarantees - Contractor - Master Build Services Ltd

2.1 MASTER BUILD SERVICES LTD - 10 YEAR GUARANTEE

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

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2.2 MASTER BUILD SERVICES LTD - 10 YEAR MULTI-UNIT GUARANTEE

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

Guarantee - Contractor - New Zealand Certified Builders Association

2.3 HALO 10-YEAR RESIDENTIAL GUARANTEE

Complete the Halo 10-year residential guarantee insurance application process and pay the premium. Instruct the owner to return the Completion Certificate to Halo Guarantees Limited on practical completion.

Weathertightness and watertightness warranty

2.4 WEATHERTIGHTNESS AND WATERTIGHTNESS WARRANTY

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

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

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

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1237S1 SCHEDULE OF WARRANTIES

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Warranties

1.2 WARRANTIES

Refer to the following sections:

3114E	Expol Underslab Insulation
3813CL	XLAM CLT Panel Systems
4131N	Nuralite Nuraply 3P Covered Tanking Systems
4161PC	Pro Clima Wall and Roof Underlays, Tapes & Accessories
4165DV	Drispace Roof Ventilation & Wall Vented Cavity Batten
4171GR	GIB Weatherline Rigid Air Barrier
4239JH	James Hardie® Soffits
4252AM	Archimax Aluminium Cladding System
4271	Natural Stone Veneer Cladding
4311M	Metalcraft Profiled Roofing
4522VL	Ventuer Performance Louvres
4541SU	Starke Ambiance Inline uPVC Window System
4610	Glazing Residential
4711	Thermal Insulation
4811S	Sika Sealants
4824SG	Seismic Guys - Expansion Joint Systems
5241	Fire & Acoustic Interior Doors & Windows
5316RC	Rondo Direct-Fix Ceilings - Residential
5511	Joinery & Cabinetry Fixtures
6411	Vinyl Surfacing
6511	Carpeting
6512	Carpet Tiles
6700R	Resene Painting General
6742A	Altex Fireproofing Coatings - Steelwork
6743ZF	Zone FireZone Interior Intumescent Systems
6813SD	SoundDown Acoustic Floor Systems
7123	Hot & Cold Water System
7150	Sanitary Fixtures, Tapware & Accessories.
7372	Fire Hydrant Systems for Buildings
7382	Fire Stopping Systems
7411M	Metalcraft Roofing Rainwater Spouting Systems
7612	Residential Extract Systems
7673	Split Unit Heat Pump Systems
7702	Electrical Standard
7811	Communications Cabling
7835	Access Control
7910	Lift - Low Speed or Platform

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1.3 PROJECT WARRANTIES

Refer to section 1237 WARRANTIES for project warranties.

1.4 WARRANTIES - ADDITIONAL ITEMS

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



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1237WA WARRANTY AGREEMENT

1 SPECIFICS

1.1 PARTIES TO THE WARRANTY AGREEMENT

Principal: ~
.....

Contractor: ~
.....

Warrantor: ~
.....

1.2 BACKGROUND

The principal has entered into a 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 agreement.

1.3 LOCATION

Project name: ~
.....

Project address: ~
.....

1.4 WARRANTED WORKS

Warranted works: ~
.....

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

1.5 WARRANTED MATERIALS

Warranted materials: ~
.....

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

2 WARRANTY TERMS

2.1 WORKS ARE AS REQUIRED IN THE CONTRACT

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

2.2 WARRANTY ADDITIONAL TO OTHER OBLIGATIONS

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

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2.3 WARRANTOR TO REMEDY DEFECTS

The warrantor agrees that if within the warranty period, the warrantor is advised by the principal in writing of any defect in the warranted works / materials 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.

2.4 CARRYING OUT 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,
- in a prompt and timely manner,
- without unnecessary inconvenience to any occupants,
- at the warrantor's cost,
- subject to reasonable access being provided to the warrantor for the purpose of carrying out the remedial work.

2.5 WHERE COST OF REPLACEMENT IS OUT OF PROPORTION TO THE DEFECT

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.

2.6 PRINCIPAL SHALL CONSIDER REASONABLE PROPOSALS

The principal must consider the warrantor's reasonable proposals and the parties shall 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.

2.7 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 shall first give the warrantor 10 working days notice, or such other reasonable time as agreed by the principal, 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 shall then advise the warrantor in writing that the work will be carried out / materials will be supplied by others.

In such an 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 by such other persons including all reasonable costs of the principal is to be paid to the principal by the warrantor on demand.

2.8 WARRANTOR NOT LIABLE FOR

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

- Wilful act or negligence of the principal or any person other than the warrantor.
- Fire, explosion, earthquake, war, subsidence, slips, faulty materials or workmanship other than caused by the defect in the warranted work.
- Any force of nature which the warrantor could not have reasonably foreseen.
- Any neglect or unnecessary delay by the principal in giving notice to the warrantor of a defect in the warranted works becoming apparent.
- Design faults, errors or discrepancies, unless the warrantor undertook the design of the part

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of the warranted works that is the subject of the defect.
- Use of the Warranted Works by the Principal or other person in any manner or for any purpose not being the intended manner of use or purpose of the Warranted Works.
- Failure by the principal or other persons to maintain the warranted works in accordance with good practice and any manufacturer's stated or recommended instructions or requirements.
- Fair wear and tear.

2.9 WARRANTY MAY BE ASSIGNED

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

2.10 DISPUTES

Any dispute between the principal and the warrantor arising out of this warranty is to be referred to arbitration before a sole arbitrator. If within 15 Working Days of notice of dispute, the principal and the warrantor cannot agree upon a single arbitrator, either party may request the president of the Arbitrators and Mediators Institute of New Zealand Incorporated (AMINZ) to appoint an arbitrator.

3 SIGNATORIES

3.1 SIGNED BY THE WARRANTOR

....
Signed Date

.....
Print name of person(s) authorised to sign

....
Signed by witness, include occupation and address Date

3.2 SIGNED BY THE PRINCIPAL

....
Signed Date

.....
Print name of person(s) authorised to sign

....
Signed by witness, include occupation and address Date

3.3 NOTE

The warranty shall be executed by the warrantor and the principal in the manner required for execution of a deed. In the case of a natural person, the person shall sign and their signature shall be witnessed by another person, a witness must not be a party to the deed.

Sign the warranty on behalf of a company by having 2 or more directors sign, or if there is only 1 director, by that director whose signature must be witnessed, or if the constitution of the company so provides, a director, or other person or class of person(s) whose signature(s) must be witnessed, or by 1 or more attorneys appointed by the company in accordance with section 181 of the Companies Act 1993.

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Execute the warranty on behalf of a body corporate (other than a company) by affixing its seal, which shall be attested in the manner provided for in the rules of, or applicable to, the body corporate. If signing for another type of entity for example an incorporated society, trust, school board etc. follow the protocol required for the execution of a deed.



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1238 AS BUILT DOCUMENTATION

1 GENERAL

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

1.1 SCHEDULE SECTION

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

1.2 AS BUILT DOCUMENT REQUIREMENTS

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

As built drawings recording:

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

Records of:

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

1.3 PROVISIONAL AS BUILT DOCUMENTS

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

1.4 AS BUILT DOCUMENT REVIEW

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

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

1.5 COMPLETE AS BUILT DOCUMENTS

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

1.6 AS BUILT DOCUMENTS - ELECTRONIC COPY

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

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

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1238S1 SCHEDULE OF AS BUILT DOCUMENTATION

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

As built documents

1.2 AS BUILT DOCUMENTS

Refer to the following sections:

2242	Backfilling
7352	Automatic Fire & Smoke Alarm System
7372	Fire Hydrant Systems for Buildings
7431	Drainage Common Requirements

1.3 AS BUILT DOCUMENTS - ADDITIONAL ITEMS

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

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1239 OPERATION & MAINTENANCE

1 GENERAL

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

1.1 SCHEDULE SECTION

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

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

Operation and maintenance documents

1.2 OPERATION AND MAINTENANCE INFORMATION - BUILDING ACT

Provide in writing the information and documentation prescribed by regulations made under the Building Act, to the owner/principal and the relevant territorial authority.

1.3 OPERATION AND MAINTENANCE INFORMATION

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

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

1.4 MAINTENANCE REQUIREMENTS

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

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

1.5 APPLIANCE MANUALS AND OPERATING INSTRUCTIONS

Provide appliance manuals and operating information for all appliances including details of all isolating valves and switches including:

- Water supply isolating valve.
- Location of isolating valves for appliances including dishwasher, clothes washer and fridge with and icemaker connection.
- Gas supply isolating valve.
- Electrical main switch and all sub boards.
- Location of isolating switches for electrical appliances including cooker and cook top, kitchen extract system, electric under floor heating.
- Fire and heating device operating instructions.

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1.6 EQUIPMENT AND APPLIANCE MANUALS AND OPERATING INSTRUCTIONS

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

1.7 SELECTIONS INFORMATION

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

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

Include brochures and other information included with the items supplied.

1.8 SELECTIONS INFORMATION - SUBSTITUTIONS

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

Documentation format

1.9 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

1.10 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

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- 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

1.11 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.

1.12 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.

1.13 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.

1.14 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.

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Maintenance contract proposals

2.3 MAINTENANCE CONTRACT PROPOSALS

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

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1239S1 SCHEDULE OF OPERATION & MAINTENANCE INFO

1 GENERAL

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

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Information for operation and maintenance

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the following sections:

3813CL	XLAM CLT Panel Systems
4239JH	James Hardie® Soffits
4252AM	Archimax Aluminium Cladding System
4271	Natural Stone Veneer Cladding
4311M	Metalcraft Profiled Roofing
4522VL	Ventuer Performance Louvres
4824SG	Seismic Guys - Expansion Joint Systems
6700R	Resene Painting General
6743ZF	Zone FireZone Interior Intumescent Systems
7123	Hot & Cold Water System
7150	Sanitary Fixtures, Tapware & Accessories.
7411M	Metalcraft Roofing Rainwater Spouting Systems
7431	Drainage Common Requirements
7612	Residential Extract Systems
7673	Split Unit Heat Pump Systems

Operation and maintenance manuals

1.3 OPERATION AND MAINTENANCE MANUALS

Refer to the following sections:

7352	Automatic Fire & Smoke Alarm System
7421	Sanitary Systems

Maintenance contract proposals

1.4 MAINTENANCE CONTRACT PROPOSALS

Refer to the following sections:

4811S	Sika Sealants
7352	Automatic Fire & Smoke Alarm System
7673	Split Unit Heat Pump Systems
7910	Lift - Low Speed or Platform

Additional Items

1.5 ADDITIONAL ITEMS

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

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1270 CONSTRUCTION

1 GENERAL

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

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

1.1 SCHEDULE SECTION

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

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

Quality control and assurance

1.2 QUALITY ASSURANCE

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

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

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

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

1.3 NOTICE

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

1.4 NOTIFIABLE WORK

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

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Noise and nuisance

1.5 LIMIT CONSTRUCTION NOISE

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

1.6 ACCEPTABLE NOISE LEVELS

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

1.7 PROVIDE INFORMATION TO NEIGHBOURS

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

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

1.8 INCONVENIENCE TO OTHERS

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

1.9 ROADWAY AND FOOTPATH

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

1.10 VEHICLE CROSSING

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

1.11 TRAFFIC SAFETY

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

1.12 DIRT AND DROPPINGS

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

1.13 DAMAGE AND NUISANCE

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

1.14 SMOKE FREE REQUIREMENTS

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

1.15 RESTRICTIONS

Do not:

- light rubbish fires on the site.
- bring dogs on to or near the site.

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- bring radios/audio players on to the site.

Set-out and tolerances

1.16 SURVEY INFORMATION

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

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

1.17 DATUM

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

1.18 SET-OUT

Set out the work to conform with the drawings.

1.19 SET-OUT BY LICENSED CADASTRAL SURVEYOR

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

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

1.20 CONFIRM HEIGHT IN RELATION TO BOUNDARY

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

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

1.21 USE OF SET-OUT INSTRUMENTS

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

1.22 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.

1.23 TOLERANCES

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

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

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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

1.24 EXAMINE PREVIOUS WORK

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

1.25 REPORT DEFECTIVE PREVIOUS WORK

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

1.26 EXECUTION GENERALLY

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

1.27 EXECUTION - NO DETAIL IS PROVIDED

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

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

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

1.28 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

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

1.29 MINIMISE DELAYS DUE TO WEATHER

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

Defective or damaged work

1.30 DEFECTIVE OR DAMAGED WORK

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

Hot work - fire safety

1.31 HOT WORK

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

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

1.32 COMBUSTIBLE MATERIAL

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

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1.33 HOT WORK PERMIT

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

1.34 FIRE SYSTEMS

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

1.35 DURING SUSPENDED WORK

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

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

Qualifications

1.36 QUALIFICATIONS GENERALLY

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

1.37 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

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

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

1.38 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

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

1.39 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

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

1.40 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

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

1.41 QUALIFICATIONS – PRODUCER STATEMENTS

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

1.42 REPLACEMENT OF PERSON

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

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

Products

1.43 NEW PRODUCTS

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

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1.44 COMPATIBILITY OF PRODUCTS

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

1.45 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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

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

Refer to individual work sections for any special requirements.

1.46 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.

1.47 INSTALLING PRODUCTS

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

1.48 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.

1.49 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.50 INCOMPATIBLE PRODUCTS

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

Samples

1.51 SAMPLES FOR REVIEW

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

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

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

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

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

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

Refer to SAMPLES clauses in work sections for further detail.

1.52 CONTROL SAMPLES

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

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

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

1.53 OTHER SAMPLE REQUIREMENTS

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

Prototypes

1.54 PROTOTYPES - TESTING

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

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

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

1.55 PROTOTYPES - REVIEW

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

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

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

1.56 PROTOTYPES - GENERAL

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

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

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Spares & maintenance products

1.57 SPARES & MAINTENANCE PRODUCTS

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

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

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

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

Cleaning during the works

1.58 PERIODIC SITE CLEANING

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

1.59 TRADE CLEANING

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

1.60 SPECIAL SITE CLEANING

TBC by Project Manager.

Remove protection

1.61 REMOVE PROTECTION

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

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

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

Refer to individual work sections for any special removal requirements.

Completion

1.62 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.63 LEAVE WORK

Leave work to the standard required for the following procedures.

1.64 COMPLETION - TESTS & CERTIFICATION

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

1.65 REMOVE CONSTRUCTION WASTE

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

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1.66 COMPLETE ALL SERVICES

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

1.67 CLEANING BY CONTRACTOR

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

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

1.68 CLEANING BY COMMERCIAL CLEANER

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

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

Commissioning

1.69 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.70 MOVING PARTS

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

1.71 COMMISSIONING - TESTS & CERTIFICATION

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

1.72 INSTRUCTION AND DEMONSTRATION

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

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

1.73 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.

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Practical completion submission

1.74 ADDITIONAL PRACTICAL COMPLETION INFORMATION

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

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

1.75 ADDITIONAL PRACTICAL COMPLETION REQUIREMENTS

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

In addition to the requirements in the contract, the following conditions also apply:

- TBC by Project Manager.

Defects period submissions

1.76 DEFECTS REMEDIATION - SUBMISSIONS

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

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

Completion submissions

1.77 FINAL COMPLETION - SUBMISSIONS

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

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

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1270S1 SCHEDULE OF SAMPLES & PROTOTYPES

1 GENERAL

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

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Samples

1.2 SAMPLES

There are no work section requirements.

1.3 SAMPLES - ADDITIONAL ITEMS

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

Prototypes

1.4 PROTOTYPES - REVIEW

Refer to the following sections:

4821 Flashings

1.5 PROTOTYPES - TESTING

There are no work section requirements.

1.6 PROTOTYPES - ADDITIONAL ITEMS

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



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1270S2 SCHEDULE OF SPARES & MAINTENANCE PRODUCTS

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Spares & maintenance products

1.2 SPARES & MAINTENANCE PRODUCTS

Refer to the following sections:

7835 Access Control

1.3 SPARES & MAINTENANCE PRODUCTS - ADDITIONAL ITEMS

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

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1278SR SCHEDULE OF SLIP RESISTANCE TESTING

1 GENERAL

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

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

This section includes schedules identifying work sections with:

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

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

Slip resistance - surfaces not requiring testing

1.4 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

There are no work section requirements.

1.5 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

There are no work section requirements.

Slip resistance - surfaces requiring testing

1.6 SLIP RESISTANCE - SURFACES REQUIRING TESTING

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

6411 Vinyl Surfacing

1.7 TEST METHODS & MINIMUM TEST VALUES

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

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

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

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

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

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

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

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0.557	1 in 8	7.125°

1.8 GENERAL REPORTING REQUIREMENTS

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

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

Slip resistance - additional items

1.9 SLIP RESISTANCE - ADDITIONAL ITEMS

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



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2241 EXCAVATION

1 GENERAL

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

Related work

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

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

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

Requirements

1.2 ARCHAEOLOGICAL DISCOVERY

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

Performance

1.3 GROUND CONDITIONS

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

Copies of bore logs are found in the Geotechnical Report.

1.4 PROOF DRILLING

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

1.5 ACCESS FOR MACHINES

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

1.6 SAFE WORKING CONDITIONS

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

1.7 FOUNDATION BEARING

Request written instructions if a natural bearing is:

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

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

1.8 INSPECTION

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

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1.9 SITE MEASUREMENT, ROCK

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

1.10 SITE MEASUREMENT, OTHER FORMATIONS

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

2 PRODUCTS

Materials

2.1 TOPSOIL

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

2.2 CUT MATERIAL

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

2.3 ROCK

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

2.4 UNCONTROLLED FILL

Variable fill material placed with little or no compaction control.

2.5 EXCAVATED FILL

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

3 EXECUTION

Conditions

3.1 REPORT

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

3.2 COMPLY

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

3.3 WORK BY OTHERS

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

3.4 EXISTING SERVICES AND FOUNDATIONS

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

3.5 KEEP FREE OF WATER

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

3.6 TERRITORIAL AUTHORITY REQUIREMENTS

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

3.7 FORM SUMPS

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

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3.8 SILT CONTROL

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

Application

3.9 STRIP TOPSOIL

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

3.10 STRIP TO SUBGRADE

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

3.11 DIVERT WATERWAYS

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

3.12 DIVERT DRAINS AND SERVICE LINES

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

3.13 BREAK OUT

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

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

3.14 EXCAVATION GENERALLY

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

Use plant and equipment suitable for the purpose.

3.15 OVER EXCAVATION

Make good with well compacted backfill.

3.16 EXCAVATED BACKFILL

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

Finishing

3.17 BATTERS, TEMPORARY PROTECTION

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

Completion

3.18 LEAVE

Leave work to the standard required by following procedures.

3.19 SURPLUS TOPSOIL

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



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3.20 SURPLUS MATERIAL

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

4 SELECTIONS

4.1 BORE LOGS

Copies of bore logs are found in the Geotechnical Report.

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2242 BACKFILLING

1 GENERAL

This section relates to the supply, placing and compaction of materials for backfill, basecourse or built-up ground, as required for the contract works.

Related work

1.1 RELATED SECTIONS

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for common requirements to do with the supply and laying of gravity subsoil, surface water and foul water drains.

Refer to 7441 GROUNDWATER DRAINAGE for groundwater drainage behind retaining walls.
Refer to 7451 SURFACE WATER DRAINAGE for below ground, gravity flow stormwater pipework.
Refer to 7461 FOUL WATER DRAINAGE for below ground, non-pressure foul water pipework.

Documents

1.2 DOCUMENTS

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

NZS 3104	Specification for concrete production
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4431	Code of practice for earth fill for residential development
NZS 4402	Methods of testing soils for civil engineering purposes
NZTA F2	Specification for pipe subsoil drain construction
TNZ M/04	Specification for basecourse aggregate
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls

Requirements

1.3 AS BUILT DOCUMENTS - NZS 4431

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

Provide the following as built documents and records:

- Provide as built contour plan relating final topography to original topography.
- Record areas of filled ground including areas of low density filling and areas not considered to meet the standard.
- Record location of associated drainage.
- Record location and relative levels of levelling points and benchmarks, including the date of the levelling
- Provide draft as built information prior to practical completion.
- Provide final as built information prior to the end of the defects liability period.
- Provide copies to the owner of the land and to the TA

1.4 CONTROL TESTING FOR FILLS - NZS 4431

During construction of earth fills undertake required quantitative control tests on the fill material.

1.5 INSPECTION NOTIFICATION - NZS 4431

Notify the inspecting engineer of the times required for inspection.

1.6 INSPECTION NOTIFICATION

Notify the inspecting engineer of the times required for inspection.

1.7 STATEMENT OF SUITABILITY - NZS 4431

Provide a statement of suitability of earth fill for residential development in accordance with Appendix A of NZS 4431, including engineers report.

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2 PRODUCTS

Earth fill materials

2.1 EARTH FILL – COMMERCIAL AND INDUSTRIAL DEVELOPMENTS
Earth fill as specified/identified by the geo-professional. Refer to SELECTIONS.

Granular fill materials - Specific Design

2.2 GRANULAR FILL MATERIAL – SPECIFIC DESIGN
Refer to SELECTIONS.

2.3 BLINDING LAYER – SPECIFIC DESIGN
Refer to SELECTIONS.

Private flexible pavements

2.4 SUBBASE – FLEXIBLE PAVEMENTS
Hard rock material with the largest aggregate size not larger than 60% of the depth of the layer or 65mm. Refer to SELECTIONS.

2.5 BASECOURSE – FLEXIBLE PAVEMENTS
Refer to Selections.

Concrete pavements

2.6 SUBGRADE - CONCRETE PAVEMENTS
Refer to SELECTIONS.

2.7 SUBBASE - CONCRETE PAVEMENTS
Refer to SELECTIONS.

Dressing course

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

Site concrete

2.9 SITE CONCRETE
Low strength concrete 10 MPa with minimum water for workability, all materials and batching to NZS 3104, table 3.1, **Prescribed mixes (P)**.

Service trench backfill material

2.10 GRANULAR BEDDING
Clean granular non-cohesive material with a maximum particle size of 20mm.

2.11 GRANULAR BEDDING AND SURROUND
Clean granular non-cohesive material with a maximum particle size of 20mm.

2.12 ORDINARY FILL
Use material previously excavated from the trench.

2.13 COMPACTED SELECTED FILL
Granular material free from topsoil and rubbish and has a maximum particle size of 20mm.

2.14 BEDDING & SURROUND – WATER PIPES
Sand.

2.15 BACKFILL – WATER PIPES
Backfill free from organic matter, rock and other hard matter, containing no soil lumps larger than 75mm.

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2.16 MARKING TAPE
Marking tape, refer to SELECTIONS

Drainage materials

2.17 FREE-DRAINING AGGREGATE
Scoria or crushed gravel graded 50 to 14 clean.

2.18 FREE DRAINING HARDFILL – NZS 4229
Free draining imported hardfill to NZTA F2 specification.

2.19 EXPANDED POLYSTYRENE FOAM DRAINAGE SHEET
Expanded polystyrene (EPS) sheets offering drainage. Refer to SELECTIONS.

Protection Sheets

2.20 EXPANDED POLYSTYRENE FOAM SHEET
Expanded polystyrene (EPS) sheet used to protect tanking from damage (particularly from backfill). Refer to SELECTIONS.

Geotextile Fabric

2.21 GEOTEXTILE FABRIC
Geotextile fabric. Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 UNSUITABLE MATERIALS
Remove from site all unsuitable filling material.

3.2 REMOVE SURPLUS
Remove surplus imported filling materials from the site.

3.3 PLACE FILLING
Place filling using approved methods, to required dimensions, levels, lines and profiles.

3.4 PROTECTION OF FORMATION
Do not allow construction traffic on filling until the level has been raised not less than 150mm above formation level by properly compacted temporary protective filling. Remove temporary protective filling from the site before beginning permanent construction. Do not stockpile materials on newly filled areas without permission.

3.5 DIFFERING MATERIALS
Where materials of widely divergent characteristics are used for filling, spread and compact in clearly defined separate layers.

3.6 EARTHMOVING EQUIPMENT
Do not use earthmoving equipment for compaction.

3.7 COMPACTION NEAR EDGE SUPPORTS
Ensure that edge supports are strong enough to support compaction forces without movement, cracking or other damage. Make good damage caused by compaction.

3.8 MOISTURE CONTENT, GENERAL FILL
Moisture content at time of compaction to be within the range of optimum less 6% up to optimum. Do not use filling with moisture content above optimum value. If necessary:

- adjust moisture content of filling by turning and drying
- provide water sprinkling equipment if fill is too dry.

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Application - Earth fill materials

3.9 SITE PREPARATION - NZS 4431

Before fill is placed on stripped natural ground, the ground surface shall be smoothed and compacted in a manner similar to that to be used on the layers of fill.

3.10 FILL PLACING - NZS 4431

Fill shall be placed in a systematic manner, with near-horizontal layers of uniform thickness of material each being deposited progressively across the fill area. The uncompacted thickness of a layer shall be no greater than 230 mm. Fill water content control and uniformity to the requirements of NZS 4431.

3.11 FILL COMPACTION - NZS 4431

Each layer shall be compacted as a specific construction operation, using plant specifically assigned to the compaction task and following systematic patterns of travel tracks which progressively work across the surface of the fill. Recompact any compacted layer that has deteriorated after the interruption of the work.

Application - Granular fill material

3.12 SPREAD AND COMPACT GRANULAR FILL - GENERAL

Spread and level in layers not more than 150mm loose depth from the approved level. Compact filling in layers as specified by at least four passes of a vibratory roller having a static linear loading of 1.8 - 2.3 kg/mm, or twelve passes of a vibratory roller having a static linear loading of 0.8 - 1.2 kg/mm. Achieve a density of not less than 95% of maximum at optimum moisture content to NZS 4402. Compact with a vibrating plate compactor for small areas and in confined shapes.

Alternative compaction plant may be used provided it can be shown that the density requirement can be achieved.

3.13 SAND BLIND SURFACE

Blind surface of area being covered with a concrete slab with sand to required thickness. Roll or compact with a vibrating plate tamper ready to take damp-proofing. Finish the surface with a non-vibrating smooth wheeled roller.

3.14 AP 7 BLIND SURFACE

Blind surface of area being covered with a concrete with AP 7 to required thickness. Roll or compact with a vibrating plate tamper ready to take damp-proofing. Finish the surface with a non-vibrating smooth wheeled roller.

Application - Service trench backfill

3.15 BEDDING AND BACKFILL – COLD WATER PIPES

Surround cold water pipes with compacted sand to provide not less than 75mm cover. Backfill trench and ensure no hard edged object is permitted to come in contact with or rest against any pipe or fitting.

3.16 BEDDING AND BACKFILL – COLD WATER PIPES BENEATH CONCRETE SLABS

Surround cold water pipes with compacted sand to provide not less than 75mm cover between the top of the pipe and the underside of the slab or concrete structure. Compact sand in a manner that will not damage the piping

3.17 MARKING TAPE

Install marking tape at required level during backfilling process.

Application - Geotextile Fabric

3.18 GEOTEXTILE FABRIC

Install geotextile fabric to manufacturer's requirements.

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Application - Retaining wall backfill

3.19 PROTECT RETAINING WALL TANKING

Protect tanking membranes with protection sheets fixed/placed in accordance with manufacturer's requirements.

3.20 BACKFILL TO RETAINING WALLS

Backfill the drainage space behind walls with free-draining aggregate in 200mm layers. Do not disturb subsoil drains. Follow the sequence of filling shown on the drawings so that dependent action from suspended floors is available before filling behind the wall is complete. Do not over-compact with heavy plant.

3.21 BACKFILL TO RETAINING WALL - NZS 4229

Place free draining hardfill in layers not exceeding 150 mm loose depth. Positively compact to provide support of not less than that of the adjacent material.

Completion

3.22 LEVELLING POINTS - NZS 4431

Set permanent levelling points in the upper surface of the fill to the requirements of NZS 4431.

3.23 TAKE AWAY

Take away from the site all selected excavated material or brought-in material not used for backfilling, leaving the site clear and tidy.

3.24 LEAVE

Leave work to the standard required by following procedures.

3.25 REMOVE

Remove all debris and unused materials from the site.

4 SELECTIONS

Earth fill

4.1 EARTH FILL – COMMERCIAL AND INDUSTRIAL DEVELOPMENTS

Location: Refer to Architectural Drawings and Structural Drawings
Type: Refer to Structural Drawings and Specifications

Granular fill - specific design

4.2 GRANULAR FILL MATERIAL – SPECIFIC DESIGN

Location: Refer to Architectural Drawings and Structural Drawings
Type: Refer to Structural Drawings and Specifications

4.3 BLINDING LAYER – SPECIFIC DESIGN

Location: Refer to Architectural Drawings and Structural Drawings
Type: Refer to Structural Drawings and Specifications

Private flexible pavements

4.4 SUBBASE – FLEXIBLE PAVEMENTS

Location: Refer to Architectural Drawings and Structural Drawings
Type: Refer to Structural Drawings and Specifications

4.5 BASECOURSE – FLEXIBLE PAVEMENTS

Location: Refer to Architectural Drawings and Structural Drawings
Type: Refer to Structural Drawings and Specifications

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Concrete pavements

4.6 SUBGRADE – CONCRETE PAVEMENTS

Location: Refer to Architectural Drawings and Structural Drawings
Type: Refer to Structural Drawings and Specifications

4.7 SUBBASE – CONCRETE PAVEMENTS

Location: Refer to Architectural Drawings and Structural Drawings
Type: Refer to Structural Drawings and Specifications

Site concrete

4.8 SITE CONCRETE

Location: Refer to Architectural Drawings and Structural Drawings
Type: Prescribed mix 10.0 MPa

Service trench backfill material

4.9 SERVICE TRENCH - GRANULAR BEDDING

Location: Refer to Architectural Drawings and Structural Drawings
Type: Clean granular non-cohesive material with a maximum particle size of 20mm

4.10 SERVICE TRENCH - GRANULAR BEDDING AND SURROUND

Location: Refer to Architectural Drawings and Structural Drawings
Type: Clean granular non-cohesive material with a maximum particle size of 20mm.

4.11 SERVICE TRENCH - ORDINARY FILL

Location: Refer to Architectural Drawings and Structural Drawings
Type: Use material previously excavated from the trench.

4.12 SERVICE TRENCH - COMPACTED SELECTED FILL

Location: Refer to Architectural Drawings and Structural Drawings
Type: Granular material free from topsoil and rubbish and has a maximum particle size of 20mm.

4.13 BEDDING & SURROUND – COLD WATER PIPES

Location: Refer to Architectural Drawings and Structural Drawings
Type: Sand

4.14 BACKFILL – COLD WATER PIPES

Location: Refer to Architectural Drawings and Structural Drawings
Type: Backfill free from organic matter, rock and other hard matter, containing no soil lumps larger than 75mm.

Marking Tape

Drainage materials

4.15 FREE-DRAINING AGGREGATE

Location: Refer to Architectural Drawings and Structural Drawings
Type: Scoria or crushed gravel graded 50 to 14 clean

4.16 FREE DRAINING HARDFILL – NZS 4229

Location: Refer to Architectural Drawings and Structural Drawings
Type: Free draining imported hardfill to NZTA F2 specification.

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4.17 EXPANDED POLYSTYRENE FOAM DRAINAGE SHEET

Location: Refer to Architectural Drawings
Type: Refer to Architectural Drawings

Protection Sheets

4.18 EXPANDED POLYSTYRENE FOAM SHEET

Location: Refer to Architectural Drawings
Type: Refer to Architectural Drawings

Geotextile Fabric

4.19 GEOTEXTILE FABRIC

Location: Refer to Architectural Drawings
Type: TBC

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2361 STRIP FOOTINGS

1 GENERAL

This section relates to the supply and installation of concrete strip footings of non-specific design to NZS 3604 and NZS 4229, including;

- formwork, reinforcement, concrete mixes and the placing of concrete

1.1 RELATED WORK

Refer to 3321 CONCRETE MASONRY - ENGINEERED for masonry walls and foundation walls (to NZS 4229).

Documents

1.2 DOCUMENTS

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

NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3121	Water and aggregate for concrete
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4431	Engineered fill construction for lightweight structures
AS/NZS 4671	Steel reinforcing materials
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls

Requirements

1.3 QUALIFICATIONS

Concrete workers to be experienced, competent and familiar in the fabrication and erection of formwork and with the materials and the techniques specified.

All work to be installed or supervised by a Registered Mason or licensed building practitioner (LBP): Licensed for Bricklaying and Blocklaying 2: Structural Masonry. RBW must be supervised by an LBP.

1.4 QUALITY RECORDS

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

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2 PRODUCTS

2.1 NORMAL CONCRETE

Normal concrete 17.5, 20 or 25 MPa grade (refer to SELECTIONS), maximum aggregate size 19mm ready-mixed to NZS 3104. Retain delivery dockets listing mix and despatch details. Mass concrete 10 MPa grade.

2.2 REINFORCEMENT

To AS/NZS 4671 Grade 300E deformed mild steel except for ties in plain round mild steel and as detailed.

2.3 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.4 WATER

To NZS 3121. Water from a territorial authority/NUO water supply is acceptable.

2.5 SPACERS AND CHAIRS

Precast concrete or purpose made moulded PVC.

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3 EXECUTION

3.1 STORAGE

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

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

3.2 SOIL BEARING

To NZS 3604 or NZS 4229, Section 3, **Site Requirements**.
All soil bearing surfaces of footings shall be horizontal and may be stepped to accommodate variations in cleared ground level. Bearing shall be upon solid bottom in undisturbed good ground to NZS 3604 or NZS 4229, or firm fill to NZS 4431.

3.3 DEPTH OF FOOTINGS

As shown on drawings with minimum depth of footings below cleared ground level, to NZS 3604 or NZS 4229, clause 3.4.2.

- 200mm.

3.4 STEPPED FOOTINGS

Footings can be stepped for uneven sites with the following requirements:

- minimum vertical step in footings 600mm
- stepped walls overlapped minimum 450mm vertically and horizontally

3.5 BLINDING CONCRETE SUB FOOTING FOR MASONRY FOUNDATION

For footings made of reinforced concrete masonry lay the blocks on a level blinding of 17.5 MPa unreinforced concrete with a minimum thickness of 60mm and a minimum width of the masonry unit plus 110mm (centred).

3.6 WIDTH OF FOOTINGS

Footing to be centred on foundation wall above. Refer to drawings or SELECTIONS for minimum dimensions.

3.7 FORMWORK

Use formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Water blast to clean formwork. Keep formwork wet before concrete is placed.

3.8 REINFORCEMENT

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.
Longitudinal reinforcing and ties, refer to SELECTIONS for size and quantity.
Stepped footings to NZS 4229, at least 50% of the lower footing reinforcement shall be turned up the step to a minimum of 450mm beyond the rebar intersection, and at least 50% of the upper footing reinforcement shall be carry on into the lower foundation wall to a minimum of 450mm (350 with hook) beyond the rebar intersection.

3.9 REINFORCING LAPS

To NZS 3604, 6.11.7, **Foundation wall reinforcement.** Horizontal reinforcing bars lapped 500mm minimum.
To NZS 4229, 6.6.3, 40 diameter laps for deformed bars.
Tie all lapping bars to each other.

3.10 STARTER BARS

Vertical starter reinforcement to NZS 4229, to match vertical wall reinforcement in size, type, location and spacing. Starters to penetrate foundation wall by 600mm minimum, and in the footing to be bent through 90° and tied to longitudinal reinforcing.

3.11 COVER

Minimum cover 75mm.

3.12 OPENINGS

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Footings to be continuous under openings unless shown otherwise.

3.13 PUMPING CONCRETE

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

3.14 STRIKE FORMWORK

Strike formwork without damaging or overloading structure to NZS 3109. Do not remove formwork before the following minimum periods under average temperature conditions:

12 hours: Sides of beams, walls and columns

Completion

3.15 PROGRESSIVE CLEANING

Clean off concrete spills as they occur, making good any damage at the same time.

3.16 FINAL CLEANING

Clean down exposed walls and remove waste material from adjoining surfaces at completion.

3.17 REMOVE

Remove from the site materials not used.

4 SELECTIONS

4.1 CONCRETE

Normal concrete: 17.5 MPa

4.2 BLINDING CONCRETE SUB FOOTING FOR MASONRY FOUNDATION

Concrete strength:	17 MPa
Minimum width:	Masonry unit foundation width plus 110mm
Minimum height:	60mm

4.3 FOOTING SIZE AND REINFORCING

The following are minimum requirements.

Location:	Refer to Architectural Drawings and Structural Drawings
Footing width:	Refer to Structural Drawings
Footing height/depth:	Refer to Structural Drawings
Longitudinal steel:	Refer to Structural Drawings
Stirrups:	R6 ties @ 600mm centres minimum (to NZS 4229 table 6.2)

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3102 CONCRETE WORK - STANDARD

1 GENERAL

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

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOILS AND DPC for DPM.

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:

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

The following definitions apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

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

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Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications

1.5 RECORDS

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

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

Performance

1.6 CONCRETE PRODUCTION COMPLIANCE

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

1.7 STEEL REINFORCING COMPLIANCE

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

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

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

Quality control and assurance

1.8 CONCRETE ASSESSMENT - ON SITE

Where the quality of concrete supplied in in doubt, carry out concrete assessment during construction to NZS 3109: section 9 Concrete Assessment.

Make all test records available, if requested.

1.9 INSPECTIONS

Reviewer:	Stage:	Hold/Notification Point:
Construction Reviewer:	TBC by Project Manager	TBC by Project Manager

1.10 QUALITY ASSURANCE

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

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

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

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2 PRODUCTS

Materials

2.1 CEMENT

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

2.2 CEMENT, FILLER

Portland limestone filler cement to NZS 3125.

2.3 SAND

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

2.4 COARSE AGGREGATE, NORMAL CONCRETE

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

2.5 AGGREGATE, PRESCRIBED MIX CONCRETE

Builder's mix (all-in aggregate) to NZS 3104: clause 3.1.4, Definition and clause 3.3.2, Aggregate or separate aggregate and sand materials to clause 3.3.3 Proportion of sand and aggregate.

2.6 WATER

To NZS 3121.

2.7 ADMIXTURES, SITE OR PLANT

To AS 1478.

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

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

Concrete

2.8 NORMAL CONCRETE

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

2.9 SITE CONCRETE

Low strength concrete 10 MPa with minimum water for workability, all materials and batching to NZS 3104, section 3 Provisions for Prescribed Mix Concrete.

2.10 MASS CONCRETE

Concrete having a minimum strength of 10 MPa at 28 days

Reinforcement

2.11 GRADE 300E STEEL

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

2.12 GRADE 500E STEEL

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

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2.13 WELDED WIRE FABRIC

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

2.14 MESH FOR SLABS TO NZS 3604 OR NZS 4229

For concrete slab-on-ground designed to NZS 3604 or NZS 4229, mesh to be in accordance to NZBC B1/AS1, welded reinforcing mesh to AS/NZS 4671, Class E, minimum - Grade 500E, 2.27kg/m2 (1.14kg/m2 in each direction).

2.15 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.16 SPACERS AND CHAIRS

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

2.17 TIMBER BOARDS

Dressing or merchantable grade radiata pine to NZS 3631 for shutter face, to obtain the concrete finish specified.

2.18 STRUCTURAL PLYWOOD

To AS/NZS 2269.0 for shutter face with plywood grade as necessary to obtain the concrete finish specified.

2.19 TIMBER FALSEWORK

No. 2 framing radiata pine or as required to construct the required formwork.

2.20 RELEASE AGENT

A release agent that will not stain or adhere to the concrete, contaminate reinforcing steel or construction joints, or have a detrimental effect on any finished surface or applied finishes.

Damp proof membrane

2.21 DAMP-PROOF MEMBRANE

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

Accessories

2.22 CEMENT GROUTS

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

2.23 CELLULAR POLYSTYRENE INSULATION

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

3 EXECUTION

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

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

3.5 TOLERANCES OF CONCRETE SURFACE FINISHES

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

Fix formwork

3.6 LOADINGS

Design and construct formwork and falsework in accordance with in accordance with NZS 3109 Section 5 and sound engineering principles to withstand the worst combination of:

- dead loads of formwork, reinforcement, concrete and precast elements such as floor planks
- construction loads including dynamic effects of placing, compacting and construction traffic
- wind and snow loads

3.7 PROVIDE ALL FORMWORK

Provide formwork and falsework to NZS 3109 Section 5 and to achieve the required off-the-form surface finishes to NZS 3114. Fabricate in a manner permitting its easy removal without damage to the concrete.

Provide a 20mm x 20mm chamfer to all corners unless detailed otherwise. Protect corners from damage during and after stripping.
Keep absorbent formwork wet before concrete is placed. Clean formwork by waterblasting.

3.8 FALSEWORK

Carry strutting down to a construction sufficiently strong and stable to afford the required support without permissible stress or deflections being exceeded. Prop through to other floors if the construction load on a particular suspended floor exceeds the design load.

3.9 EXPOSED CONCRETE

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

3.10 JOINTS IN FORMS

Construct joints to prevent loss of grout between joints in form linings, as well as between forms and completed work. Column forms to have full height linings so that no horizontal joints occur on exposed faces.

3.11 CAMBERS

Cambers shown on the drawings or specified, relate to the concrete immediately before formwork is struck.

3.12 STRIKING FORMWORK

Ensure the safe removal of all or any part of the formwork. Remove without shock, vibration or damage to the concrete and in such a manner as to take the imposed stresses gradually to NZS 3109.5.4. Stripping times to NZS 3109 table 5.3.

Install damp proofing

3.13 INSTALL DAMP-PROOF MEMBRANE

Install to NZS 3604.7.5.6 Polyethylene (polythene) sheet damp proof membranes. Bring granular hardfill to a suitable surface to receive the DPM using maximum 25mm sand blinding.

Lay the DPM on prepared basecourse with 150mm laps between sheets. Seal laps and penetrations with 50mm wide pressure sensitive plastic tape.
Refer to drawings for perimeter details.

Install insulation

3.14 INSTALL UNDERSLAB POLYSTYRENE INSULATION

Install polystyrene insulation system to manufacturer's requirements.

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Install reinforcing / cast-in items

3.15 INSTALL REINFORCEMENT TO NZS 3101 & NZS 3109

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

3.16 INSTALL REINFORCEMENT TO NZS 3604 OR NZS 4229

Install reinforcing in accordance to NZS 3604 or NZS 4229 as modified by NZBC B1/AS1 for foundations, foundation walls and slab-on-grade.

3.17 CUT AND BEND

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

3.18 ADJUSTMENTS

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

3.19 TOLERANCES

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

3.20 SECURE REINFORCEMENT

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

3.21 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked

Wire mesh laps to NZS 3101.1, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

3.22 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground the welded reinforcing mesh to be lapped such that the outermost wires overlap by the greater of:

- the spacing of the cross wires plus 50mm
- 150mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire

3.23 REINFORCING BAR LAPS TO NZS 3604

For foundation walls horizontal reinforcing bars to be lapped with a lap length of not less than 500mm. Corners and intersection laps shall be determined by NZS 3604 figure 6.15a

3.24 REINFORCING BAR LAPS TO NZS 4229

For footings reinforcing bars to be lapped with a lap length of not less than 40 times the diameter of the bar. Corners and intersection laps shall be determined by NZS 4229 figure 6.8.

3.25 REINFORCEMENT COVER TO NZS 3101.1

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

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3.26 REINFORCEMENT COVER TO NZS 3604 OR NZS 4229

For in-situ concrete, foundations and interior slabs on ground, to NZS 3604 or NZS 4229, the reinforcement and welded mesh cover to be:

Location, cover to	NZS 3604	NZS 4229
Footing, to earth	75mm	75mm
Footing, to DPM	75mm	50mm
Foundation, to edge	75mm	75mm
Slab, to slab top	30mm	30mm
Slab, to slab edge	50mm to 75mm	50mm to 75mm

3.27 CASTING IN

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

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

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

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

3.28 EQUIPOTENTIAL BONDING REINFORCING

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

Place concrete

3.29 CONSTRUCTION JOINTS

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

3.30 PRE-PLACEMENT INSPECTION

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

3.31 UNFAVOURABLE CONDITIONS

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

3.32 PROTECT CONCRETE WORK

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

3.33 PREPARATORY WORK

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

3.34 TRANSPORT CONCRETE

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

3.35 PUMPING CONCRETE

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

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3.36 PLACE CONCRETE

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

3.37 COMPACT CONCRETE

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

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

3.38 VIBRATORS

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

Floor slabs to NZS 3604 or NZS 4229

3.39 FLOOR SLABS TO NZS 3604

Generally for slabs on ground to NZS 3604 as modified by NZBC B1/AS1 and NZBC E2/AS3. Construct to NZS 3604, 4.5 Concrete and concrete masonry and NZS 3604, 7.5, Concrete slab-on-ground floors in timber buildings as modified by NZBC B1/AS1, 2.3 Timber. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish.

Allow for free joints maximum 24m centres to NZBC B1/AS1, paragraph 2.3.7.6 **NZS 3604** New clause.

Finishing

3.40 SCREED THE SURFACE

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

3.41 SURFACE FINISHES

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

3.42 SAW CUTS TO NZS 3604 OR NZS 4229

Provide saw cuts in accordance to NZS 3604 clause 7.5.8.6 Shrinkage Control Joints and NZS 4229 clause 7.8.5 Shrinkage Control Joints. Cut slabs where indicated on the drawings as required to control shrinkage cracking. Form by saw cutting the slab (blade width approximately 5 mm) to a quarter of the depth of the slab (saw cutting shall take place no later than 24 hours after initial set for average ambient temperatures above 20 ºC, and 48 hours for average ambient temperatures below 20 ºC).

3.43 SAW CUTS

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

3.44 CLEAN OUT SAWCUTS

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

Curing

3.45 CURING PERIOD

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

3.46 CURING METHOD

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

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

3.47 KEEP ABSORBENT FORMWORK MOIST

Keep formwork left in place continuously moist by sprinkling with water over the curing period. Continue sprinkling the exposed surface if the formwork is removed before the end of the curing period.

3.48 SECURE COVERINGS

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

Defects

3.49 DEFECTS

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

3.50 SURFACE DEFECTS

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

Completion

3.51 COMPLETION MATTERS

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

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4 SELECTIONS

4.1 FORMWORK

Location: Floor Slab
Type: Timber board, ply as required
Finish: As required

4.2 DAMP-PROOF MEMBRANE

Location: Refer to Architectural Drawings
Brand/type: Refer to Architectural Drawings
Thickness: Refer to Architectural Drawings

4.3 CELLULAR POLYSTYRENE INSULATION

Location: Refer to Architectural Drawings
Brand: Refer to Architectural Drawings
Type/grade: Refer to Architectural Drawings
Thickness: Refer to Architectural Drawings
R-value: Refer to Architectural Drawings

4.4 SAW CUTS

Location: Refer to Structural Drawings
Spacing: Refer to Structural Drawings

4.5 LOCATION OF CONSTRUCTION JOINTS

Location: Refer to Structural Drawings
Spacing: Refer to Structural Drawings

4.6 REINFORCEMENT LAPS

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

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

4.7 WELDED WIRE FABRIC

Location: Refer to Structural Drawings
Type: Refer to Structural Drawings
Wire diameter: Refer to Structural Drawings
Pitch: Refer to Structural Drawings

4.8 NORMAL CONCRETE (N)

Location: Refer to Structural Drawings
28 day strength: Refer to Structural Drawings
Aggregate size: Refer to Structural Drawings

4.9 SITE CONCRETE

Location: Refer to Structural Drawings
Type/grade: Prescribed Mix Concrete (P) / 10MPa

4.10 MASS CONCRETE

Location:
Type/grade: Prescribed Mix Concrete (P) / 10MPa

4.11 SURFACE FINISHES

Refer to Structural Drawings

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3114E EXPOL UNDERSLAB INSULATION

1 GENERAL

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

It includes:

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

DPM	Damp proof membrane
EPS	Expanded polystyrene
XPS	Extruded polystyrene

Documents

1.2 DOCUMENTS

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

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

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

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

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

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

Refer to the general section 1237 WARRANTIES for additional requirements.

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1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year For installation

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

2 PRODUCTS

Materials - under slab insulation

2.1 EXPOL SLABX200

Expol SlabX200, a 200kPa rated EPS under slab insulation sheets to AS 1366.3 and AS/NZS 4859.1. Available in 2400mm x 1200mm and in a range of thicknesses. Refer to SELECTIONS.

Materials - slab edge insulation

2.2 EXPOL THERMASLAB EDGE

Expol ThermaSlab XPS slab edge insulation board. Available uncoated or pre-coated with a water based waterproof resin coating. Refer to SELECTIONS.

Components

2.3 EXPOL STYRO-FIX ADHESIVE

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

2.4 EXPOL PATCH KIT

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PROTECT

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

3.4 PRE-INSTALLATION REQUIREMENTS

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

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Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 INSTALLATION - GENERAL

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

3.7 INSTALL UNDERSLAB INSULATION

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

Installation - concrete slab edge

3.8 INSTALL SLAB EGDE INSULATION

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

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

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

Completion

3.9 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials - under slab insulation

4.1 EXPOL SLABX200

Location:	Refer to Architectural Drawings
Brand:	Expol SlabX200
Size:	2400mm x 1200mm
Thickness:	85mm
Compressive resistance at 10%:	200kPa
R value:	2.5

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Materials - slab edge insulation

4.2 EXPOL THERMASLAB EDGE

Location:	Refer to Architectural Drawings
Brand:	Expol ThermaSlab Edge
Size:	To suit
Thickness:	30mm
Compressive resistance at 10%:	250kPa
R value:	1.00
Finish:	Coated

Components

4.3 ADHESIVE

Type/Brand:	Expol Styro-fix adhesive

4.4 EXPOL PATCH KIT

Type/Brand:	Expol patck kit

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3321 CONCRETE MASONRY - ENGINEERED

1 GENERAL

This section relates to the supply and installation of hollow concrete masonry to NZS 4230 including;

- concrete masonry, mortar, reinforcement and grouting
- self insulating concrete masonry

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following definitions apply specifically to this section:

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

1.2 DOCUMENTS

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

NZBC B1/VM1	Structural design of buildings
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2699	Built-in components for masonry
NZS 3101.1	Concrete structures standard - The design of concrete structures
NZS 3103	Specification for sands for mortars and plasters
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3112.1	Methods of test for concrete - Tests relating to fresh concrete
NZS 3121	Water and aggregate for concrete
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 4230	Design of reinforced concrete masonry structures
AS/NZS 4455.1	Masonry units, pavers, flags, and segmental retaining wall units - Masonry units
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet Area membranes
CCANZ CP 01	Code of practice for weathertight concrete and concrete masonry construction

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 – INDUSTRY QUALIFICATION REQUIREMENTS

Work to be carried out or under supervision of a Licensed Building Practitioner (LBP) with the relevant license class. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.4 CONSTRUCTION CONTROL

Supervise masonry construction to NZS 4230, table 3.1, Observation Type A, admissible use and nominal strengths. Keep records of materials to NZS 4210, 2.4.2. and to the test requirements listed in this section.

1.5 CONSTRUCTION OBSERVATION BY ENGINEER

Inspections shall confirm compliance with the design and the required standards of construction.

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Obtain from the engineer Producer Statement (PS4) required relating to the masonry construction. Advise the engineer when inspections are required.

1.6 QUALITY RECORDS

Keep accurate records relating to strength and quality of materials used in the construction, and make the information available to the Building Consent Authority inspector on request.

Do not place grout until all blockwork and reinforcing have been inspected and passed by the Engineer and the Building Consent Authority.

1.7 SELECTED MASONRY

Refer to the drawings for areas of masonry, which require select quality blocks to both sides, self-insulating masonry or for weatherproof construction.

1.8 STEEL REINFORCING COMPLIANCE

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

1.9 CONFIRM STEEL REINFORCING COMPLIANCE

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

1.10 DURABILITY

To NZS 4230, Table 4.1 - **Masonry durability requirements**, and mortar to NZS 4210, Table 2.E1. Refer to SELECTIONS.

Eposure NZS 3604 zones Figure 4.2	**Exposure NZS 3101 Classification** Table 3.1	**Durability Mortar from NZS 4210** (Note 1)	**Durability Built in Components** (Note 2)	**Durability Minimum Cover Reinforcement** (Note 3)
Zone D	B2	M4	R4	60 (30)mm
Zone C	B1	M4	R3	50 (20)mm
Zone B	A2	M3	R3	45 (15)mm
Closed interiors	A1	M2	R1	35 (5)mm
Walls against earth	B2	M4	R4 (from NZS 4210)	60 (30)mm (from NZS 4210)
Geothermal hotspots	U	M4	R5	Special study
Zone E (NZBC E2/AS1)	C	M4	R4	60(30)mm

Notes:
1. Mortar mixes to NZS 4210, 2.2.2.1.
2. Classifications to the three parts of AS/NZS 2699, R1 is light to heavy galvanised, R3 is heavy hot-dip galvanised, R4 is 316 stainless steel, R5 specific performance.
3. Cover is measured to NZS 4230 from the outside face of the block, assuming 30mm shell thickness (or in brackets to the inside face of the block cell)

Performance - tests

1.11 TESTS

Carry out all required tests to NZS 4210, appendix 2A, **Compressive strength tests for mortar and grout**.

1.12 TESTING PROCEDURES

Provide advance notice of all or any cell filling work. Maintain on site all equipment necessary for taking and preparing samples for test. Retain records of all test results and supply on request.

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1.13 SPREAD OF GROUT

If requested, carry out tests to NZS 3112, part 1, to the requirements of NZS 4210.

1.14 COMPRESSIVE STRENGTH OF GROUT

If requested, carry out tests to NZS 4210, appendix 2.A, **Compressive strength tests for mortar and grout**, with 3 specimens per test.

1.15 COMPRESSIVE STRENGTH OF MORTAR

If requested, carry out tests to NZS 4210, appendix 2.A, **Compressive strength tests for mortar and grout**, with 3 specimens per test.

1.16 MASONRY TO MORTAR BOND TEST

If requested, carry out tests to NZS 4210, appendix 2.B, **Masonry to mortar bond strength test**, with 6 specimens per test.

1.17 EXPANSION OF GROUT

If requested, carry out tests to NZS 4210, appendix 2.C, **Test for expansion of grout**.

1.18 RECORDS OF TESTS

To NZS 4210 and kept on site:

- spread of grout tests
- grout supplier's test certificates.

2 PRODUCTS

Materials

2.1 MASONRY

To AS/NZS 4455.1 with true and unblemished surfaces and arrises and from a single manufacturer. Knock-in bond beam masonry not to be used. Use appropriate masonry for intermittently filled construction where vertical reinforcement is placed prior to laying of masonry.

Components

2.2 REINFORCEMENT

To AS/NZS 4671, deformed mild steel except for ties in plain round mild steel and as detailed.

2.3 SAND FOR MORTAR

Sand to comply with NZS 3103. Chloride levels not exceeding 0.04% by dry weight of sand.

2.4 MORTAR

To NZS 4210, 2.2 **Mortar**.

Mix:	M2, M3 or M4, refer to DURABILITY in SELECTIONS
Strength:	12.5 MPa
Bond strength:	200 kPa
Pigment:	to NZS 3117

Do not rework if not used within 1.5 hours of adding cement.
A plasticiser may be used instead of lime.

2.5 COARSE AGGREGATE GROUT

To NZS 4210, 2.3 **Grout**.

Mix:	3:8:4 - cement: concreting sand: coarse aggregate
Strength:	20 MPa at 28 days (normal grout)
Aggregate:	4.75mm to 13.2mm maximum
Spread value:	450mm to 530mm
Ready mix:	To NZS 3104 with a copy of the mix design information

2.6 FINE AGGREGATE GROUT

To NZS 4210, 2.3 **Grout.**

Mix:	2:7 - cement: concreting sand
Strength:	20 MPa at 28 days (normal grout)

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Aggregate:	4.75mm to 6mm maximum
Spread value:	450mm to 530mm
Ready mix:	To NZS 3104 with a copy of the mix design information

2.7 EXPANSIVE AGENT

Proprietary admixture providing controlled expansion prior to initial set. Use in strict accordance with the manufacturers requirements. Add the required measured dose of agent to the agitator truck on site, immediately prior to grouting. Ensure thorough mixing for 3 to 5 minutes before discharge.

2.8 WATER

To NZS 3121. Water from a territorial authority/NUO water supply is acceptable.

Accessories

3 EXECUTION

Conditions

3.1 MASONRY CONSTRUCTION GENERALLY

To NZS 4210, NZS 4230 and NZBC B1/VM1.

3.2 STORAGE

Store masonry units clear of the ground, under cover and well ventilated until placed in the work.

Handle and store reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat. Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

3.3 MOISTURE CONTENT

Ensure that blocks are air-dry prior to laying. If necessary to reduce excess absorption of water from the mortar, some dampening of the surface is permissible but no surface water may be present at the time of placing mortar.

3.4 CHECK BASE

Ensure the base concrete is true to line and level, requiring a base mortar bed of 10mm (minimum) to 20mm (maximum). Ensure that all laitance, loose aggregate, or anything preventing bond is removed prior to laying masonry units.

If more than 20mm thickness of mortar bed is needed to correct inaccuracies obtain written direction on remedial action.

3.5 STARTER POSITIONS

Before commencing laying masonry units, check the location of starter reinforcement by measure or by a dry trial lay up of the first course. Do not correct misplacement by cranking bars. Where misplacement exceeds the location tolerance, obtain written direction before proceeding.

3.6 EQUIPOTENTIAL BONDING REINFORCING

If it is a project requirement, ensure that reinforcing is electrically equipotential bonded (or at least conductor cable attached) before laying/grouting. For bonded reinforcing ensure all reinforcing is interconnected with good contact at joints and tight conductive ties.

3.7 TOLERANCES

Construct within the tolerances set out in NZS 4210, 2.6.5, **Tolerances** and clause 2.7, **Laying the units**, unless specified otherwise on the drawings or in this specification. Lay blocks with jointing of consistent thickness throughout.

Lay masonry to an even, plane surface with no deviation exceeding 3mm in 3 metres on any surface in view in the finished work.

3.8 CONSTRUCTION JOINTS

Ensure the structural integration of all masonry with adjacent concrete work by providing well roughened, retarded construction joints at all junctions.

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All construction joints between grout and concrete and between grout and grout similar to Type B as described in NZS 3109, 5.6.3, prepared using an approved retarder, except that the roughness at fine grout surfaces may be ±1.5mm above and below the average level. Use a "double strength" retarder if necessary to suit the high cement content of the grout.

Vertical joints between masonry and concrete to achieve full structural integration across the joints. Allow to construct concrete work first with prepared vertical construction joints at block junctions the same as for horizontal construction joints. Lay masonry so that all courses have open ends abutting the existing concrete work.

3.9 COVER

Cover to NZS 4230, Table 4.1 - **Masonry durability requirements**, refer to DURABILITY clause in SELECTIONS. Maintain reinforcing bars for retaining walls and bond beams, a minimum of 15mm, and for other masonry a minimum of 9mm, from the masonry work face, with the space filled with grout.

3.10 PROTECTION

Keep fair face block walls clean of mortar droppings, grout splashes, or stains of any kind as the work proceeds and before any droppings set.

3.11 WEATHER PRECAUTIONS

When extreme temperatures prevail, either below 4°C or above 27°C, make adjustments to construction as listed in NZS 4210, 2.18, **Cold weather construction**, and clause 2.19, **Hot weather construction**. Do not use expansive grout for filling in temperatures below 5°C.

Application

3.12 SELECTION

For fair face walls select blocks for consistent colour, texture and lack of imperfections.

3.13 BONDING PATTERN

Unless specifically shown or described otherwise, lay masonry in running bond with full masonry bonding at intersections.

3.14 OPEN-ENDED DEPRESSED WEB MASONRY

Use open-ended depressed web masonry throughout all courses in fully grouted walls.

3.15 CUTTING

Always use a masonry saw to provide clean, accurate cuts, without chips.

3.16 SHELL BEDDING

Lay masonry on full mortar beds under face shells only where fully grouted.

3.17 BOTTOM COURSE

For fully grouted walls use inverted open-end depressed web bond beam masonry for the first course, to permit clean-out of grout space at the base.

3.18 CLEAN OUT HOLES

Use special clean-out masonry or saw off a 100mm x 200mm high section of face shell at the base of all cells containing reinforcement, to form clean out and inspection holes.

3.19 GROUT SPACE

Ensure that grouting cells at reinforcement locations are continuously clear by removal of projecting mortar. Ensure tightly filled perpends and beds.

3.20 REINFORCEMENT

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.

3.21 TIE REINFORCING STEEL

Tie vertical reinforcing steel to starter bars prior to laying blocks. Lay and tie horizontal bars as the work proceeds.

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3.22 REINFORCEMENT LAPS

Minimum reinforcing laps schedule (except as noted otherwise on the drawings)

BAR TYPE	LAPS
Deformed grade 300E bars	40 diameters
Deformed grade 500E bars	70 diameters
Plain round (with hooks)	80 diameters
Bars larger than 25mm dia.	welded

Refer to CONTROL JOINTS clause for requirements for shrinkage control joints.

3.23 BRACING

Provide temporary lateral bracing where necessary to ensure stability and until final supporting construction is in place.

3.24 FLUSH JOINTS

Finish joints which are not visible in the completed work, or in walls to be plastered, by striking off flush with the trowel.

3.25 TOOLED JOINTS

Finish joints on exposed masonry by tooling to produce a neat joint. Refer to SELECTIONS for joint type.

3.26 CONTROL JOINTS

To NZS 4210, NZS 4230 and NZBC B1/VM1.

To NZS 4230, 3.5.2.6, **Shrinkage and shrinkage/thermal control joints**, and to NZS 4230, Figure 3.1, **Shrinkage control joints**, locate as shown on drawings and not more than 7.8 metres apart.
NZS 4230, Figure 3.1a should only be used for block walls directly supported on grade.
NZS 4230, Figure 3.1b should be used for block walls supported on beams or on grade.

Rake out and prime adhesion faces of vertical control joints between masonry and between masonry and concrete as required by the sealant manufacturer. Use masking tape to avoid over-run of sealant onto the block face. Install a backing strip to limit sealant depth to 10mm, and insert sealant, all to the manufacturer's requirements.
Discontinue grouting of bond beams at control joint locations unless specifically noted otherwise.

3.27 CONTROL JOINTS - HORIZONTAL REINFORCEMENT

To NZS 4230, Figure 3.1, **Shrinkage control joints**, single or two walls as shown on drawings.

NZS 4230, Fig 1a for block walls on grade only - Two wall, discontinuous reinforcement: Horizontal reinforcement other than as noted above shall be discontinuous at control joints. Debond reinforcement passing through control joints with bond break tape for 300mm minimum or as specified. Cells within the masonry units either side of the control joints shall be vertically reinforced and grouted.

NZS 4230, Fig 1b for block walls on beams or grade - Single wall, continuous reinforcement: Reinforcement required in lintels and in top course bond beams connecting to floors and roofs shall be continuous through control joints. Debond reinforcement passing through control joints with bond break tape for 150mm minimum either side of the joint or as specified.

Application - grouting

3.28 INSPECTION

Inspect clean-out holes prior to grouting. Ensure that cells are clean and reinforcement is correctly placed. Mortar back the clean-out hole shell after verifying the adequacy of grout filling. If holes are covered in the completed work, boxing across the face may replace the shell infill. Brace hole infills to prevent blowouts during grouting.

Notify when work is ready for inspection.

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3.29 GROUT CELLS

Grout all masonry unit cells.

3.30 GROUTING, LOW LIFT

Fill masonry walls to NZS 4210, 2.14, The low lift grouting method, up to a maximum height of 1200mm. Consolidate by rodding and then prepare a construction joint to NZS 4210, 2.16, Horizontal construction joints, before repeating the sequence.

3.31 LIMIT RATE

Limit rate of pour to avoid hydrostatic blowouts.

Application - ancillary work

3.32 HOLES AND CUT MASONRY

Provide all necessary holes, pockets and chases. Cut blocks when non-standard shapes are required. When cut masonry units are used, ensure vertical joints in adjacent courses are no closer than 100mm. Subsequent cutting away of masonry to form holes is not permitted.

3.33 BUILT IN ELEMENTS

As the work proceeds, mortar in place elements such as sills, copings, lintels, and steps.

3.34 BUILT IN FIXINGS

Build in all necessary plugs, bolts, ties, metal flashings, dowels, fastenings and fixings required by this and other work sections. Co-operate with others to meet this requirement. Fixings only permitted into filled cells.

3.35 ELECTRICAL WORK

Ensure that provision for and fitting of boxes, conduit and pre-wiring are made and done as the work proceeds under the direction of the electrician.

Completion

3.36 PROGRESSIVE CLEANING

Clean off mortar splashes and grout spills as they occur.

3.37 FINAL CLEANING

At completion, clean down block work, remove efflorescence and remove waste materials from adjoining surfaces and floors.

3.38 REPLACE

Replace damaged, cracked or marked elements.

3.39 LEAVE

Leave work to the standard required by following procedures.

3.40 REMOVE

Remove debris, unused materials and elements from the site.



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4 SELECTIONS

4.1 DURABILITY - PROJECT REQUIREMENTS

Refer to clause DURABILITY.

Location:	Refer to Architectural Drawings and Structural Drawings
Exposure Zone:	B to NZS 2604
Mortar mix:	Refer to Structural Drawings and Specifications
Components:	Refer to Structural Drawings and Specifications
Rebar cover:	Refer to Structural Drawings and Specifications

4.2 MASONRY UNITS

Brand:	Refer to Structural Drawings and Specifications
Width:	Refer to Structural Drawings and Specifications
Bond:	Stretcher

4.3 MORTAR JOINTS

Location:	Refer to Architectural Drawings, Structural Drawings and Specifications
Joint profile:	Concave and Pointed Flush as required.
Mortar colour:	Natural mortar

4.4 FINE AGGREGATE GROUT

Design strength:	20 MPa at 28 days
Aggregate size:	6mm maximum
Grout expansion:	Refer to Structural Drawings and Specifications

Note; if expansive agents are used the minimum strength must be 20 MPa or the design strength whichever is greater.

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3410 STRUCTURAL STEEL

1 GENERAL

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

Refer to SELECTIONS for project Construction Category.

1.1 RELATED WORK

Refer to 6742A ALTEX FIRE PROOFING COATINGS - STEELWORK for specialised coating /painting.

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:

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

1.3 DOCUMENTS

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

NZBC F5/AS1	Construction and demolition hazards
AS 1111.1	ISO metric hexagon bolts and screws - Product grade C - Bolts
AS 1111.2	ISO metric hexagon bolts and screws - Product grade C - Screws
AS 1112.1	ISO metric hexagon nuts - Style 1 - Product grades A and B
AS/NZS 1163	Cold-formed structural steel hollow sections
AS/NZS 1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
AS/NZS 1252.1	High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Technical requirements
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1554.1	Structural steel welding - Welding of steel structures
AS 1554.2	Structural steel welding - Stud welding (steel studs to steel)
AS/NZS 1554.3	Structural steel welding - Welding of reinforcing steel
AS/NZS 1554.4	Structural steel welding - Welding of high strength quenched and tempered steels
AS/NZS 1554.5	Structural steel welding - Welding of steel structures subject to high levels of fatigue loading
AS/NZS 1594	Hot-rolled steel flat products
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Abrasive blast cleaning
AS 1627.9	Metal finishing - Preparation and pretreatment of surfaces - Pictorial surface preparation standards for painting steel surfaces
AS/NZS 2312.2	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 2: Hot dip galvanizing
AS/NZS 2312.3	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 3: Thermal metal stray coatings
NZS 3404.1	Steel Structures Standard
AS 3597	Structural and pressure vessel steel - Quenched and tempered plate
AS/NZS 3678	Structural steel - Hot-rolled plates, floorplates and slabs

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AS/NZS 3679.1	Structural steel - Hot-rolled bars and sections
AS/NZS 3679.2	Structural steel - Welded I sections
AS/NZS 3750.9	Paints for steel structures - Organic zinc-rich primer
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 13918	Welding - studs and ceramic ferules for arc stud welding
GANZ	Galvanizing Association of New Zealand - After-Fabrication Hot Dip Galvanizing. A practical reference for designers, specifiers, engineers, consultants, manufacturers and users

Requirements

1.4 QUALIFICATIONS

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

1.5 TOLERANCES

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

1.6 SHOP DRAWINGS

Generally to AS/NZS 5131, 4.4.

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

Provide shop drawings to show, but not be limited to:

- Design calculations
- Fully dimensioned elevations of all elements (minimum scale 1:20)
- Complete details of construction, connections and all support systems (minimum scale 1:10)
- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Co-ordination requirements with other work
- A full schedule of materials and finishes.

Submit shop drawings for review to the Project Manager/Architect.

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

1.7 VERIFY DETAILS AND DIMENSIONS

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

1.8 TESTS

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

- Welds: Non-destructive examinations (NDE)

1.9 HOT WORK - FIRE SAFETY

Refer to section 1270 CONSTRUCTION

Architecturally Exposed Structural Steelwork (AESS)

1.10 AESS - SEPARATE SECTION

Refer to the separate section 3415 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL for additional requirements of AESS, which are to be read in conjunction with this section.

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2 PRODUCTS

2.1 STRUCTURAL STEEL

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

Steel members and sections steel grade table

Component	Conforming to	Grade
Hot rolled steel sections	AS/NZS 3679.1	300; 350; 300L0; 300S0; 350L0, 300L15; 350L15
Plates and flats	AS/NZS 3678; AS/NZS 1594;	250; 300; 350; 400; 450; WR350; 250L0, 300L0; 350L0; 300L15; 350L15
Plates and flats	AS/NZS 1594; TS 102	HA250; HA300; HA350; HA400; HW350
Circular hollow sections	AS/NZS 1163; TS 102	C250L0; C350L0; C450L0
Square hollow sections	AS/NZS 1163; TS 102	C350L0; C450L0
Rectangular hollow sections	AS/NZS 1163; TS 102	C350L0; C450L0
Welded beams and columns	AS/NZS 3679.2; TS 102	300; 400
Quench & tempered plate	AS 3597	500; 600; 700; 900; 1000
Purlins and girts	AS 1397	G250; G300; G350; G450; G500; G550, Z350, Z450

2.2 WELDING CONSUMABLES

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

2.3 FLUX

Welding flux to be dry and from sealed containers.

2.4 BOLTS, NUTS AND WASHERS

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

Bolt Categories and tensioning

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

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

2.5 GROUT

To AS/NZS 5131, 5.8.

3 EXECUTION

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Preparation, assembly and Fabrication

3.1 GENERALLY

To AS/NZS 5131, Section 6.

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.3 ROUTINE MATTERS

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

3.4 SURFACE FINISH

Grind off all burrs and sharp arrises.

3.5 CUTTING

To AS/NZS 5131, Section 6.5.

3.6 HOLING

To AS/NZS 5131, Section 6.7

Do not use slotted holes for connections, other than those documented.

Welding

3.7 WELDING GENERALLY

To AS/NZS 5131, Section 7 and AS/NZS 1554.1. Equipment to comply with AS/NZS 1554.1, clause 1.8.2.

Site weld only when correct alignment and preset or camber have been achieved.
Weld types as documented elsewhere or on drawings
Weld categories not documented elsewhere or on drawings to be Category GP.

3.8 NON-DESTRUCTIVE WELD EXAMINATION

Non-destructive weld examination (NDE) to AS/NZS 5131, clause 13.6.2 and AS/NZS 5131 Appendix I, Inspection of Welding and Bolting (New Zealand Only).

If non-visual NDE is required, use a third party testing authority.
Repair any welds revealed as faulty by NDE and repeat the examination.

Mechanical fastening

3.9 MECHANICAL FASTENING GENERALLY

To AS/NZS 5131.

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

3.10 TENSIONING BOLTS

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

3.11 THREADS EXCLUDED FROM SHEAR PLANE

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

Erection of structural steel

3.12 ERECTION GENERALLY

To AS/NZS 5131, Section 11.

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

3.13 BOLTS AND ANCHORAGES

For each group of anchor bolts, provide a template with set-out lines clearly marked for positioning the bolts when casting in.

Start erection only when the holding down bolts and anchorages have been cast-in-place long enough to achieve sufficient strength.

3.14 TEMPORARY WORK

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

3.15 SITE WORK

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

3.16 GROUTING SUPPORTS

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

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

Grout at supports before constructing supported floors, walls and roofing.
Do not grout if the base plate or the footing surface temperature are outside the range 3°C to 35°C or to manufacturer's requirements.
Fill the space beneath the base plate with grout, if necessary hammered in tight to ensure complete filling of space.

3.17 DRIFTING

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

3.18 EARTHING STRUCTURAL STEEL

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

Finishing - preparation

3.19 ENCASED STEELWORK

Clean the steelwork to be encased in concrete to remove all loose mill scale, rust, dirt and other matter affecting bond with concrete. Achieve this by wire brushing and the use of suitable solvents.

Finishing - fire rated coatings

3.20 FIRE RATED COATINGS - SEPARATE SECTION

Refer to the separate section 6742 FIRE RATED COATINGS - STEELWORK for fire rated coating requirements.

3.21 TEMPORARY CONNECTIONS

Remove temporary elements on completion and restore the surface.

Completion & Commissioning

3.22 COMPLETION MATTERS

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

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4 SELECTIONS

4.1 CONSTRUCTION CATEGORY

Construction category (to AS/NZS 5131)	Location
Refer to Structural Drawings and Specifications	Refer to Structural Drawings and Specifications

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3811 PREFABRICATED STRUCTURAL TIMBER FRAMING

1 GENERAL

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

- timber roof panels
- timber wall panels

1.1 RELATED WORK

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
FTMA	Frame and Truss Manufacturers Association of New Zealand Inc.
PEFC	Programme for the Endorsement of Forest Certification
SED	Specific Engineering Design

Documents

1.3 DOCUMENTS

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

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

1.4 SPECIFIC DESIGN DOCUMENTS

Specific design documents relating to this part of the work:

Documents:	Structural Drawings and Fabrication Drawings from Hector Egger New Zealand

Requirements

1.5 QUALIFICATIONS

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

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

1.6 DESIGN CRITERIA SED

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

1.7 SHOP DRAWINGS

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

Provide shop drawings to show the general arrangement including, but not be limited to: TBC by Project Manager/Architect

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Submit shop drawings for review to the Project Manager/Architect.

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

1.8 MANUFACTURING STATEMENT - PREFABRICATED TRUSSES

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

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

1.9 IDENTIFICATION OF TRUSSES ON SITE

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

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

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

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

2 PRODUCTS

Materials

2.1 TRUSSES NOT EXPOSED

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

2.2 FRAMES NOT EXPOSED

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

Accessories

2.3 STEEL CONNECTOR PLATES

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

2.4 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).

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3 EXECUTION

Conditions

3.1 COMPLY

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

3.2 DELIVER, HANDLE AND STORE TRUSSES AND FRAMES

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

Fabrication

3.3 DIMENSIONS, NOT EXPOSED ELEMENTS

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

3.4 DIMENSIONS, EXPOSED ELEMENTS

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

3.5 INSPECTION

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

3.6 FABRICATION

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

3.7 TRUSS AND FRAME FIXINGS

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

Site installation

3.8 TRUSS ERECTION

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

3.9 FRAME ERECTION

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

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3.10 FIT CONNECTORS AND FIXINGS - TRUSS

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

3.11 FIT CONNECTORS AND FIXINGS - FRAMES

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

3.12 ROOF BRACING

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

3.13 WALL BRACING

Refer to 3821 TIMBER FRAMING for wall bracing.

3.14 DPC TO TIMBER

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

3.15 TIGHTEN BOLTS

Check and tighten all fixing bolts after erection is completed.

Completion

3.16 REPLACE

Replace or repair damaged elements.

3.17 REMOVE

Remove debris, unused materials and elements from the site.

3.18 LEAVE

Leave work to the standard required by following procedures.

4 SELECTIONS

4.1 PREFABRICATED TIMBER ROOF PANELS, EXPOSED

Location:	Refer to Architectural Drawings and Structural Drawings
Fabricator/brand:	Hector Egger New Zealand (HENZ)
Species/grade:	Refer to Structural Drawings
Moisture content:	20% maximum
Treatment:	Refer to Architectural Drawings and Structural Drawings
Connectors:	Refer to Structural Drawings

4.2 PREFABRICATED TIMBER WALL PANELS, NOT EXPOSED

Location:	Refer to Architectural Drawings and Structural Drawings
Fabricator/brand:	Hector Egger New Zealand (HENZ)
Species/grade:	Refer to Structural Drawings
Moisture content:	20% maximum
Treatment:	Refer to Architectural Drawings and Structural Drawings
Connectors:	Refer to Structural Drawings

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3813CL XLAM CLT PANEL SYSTEMS

1 GENERAL

This section relates to the supply and installation of XLam Cross Laminated Timber (CLT) panels used as structural building components.
It includes:

- XLam CLT panels
- Fire rated systems
- Acoustic rated systems
- Components, fixings and accessories

1.1 RELATED WORK

Refer to 3821 TIMBER FRAMING for solid timber framing for acoustic systems.

Refer to 6813SD SOUNDDOWN ACOUSTIC FLOOR SYSTEMS for acoustic floor systems.
Refer to 5171 PLASTERBOARD SOUND & FIRE LININGS or 5113G GIB PLASTERBOARD or 5171G GIB PLASTERBOARD FIRE & SOUND LININGS for linings to fire rated systems and linings & rondo channels for acoustic 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:

BMT	Base metal thickness
CLT	Cross laminated timber
CNC	Computer Numerical Control
IND Grade	Industrial Appearance Grade
MoE	Modulus of Elasticity
NAT Grade	Natural Appearance Grade
T3 Plus	T3 Plus timber treatment
XGP1 / XGP2	XLam Grade Property 1 and 2

The following definitions apply specifically to this section:

XLam CLT panel	Refers to all types of Xlam CLT structural building components including walls, floors, roofs, landings, balconies, Airstairs and Band Beams.

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC C/AS2	Protection from fire
NZBC C/VM2	Protection from fire
AS/NZS 1328.1	Glue laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1491	Finger Jointed Structural Timber
AS/NZS 2588	Gypsum plasterboard
AS/NZS 4600:2005	Cold-formed steel structures
AS 1530.4:2005	Methods for fire tests on building materials, components and structures, Part 4: Fire-resistance tests for elements of construction
NZS 3602	Timber and wood based products for use in buildings
NZS 3604	Timber framed buildings
NZS 3640	Chemical preservation of round and sawn timber

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

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XLam Design Service Guide
XLam Product Guide
XLam CLT Panel Product Technical Statement New Zealand
XLam CLT Panel Product Data Sheet
XLam CLT Panel Safety Data Sheet, Treated / Untreated
XLam Band Beam System Information Sheet
XLam Structural Design Guide
XLam Fire Design Guide
XLam Acoustic Design Guide
XLam Shop Drawing Guide
XLam Site Guide
XLam Operations & Maintenance Guide
XLam Envelope Guide
XLam CodeMark Certificate, No: CM70119
EWPAA Certificate - ISO 16696-1:2019 Certified Products, No: 357

Manufacturer/supplier contact details

Company:	**XLam NZ Ltd**
Web:	www.xlam.co
Email:	enquires@xlam.co.nz

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For manufacture and supply of XLam CLT panels

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER

Provide an installer warranty:

2 years	For the installation of XLam CLT panels

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

XLam CLT is an Engineered Wood Product is a specifically designed structural element that is covered by the Registered Structural Engineers Producer Statement – PS1 Design substitution is not permitted.
If substitution is to be considered and the Registered Structural Engineer is prepared to amend the structural design and Producer Statement – PS1 Design the following additional requirements must be meet;

- CLT Billets must be mechanically pressed
- XGP1 Lamellas must have a MoE of 10,000 MPa
- XGP2 Lamellas must have a MoE of 6,000 MPa
- External Lamellas must not exceed 85mm ± 5mm in width

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- CLT must have PEFC Chain of Custody Certification
- CLT must be CodeMark Certified
- CLT to have formaldehyde emissions <0.1mg/m2hr when tested to ASTM C5116
- CLT meet California Specification CA 01350 for VOC emissions
- CLT to have EWPAA certification to ISO 16696-1:2019

1.9 PRE-LETTING MEETING

Contractor to convene a meeting prior to the commencement of works, between a representative of the contractor, an XLam NZ Ltd representative and project manager. The following topics to be reviewed and agreed upon:

- Delivery / construction program
- Shop drawing process and program
- Identify the best assembly process
- Arrange panel supply sequence and program
- Site management issues such as site access, crane weight, lifting procedures, building tolerances and weather protection.

1.10 SHOP DRAWINGS

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

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

- Full dimensions and layout of panels
- Dimensions and details of panel edges
- Dimensions, details and position of openings/penetrations/rebates/recesses in panels
- Surface finish requirements and locations
- Durability treatment requirements and locations
- Details, fixing details as required
- Details, position and layout of proposed items to aid lifting and handling
- Details, delivery and installation sequence
- Further specification items beyond the above scope

Submit shop drawings for review to: Project Manager and Structural Engineer

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

1.11 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:

Operation & Maintenance Guide, Australia & New Zealand

Provide this information prior to practical completion.

Compliance information

1.12 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer's warranty
- Installer's warranty
- Producer Statement - Design by certifying structural engineer
- Producer Statement - Construction from the manufacturer
- Producer Statement - Construction from the installer
- Producer Statement - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance - Fire

1.13 SURFACE FIRE PROPERTIES - UNFINISHED PANELS

All XLam CLT panels achieve a Group Classification of Group 3 to NZBC C/AS2, Table 4.3, in accordance with NZBC C/AS2 Appendix C, Table C1.2.

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1.14 SURFACE FIRE PROPERTIES - INTUMESCENT COATING OVER XLAM CLT PANEL

Intumescent timber coating to be applied over XLam CLT panels to achieve the specified Group Classification to NZBC C/AS2, Table 4.3. Refer to SELECTIONS for required Group Classification.

1.15 FIRE RATING REQUIREMENTS

XLam fire rated systems provide a FRR of 30/30/30, 60/60/60, 90/90/90 and 120/120/120 in accordance with the XLam Fire Design Guide. Refer to SELECTIONS for system/FRR requirements.

Performance - Acoustic

1.16 ACOUSTIC REQUIREMENTS

Provide XLam acoustic wall assemblies and floor/ceiling assemblies in accordance with the XLam Acoustic Design Guide. Refer to SELECTIONS for system/STC and/or IIC requirements. Include for forming and treating of perimeters of openings and joins in the elements to ensure the specified performance.

2 PRODUCTS

Materials

2.1 XLAM CLT PANEL

XLam CLT (Cross Laminated Timber) pre-fabricated panels are structural timber panels made by face-gluing layers of finger-jointed Radiata Pine boards with a moisture curing polyurethane adhesive in alternating right angles or parallel to one another and laminated under mechanical pressure. Panels are available in 3-layers, 5-layers, 7-layers, and 8-layers and vary from 90mm to 350mm thick, 6000mm to 15700m long and 2400mm to 3400mm wide. Panels are available untreated or treated with T3 Plus. Panels can be supplied with the outer surfaces having either an Industrial (IND) or Natural (NAT) Appearance Grade. Refer to SELECTIONS.

Components - General

2.2 SCREW FIXINGS

Screw fixings as determined by engineer to suit specific design. Unless stated otherwise screws to be self-tapping, engineered wood screws, both partially threaded and fully threaded. Screw material / finish to comply with NZS 3604 Section 4, clause 4.4.3 & 4.4.4.

2.3 STEEL CONNECTOR PLATES

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

2.4 STAINLESS STEEL CONNECTOR PLATES

0.9mm to 2.0mm thick 304 stainless steel sheet, punched to form a nail on connector.

2.5 GALVANIZED STRUCTURAL BRACKETS

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

2.6 STAINLESS STEEL STRUCTURAL BRACKETS

>3mm thick, 304 stainless steel plate brackets with stainless steel bolts/screws and washers.

Components - Fire Resistant Systems

2.7 PLASTERBOARD LININGS - FIRE RESISTANT SYSTEMS

Fire rated plasterboard to AS/NZS 2588, to form part of a XLam CLT fire system. Refer to SELECTIONS for details.

Components - Acoustic Systems

2.8 PLASTERBOARD LININGS - ACOUSTIC SYSTEMS

Standard, acoustic and fire rated plasterboard to AS/NZS 2588, to form part of a XLam CLT acoustic system. Refer to SELECTIONS for details.

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2.9 CHANNELS & SUSPENDED CEILINGS

Furring channels and/or suspended ceiling on sound isolation mounts and clips to form part of a XLam CLT acoustic system. Refer to SELECTIONS for details

Accessories - General

2.10 SEALER - FACTORY APPLIED

End grain sealer to all exposed timber end grains.

2.11 EXPOSED EDGE FLASHING TAPE – SITE APPLIED

Refer to SELECTIONS for details.

Accessories - Fire Resistant Systems

2.12 FIRE RESISTANT SEALANT

Use fire resistant sealants with XLam CLT panels as specified by project fire engineer.

2.13 FIRE COLLARS

Only use fire-resistant collars which have certified testing or assessment with XLam CLT panels.

2.14 FIRE BATTS

Only use tested fire resistant batts which have certified testing or assessment with XLam CLT panels.

Accessories - Acoustic Systems

2.15 ACOUSTIC SEALANT

Highly flexible acoustic sealant.

Finishes

2.16 FINISHING COATING SYSTEM - SITE APPLIED

Refer to relevant PAINTING section for paint and clear finishes.

2.17 INTUMESCENT COATING SYSTEM - SITE APPLIED

Refer to relevant INTUMESCENT COATINGS section for Intumescent timber coatings.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products. Move and handle Xlam CLT panels in accordance with manufacturer's requirements. Arrange Xlam CLT panel delivery together with XLam NZ Ltd. to suit sequence of intended construction program to minimise handling and on-site storage. If Xlam CLT panels require storage before assembly, lay panels flat, evenly supported and 150mm minimum clear of the ground. Store panels under cover protected from weather/ sun prior to installation and protect panel surfaces, edges and corners from damage.

3.2 INSPECT

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

3.3 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.4 FABRICATION TOLERANCES

Manufacture Xlam CLT panels to the following tolerances:

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Item	Tolerance
Length (L):	± 2mm
Width (W):	± 2mm
Squareness (S) (Difference between the two hypotenuse):	± 2mm
Thickness overall (T):	± 2mm
Flatness (F) (Under a 3m straight edge):	± 5mm
Lap depth	± 2mm
Lap width	± 2mm
Position of panel openings, rebates, recesses etc	± 2mm

3.5 SAMPLE FOR INSPECTION

Request a 300mm x 300mm Xlam CLT panel Natural Appearance (NAT) grade sample of the common thickness to be inspected by the project manager prior to the XLam CLT panel CNC cutting process to approve surface finish.

3.6 FACTORY APPLIED SEALER TO EXPOSED END GRAINS

Prior to dispatch from factory, apply sealer to all exposed timber end grains in accordance with sealer manufacturer's requirements.

3.7 PRE-INSTALLATION REQUIREMENTS

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

Confirm that foundations and all supports for temporary propping or bracing are up to strength and capable of resisting the applied loads prior to commencing installation of panels.
Confirm set out of steel dowels in concrete foundations, if using XLam 'drossbach type' fixings.

Installation

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Locate panels to the following tolerances:
Plan: ± 2mm
Vertical: ± 2mm

3.9 LIFTING

Mobile crane positions to be arranged and prepared prior to Xlam CLT panel delivery to provide suitable clearances from power lines, trees and any obstructions for all operations including lifting and positioning. Ensure the crane has adequate capacity and is suitable for all aspects of the erection process. Check that all necessary items for lifting, propping or bracing and fastening etc, to suit the panel design, are on site and available prior to delivery of the panels. Xlam CLT panels are to remain attached to the crane until they are either fully fixed into their final position or adequately secured by temporary means.

3.10 PROPPING AND BRACING

Provide temporary adjustable props or braces to secure the Xlam CLT panel in position until final support is provided. They must be able to withstand the expected wind loads on the panel for the site and position. Ensure temporary supports do not damage any visually exposed surfaces of panels.

3.11 FINAL POSITION

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

3.12 POST PLACING ADJUSTMENTS

After permanent placing check and adjust as necessary;

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

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3.13 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 XLam CLT panel joint and in accordance with the engineering specific design. Ensure all minimum edge distances of fixings, as documented, are strictly maintained.

3.14 FORM LAP JOINTS

Form lap joints and fix with partially threaded screws, as per details and in accordance with the engineering specific design.

3.15 FORM SPLINE JOINTS

Form laminated veneer lumber (LVL) or plywood (PLY) spline joints and fix with partially threaded screws, as per details and in accordance with the engineering specific design.

3.16 EPOXY GROUT DUCTS

Fit pre-drilled holes in XLam CLT panel over steel dowels cast into slab. Fill with selected epoxy grout, ensure ducts are completely filled.

3.17 TAPE JOINTS AND EDGES

Immediately after fixing of Xlam CLT panels, tape all panel joints and exposed edges of panel openings with flashing tape.

Application - Fire Rated Systems

3.18 INSTALL FIRE RATED SEALANT - JOINTS

Install fire rated sealant, in accordance with XLam CLT Fire Design Guide, to all XLam CLT panel joints of all unprotected FRR systems.

3.19 INSTALL FIRE RATED PLASTERBOARD LININGS

Once the building is fully weather-tight, direct fix 16mm thick fire-rated plasterboard in accordance with manufacturer's recommendations, as per fire assessment requirements.

3.20 INSTALL FIRE STOPPING TO PENETRATIONS

Once the building is fully weather-tight, install fire stopping to all penetrations in XLam CLT FRR systems in accordance with the required fire stopping product manufacturer's recommendations.

Application - Acoustic Systems

3.21 INSTALL CHANNELS & SUSPENDED CEILINGS

Install furring channels and/or suspended ceiling on specified sound isolation mounts and clips, in accordance with manufacturer's recommendations and in accordance with specified XLam acoustic system requirements.

3.22 INSTALL ACOUSTIC INSULATION

Install acoustic blanket in accordance with manufacturer's recommendations and in accordance with specified XLam acoustic system requirements.

3.23 INSTALL PLASTERBOARD LININGS

Install plasterboard linings in accordance with manufacturer's recommendations and in accordance with specified XLam acoustic system requirements.

3.24 INSTALL ACOUSTIC SEALANT

Install lining joint filler and perimeter sealant in accordance with manufacturer's requirements.

Completion

3.25 COMPLETION MATTERS

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

3.26 DEFECTIVE OR DAMAGED WORK

Do not repair or patch damage to XLam CLT panels without written approval from the project manager. Replace damaged panels where repair is not acceptable.

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3.27 EXTERNAL CLADDING

Carry out external installation of air barrier and subsequent claddings in a timely manner according to manufacturer's requirements. If external cladding materials are delayed, ensure XLam CLT panels are adequately protected from weather, water, sun, and other damage.

3.28 PROTECTION

Provide the following temporary protection of the finished work:

TBC by Project Manager

4 SELECTIONS

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

Materials

4.1 XLAM CLT PANEL - FLOOR

Location:	Refer to Architectural Drawings and Structural Drawings
Structural Element:	Floor panel / Mid-Floor, Stair Landings, Stairs
Type/Brand:	XLam CLT Panel - Refer to Structural Drawings and Specifications
Panel Thickness:	130 mm Mid-Floor, 200mm Sti
Panel Width:	Refer to Architectural Drawings and Structural Drawings
Panel Length:	Refer to Architectural Drawings and Structural Drawings
Treatment:	Refer to Architectural Drawings and Structural Drawings
Surface Appearance Grade - Side 1:	Refer to Architectural Drawings and Structural Drawings
Surface Appearance Grade - Side 2:	Refer to Architectural Drawings and Structural Drawings
Fixings:	Refer to structural engineer's drawings, schedules and details.

Surface Fire Properties

4.2 XLAM CLT PANEL - SURFACE FIRE PROPERTIES

Location:	Refer to Architectural Drawings
Group No req'd:	Refer to Fire Report
System:	Refer to Architectural Drawings

Fire Rated Systems

4.3 XLAM CLT PANEL - FIRE RATED SYSTEM & ACOUSTIC SYSTEM

Location:	Refer to Architectural Drawings and Structural Drawings
System:	Refer to Architectural Drawings and Structural Drawings and Acoustic Report
FRR:	30 / 30 / 30
Sealant:	Refer to Architectural Drawings
Fire stopping:	Refer to fire engineers documents for details

Acoustic Systems

Accessories

4.4 EDGE FLASHING TAPE - SITE APPLIED

Location:	To all panel joints and all exposed edges including to panel openings

4.5 END GRAIN SEALER - FACTORY APPLIED

Location:	To all exposed end grains

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4.6 EPOXY GROUT

Location: To all XLam 'drossback type' fixings
Brand / type: Refer to Structural Engineers Drawings and Specifications

4.7 PLYWOOD SPLINE

Location: As documented
Brand / type: Refer to Structural Engineers Drawings and Specifications



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3813NE NELSONPINE LVL LINTELS BEAMS & MASS TIMBER COMPONENTS

1 GENERAL

This section relates to the supply and installation of **NelsonPine®** laminated veneer lumber (LVL). It includes:

- NelsonPine® NP Frame LVL11 & LVL13 members.
- NelsonPine® LVL Mass Timber LVL11 & LVL13 custom-made members

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOILS AND DPC section for damp-proof membrane.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC®	Forest Stewardship Council®
LVL	Laminated veneer lumber

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
AS/NZS 1604.4	Specification for preservative treatment - Laminated veneer lumber (LVL)
AS/NZS 1720.4	Timber structures - Fire resistance of timber elements
NZS 3604	Timber-framed buildings
AS/NZS 4357	Structural Laminated Veneer Lumber

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

NelsonPine® LVL Care and Protection Guide
NelsonPine® LVL Commercial Buildings Brochure
NelsonPine® LVL Framing Solutions Brochure
NelsonPine® LVL Mass Component - Size Chart
NelsonPine® LVL Nail Laminating / Screwing Double Sections Guide
NelsonPine® LVL Product Technical Statement
NelsonPine® LVL Safety Data Sheets - Untreated / Azotek H1.2 treated
NelsonPine® LVL Span Tables
NelsonPine® LVL Specific Engineering Design Guide
NelsonPine® LVL Stain & Paint System Guidelines
Azotek Technical Data Sheet
Henkel Aquence WL Z7758 Technical Data Sheet & Safety Data Sheet
BRANZ Article - Sizing up holes and notches
Scion - Carbon Footprint of New Zealand Laminated Veneer Lumber
Scion - Moisture Meter Correction Figures for NelsonPine LVL Framing

Manufacturer/supplier contact details:

Company:	Nelson Pine Industries Ltd
Web:	www.nelsonpine.co.nz
Email:	lvl@nelsonpine.co.nz
Telephone:	0800 800 438 or 03 543 8800

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to the general section 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified NelsonPine® LVL engineered wood products, associated components or accessories.

1.7 SHOP DRAWINGS

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

Provide shop drawings for custom LVL mass timber components to show the general arrangement including, but not limited to:

- Full dimensions and layout of components
- Details, fixing details as required
- Details, position and layout of proposed items to aid lifting / handling

Submit shop drawings for review to the Project Manager/Architect.

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

1.8 QUALITY CONTROL SYSTEM - MANUFACTURER / SUPPLIER REQUIREMENTS

Maintain a quality control system to manufacturer / supplier requirements, including but not limited to:

For Custom LVL Mass timber, convene a meeting prior to the commencement of works, between a representative of the contractor, a Nelson Pine Industries Ltd representative and the Contract Administrator. The following topics to be reviewed and agreed upon:

- Delivery / construction program
- Shop drawing process and program
- Identify the assembly process
- Site management issues such as site access, lifting procedures, tolerances & weather protection.

1.9 INSPECTIONS

Type:	TBC by Project Manager
Requirement:	TBC by Project Manager
Location:	TBC by Project Manager
Notify:	TBC by Project Manager
Notification:	2 working days prior to work/item being carried out.

Compliance information

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Producer Statement - Construction (PS3) from the manufacturer, for custom LVL mass timber components
- Producer Statement - Construction (PS3) from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Performance – General

1.11 FIRE RESISTANCE- SURFACE CHARRING RATE

The design charring rate of Nelson Pine LVL is 0.72mm/min, this has been determined by the University of Canterbury in accordance with AS/NZS 1720.4.

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2 PRODUCTS

Materials

2.1 NELSON PINE LVL NP FRAME

Structural, Radiata Pine, NelsonPine® LVL NP Frame manufactured to AS/NZS 4357, engineered wood composite made from rotary peeled veneers, laid up with parallel grain orientation and bonded with an exterior grade structural adhesive. H1.2 treated in accordance with B2/AS1 and AS/NZS 1604.4. Refer to SELECTIONS for details.

Components

2.2 FIXINGS

Fixings to suit application, to NelsonPine® LVL technical requirements or as determined by engineer to suit specific design. Fixing material/finish to the requirements of NZS 3604, section 4, 'Durability', to suit application. Refer to drawings for details.

2.3 JOIST HANGERS / FIXING PLATES / STRAPS / BRACKETS

Mild steel galvanized or stainless steel brackets, straps, plates and joist hangers to NelsonPine® LVL technical requirements or as determined by engineer to suit specific design. Material/finish to the requirements of NZS 3604, section 4, 'Durability', to suit application. Refer to drawings for details.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCT

Refer to the general section 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of product. On arrival at site, check LVL members for damage prior to unloading. Record any damage and advise NelsonPine immediately.

Refer to NelsonPine® LVL Care and Protection Guide, for guidance on handling and storage.

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Typically, the moisture content of NelsonPine® LVL members when they leave the manufacturing facility is 10-12% moisture content. Ensure moisture content of LVL members at the time of installation is less than 18% moisture content.

3.4 CONDITIONS

Install LVL in fair weather conditions. Any standing water on adjacent slabs and surfaces to be removed prior to installation of LVL members.

Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

NelsonPine® LVL mass timber shall comply with the following tolerances:

LVL	
Length (CNC machined items)	± 2mm
Length (Non-CNC items)	+15mm / -2mm
Width	± 2mm
Thickness	± 2mm

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Squareness - vertical (thickness)	± 0.5mm
Squareness - horizontal (thickness)	± 0.5mm
Bow	Typically up to 1mm per metre
Crook (spring)	Typically up to 1mm per metre
Twist	Typically up to 1mm per 4 metres
Cup	Typically up to 2mm per 300mm
CNC Machining	
Hole location to centre	± 2mm
Hole diameter	± 0.5mm
Hole depth	± 2mm
Milling - rebates, recessed, slots etc - location	± 2mm

3.6 SEPARATION

Ensure all NelsonPine® LVL members are separated from concrete and masonry. If required, refer 4161 UNDERLAYS, FOILS AND DPC section for damp-proof membrane.

3.7 ERECTION

Lift, place and fix NelsonPine® LVL members without over-stressing or deformation. Use temporary supports as needed without causing damage. Fix NelsonPine® LVL members to NZS 3604, NelsonPine® LVL Specific Engineering Design Guide requirements and/or to project specific design requirements. Ensure all members are correctly located, plumb and true to line and face.

3.8 HOLES AND NOTCHES IN LVL MEMBERS

Holes and notches in members to the size and position as per limitations in NZS 3604, NelsonPine® LVL requirements and/or to specific engineered design.

3.9 CONNECTIONS AND FIXINGS

Ensure all connections and fixings are to the requirements of NZS 3604, NelsonPine® LVL requirements and/or to specific engineered design.

3.10 INSTALL TIMBER PLUGS

Immediately install timber plugs over lifting / screw holes and any service penetrations in LVL members, that may trap moisture.

Finishing

3.11 PROTECTION

Provide temporary protection of the LVL members until building is fully enclosed from weather. Refer to NelsonPine® LVL Care and Protection Guide for further information.

3.12 PERIODICALLY INSPECT

Periodically inspect LVL members during construction for any damage or fading of the factory applied sealer coat. Record inspections and advise Contract Administrator of any damage. Any required remedial work to be agreed in writing with Contract Administrator prior to proceeding.

3.13 TOUCH-UP TO SURFACE FINISH

Once exposure to weather and sunlight is no longer a risk, inspect LVL members for any damage to surface finish or coatings. Any required remedial work to touch-up surface finish to be agreed in writing with Contract Administrator prior to proceeding.

Completion & Commissioning

3.14 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 NELSONPINE NP FRAME LVL11 AND LV13

Location:	Refer to Architectural Drawings and Structural Drawings
Type:	NelsonPine® NP Frame LVL11
Timber certification:	Refer to Hector Egger New Zealand Drawings and Specifications
Size:	Refer to Architectural Drawings and Structural Drawings
Treatment:	H1.2
Finish:	Non-visual
Factory sealer:	Refer to Hector Egger New Zealand Drawings and Specifications

Accessories

4.2 CONNECTIONS / FIXINGS

Location:	Refer to Structural Drawings and Specifications
Type:	Refer to Structural Drawings and Specifications
Material:	Refer to Structural Drawings and Specifications
Fixings:	Refer to Structural Drawings and Specifications

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3813NT NELSONPINE LVL NP FRAME STRUCTURAL FRAMING

1 GENERAL

This section relates to the supply and installation of **NelsonPine® LVL NP Frame** engineered wood products. Structural framing product suitable for residential and light commercial applications
The range includes:

- NP Frame LVL 8
- NP Frame LVL 11
- NP Frame LVL 13

1.1 RELATED WORK

Refer to: 3811 PREFABRICATED STRUCTURAL TIMBER FRAMING for supply of roof panels and wall panels

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC®	Forest Stewardship Council®
LVL	Laminated Veneer Lumber

Documents

1.3 DOCUMENTS

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

NZBC B1	Structure
NZBC B2/AS1	Durability provisions for building elements
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3602	Timber and wood-based products for use in buildings
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 1170.0	Structural design actions - General principles
AS/NZS 1170.1	Structural design actions - Permanent, imposed and other actions
AS/NZS 1170.2	Structural design actions - Wind actions
AS/NZS 4357.0	Structural laminated veneer lumber - Specifications
AS/NZS 4364	Timber - Bond performance of structural adhesive

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

Nelson Pine LVL NP Frame documents relating to work in this section are:

- Specific Engineering Design Guide
- Nelson Pine LVL8 H1.2 General Framing
- LVL Framing Technical Data Sheet
- Paint and Stains Systems Brochure
- Nelson Pine LVL NP Frame Framing Solutions
- LVL Product Technical Statement
- Durability Statement
- Carbon Footprint of NZ Laminated Veneer Lumber
- Moisture Meter Correction Figures for Nelson Pine LVL Framing
- Holes and Notches Guide
- Safety Data Sheet (H1.2)
- Nail Laminating/Screwing Double Sections Guide

Manufacturer/supplier contact details

Company:	Nelson Pine Industries Limited
Web:	www.nelsonpine.co.nz

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Email: LVL@nelsonpine.co.nz
Telephone: 0800 800 438 or 03 543 8800

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified NelsonPine® LVL NP Frame engineered wood product, associated components or accessories.

1.6 QUALIFICATIONS GENERALLY

Refer to the general section 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 CO-ORDINATION

Refer to all drawings to ensure details and fixings required are provided for in the structural Nelson Pine LVL NP Frame work.

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

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

Performance

1.9 DESIGN CRITERIA

NelsonPine® LVL NP Frame product to be designed to comply with NZS 3604, AS/NZS 1170.0, AS/NZS 1170.1, AS/NZS 1170.2, AS/NZS 1170.3, and NZS 1170.5 and NZS 3603. To specific design.

1.10 DURABILITY

Timber species and/or treatment selected in accordance with NZBC B2/AS1, NZS 3602, Tables 1, 2 or 3. The adhesive to be Type 1 to AS/NZS 4364, for Service Class 3 conditions (exterior non-protected) to AS/NZS 1328.1, Table A1, Type of adhesive for given service conditions. The adhesive manufacturer's information states that the adhesive can match the durability of the timber up to 50 years

Performance - Wind (design by Consultant)

1.11 DESIGN PARAMETERS WIND - DESIGN BY CONSULTANT

Design the installation to NelsonPine® requirements as determined by clause 5.2.1 of NZS 3604.

2 PRODUCTS

Materials - Laminated Veneer Lumber (LVL)

2.1 NELSONPINE® LVL NP FRAME

High stiffness Radiata Pine structural NelsonPine® LVL NP Frame manufactured to AS/NZS 4357.0, engineered wood composite made from rotary peeled veneers, laid up with parallel grain orientation and bonded with an exterior grade structural adhesive.
NelsonPine® LVL NP Frame is an Acceptable Solution as per NZS 3640 for treatment and NZS 3604 Clause 2.3.9 for timber framing.

Components

2.2 JOIST HANGERS

Mild steel galvanized or stainless steel strap , brackets, Tyvek plates and joist hangers to the requirements of NZS 3604, section 4, 'Durability', to suit application and NelsonPine® LVL NP Frame technical documentation.

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2.3 STEEL STRAPS

Mild steel galvanized or stainless steel strap , brackets, Tyvek plates and joist hangers to the requirements of NZS 3604, section 4, 'Durability', to suit application and NelsonPine® LVL NP Frame technical documentation.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCT

Refer to the general section 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of product.

NelsonPine® LVL NP:

- Keep dry during storage and transport.
- Store under a ventilated cover.
- Stack clear of the ground on bearers set at 2m maximum centres.
- Place bearers vertically in line to provide even support.

3.2 ROUTINE MATTERS

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

Application

3.3 ERECTION

Lift, place and fix NelsonPine® LVL NP Frame without over-stressing or deformation. Use temporary supports as needed without causing damage. Fix NelsonPine® LVL NP Frame to NZS 3604 and/or to NelsonPine® LVL NP Frame requirements for specific design. Ensure all members are correctly located, plumb and true to line and face.

3.4 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.

3.5 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 to NZS 3604 or to engineering specific design.

3.6 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, to NZS 3604 or to engineering specific design guide.

3.7 HOLES AND NOTCHES IN LVL FLOOR JOISTS

Holes and notches in NelsonPine® LVL NP Frame floor joists to NZS 3604 and/or NelsonPine® Holes & Notches Guide.

3.8 RAFTERS AND OVERHANGS

Refer to NZS 3604 for details of rafter tie down, restraint at supports, lateral restraint for rafters, ridge support detail, fascia connection detail and overhang details. For sloping soffit with rafters birds-mouthed at supports, cut notch to provide 45mm minimum bearing. Flange must not overhang support. Do not cut beyond flange.

3.9 BEARING AND SUPPORT DETAILS

Refer to NZS 3604 for details of bearing and support, nailing down to supports, installation of joist hangers, web stiffeners, web stiffeners for double joists, for joists oblique to bearer, concentrated loads from jamb studs or posts and limited notching at end supports.

3.10 JOIST HANGERS FOR JOISTS

To NZS 3604 for specific design.

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3.11 LINTEL END CONNECTIONS

Design and installation for lintel end connections and cantilevered lintel connections, trimming stud connections and tie down where required for uplift construction details to NZS 3604 for specific design.

Completion & Commissioning

3.12 COMPLETION MATTERS

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

4 SELECTIONS

Substitutions are not permitted to the following NelsonPine® LVL NP Frame product, unless stated otherwise.

4.1 NELSONPINE RADIATA PINE CERTIFIED SUSTAINABLE TIMBER

Product:	NelsonPine® LVL NP Frame products
Certification type:	FSC
Timber species:	Pinus Radiata
Origin:	New Zealand
Claim:	TBC by Hector Egger New Zealand

Materials

4.2 NP FRAME LVL 11

Location:	Refer to Architectural Drawings and Structural Drawings
Size/Grade:	Refer to Architectural Drawings and Structural Drawings
Treatment:	H1.2

Accessories

4.3 FIXINGS

Location:	Refer to Structural Drawings and Specifications
Manufacturer / Supplier:	Refer to Structural Drawings and Specifications
Type:	Refer to Structural Drawings and Specifications
Material:	Refer to Structural Drawings and Specifications

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3821 TIMBER FRAMING

1 GENERAL

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

1.1 RELATED WORK

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:

SG Structural grade to NZS 3604, 1.3 Definitions

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2904	Damp-proof courses and flashings
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3631	New Zealand timber grading rules
NZS 3640	Chemical preservation of round and sawn timber
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry.
BRANZ BU 673	Cavity battens

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

1.4 DIMENSIONS

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

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

2 PRODUCTS

Materials

2.1 TIMBER FRAMING, TREATED

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

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2.2 APPEARANCE TIMBERS

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

2.3 STRAPPING

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

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

2.4 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

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

2.5 EXTERIOR CAVITY WALL BATTENS - TIMBER - STRUCTURAL

To BRANZ BU 673, part 6. H3.2 SG6 Radiata pine kiln dried battens, 20mm thick, 40mm minimum width, and height to match timber framing studs. To NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.6 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Components

2.7 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.

2.8 SCREWS

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

2.9 BOLTS AND COACH SCREWS

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

2.10 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.

2.11 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.

2.12 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.

2.13 POWDER ACTUATED FASTENERS

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

2.14 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.

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

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

Moisture content:

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

3.4 PROTECT TIMBER

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

Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

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

3.6 SEPARATION

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

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

3.7 EXECUTION

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

3.8 SET-OUT

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

3.9 SET TIMBERS

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

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3.10 TIMBER CUTTING

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

3.11 STRAIGHTENING STUDS

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

3.12 TIMBER PLATES AND FURRING

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

3.13 HOLES AND NOTCHES

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

3.14 EXPOSED TIMBER CONNECTORS AND FIXINGS

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

3.15 POWDER-ACTUATED FASTENING TOOLS

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

3.16 ADDITIONAL FRAMING

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

3.17 FORM NAILED JOINTS

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

3.18 FORM BOLTED JOINTS

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

3.19 FIT CONNECTORS AND FIXINGS

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

3.20 FIT STRUCTURAL CAVITY BATTENS

Fit and fix 20mm cavity battens over wall underlay or rigid air barrier. Permanently fix battens onto the framing using 60mm x 2.8mm jolt head (60mm x 2.87mm power-driven) hot-dip galvanized nails, or 64mm x 2.8mm power driven stainless steel annular grooved nails at 300mm centres maximum up to Very High Wind Zone and 250mm centres maximum for Extra High Wind Zone, and staggered 12mm either side of the batten centreline, to BRANZ BU 673, part 6. Make allowances for cladding control joints where required. Fit and fix related flashings. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc). Use cavity spacers set to 5° fall where fixing is required between cavity battens.

3.21 FIT BRACING

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

3.22 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.23 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section



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Completion

3.24 COMPLETION MATTERS

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

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4 SELECTIONS

4.1 FLOOR FRAMING - RADIATA PINE

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

4.2 EXTERIOR WALL FRAMING - RADIATA PINE

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

4.3 ROOF FRAMING - RADIATA PINE

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

4.4 INTERIOR WALL FRAMING - RADIATA PINE

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

4.5 CEILING FRAMING - RADIATA PINE

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

4.6 CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Structural	Radiata pine	Merch	H3.2
Timber - Non Structural	Radiata pine	Merch	H3.1
Cavity closer:	Manufacturer TBC	Refer to Architectural Drawings	uPVC

4.7 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

4.8 NAILS

Refer to Architectural Drawings and Structural Drawings

4.9 SCREWS

Refer to Architectural Drawings and Structural Drawings

4.10 BOLTS AND COACH SCREWS

Refer to Architectural Drawings and Structural Drawings

4.11 NAIL PLATES

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Refer to Architectural Drawings and Structural Drawings

4.12 CONNECTORS

Refer to Architectural Drawings and Structural Drawings



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4131N NURALITE NURAPLY 3P COVERED TANKING SYSTEMS

1 GENERAL

This section relates to the application of NURALITE NURAPLY 3P Covered Tanking Systems for basement and retaining wall tanking and damp-proofing.

It includes:

- NURAPLY 3PT for below ground walls and footings with moderate hydrostatic pressure
- NURAPLY 3PTM for underslab, footings and blindside wall tanking
- NURAPLY 3PG for root-resistant membrane for below ground walls and footings

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS or 7441 GROUNDWATER DRAINAGE for subsoil drainage and backfill to basement walls.

Documents

1.2 DOCUMENTS

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

NZS 3604 Timber-framed buildings
CodeMark CM70033 - The Nuraply 3P Waterproof Tanking Membrane system

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

NURALITE NURAPLY 3P Technical Data Sheets
NURAPLY 3P Covered Membrane Installation Manual 2024
NURAPLY 3P Covered Check Sheets and Maintenance Programme
NURALITE Waterproofing Limited: CAD Tanking drawings®

Manufacturer/supplier contact details

Company:	Nuralite Group Limited
Web:	www.nuralite.co.nz
Email:	info@nuralite.co.nz
Telephone:	09 579 2046 Auckland 0800 Nuralite (0800 687 254)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years:	For system under normal environmental and use conditions against failure

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years:	NURAPLY applicator to warrant this work under normal environmental and use conditions against failure of materials, waterproofing and execution

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT

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- Commence the warranty from the date of completion of application

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 NO SUBSTITUTIONS

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

1.7 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be Nuralite Group Limited Authorised Membrane Applicators. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

Conditions

1.8 EXCAVATION CONDITIONS FOR DAMP-PROOFING

Ensure that excavations are free of running water and seepage during dry weather. If water is present the Contract Administrator is to be notified before any damp-proofing work is started. This specification is not suitable for any hydrostatic pressure conditions or installation below the water table.

1.9 EXCAVATION CONDITIONS FOR WATERPROOFING

Ensure that excavations are free of running water during dry weather. If running water is present the Contract Administrator is to be notified before any waterproofing work is started. This specification is not suitable for high hydrostatic pressure conditions or installation below the water table.

Performance

1.10 COMPLIANCE CODEMARK CERTIFICATE - NURAPLY 3P

NURAPLY 3P Waterproof Tanking Membrane System meets the requirements of the CodeMark® certificate CodeMark CM70033 when used within the conditions and limitations of its Certificate of Conformity.

2 PRODUCTS

Waterproofing

2.1 NURALITE UNDERGROUND WATERPROOFING MEMBRANE

NURAPLY 3PT reinforced fibre asphalt film faced flexible, tough, waterproofing system for walls, applied and joined by traditional NURALITE techniques. Thickness not less than 3mm.

Waterproofing or damp-proofing near plants

2.2 NURAPLY 3PG WALL MEMBRANE NEAR PLANTING

Nuraply 3PG 4mm thick reinforced fibre asphalt waterproofing or damp-proofing membrane for walls, impregnated with anti-root additive to prevent attack from plant root systems.

Components

2.3 PRIMER

NURAFLUX QD surface primer for the tanking system, to prepare the substrate for optimum adhesion.

2.4 TOP EDGE ANCHOR STRIP

Aluminium or stainless steel anchor strip.

2.5 INSULATION SHEET – ENERTHERM PIR

Enertherm PIR is a closed cell rigid polyisocyanurate insulation board exhibiting a high compressive strength, clad on both sides with a multi-layer gastight aluminium complex.

Available in a range of sizes and thicknesses. Refer to SELECTIONS for options.

2.6 NURADRAIN POLYETHYLENE PROTECTION SHEET

Dimpled rot-proof board for use as a protective barrier and drainage medium behind retaining walls.

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2.7 NURALITE GREENDRAIN

20SRXSSc3g is a geo-composite drainage and water attenuation layer comprising a perforated cuspated HDPE (High Density Polyethylene) core with selected geotextiles thermally bonded on each side.

Accessories

2.8 ALUMINIUM TAPE

3M 150mm and 48mm wide aluminium tape.

2.9 BITUMEN FILLET

NURALITE triangular fillet.

2.10 LEVELLING COMPOUND

NURAFLUSH levelling compound.

2.11 EXPANDING FOAM

Holdplast Gorilla Nailpower fire rated expanding foam.

2.12 SEALANTS

IKO Stickall Bitumen or Millennium LPS.

2.13 TERMINATION BAR

NURALITE pre-formed termination bar.

2.14 COATING

NURACOAT BG coating to ENERTHERM PIR insulation sheet.

2.15 ADHESIVE

Selleys water based KWIK GRIP, for spot fixing of ENERTHERM PIR insulation sheet.

2.16 FIXINGS

NURALITE self-adhesive mechanical fixing.

2.17 PENETRATION SEAL

Lockin Pocket.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

- Store NURALITE rolls and accessory materials under conditions that ensure no deterioration or damage.

Store in shade or cover in hot sun. Protect liquid components from freezing.

3.2 ROUTINE MATTERS

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

3.3 COMPLY

Comply with the NURALITE requirements and instructions.

3.4 STORE

Store NURALITE rolls and accessory materials under conditions that ensure no deterioration or damage. Store in shade or cover in hot sun. Protect liquid components from freezing.

3.5 WEATHER CONDITIONS

Apply NURALITE tanking systems only in fair weather with air temperature above 5°C. Apply adhesives and make site joints only in weather conditions compatible with perfect jointing.

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3.6 DE-WATERING

Maintain water level at not less than 300mm below the level of the base concrete during the progress of the tanking work and until protective loading coats and walls are complete and fully set.

3.7 DRAINAGE

Install approved drainage system to remove water from foundations. Ensure drain is protected with geotextile cloth to prevent it clogging with fines, and that it is correctly located, 150mm from the membrane and below the footing.

3.8 CHECK SUBSTRATE

Check that the substrate will allow work of the required standard with adequate safe working space for applicators. Complete any remedial work identified and allow to cure before commencing tanking application.

3.9 CURING OF NEW CONCRETE

Allow concrete and masonry to dry to the NURALITE requirements before applying tanking. Minimum curing of new concrete: 28 days. This is not applicable for blockwork or site lean concrete.

Application - Preparation

3.10 ENSURE SUBSTRATE

Ensure all surfaces are clean and free from voids, spalled areas, loose particles, and sharp protrusions. Ensure no projections of sharp materials exist that will cause damage to tanking. Check that masonry joints are struck off flush.

Ensure form oils or release agents and curing compounds are completely removed.

3.11 PREPARE SUBSTRATE

Remove projections, wire-brush and remove all debris, leaving the surface dust-free, oil-free and clean, with nothing that could diminish the adhesion of primers. Fill tie holes flush and smooth with NURAFLUSH. Grind off steps or sharp protrusions caused by formwork joints.

3.12 TURN UPS

Where tanking is turned up against hardened concrete, ensure the surface is smooth and free of all sharp projections. Fill internal corners with NURALITE bitumen triangular fillets.

3.13 TURN DOWNS

Where NURAPLY 3PT is turned over an external corner, first grind the corner to produce a smooth 25mm radius or chamfer.

3.14 CLEAN SURFACES

Clean surfaces with a broom or oil free compressed air to remove dust, loose particles and material that could affect bonding.

3.15 DRESS OFF HARDFILL SURFACE

Dress off surface of hardfill with a 15mm layer of fine, clean sand rolled to a smooth surface. Ensure concrete surface is a smooth steel trowel U3 surface to NZS 3114. Grind off any steps or sharp protrusions.

3.16 REMOVE OTHER FORMWORK

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

3.17 PRIMING

Ensure concrete or masonry substrates are sufficiently cured and dry to permit the intended performance of the NURAFLUX QD primer. Apply NURAFLUX QD primer at the coverage rate recommended by NURALITE.

3.18 ALLOW PRIMER TO DRY

Allow the primer to dry. Do not prime more than can be covered in one working day. Prevent contamination of the primed surface prior to application of the tanking system.

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Waterproofing application - walls

3.19 3PT APPLICATION METHOD - WATERPROOFING

Apply the NURAPLY 3PT waterproofing system with laps and joints and reinforcing pieces at junctions to provide a waterproof finish.

3.20 WELD NURAPLY 3PT JOINTS

Heat fuse joints minimum laps side 80mm, ends 150mm, using self checking lap welding techniques.

Waterproofing or damp-proofing application - walls near planting

3.21 NURAPLY 3PG APPLICATION - WATERPROOFING OR DAMP-PROOFING

Apply the NURAPLY 3PG waterproofing system with laps and joints and reinforcing pieces at junctions to provide a waterproof finish.

3.22 WELD NURAPLY 3PG JOINTS

Heat fuse joints minimum laps side 75mm, ends 150mm, using self checking lap welding techniques.

3.23 JOIN TO DPM - DAMP-PROOFING

Extend the NURAPLY 3PG membrane to the base of the footing. Fold the concrete slab DPM over the NURAPLY 3PG and seal with bitumen based adhesive tape.

Application - general

3.24 ADDITIONAL THICKNESS

Provide a double layer of tanking around pipes and penetrations and at all junctions and changes of direction. Seal edges to NURALITE requirements.

3.25 SEALING EDGES WITH ANCHOR STRIPS

At edges of the membrane, adhere firmly on to the substrate and anchor strip on all top edges of tanking.

3.26 SECTIONAL COMPLETION

As sections of tanking are completed, arrange for inspection of the work before covering with protective sheets, walls, or slabs.

3.27 PROTECT VERTICAL SURFACES

Protect vertical surfaces from damage before covering with NURADRAIN protective sheets.

3.28 PROTECT HORIZONTAL SURFACES

Protect the horizontal tanking from damage during laying by ensuring applicators wear soft soled shoes. Except for inspection purposes do not allow traffic on the tanking after installation and before protection sheets have been laid.

3.29 INSTALL ENERTHERM PIR INSULATION SHEETS

Bond the PIR with Selleys Water Based Kwik Grip. Tape any exposed edges of PIR with150mm foil tape before installing. Tape all PIR joins with 48mm foil tape once installed and before coating with Nuracoat BG, to NURALITE requirements for this work, to fully protect and insulate the whole of the tanking area.

3.30 INSTALL NURADRAIN PROTECTION SHEETS

Fix sheets with Nuralite self-adhesive mechanical fixings to NURALITE requirements for this work, to fully protect the whole of the tanking from backfill.

3.31 INSTALL GREENDRAIN PROTECTION SHEETS

Place sheets and tape joins before the placement of the Green roof medium.

3.32 SUPERVISION OF BACKFILLING

Supervise backfilling operations to ensure no damage is caused to the waterproofing system. Refer to the appropriate drainage section for subsoil drainage and backfilling.

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Completion

3.33 COMPLETION MATTERS

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

3.34 CLEAN UP

Clean up as the work proceeds.

4 SELECTIONS

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

4.1 PRESSURE RATING FOR WATERPROOFING

For waterproofing systems only (not for damp-proofing systems).

Waterproofing - underground walls

4.2 NURAPLY 3PT TANKING SYSTEM - UNDERGROUND WALLS

Location:	Refer to Architectural Drawings
Supplier:	Nuralite Group Ltd
Brand:	NURAPLY 3PT

Waterproofing or damp-proofing underground walls - near planting

4.3 NURAPLY 3PG SYSTEM

Location:	Refer to Architectural Drawings
Supplier:	Nuralite Group Ltd
Brand:	NURAPLY 3PG
Protection level:	Waterproofing

Components

4.4 NURAPLY INSULATION SHEETS

Location:	Refer to Architectural Drawings
Supplier:	Nuralite Group Ltd
Brand:	ENERTHERM PIR Insulation Board
Thickness:	Refer to Architectural Drawings

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4161 UNDERLAYS, FOIL AND DPC

1 GENERAL

This section relates to the application of:

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

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

Requirements

1.3 INSTALLATION SKILL LEVELS

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

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2 PRODUCTS

Materials

DPC

2.1 POLYETHYLENE DPC

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

2.2 BITUMINOUS IMPREGNATED DPC

Heavy Kraft impregnated with high grade bitumen and coated with higher heat resistant bitumen to AS/NZS 2904 and to the appropriate test methods set out in AS/NZS 4347.0.

DPM

2.3 DAMP PROOF MEMBRANE - CONCRETE FLOOR

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

Rigid Air Barriers

2.4 RIGID AIR BARRIERS

For rigid air barriers refer to the appropriate section.

Accessories

2.5 WINDOW DOOR SEALING SYSTEM

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

2.6 GUTTER AND UNDER FLASHINGS

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

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

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

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

3.2 STORAGE

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

3.3 INSPECTION

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

Application - DPC

3.4 POLYETHYLENE DPC TO TIMBER

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

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3.5 BITUMINOUS DPC TO TIMBER

Lay bituminous DPC under timber of all timber framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

NOTE: Do not use bituminous DPC under LOSP treated timber.

3.6 DPC TO MASONRY AND BRICK VENEER

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

3.7 DPC BETWEEN DISSIMILAR MATERIALS

Lay DPC between dissimilar materials where required.

Application - DPM

3.8 DPM TO CONCRETE FLOOR

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

Completion

3.9 CLEAN UP

Clean up as the work proceeds.

3.10 LEAVE

Leave work to the standard required by following procedures.

3.11 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 DPC

Location:	Refer to Architectural Drawings
Brand / type:	Refer to Architectural Drawings

4.2 DPM - CONCRETE FLOOR

Location:	Refer to Architectural Drawings
Brand / type:	Refer to Architectural Drawings
Thickness:	Refer to Architectural Drawings
Jointing tape:	As required

Accessories

4.3 WINDOW/DOOR SEALING SYSTEM

Brand / type:	Refer to Architectural Drawings

4.4 AIR SEAL BACKING ROD

Location:	Refer to Architectural Drawings
Brand / type:	Refer to Architectural Drawings
Size:	Refer to Architectural Drawings

4.5 GUTTER AND UNDER FLASHINGS

Location:	Refer to Architectural Drawings
Brand / type:	Refer to Architectural Drawings

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

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F2/AS1	Hazardous building materials
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays - part 1: materials
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice
CodeMark™ CMNZ30032 verH	SOLITEX EXTASANA Wall Underlay

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Pro Clima documents relating to work in this section are:

SOLITEX EXTASANA® Installation Guide
SOLITEX MENTO® Application Guide 24.06.2025
BRANZ Appraisal 815 (2024) - TESCON EXTOSEAL Sill Tape
BRANZ Appraisal 838 (2024)- TESCON EXTORA Sealing Tape
BRANZ Appraisal 855 (2025)- SOLITEX MENTO 3000 Roof and Wall Underlay
BRANZ Appraisal 953 (2024) - KAFLEX and ROFLEX Grommets
BRANZ Appraisal 1163 (2021) - SOLITEX EXTASANA® Wall Underlay
SOLITEX MENTO® 1000 CONNECT Roof Underlay Installation Guide
Specification Guidelines 30 January 2026
Early-Close-In with SOLITEX EXTASANA®
SOLITEX EXTASANA® Early Close-In Application Guide for Horizontal Cladding
SOLITEX EXTASANA® Early Close-In Application Guide for Vertical Cladding

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years For Pro Clima system

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

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

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer warranty:

2 years: For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Compliance

1.6 COMPLIANCE - CODEMARK CERTIFICATE

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

1.7 COMPLIANCE - BRANZ APPRAISAL 815

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

1.8 COMPLIANCE - BRANZ APPRAISAL 855

SOLITEX MENTO 3000 Roof and Wall Underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 855.

1.9 COMPLIANCE - BRANZ APPRAISAL 953

KAFLEX and ROFLEX Grommets have been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of their BRANZ Appraisal 953.

1.10 COMPLIANCE - BRANZ APPRAISAL 1163

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

Requirements

1.11 NO SUBSTITUTIONS

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

1.12 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Installation to be carried out by or under the supervision of a Licensed Building Practitioner (LBP) with the relevant License Class.

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

2 PRODUCTS

Wall underlays

2.1 WALL PROTECTION MEMBRANE - MECHANICAL FIX

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

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

Roofing underlays

2.2 ROOF UNDERLAY - MEDIUM WEIGHT, TYPE R4, VERY HIGH EXPOSURE (90 DAYS), SELF-ADHESION STRIP

SOLITEX MENTO® 3000 CONNECT consists of a waterproof, non-porous diffusion open membrane laminated to two layers of polypropylene fleece. Has a flammability Index of ≤ 5, when tested to AS 1530.2. Complies with NZBC C/AS2, paragraph 4.12.5.2 (b), for suspended flexible fabrics. Refer to BRANZ Appraisal 855 for details. Available in rolls 1.5m and 3m wide x 50m long. Self-supporting to 1200mm.

SOLITEX MENTO® 3000 connect, must be covered and protected against weather or ultraviolet light within 90 days.

Components

2.3 8mm SEPARATION MESH

Polypropylene 3D separation layer. Available in 1.4 x 30m x 8mm thick rolls.

2.4 WINDOW AND DOOR WEATHERTIGHT CONNECTION STRIP

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

2.5 WINDOW AND DOOR CONNECTION TAPE

CONTEGA SOLIDO EXO-D, a full-surface adhesive plaster/window-sealing tape with an additional adhesive zone on the fleece side, for exterior use. Can be plastered over directly.

2.6 MULTI-PURPOSE ADHESIVE

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

2.7 PRIMER

TESCON® PRIMER RP is a solvent free acrylic copolymer used to stop water capillarity in the fleece of SOLITEX EXTASANA ADHERO® when used in low pitch roof applications. Used to pre-treat rough or dirty surfaces before applying SOLITEX® ADHERO VISTO floor protection membrane on internal floors, or before applying COMPEGO sealing tape. Supplied in a 1 litre bottle.

Tapes

2.8 WEATHERTIGHT SEALING TAPE

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

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

2.9 SILL TAPE

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

2.10 WEATHERTIGHT JOINERY SEALING TAPE

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

2.11 NAIL & SCREW SEALING TAPE

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

2.12 DOUBLE-SIDED TAPE

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

Accessories

2.13 SEALING GROMMETS FOR ROUND CABLES - SINGLE, 5-12MM DIAMETER

KAFLEX mono sealing grommets 145mm x 145mm, manufactured from special reinforced paper with EPDM. For single cables of diameter 5 - 12mm.

Suitable for sealing penetrations through roof and wall underlays. KAFLEX grommets can be exposed to weather or ultraviolet light for a period of up to 180 days.

2.14 SEALING PATCH FOR CABLES ALREADY INSTALLED, UP TO 20MM DIAMETER

KAFLEX post, cable sealing grommet, flexible and elastic for airtight seals around cables that are already in place.

2.15 MULTIPLE CABLE GROMMET FOR UP TO 16 CABLES, 5-12MM DIAMETER

KAFLEX multi, cable sealing grommet manufactured from EPDM with an integrated adhesive flange. Suitable for sealing up to 16 cables of 4.8 - 12mm diameter each in facades and roof linings.

2.16 SEALING GROMMET - FOR PIPES, 15-30mm DIAMETER

ROFLEX 20 self-adhesive sealing grommet for pipes manufactured from PP fleece, solid acrylic glue and EPDM rubber, 140mm x 140mm in size. Sealing grommet for pipes of diameter 15mm-30mm.

Suitable for sealing penetrations through roof and wall underlays, for indoor and outdoor applications. ROLEX 20 grommets can be exposed to weather or ultraviolet light for a period of up to 180 days.

2.17 SEALING GROMMET - FOR PIPES, 30 - 320mm DIAMETER

ROFLEX 30/50/100/150/200/250/300 self-adhesive sealing grommet for pipes manufactured from PP fleece, solid acrylic glue and EPDM rubber, vary in size from 140mm x 140mm to 500mm x 500mm. Sealing grommet for pipes of diameter 30-50mm, 50-90mm, 100-120mm, 120-170mm, 170-220mm, 220-270mm and 270-320mm.

Suitable for sealing penetrations through roof and wall underlays, for indoor and outdoor applications. ROLEX 30/50/100/150/200/250/300 grommets can be exposed to weather or ultraviolet light for a period of up to 180 days.

2.18 SEALING GROMMET FOR UP TO 9 PIPES/CONDUITS, 15-30MM DIAMETER

ROFLEX 20 multi, a multiple cable sealing grommet manufactured from EPDM. Creates an airtight seal for up to 9 cables of 15 - 30mm diameter in façades and roof underlays. ROFLEX 20 multi can be exposed to ultraviolet light for up to 180 days

2.19 STUD STRAPS - POLYPROPYLENE

Stud straps, 19mm wide polypropylene straps.

2.20 ROOF SARKING / SUBSTRATE

Refer to sarking section 4337 PLYWOOD ROOFING & DECKING SUBSTRATE or 4338LS LAMINEX NZ STRANDSARKING ROOFING SUBSTRATE.

2.21 GUTTER AND UNDER FLASHINGS

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

2.22 CAVITY CLOSERS, EAVES FLASHINGS, RIDGE VENT FLASHINGS

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

Accessories - Early Close-In

2.23 CAP NAILS

Delfast FN-RCAP25 E-galv wire collated cap nails, incorporating plastic heads to weather-protect nail heads. For early close-in of building envelope. Refer to Pro Clima early close-in guides.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 GENERAL REQUIREMENTS

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

3.4 INSPECTION

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

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Preparation

3.5 PREPARATION

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

Application - wall underlay - SOLITEX EXTASANA

3.6 SCOPE LIMITATIONS - TIMBER FRAMED BUILDINGS

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

- The scope limitations of NZBC E2/AS1, 1.1.1 Scope of this document, with regards to building height and floor plan area.
- With absorbent wall claddings directly fixed to the frame.
- With non-absorbent, non-metallic wall claddings directly fixed to the frame.
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer to NZBC E2/AS1.
- Situated in NZS 3604 Wind Zones up to and including Very High.

3.7 FIX WALL UNDERLAY - TIMBER FRAMING

Fix wall underlay in accordance with SOLITEX EXTASANA® Instruction Guide and as follows:

- Apply underlay to exterior walls from below bottom plate to top plate. Fix securely with fasteners e.g. "LITTLE GRIPPERS", 6mm - 8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Provide additional fixings around window and door openings.
- For early close-in of building envelope, fix securely using Delfast FN-RCAP25 E-galv wire collated cap nails, incorporating plastic heads to weather-protect nail heads. Refer to Pro Clima early close-in guides.
- In sea spray zone (Zone D) all fixings to be stainless steel.
- Allow a 150mm minimum lap at joins and all vertical overlaps over studs and tape with Pro Clima TESCON EXTORA® to increase weathertightness. Repair any forced tears using TESCON EXTORA®.
- Pro Clima recommendation: Apply ORCON® Classic adhesive to perimeter at footing level to prevent wind wash over insulation.
- Pro Clima recommendation: Apply TESCON EXTORA® to horizontal laps to prevent wind wash over insulation.
- Note: Fastenings behind brick veneer must have equivalent service life of 50 years. Refer to NZS 3604 Tables 4.1, 4.2 and 4.3.
- When ready to install doors and windows cut at each opening at 45° from each corner. Pull SOLITEX EXTASANA® flaps inside and fasten to frame.
- Apply TESCON EXTOSEAL® sill tape.

Application - wall underlay - generally

3.8 INSTALL STUD STRAPS

Where studs are at greater than 450mm centres, install 19mm wide polypropylene straps horizontally at 300mm centres over wall underlay, draw taut and fix to studs.

Application - roofing underlay

3.9 FIX ROOF UNDERLAY - PRO CLIMA METHOD WITH SELF-ADHESION STRIP

Fix roof underlay in accordance with SOLITEX MENTO® 3000 CONNECT Application Guide and as follows. Applicable when the underlay is separated from the roofing to provide additional ventilation to the roof space:

- Fix roof underlay at maximum 150mm centres to all framing with large-head clouts 20mm long, 8mm-12mm stainless steel staples, self-drilling screws or proprietary underlay fixings.
- Fix roof underlay horizontally and fix direct to the top of the rafter or truss top chord and secure with minimum 20mm x 45mm counter batten fixed directly over the rafter or truss member. Increase the length of fixings used to secure purlins and tile battens to the rafter or

truss by the depth of the counter batten.
- All laps to be a minimum of 150mm. Seal laps with self-adhesion strips provided on either side of sheet.
- For pitches less than 10° Pro Clima recommend that the underlay is laid on solid sarking.

3.10 GUTTER AND UNDER FLASHINGS

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

Application - tape systems

3.11 APPLY TESCON TAPE SYSTEMS

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

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

Application - grommet and detail solutions

3.12 INSTALL GROMMETS AND DETAIL SOLUTIONS

Install grommets and detail solutions in accordance with Pro Clima KAFLEX and ROFLEX Installation Guides.

Completion

3.13 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 PRO CLIMA SOLITEX EXTASANA® MEMBRANE - MECHANICAL FIX

Location:	Refer to Architectural Drawings
Manufacturer:	Pro Clima NZ Limited
Type:	SOLITEX EXTASANA® Wall Protection Membrane
Jointing & sealing tape:	TESCON EXTORA® weathertight sealing tape
	TESCON EXTOSEAL® sill tape
Adhesive:	ORCON® Classic multi-purpose adhesive
Accessories:	KAFLEX mono sealing grommets for cables ∅ 6-12mm KAFLEX multi-sealing grommet for multiple cables ∅ 6-12mm ROFLEX 20 sealing grommet for pipes and conduit ∅ 15-30mm ROFLEX 20 multi-sealing grommet for multiple pipes and conduit ∅ 15-30mm ROFLEX 30 / 50 / 100 / 150 / 200 / 250 / 300 sealing grommets for pipes ∅ 30-320mm

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4.2 PRO CLIMA SOLITEX MENTO 3000 CONNECT ROOF & WALL UNDERLAY, WITH SELF-ADHESION STRIP

Location:	Refer to Architectural Drawings
Manufacturer:	Pro Clima NZ Limited
Type:	SOLITEX MENTO® 3000 CONNECT three-layer underlay
Jointing & sealing tape:	TESCON EXTORA® weathertight sealing tape
	TESCON EXTOSEAL® sill tape
Adhesive:	ORCON® Classic multi-purpose adhesive
Accessories:	KAFLEX mono sealing grommets for cables ∅ 6-12mm KAFLEX multi-sealing grommet for multiple cables ∅ 6-12mm ROFLEX 20 sealing grommet for pipes and conduit ∅ 15-30mm ROFLEX 20 multi-sealing grommet for multiple pipes and conduit ∅ 15-30mm ROFLEX 30 / 50 / 100 / 150 / 200 / 250 / 300 sealing grommets for pipes ∅ 30-320mm

Accessories

4.3 STUD STRAPS

Location:	As required
Type:	19mm blue polypropylene tape

4.4 ROOF SARKING / SUBSTRATE

Location:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings

4.5 GUTTER AND UNDER FLASHINGS

Location:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings
Jointing tape:	TESCON EXTORA

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4165DV DRISPACE ROOF VENTILATION & WALL VENTED CAVITY BATTEN

1 GENERAL

This section relates to the supply and installation of DriSpace VENT roof and wall ventilation systems.

It includes:

- Ventilated Wall Cavity Batten
- Ventilated Roof Products

1.1 RELATED WORK

Refer to 4161TH DRISPACE UNDERLAYS, DPC & AIRTIGHT SYSTEMS for roof and wall underlays.

Documents

1.2 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC C/VM1	Protection from fire
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
BRANZ Appraisal 979 Roof Ventilation Products
BRANZ Appraisal 1099 (2024) - Vent Ventilated Wall and Drainage Cavity Batten

Roof Ventilation Design Guide for all roof pitches
VENT Passive Ventilation System - brochure
VENT Product Technical Sheets - for various products
ProctorPassive HC9 Drainage Mat - Product Technical Statement

Manufacturer/supplier contact details

Company:	DriSpace (a division of TCL Hunt Ltd)
Web:	www.drispace.co.nz
Email:	sales@drispace.co.nz technical@drispace.co.nz
Telephone:	0800 DRISTUD (0800 374 7883)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For durability of DriSpace ventilation products

- Provide this warranty on the TCL Hunt Warranty for DriSpace Products standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT).
- Refer to TCL Hunt Warranty for DriSpace Products warranty form for conditions and limitations of warranty.
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

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Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

2 PRODUCTS

Materials

2.1 VENT G1200N & G2500N OVER FASCIA VENT - ROOF

VENT G1200N & G2500N Over Fascia Vents are manufactured from extruded polypropylene with 4mm vents that provide passive air flow 10,000mm² per lineal metre for G1200N and 25,000mm² per lineal metre for G2500N. Supplied in 1000mm lengths, black colour.

2.2 VENT RV10P & RV10DT, ROOF RIDGE VENT / APRON VENT

VENT RV10P & RV10DT Ridge Vents, manufactured from extruded polypropylene with an aluminium-based conformable, soft edge flashing along the bottom edge and provides passive air flow of 8,000mm² per lineal metre. VENT RV10P is 410mm wide (including flashing) x 20mm thick x 1200mm long lengths, to suit trough depths that are less than 34mm and VENT RV10DT is 460mm wide (including flashing) x 20mm thick x 1200mm long lengths, to suit trough depths between 34mm and 60mm. RV10P & RV10DT can be used as an Apron Vent, for abutments and barges, by cutting RV10P & RV10DT in half lengthwise.

Components

2.3 FIXINGS - ROOF BATTEN VB20 FIXING

40 x 2.5mm hot-dip galvanized flat head nails or hot-dip galvanized or stainless steel finishing brads.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Carry out remedial work identified before installing VENT products.

3.4 CONDITIONS - PREVENTION OF FIRE

Separation or protection must be provided to the VENT products from heat sources such as fire places, heating appliances, flues and chimneys. Refer to NZBC C/AS1-AS2 and NZBC C/VM1 for requirements.

3.5 CONDITIONS - SITE EXPOSURE

Do not expose VENT propylene products to weather or ultra-violet light for a prolonged periods of time, especially G502 Roll Panel Vent (Ventilated Eaves Baffle) which should be covered on the same day as installation.

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Installation/application

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - Roof

3.7 INSTALL OVER FASCIA VENT - ROOF

Install selected Over Fascia Vent to the manufacturer's requirements to the top of fascia board prior to the installation of roofing underlay. Fix in place using screws or nails through the fixing holes provided.

3.8 FIX ROOF UNDERLAY

Refer to relevant underlay section for installation.

3.9 INSTALL ROOF RIDGE VENTS & ROOF APRON VENTS

Install selected VENT Ridge to the manufacturer's requirements after the installation of roof cladding but prior to the installation of flashings. Cut ridge vents in half lengthwise to use as apron vents.

Lay in position over the top of roof cladding, remove peel-off backing and temporary fix in place, if required screw at each corner to ensure the underside of vent is flat against the roof.

Ensure all moisture and dust are removed from roof before dressing down the aluminium soft edge, notch or snip to suit roofing profile.

Completion & Commissioning

3.10 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 VENT OVER FASCIA VENT

Location:	Refer to Architectural Drawings
Supplier:	DriSpace
Manufacturer:	Blue Building Solutions Ltd (T/A VENT)
Type/Brand:	VENT G1200N - Over Fascia Vent
Colour:	Black
Fixings:	Ñail or screw in place

4.2 VENT RIDGE VENT / APRON VENT

Location:	Refer to Architectural Drawings
Supplier:	DriSpace
Manufacturer:	Blue Building Solutions Ltd (T/A VENT)
Type/Brand:	VENT VENT RV10P-Half - Ridge Vent
Size:	410mm wide (including flashing) x 20mm thick x 1200mm long lengths
Fixings:	Self-adhesive backing (& if required screw at each corner)

4171GR GIB WEATHERLINE RIGID AIR BARRIER

1 GENERAL

This section relates to the supply and fixing of GIB Weatherline® Rigid Air Barrier to residential and commercial buildings.
It incudes;

- GIB Weatherline® Rigid Air Barrier Structural batten, screw and tape; and screw and tape systems
- GIB Weatherline® Rigid Air Barrier bracing systems
- GIB Weatherline® Rigid Air Barrier fire rated systems

1.1 RELATED WORK

Refer to 5171G GIB® PLASTERBOARD FIRE & SOUND LININGS for performance wall linings in Standard only.

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 B1/AS1	Structural provisions for buildings
NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
BS EN 13501-1	Fire classification of construction products and building elements - Classification using test data from reaction to fire tests
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section:

GIB® Site Guide (April 2024)
GIB® Noise Control Systems (September 2017)
GIB® Fire Rated Systems (September 2024)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIB Ezybrace® for Light Steel Frame Systems (March 2017)
GIB Weatherline® Rigid Air Barrier Systems Design and Construction Manual (March 2021)
GIB Weatherline® Rigid Air Barrier Systems Supplement (November 2021)
BRANZ Appraisal 1048 (2025)- GIB Weatherline® Rigid Air Barrier Systems

Manufacturer/supplier contact details

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

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For GIB® products and/or systems for a minimum of 10 years from the date of purchase

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

(TBC) years	For (TBC)

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, associated GIB® products or GIB® accessories.

Compliance information

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

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

Performance - Wind (design by contractor)

1.10 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

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

Performance - Fire

1.11 EXTERNAL FIRE SPREAD - NON-COMBUSTIBLE MATERIAL

GIB Weatherline® classifieds as A1 in accordance with BS EN 13501-1.

Performance - General

1.12 FIRE RATED SYSTEM

Provide GIB Weatherline® Rigid Air Barrier fire rated system. Refer to SELECTIONS for system/FRR.

Fire Rated Systems:

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Two-way FRR - Timber frame

Specification	LB/NLB	Insulation	FRR	Lining requirements
GWTLE 30	LB	optional	30/30/30	Internal: 10mm GIB Fyreline® Exterior: 10mm GIB Weatherline®
GWTLE 60	LB	optional	60/60/60	Internal: 13mm GIB Fyreline® Exterior: 13mm GIB Weatherline®

2 PRODUCTS

Materials

2.1 GIB WEATHERLINE® RIGID AIR BARRIER

Exterior grade, glass-fibre fleece wrapped modified gypsum core sheet.
Meets NZBC requirements for Rigid Air Barriers as an Alternative Solution Proprietary System as per NZBC E2/AS1, 9.1.3 Barriers to airflow, paragraphs 9.1.6.2 - 9.1.6.4, and Table C.2.1.1: Properties of roof underlays and wall underlays.

Complies with NZBC B2/AS1 Durability.
Sizes;

Standard lengths:	2750mm and 3000mm (2450 available but in 10mm thickness only)
Width:	1200mm
Thicknesses:	10mm and 13mm
Colour:	Purple

Components

2.2 SCREWS

GIB® Grabber® 41mm x 6g Ceramic Coated High Thread Screws.

GIB® Grabber® 63mm x 8g Ceramic Coated High Thread Screws.
GIB® Grabber® 32mm x 8g Ceramic Coated Drill Point Screws.
GIB® Grabber® 47mm x 8g Ceramic Coated Drill Point Screws.
Refer to GIB® requirements for appropriate details.

2.3 GIB WEATHERLINE® FLASHING TAPE

Flashing tape available in 30mm, 60mm, 100mm, 150mm and 200mm widths x 30m roll length.

2.4 GIB WEATHERLINE® SILL TAPE

Sill tapes available in 150mm and 200mm widths x 20m roll length.

2.5 STRUCTURAL CAVITY BATTENS

45mm x 18mm H3.1 Merchant Grade Pinus Radiata cavity battens.

2.6 FIRE/ACOUSTIC SEALANT

GIB Fire Soundseal® ultra low VOC, multi use fire and acoustic sealant that resists passage of smoke and fire.

2.7 GAP FILLER

GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

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3.3 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

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

Framing substrates shall be in accordance to AS/NZS 2589 and Weatherline® Rigid Air Barrier Systems requirements. Refer to GIB® Site Guide.

Timber framing moisture content is in accordance with requirements of AS/NZS 2589. Refer to NZBC E2/AS1 and GIB® Site Guide.

Timber framing:	18% maximum for fixing plasterboard to timber (8-12% recommended for fixing plasterboard to timber framing if air conditioning and/or central heating are to be installed.)

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 SCREW, TAPE AND STRUCTURAL BATTEN INSTALLATION

Fix GIB Weatherline® Rigid Air Barrier System in accordance with GIB Weatherline® Rigid Air Barrier Systems Specification and Installation Manual, Section 2.

3.6 SCREW AND TAPE INSTALLATION

Fix GIB Weatherline® Rigid Air Barrier System in accordance with GIB Weatherline® Rigid Air Barrier Systems Specification and Installation Manual.

3.7 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible. Sheets may be installed vertically or horizontally, however horizontal fixing is not acceptable when Structural Bracing or Fire Rated Systems are specified. Refer to GIB Weatherline® Rigid Air Barrier Systems Specification and Installation Manual.

3.8 INSTALL FLASHING AND SILL TAPE

Install flashing and sill tape in accordance with GIB Weatherline® Rigid Air Barrier Systems Specification and Installation Manual.

3.9 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide. Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.10 FORM FIRE RATED SYSTEMS

Form fire rated systems in accordance with GIB Weatherline® Rigid Air Barrier Systems Design & Construction Manual and GIB Weatherline® Rigid Air Barrier Systems Supplement.

Finishing

3.11 FINISHING GENERALLY

To GIB® Site Guide (September 2018) and AS/NZS 2589.

Completion & Commissioning

3.12 COMPLETION MATTERS

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

3.13 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

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4 SELECTIONS

GIB Weatherline® Rigid Air Barrier

4.1 STRUCTURAL BATTEN, SCREW & TAPE NZS 3604 - GIB WEATHERLINE® RIGID AIR BARRIER

Location:	Refer to Architectural Drawings
Product:	Weatherline® Rigid Air Barrier
Sheet length:	As required
Sheet width:	1200mm
Thickness:	Refer to Architectural Drawings
Battens:	Refer to Architectural Drawings

4.2 SCREW & TAPE NZS 3604 - GIB WEATHERLINE® RIGID AIR BARRIER

Location:	Refer to Architectural Drawings
Product	Weatherline® Rigid Air Barrier
Sheet length:	As required
Sheet width:	1200mm
Thickness:	Refer to Architectural Drawings

4.3 GIB WEATHERLINE® RIGID AIR BARRIER - 2-WAY FIRE RATED SYSTEM TIMBER FRAME

Specification Number	LB/NLB	Insulation	FRR	Lining Requirements
GWTLE 30	LB	Optional	30/30/30	Internal lining: 1 x 10mm GIB Fyreline Exterior Sheathing: 1 x 10mm GIB Weatherline
GWTL 60	LB	Optional	60/60/60	Internal lining: 1 x 130mm GIB Fyreline Exterior Sheathing: 1 x 13mm GIB Weatherline

Components

4.4 GIB WEATHERLINE® FLASHING TAPE

Brand/type:	GIB Weatherline® flashing tape
Width:	To suit

4.5 GIB WEATHERLINE® SILL TAPE

Brand/type:	GIB Weatherline® sill tape
Width:	To suit

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4239JH JAMES HARDIE® SOFFITS

1 GENERAL

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

- James Hardie® Hardie™ Flex Eaves Lining

Documents

1.1 ABBREVIATIONS AND DEFINITIONS

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

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3604	Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

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

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For lining product and accessories

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

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1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

James Hardie® Eaves and Soffit Care and Maintenance

Performance

1.8 PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

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

2 PRODUCTS

Materials

2.1 HARDIE™ FLEX EAVES LINING

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

Components

2.2 FASTENER TYPE

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

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

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

Components - Hardie™ Flex Eaves Lining

2.3 SOFFIT JOINTERS AND MOULDS

Extruded uPVC jointer, capping and scotia mould.

2.4 HARDIE™ FLEX NAILS

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

2.5 INSEAL TAPE

Inseal® 3259, 1.5mm thick x 48mm wide black compressible medium density closed cell foam tape.

2.6 POLYPROPYLENE TAPE

Polypropylene tape, 30mm minimum width.

Components - General

2.7 FLEXIBLE JOINT SEALANT

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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



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3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Moisture content timber framing: 18% maximum

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - general

3.5 SHEET LAYOUT

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

3.6 CUTTING SOFFIT CLADDING

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

3.7 CIRCULAR HOLE FORMING

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

3.8 IRREGULAR HOLE FORMING

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

3.9 INSTALL HARDIE™ FLEX EAVES LINING

Install in accordance with James Hardie® installation manual requirements. Refer to SELECTIONS for fixing and jointing methods.

3.10 BUTT JOINT

Paint sheet edges prior to installation.

3.11 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.12 FASTENER - SIZE AND LAYOUT

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

3.13 SEALANTS

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

3.14 PAINTING

Refer to painting section/s for protective coating system.

Completion

3.15 COMPLETION MATTERS

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

4 SELECTIONS

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

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Materials

4.1 HARDIE™ FLEX EAVES LINING

Location:	Refer to Architectural Drawings
Brand/type:	James Hardie® Hardie™ Flex Eaves Lining
Thickness:	Refer to Architectural Drawings
Width:	To suit
Fixing Method:	Hardie™ Flex nails
Fixing type:	Galvanized Hardie™ Flex Nail, 40 x 2.8mm
Joint detail:	Hardie™ Jointer 5mm for 4.5mm thick sheet

Painting

4.2 PAINTING

Refer to painting section/s for details.

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4252AM ARCHIMAX ALUMINIUM CLADDING SYSTEM

1 GENERAL

This section relates to the supply and installation of Archimax® aluminium cladding system fixed over a drained and ventilated cavity.

It includes:

- Archimax® pre-finished, interlocking aluminium weatherboard profiles
- All associated cavity battens, flashings, fixings and components.

1.1 RELATED WORK

Refer to 3821 TIMBER FRAMING or relevant timber framing section for cavity battens.

Refer to 4171GR GIB WEATHERLINE RIGIGD AIR BARRIER for rigid air barriers.
Refer to 4821 FLASHINGS or relevant flashing section for window and door flashings.

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:

NASH	National Association of Steel Framed Housing

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind loads
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
AAMA 2603	Voluntary Specification, Performance requirements and test procedures for pigmented organic coatings on aluminium extrusions and panels
AAMA 2604	Voluntary Specification, Performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
AAMA 2605	Voluntary Specification, Performance requirements and test procedures for superior organic coatings on aluminium extrusions and panels
BRANZ BU 519	Fastening selection
NASH Building Envelope Solutions	2019 Light steel framed buildings
NASH N-11	House insulation guide
NASH Standard Part 1 & 2	May 2019 Light steel framed buildings

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1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Archimax® technical standard details
BRANZ Appraisal 1173 (2021) - Archimax® Cladding System - Amended 12 December 2024
BRANZ Structures Test Report TP13210-001-01 - Archimax Face Load and Connection Tests
Dulux Powder & Industrial Coatings - Caring for your powder coated article or joinery
Interpon Powder Coatings - Care and Maintenance

Manufacturer/supplier contact details

Company:	Archimax Ltd
Web:	www.archimax.co.nz
Email:	info@archimax.co.nz
Telephone:	09 299 9999

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

100 years	For rotting, rusting, cracking or distorting of the Archimax® aluminium cladding
(TBC) years	For film durability & colour of powder coat finish

- Provide the aluminium cladding warranty on the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Provide the powder coat warranty on the manufacturers standard form and
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For installation of Archimax® cladding system

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved / licensed by Archimax Ltd. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Provide copies of all relevant Archimax® and powder coat finish maintenance information on completion of the work.

Compliance information

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer / supplier warranty
- Installer / applicator warranty
- Other information required by the BCA in the Building Consent Approval documents.

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Performance - Wind

1.11 DESIGN WIND PARAMETERS

Archimax® cladding system is suitable for use in all Wind Zones of NZS 3604 up to and including Extra High or up to design differential 2.5kPa ULA wind pressure when the building is specifically designed to wind pressure parameters of AS/NZS 1170.2.

Performance - Fire

1.12 EXTERNAL FIRE SPREAD - NON-COMBUSTIBLE MATERIAL

Archimax® aluminium cladding boards are manufactured from a non-combustible material and the powder coated finish is <1mm thick.

Quality control and assurance

1.13 INSPECTIONS

TBC by Project Manager.

2 PRODUCTS

Materials

2.1 ARCHIMAX ALUMINIUM CLADDING PROFILES

Archimax® interlocking aluminium cladding profiles, manufactured from extruded 6060 T5 aluminium alloy formed to length, up to 12m length. Supplied pre-finished with Interpon or Dulux powder coat finish or selected powder coated wood-look finish. Refer to SELECTIONS for details.

2.2 RIGID AIR BARRIER

Rigid Air Barrier to the requirements of NZBC E2/AS1, Table C.2.1.1 Properties of roof underlays and wall underlays, and suitable to the appropriate wind pressure and installed in accordance to manufacturer's requirements. Refer to relevant underlay or RAB section for details.

2.3 VERTICAL ALUMINIUM CAVITY BATTENS - STRUCTURALLY FIXED

Aluminium cavity battens by Archimax to NZBC B2/AS1, 20mm x 48mm with height to match timber framing studs to NZBC E2/AS1, 9.1.7 Drained cavities.

2.4 HORIZONTAL ALUMINIUM CAVITY BATTENS - STRUCTURALLY FIXED

Aluminium cavity battens by Archimax to NZBC B2/AS1, with 15° slope bevelled top and bottom edge, 20mm x 48mm. Fix horizontally with bevelled edge sloping down to the outside.

Components

2.5 ARCHIMAX SYSTEM FLASHING & TRIM EXTRUSIONS

Archimax® system flashing and trim components, manufactured from extruded 6060 T5 aluminium alloy, supplied in 6m lengths.

- Board starter - extruded aluminium starter fitted at the bottom of cladding for locating and securing the initial cladding board. To be punched with drainage holes. Available in powder coated finish to match cladding
- Corner capping - two piece, extruded aluminium corner capping for 90° internal and external corners. Available in powder coated finish to match cladding.
- Jointer - three piece, extruded aluminium jointer fixed at joints. Available in powder coated finish to match cladding.
- End capping - three piece extruded aluminium end caps to cover edges of cladding boards at jambs & sills of openings or where cladding profiles abut other claddings. Available in powder coated finish to match cladding.

2.6 ARCHIMAX SYSTEM CLIP BRACKET

Archimax® system fixing clip, D22 Parts profile - AM029 for securing vertical weatherboards and D23 Parts profile - AM029 for securing horizontal weatherboards. Clip brackets are 60mm in length, pre-drilled to suit 2 x 10g countersunk head screws.

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2.7 FIXINGS & FASTENINGS - GENERAL

Fixings and fastening to Archimax® requirements in accordance to E2/AS1, Table C.1.1.1A: Material selection, and Table C.1.1.1B: Compatibility of materials in contact, and BRANZ BU 519, to suit project Exposure Zones to NZS 3604. Refer to SELECTIONS for details.

2.8 CAVITY CLOSER / VERMIN PROOFING STRIP

Perforated aluminium cavity closer/vermin proofing strip with length and width to suit cavity. To NZBC E2/AS1, paragraphs 9.1.7.5 - 9.1.7.7, and Figure 9.1.7.4A: Cavity base closer/vermin proofing.

2.9 FOLDED ALUMINIUM FLASHINGS

Custom folded aluminium flashings to comply with NZBC E2/AS1, 4.0 Flashings. Refer to SELECTIONS for details. Powder coat finish to match cladding.

Accessories

2.10 CAVITY BATTEN BARRIER STRIP

50mm wide medium density polyethylene (MDPE) tape or similar barrier strip. To comply with NZBC E2/AS1, Table C.2.1.1 Properties of roof underlays and wall underlays, separates aluminium components and accessories from timber battens treated with copper based treatments in NZS 3604.

2.11 FLEXIBLE SEALANT

To NZBC E2/AS1 for use as a weather sealant for exterior use.

Finishes

2.12 POWDER COATED FINISH TO ARCHIMAX ALUMINIUM WEATHERBOARDS

Polyester powder coat finish in accordance with AS 3715, AAMA 2603, AAMA 2604 and/or AAMA 2605. Refer to SELECTIONS for powder coat system & colour.

2.13 WOOD-LOOK FINISH TO ARCHIMAX ALUMINIUM WEATHERBOARDS

Selected wood-look finish, an image is transferred through a heat transfer sublimation process into the powder coat finish. Contact Archimax Ltd for options.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Archimax® cladding is a pre-finished product and must be treated as such to avoid damage. Prevent pre-finished surfaces from rubbing together. To minimise damage, materials should arrive on site as close as possible to installation. Do not drag boards across each other, or across other materials. Protect edges, corners and surface finish from damage.

Components to be stored in a dry, well ventilated environment, stacked flat, off the ground, in accordance to manufacturer's requirements.

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

Check work previously carried out and confirm it is of the required standard for this part of the work. Do not commence work until the substrate is plumb, level and true to alignment. Notify Contract Administrator of any defects and do not proceed until unsatisfactory conditions have been corrected.

Ensure timber framing is treated to NZBC B2/AS1 and NZS 3602. Structural framing to NZS 3604 or to specific design to NZS 3603 and AS/NZS 1170.2.

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Ensure studs are at maximum 600mm centres and nogs at maximum 800mm centres. Ensure additional framing has been provided as required to support Archimax® cladding system, refer to Archimax® technical details.

3.4 PRE-INSTALLATION REQUIREMENTS - TIMBER MOISTURE CONTENT

Ensure moisture content of the timber framing and/or timber cavity battens is 24% maximum at the time of installing Archimax® cladding system.

Where metal cladding is laid and directly fixed along a lengthy continuous timber member, the timber should have an equilibrium moisture content of 18% or less. Timber behind flashings or traverse flashings should have an equilibrium moisture content of between 16%-12%. Traverse flashings can be temporarily fastened in place and permanently fixed when moisture content is within the required range.

3.5 INSTALL WALL UNDERLAY, FLEXIBLE SILL AND JAMB TAPE INSTALLATION

Refer to the appropriate separate section(s) for details.

Ensure wall underlay and flexible sill and jamb tape system have been installed in accordance with the wall underlay and tape manufacturer's instructions. When using flexible wall underlay, ensure wall underlay support is provided to prevent bulging of bulk insulation into the drainage cavity when cavity battens are installed at more than 450mm centres.

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

Installation/application

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 INSTALL VERTICAL ALUMINIUM CAVITY BATTENS

Install vertical aluminium cavity battens to NZBC E2/AS1, 9.1.7 Drained cavities.

3.9 INSTALL HORIZONTAL AUMINIUM CAVITY BATTENS

Install horizontal aluminium cavity with the bevelled edge sloping down to the outside.

3.10 INSTALL CAVITY BATTEN BARRIER TAPE

Staple the barrier tape to the face of the timber cavity battens, to isolate the treated batten and the aluminium cladding and accessories.

3.11 INSTALL CAVITY CLOSER / VERMIN PROOFING STRIP

Install cavity closer strip to the base of wall, horizontal gap on junctions and over wall openings.

3.12 INSTALL ALUMINIUM JOINERY

Refer to 4521 ALUMINIUM WINDOWS AND DOORS for aluminium windows and doors for installation details.

Ensure aluminium joinery has been installed complete with required 7.5mm minimum gap at wall framing and air seal has been installed in accordance with NZBC E2/AS1.

Ensure aluminium joinery head flashing is installed in accordance with Archimax® technical details.

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3.13 INSTALL ARCHIMAX CLADDING SYSTEM - GENERALLY

Install Archimax® cladding system in accordance with the Archimax® requirements and technical details for horizontal or vertical applications. Co-ordinate as necessary with installation of adjoining trades.

Do not cut or trim component parts during installation in a manner that would damage the finish, decrease the strength, or result in visual imperfection or a failure in performance

3.14 INSTALL ARCHIMAX CAPPINGS / STARTER STRIP

Position and fix at 600mm centres, the Archimax® the base extrusions of Corner Capping, Jointer and End Capping, continuous and plumb in accordance with Archimax® technical details.

For horizontal Archimax cladding applications, where the wall is longer than the maximum cladding profile length, the base extrusion of the Jointer must be secured in place over a double width cavity batten on a double stud.

Position and secure the Board Starter strip to base of wall in accordance with Archimax® technical details, ensure the bottom course of cladding will overhang the bottom plate by minimum 50mm. Fix the Board Starter strip level and allow an expansion gap between each end of Board Starter strip and the Corner Capping extrusions.

3.15 INSTALL HORIZONTAL ARCHIMAX CLADDING PROFILES

Install selected Archimax® horizontal cladding profiles plumb, level and accurately spaced in accordance with Archimax® technical details for horizontal applications.

Commence installation at base of wall. Cut Archimax® cladding profiles to length allowing 1mm gap per metre of board for expansion. Lock the first course of cladding into the Board Starter strip and secure at top with fixing clip fixed with selected fixings through cavity battens into the stud. Ensure that the fixing clip engages correctly with fixing fin of cladding profile and that the board is held with no downward pressure on it.

Continue in same manner for subsequent boards, locking into board below at bottom and securing with fixing clip at top edge.

3.16 INSTALL VERTICAL ARCHIMAX CLADDING PROFILES

Install selected Archimax® vertical cladding profiles plumb, level and accurately spaced in accordance with Archimax® technical details for vertical applications.

Cut Archimax® cladding profiles to length and required width where abutts corners, window/door jambs and other claddings. Lock the first cladding board into the Board Starter strip at base and secure the upper section of board using fixing clips fixed with selected fixings through cavity battens into the nogs. Ensure that the fixing clip engages correctly with fixing fin of cladding profile and that the board is held with no lateral pressure on it.

Continue in same manner for subsequent boards, locking into Starter strip at base and secure the upper section of board using fixing clips.

3.17 INSTALL ARCHIMAX CAPPING TRIMS

When the cladding installation is complete install Archimax® capping facing extrusion complete with required foam tape in accordance with Archimax® technical details.

3.18 INSTALL INTER-STOREY FLASHING

Install aluminium inter-storey horizontal flashing in accordance with Archimax® technical details for walls to the lessor of more than two-storeys or 7m in height in accordance with NZBC E2/AS1, paragraph 9.1.8.4. Ensure a minimum 5mm gap is maintained between the flashing and adjacent Archimax® cladding in accordance with NZBC E2/AS1, Figure 9.1.8.4: General inter-storey junction.

Ensure inter-storey flashing is installed prior to installing Archimax® cladding above.

3.19 INSTALL SEALANT

Install selected weather sealant and if required associated backing rod along the soffit junction, at window/door jambs/sill and at penetrations in accordance with Archimax® technical details.

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Completion & Commissioning

3.20 COMPLETION MATTERS

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

Archimax® cladding system is supplied pre-finished. Insitu touch up of powder coat finishes is only permitted in accordance with instructions from Archimax® Ltd.

4 SELECTIONS

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

Materials

4.1 ARCHIMAX ALUMINIUM HORIZONTAL CLADDING

Location:	Refer to Architectural Drawings
Substrate:	Refer to Architectural Drawings
Type/Brand:	Archimax® aluminium horizontal cladding
Profile/width:	Refer to Architectural Drawings
Application:	Horizontal - over drained & vented cavity
Clip brackets:	D23 Parts Profile - AM029
Finish:	Powder coated - TBC by Architect
Colour:	TBC by Architect
Fixings:	To suit

4.2 ARCHIMAX ALUMINIUM VERTICAL CLADDING

Location:	Refer to Architectural Drawings
Substrate:	Refer to Architectural Drawings
Type/Brand:	Archimax® aluminium vertical cladding
Profile/width:	Refer to Architectural Drawings
Application:	Vertical- over drained & vented cavity
Clip brackets:	D22 Parts Profile - AM029
Finish:	Powder coated - TBC by Architect
Colour:	TBC by Architect
Fixings:	To suit

4.3 WALL UNDERLAY / RIGID AIR BARRIER

Refer to ~ for SELECTIONS.

4.4 VERTICAL ALUMINIUM CAVITY BATTENS - STRUCTURALLY FIXED

Location:	To behind Archimax® aluminium horizontal cladding
Type:	Aluminium by Archimax
Size:	48mm x 20mm
Fixings:	Refer to Architectural Drawings

4.5 HORIZONTAL ALUMINIUM CAVITY BATTENS - STRUCTURALLY FIXED

Location:	To behind Archimax® aluminium vertical cladding
Type:	Aluminium by Archimax
Size:	48mm x 20mm
Fixings:	Refer to Architectural Drawings

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Components

4.6 ARCHIMAX SYSTEM FLASHING & TRIM EXTRUSIONS

Location:	To Archimax® aluminium cladding
Type:	Archimax® System - extruded aluminium flashings
Profiles:	Board starter
	Corner capping - two piece, internal corner
	Corner capping - two piece, external corner
	Jointer - three piece
	End capping - three piece
Finish/colour:	Exposed trims to match pre-finished weatherboards

4.7 FOLDED ALUMINIUM FLASHINGS

Location:	Refer to Architectural Drawings
Type:	Refer to Architectural Drawings
Finish/colour:	To match pre-finished weatherboards

Accessories

4.8 SEALANT

Type:	Exterior grade for exterior use
Colour:	TBC by Architect

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4271 NATURAL STONE VENEER CLADDING

1 GENERAL

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

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL & DPC for damp proofing products
Refer to 4821 FLASHINGS for flashing 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:

kPa	Kilopascal
MPa	Megapascal

The following definitions apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

(TBC) years	For (TBC)

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

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(TBC) years For (TBC)

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.8 NO SUBSTITUTIONS

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

1.9 TEST MASONRY

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

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

1.10 KEEP RECORDS

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

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

1.11 INFORMATION FOR INSTALLATION

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

1.12 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

Provide this information prior to practical completion.

Compliance information

1.13 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

Quality control and assurance

1.14 INSPECTIONS

TBC by Project Manager

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2 PRODUCTS

Materials - cavity

2.1 CAVITY BATTENS
Refer to SELECTIONS.

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

Materials - veneer

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

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

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

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 STORAGE & HANDLING OF AGGREGATES
Store and handle aggregates to prevent segregation and contamination by foreign materials and intermixing of aggregate sizes.

3.3 STORAGE & HANDLING OF CEMENT & MORTAR
Store and handle cement and mortar to protect it against deterioration and contamination. Store accessible for inspection.

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

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

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

- Vertical and horizontal alignment of the concrete base

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

Installation/application - generally

3.7 STANDARDS AND TOLERANCES

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

3.8 COLD & HOT WEATHER CONSTRUCTION

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

3.9 BLENDING OF NATURAL STONE

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

3.10 CLEANING OUT

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

3.11 FACE WORK

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

3.12 PROTECTION OF UNFINISHED WORK

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

3.13 PROTECTION OF CAVITY

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

Installation - cavity

3.14 INSTALLATION CAVITY BATTENS

Install cavity battens vertically, true to line and face, at required spacing. Rigidly fix in place.

3.15 INSTALLATION BACKING BOARDS

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

Installation - veneer

3.16 PREPARATION MORTAR

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

3.17 PREPARATION CEMENT SLURRY

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

3.18 LAYING OF VENEER STONES

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

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3.19 LAYING OF CAP AND SILL STONES

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

3.20 INSTALLATION WALL TIES

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

3.21 INSTALLATION WEEP HOLES

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

3.22 INSTALLATION VENTILATION

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

Completion & Commissioning

3.23 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials - cavity

4.1 CAVITY BATTENS

Location:	Refer to Architectural Drawings
Supplier:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings
Type:	Refer to Architectural Drawings
Material:	Refer to Architectural Drawings
Size:	Refer to Architectural Drawings
Fixings:	Refer to Architectural Drawings

4.2 BACKING BOARD

Location:	Refer to Architectural Drawings
Supplier:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings
Type:	Refer to Architectural Drawings
Size:	Refer to Architectural Drawings
Fixing:	Refer to Architectural Drawings
Joint sealant:	Refer to Architectural Drawings
Joint tape:	Refer to Architectural Drawings

Materials - veneer

4.3 NATURAL STONE

Location:	Refer to Architectural Drawings
Supplier:	Refer to Architectural Drawings
Type:	Refer to Architectural Drawings
Thickness:	Refer to Architectural Drawings
Size:	Refer to Architectural Drawings
Face finish:	Refer to Architectural Drawings

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4.4 MORTAR

Location:	Refer to Architectural Drawings
Supplier:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings
Type:	Refer to Architectural Drawings
Classification:	Refer to Architectural Drawings
Colour:	Refer to Architectural Drawings
Joint type:	Refer to Architectural Drawings

4.5 WALL TIES

Location:	Refer to Architectural Drawings
Supplier:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings
Type:	Refer to Architectural Drawings
Classification:	Refer to Architectural Drawings
Material:	Refer to Architectural Drawings
Spacing:	Refer to Architectural Drawings
Embedment:	Refer to Architectural Drawings
Fixings:	Refer to Architectural Drawings

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4311M METALCRAFT PROFILED ROOFING

1 GENERAL

This section relates to the supply and fixing of Metalcraft Roofing Ltd profiled roofing complete with accessories.

It includes:

- Asymmetrical rib roofing profiles

1.1 RELATED WORK

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.3 DOCUMENTS

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

BPS	Building Product Specifications
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G12/AS1	Water supplies
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - performance requirements
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
AS 4256.3	Plastic roof and wall cladding materials, Glass fibre reinforced polyester
ISO 5660.1	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 1 Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 2 Smoke production rate (dynamic measurement)
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Metalcraft Roofing T-Rib product literature
Metalcraft Roofing Building Product Information Sheet
COLORSTEEL® Maintenance Recommendations

Manufacturer/supplier contact details

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

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER - METALCRAFT ROOFING

Provide a material manufacturer/supplier warranty:

(TBC) years	for failure of coating adhesion
(TBC) years	for weatherproofing by material penetration

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years	for installation

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.9 NO SUBSTITUTIONS

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

1.10 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

- COLORSTEEL® Maintenance Recommendations

Provide this information prior to practical completion.

Compliance information

1.11 COMPLIANCE - PROPOSED ALTERNATIVE SOLUTION

Metalcraft Roofing trough roofing profiles Metdek 500 and Metdek 855 are presented as an alternative solution for:

NZBC Clause E2-External moisture

Performance:	E2.3.1 Roofs must shed precipitated moisture.
	E2.3.2 Roofs must prevent the penetration of water that could cause undue dampness, damage to building elements, or both.

Proposed alternative solution is supported by:

- Metalcraft Roofing Ltd standard details and installation guidelines
- NZMRM CoP incorporates trough sections up to 250mm between crests
- In-service history and previously accepted Alternative Solution

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Performance

1.12 DESIGN PARAMETERS WIND – SPECIFIC DESIGN
The design wind pressures are to AS/NZS 1170.2.
Refer to general section 1220 PROJECT for details.

1.13 DRINKING WATER
Roofing for collecting potable water to NZBC G12/AS1.

2 PRODUCTS

Materials

2.1 STEEL - TYPE AZ COATING (ALUMINIUM/ZINC ALLOY), UNPAINTED
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 and have a durability no less than the material being fastened.

2.3 FIXING SCREWS
To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by Metalcraft Roofing and with a durability not less than the material being fixed. Screw fasteners to be head stamped identifying the manufacturer and class. Refer to SELECTIONS.

2.4 RIVETS
Sealed aluminium, minimum diameter 4.0mm.

Components

2.5 FLASHINGS GENERALLY
To NZBC E2/AS1, 4.0 Flashings.
Formable grade 0.55 BMT or 0.75 BMT for steel and 0.90 BMT for aluminium. Flashings coated to the same standard as the roofing sheets, notched where across profile or provided with a soft edge. Refer to SELECTIONS.

2.6 BOOT FLASHINGS
EPDM proprietary boot flashing designed to weatherproof cylindrical penetrations.

Accessories

2.7 UNDERLAY AND REFLECTIVE FOIL
Refer to 4161PC PRO CLIMA WALL AND ROOF UNDERLAYS, TAPES & ACCESSORIES.

2.8 SEALANT
Neutral cure silicone or MS polymer sealant.

2.9 CLOSURE STRIPS
Polyurethane profiled closed cell foam strips to fit the sheet profile.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS
Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Moisture content timber:	18% maximum

3.4 SEPARATION

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

Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 SET-OUT

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

3.7 END LAPS

End laps are not recommended.

3.8 THERMAL MOVEMENT

Provide for thermal expansion to NZMRM CoP.

3.9 FIXING GENERALLY

Install and fix in accordance with NZBC E2/AS1, NZMRM CoP, and Metalcraft Roofing required fixing patterns and details for each area of the roof. Paint colour matched fixings and accessories before installation.

3.10 MARKING AND CUTTING

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

3.11 FIXING SHEETS

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

Timber purlins:	Screw minimum 35mm embedment into structure
Steel purlins:	Screw minimum 3 threads beyond drill point

3.12 STOP ENDS AND DOWNTURNS

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

3.13 INSTALL FLASHINGS

Flash roof to parapets, walls and penetrations to detail. Where no detail is provided, flash to NZBC E2/AS1, NZMRM CoP, and Metalcraft Roofing details. Cut accurately and fix using sealant and rivets to detail and to Metalcraft Roofing requirements to form a weatherproof cover. For visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.14 USE OF SEALANTS

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

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3.15 FLASHING PENETRATIONS

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

Completion & Commissioning

3.16 COMPLETION MATTERS

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

4 SELECTIONS

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

Roofing - asymmetrical rib profile

4.1 METALCRAFT - T-RIB ASYMMETRICAL RIB PROFILE ROOFING

Location:	Refer to Architectural Drawings
Supplier:	Metalcraft Roofing Ltd
Profile:	T-Rib
Dimensions:	Sheet width 810mm, cover 760mm, rib height 29mm
Roof pitch:	Refer to Architectural Drawings
BMT/material:	0.55mm steel
Coating system:	COLORSTEEL® Maxam®
Coating colour:	TBC by Architect
Purlin material:	Timber
Fixings:	Refer to Architectural Drawings

Accessories

4.2 FLASHINGS - GENERALLY

Profile:	Refer to Architectural Drawings
BMT/material:	Refer to Architectural Drawings
Coating system:	To match roofing unless noted otherwise
Paint colour:	To match roofing

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4522VL VENTUER PERFORMANCE LOUVRES

1 GENERAL

This section relates to the design, fabrication, and supply of **Ventuer Performance Louvre** systems for residential, commercial, and industrial buildings:
It includes: ventilation louvres

- acoustic louvres
- glass louvres
- all associated accessories as required to complete the installation.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

STC	Sound Transmission Class

Documents

1.2 DOCUMENTS

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

NZBC B1/VM1	Structural design of buildings
NZBC B2	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.0	Structural design actions - Part 0: General principles
AS/NZS 1170.1	Structural design actions - Part 1: Permanent, imposed and other actions
AS/NZS 1170.2:2011	Structural design actions - Part 2: Wind actions
NZS 1170.5	Structural design actions - Part 5: Earthquake actions
AS//NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber Framed Buildings (Section 4 - Exposure Zones)
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4223	Glazing in buildings
BS/EN 13030	Ventilation for buildings. Terminals. Performance testing of louvres subjected to simulated rain
ASTM E413-87	Classification for rating sound insulation
WGANZ PQAS	Window and Glass Association NZ
WGANZ SFA 3503-03	Voluntary specification - Anodic Oxide Coatings On Wrought Aluminium For External Architectural Applications.
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
AAMA 2604	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
AAMA 2605	Voluntary specification, performance requirements, and test procedures for superior performing organic coatings on aluminium extrusions and panels.

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

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Ventuer Design Solutions	Online guide to Ventuer design process.
Louvre selector tool	Online tool for louvre selection.
Louvre calculator tool	Online tool for air flow and pressure drop.
Operation & Maintenance	Aluminium Ventilation Louvres - Operation & Maintenance Manual, Product Warranty.

Manufacturer/supplier contact details

Company:	Ventuer Limited
Web:	www.ventuer.co.nz
Email:	simon@ventuer.co.nz
Telephone:	Simon Hoyle M: +64 21 225 6473 T: +64 9 973 3616

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

2 years	Glass louvres, commencing from time of production.
5 years	Ventilation louvres, and Acoustic louvres, from date of dispatch

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For Installation

- Provide this warranty on the installer/applicator standard form "Ventuer Operation & Maintenance Manual, Product Warranty" (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Compliance information

1.6 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer / supplier warranty.
- Producer Statement (PS1) - Design from supplier independent/chartered engineer.
- Producer Statement (PS4) - Construction Review from an acceptable suitably qualified person.
- Certificates and other evidence that the system complies with the standards of performance specified.
- Other information required by the BCA in the Building Consent Approval documents.

Requirements

1.7 QUALIFICATIONS WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Installers must be approved by the Manufacturer/Supplier.
Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

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1.8 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.9 NO SUBSTITUTIONS

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

1.10 SHOP DRAWINGS

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

Provide shop drawings to show the general arrangement including, but not be limited to: Construction details (minimum scale 1:5) showing any interface between louvre elements and the building structure, including:

- Louvre overall dimensions
- Secondary supports
- Flashing details
- Sealants and air seals
- Non-standard fixing details including brackets
- Sequence/methodology of installation.

And where required the following:

- Structural design calculations, including Wind and Seismic loadings
- Mechanical design calculations (flow-rate)
- Producer Statement in the form PS1 Producer Statement Design
- Provision for the exclusion and/or drainage of moisture
- Provision for adjustment of fixings to ensure true alignment of louvres
- Sealant types and full size sections of all sealants and backing rods
- Provision for thermal movement
- Provision for seismic movement and movement under wind loads
- Glazing specification and details
- Mode of louvre activation (Manual, Electronic, Pneumatic).

If requested provide the following additional information:

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

Submit shop drawings for review to the Project Manager/Architect.

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

1.11 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

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

- Project details - Project number, project name, project address, project type, manufacture date, installation date, Client name.
- Installation contractor - names, addresses and telephone numbers noting which portions of the contract each provided.
- A complete list of louvres and accessories supplied (if possible, include Architects louvre schedule).
- Copies of all manufacturer/supplier product literature containing maintenance requirements/instructions.
- Final as built documents.
- Information for care, maintenance, and cleaning of louvres.

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- Originals of all warranties and guarantees properly executed.

Provide this information prior to practical completion.

Performance

1.12 LOADING CODE REQUIREMENT

Design loads and actions (permanent (deadload), imposed (live load), wind, snow, and earthquake) to AS/NZS 1170.0, AS/NZS 1170.1, AS/NZS 1170.2:2011, NZS 1170.5, NZBC B1/VM1.

1.13 ENVIRONMENTAL REQUIREMENTS

Durability to NZBC B2/AS1. Refer to SELECTIONS

Quality control and assurance

1.14 INSPECTIONS

TBC by the Project Manager

2 PRODUCTS

Materials

2.1 ALUMINIUM EXTRUSIONS

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

Refer to SELECTIONS.

2.2 ALUMINIUM SHEET AND STRIP

Complying with AS/NZS 1734 of suitable thickness. Rolled for anodising or powder coating. Alloy designation: 5005 H32 or 5052 H32.

Refer to SELECTIONS.

Performance louvres - aluminium

2.3 VENTUER VENTILATION LOUVRES

Louvre blades and frame designed to Loading Code Requirements, and Exposure Zone requirements in NZS 3604 (Section 4). Tested to BS/EN 13030, Class A/B/C/D. Extruded louvres manufactured from aluminium 6060 T5 grade to AS/NZS 1866. Powder coat or anodised finish. Blanked-off/inactive zones, bird mesh, insect mesh, or dust filters.
Refer to SELECTIONS.

Components

2.4 FIXINGS

All fixings must be Stainless Steel, grade 304 or 316, to NZBC E2/AS1. Size and type to suit location and purpose as required by Ventüer.

Refer to SELECTIONS.

2.5 LOUVRE SUPPORTS

Secondary support bars to louvres to Ventüer requirements.

Refer to SELECTIONS.

Finishes

2.6 POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER (TO AAMA 2603)

Polyester powder organic coating in accordance with WGANZ PQAS, AS 3715, and AAMA 2603

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Fabrication

3.4 FABRICATION - GENERAL

Fabricate performance louvres to Manufacturer/Supplier requirements and details.

Installation - general

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 INSTALLATION

Install aluminium performance louvres in accordance with Manufacturer/Supplier details and installation instructions. Install flashings to NZBC E2/AS1, 4.0 Flashings. Carry out the fixing, installation and fitting of performance louvres to finish rigid, plumb, true to line and face and square in accordance with Manufacturer/Supplier requirements.

Completion

3.7 COMPLETION MATTERS

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

3.8 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

4 SELECTIONS

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

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Performance louvres - aluminium

4.1 VENTUER VENTILATION LOUVRES

Location:	Refer to Architectural Drawings
Supplier:	Ventuer
Brand/Type:	VL-55S
Louvre description/number:	Refer to Architectural Drawings and Building Services Drawings and Specification
BS/EN 13030 classification:	Refer to Building Services Drawings and Specification
Air Pressure drop:	Refer to Architectural Drawings and Building Services Drawings and Specification
Aluminium grade:	TBC
Louvre frame size:	Refer to Architectural Drawings and Building Services Drawings and Specification
Frame profile:	To suit Starke uPVC joinery
Finish type / thickness:	Powder Coated to AAMA 2604 (Dulux Duratec; Interpon D2525)
Finish colour:	TBC
Accessories:	TBC

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4541SU STARKE AMBIANCE INLINE uPVC WINDOW SYSTEM

1 GENERAL

This section relates to the fabrication, supply and installation of **Stärke Group Ltd** Stärke Ambiance Inline uPVC Window System window and door systems including hardware, flashings and sealants.

1.1 RELATED WORK

Refer to glazing sections for glass types.
Refer to 5151 INTERNAL TRIMS for plant-on timber reveals.

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:

SLS	Serviceability limit state
UPVC	Unplasticized polyvinyl chloride
ULS	Ultimate limit state
WGANZ	Window & Glass Association NZ

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F4/AS1	Safety from falling
NZBC G4/AS1	Ventilation of buildings
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
EN 513	Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors. Determination of the resistance to artificial weathering
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames
EN 12608	Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors. Classification, requirements and test methods
BRANZ BU 636	Protecting Glass From Damage

Window & Glass Association NZ (WGANZ) documents:

Window Installation Guide	Guide to Window Installation as described in E2/AS1 Amendment 10

US Federal Specification:

TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)

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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 and supplier documents relating to this part of the work:
IANZ NZS 4211 Various Testing Reports - Aluplast® Ideal 4000 (available from Stärke)

FSA Catalogue Aluplast (Rotoline)
FSA Catalogue Euro Handle (Rotoline)
Stärke Care and Maintenance Guide
Stärke Checklist Sticker
Stärke Ambiance Inline uPVC Window Systems Brochure
Stärke Ambiance Inline uPVC Window Systems - NZS 4211 span charts

Manufacturer/supplier contact details

Company:	Stärke Group Ltd
Web:	www.starke.co.nz
Email:	technical@starke.co.nz
Telephone:	09 279 8617

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For Stärke Ambiance Inline uPVC Window System Windows & Doors, materials and fabrication
2 years	For Stärke supplied hardware

- Provide this warranty on the Stärke standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years	For installation

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

1.9 CERTIFICATION - WINDOW SASHES & DOORS

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

1.10 COMPLIANCE - RECESSED INSTALLATION

Stärke standard recessed installation details are an alternative solution to NZBC E2/AS1.

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1.11 SHOP DRAWINGS

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

Provide shop drawings to show the general arrangement of Stärke Ambiance Inline uPVC Window System window joinery including, but not be limited to:
Construction details (minimum scale 1:5) showing the interface between joinery elements and the building structure including:

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

And where required the following:

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

Where requested provide the following additional information

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

Submit shop drawings for review to Project Manager/Architect

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

Performance - Wind (design by contractor)

1.12 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the manufacturer requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

Performance - General

1.13 PERFORMANCE - WINDOWS AND DOORS

To NZS 4211, including:

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

Refer to SELECTIONS.

1.14 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.

1.15 THERMAL PERFORMANCE - WINDOWS & GLAZED DOORS, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix D, Table D1.1.1: Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

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1.16 THERMAL PERFORMANCE - WINDOWS & DOORS

Thermal performance of windows & doors to NZBC H1/AS1 or H1/AS2 & NZBC H1/VM1 or H1/VM2. The construction R-value of windows & doors determined by NZBC H1/VM1 or H1/VM2, Appendix D, D1 Vertical windows and doors:

- Thermal transmittance of window & doors in accordance with ISO 10077-1.
- Thermal transmittance of framing in accordance with ISO 10077-2.
- Thermal transmittance of glazing using BS EN 673.

Refer to SELECTIONS for construction R-values.

Quality control and assurance

1.17 QUALITY CONTROL SYSTEM

Stärke Checklist Sticker System to be completed for each window unit. Complete factory checklist after fabrication and install checklist after installation. Stärke Checklist Stickers to be collated at the completion of project.

2 PRODUCTS

Materials

2.1 WINDOWS - STARKE AMBIANCE INLINE uPVC WINDOW SYSTEM

Stärke Ambiance Inline uPVC Window System Windows available in Tropical White or Jet Black as standard, four other premium colours are available. Refer to SELECTIONS for details.

2.2 DOORS - STARKE AMBIANCE INLINE uPVC WINDOW SYSTEM

Stärke Ambiance Inline uPVC Window System Doors available in Tropical White or Jet Black as standard, four other premium colours are available. Refer to SELECTIONS for details.

Components

2.3 STARKE AMBIANCE INLINE uPVC WINDOW SYSTEM EXTRUSIONS

Stärke Ambiance Inline uPVC Window System extrusions are manufactured by Aluplast® GmbH in Germany, using a tropical formulation of uPVC to EN 12608 and EN 513 for severe climates with high UV such as New Zealand. All profiles incorporate internal steel core profiles for additional rigidity. Stärke Ambiance Inline uPVC Window System extrusions comes in a standard white colour and alternative colour options are achieved by application of a coloured PVDF acrylic foil.

2.4 GLASS

Double or triple glazing unit. Refer to the glazing section for glass types and installation.

2.5 SEALS & GASKETS

Co-extruded soft uPVC seals and gaskets. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.

2.6 REVEALS - TIMBER PAINTED

Refer to 5151 INTERNAL TRIMS for plant-on timber reveals.
Timber reveals, LOSP H3.1 Radiata Pine, for paint finish with all sides pre-primed grooved for wall linings or flush finished for architraves.

Components for installation - cavity systems

2.7 STANDARD CAVITY CLOSER

A device constructed from either aluminium or PVC to close the cavity above the window or door unit, between the cladding and head flashing, to provide ventilation in accordance with NZBC E2/AS1 to the spaces above the window or door.
Add WGANZ end dam if required.

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Flashings

2.8 FLASHINGS GENERALLY

To NZBC E2/AS1, 9.1.9 Windows and doors. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Accessories

2.9 FIXINGS

Fastenings to be a minimum 65mm x 8g Grade 304 stainless steel screws or min 75mm x 3.15mm hot dipped galvanized nails for fitting the uPVC windows and doors to framing.
Ensure all fixings and fastening exposed to the weather to be Type 304 stainless steel.

2.10 HARDWARE AND FURNITURE

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

2.11 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Section 2.0, Opening windows

2.12 FIXING BRACKETS

Designed by manufacturer to specific design.

2.13 WEATHERING / INSTALLATION SEALANT

Building sealant used in accordance with manufacturer's instructions for weather sealing uPVC frames to the cladding, complying with US Federal Specification TT-S-001543A or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus (± 25% movement) to US Federal Specification TT-S-00230C.

2.14 AIRTIGHTNESS TAPE

Flexible, air tight & vapour permeable tape to provide air tight seal at uPVC window & door junctions.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

3.4 AVOID CONTACT

Solvent based products must not be kept off the uPVC surface at all times. To prevent staining of uPVC surface, avoid contact with bituminous products.

3.5 PROTECTIVE COVERINGS

Retain protective coverings and coatings to BRANZ BU 636 and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect uPVC joinery from following trades. Remove protection on completion.

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3.6 ADDITIONAL PROTECTION

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

Installation - Generally

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Assembly

3.8 FABRICATION

Stärke Group Ltd to fabricate frames as detailed on shop drawings. Install glazing, hinges, stays and running gear as required or scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

3.9 HARDWARE GENERALLY

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

3.10 SAFETY STAYS

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

Installation - windows and doors

3.11 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

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

Required preparatory work includes the following:

- wall cladding underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to NZBC E2/AS1, 9.1.4 Wall underlays to wall openings.
- Full height 20mm jamb battens to NZBC E2/AS1, Figure 9.1.9.4: General window and door opening for direct fixed (direct fix only).
- claddings neatly finished off to all sides of openings.
- installation of flashings (those which are required to be installed prior to frames).
- application of waterproof sealer to all door and window sills in concrete floor or concrete sill situations. To door sills only, apply a suitable membrane over the sealer.
- all in accordance with the shop drawings, where applicable.

3.12 INSTALLATION

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

3.13 INSTALLATION - MANUFACTURER'S RECESSED DETAILS

Install in accordance to window manufacturer's details and drawings for recessed installation including airtightness tape to seal uPVC profiles to the wall underlay where it is dressed into the window/door openings.

3.14 INSTALL FLASHINGS

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

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

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

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3.15 FIX HARDWARE

Fix all sash and door hardware and furniture, not already installed, as scheduled.

3.16 TIMBER REVEALS

Refer to 5151 INTERNAL TRIMS for plant-on timber reveals.

Application - jointing and sealing

3.17 SEAL FRAMES ON SITE

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

3.18 PREPARE JOINTS

Ensure joints are dry. Remove loose material, dust and grease. Prepare joints in accordance with the sealant manufacturer's requirements, using required primers where necessary. Mask adjoining surfaces which would be difficult to clean if smeared with sealant. Note: solvent based products must not be kept off the uPVC surface at all times.

3.19 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.

3.20 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.

Cleaning

3.21 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.

3.22 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

3.23 COMPLETION MATTERS

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

3.24 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 uPVC joinery from following trades. Remove protection on completion.

3.25 SAFETY

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

3.26 MANIFESTATIONS

To NZS 4223.3, 2.2 Manifestation (making glass visible).

4 SELECTIONS

For further details on selections go to www.starke.co.nz.

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

Performance

4.1 NOMINATED FABRICATOR

The nominated fabricators for this section of work are;

Company: Stärke Group Ltd

4.2 SUPPLY AND INSTALLATION

Supply and installation of the specified Stärke uPVC joinery.

Supply: Stärke Group Ltd
Installation: TBC

Performance

4.3 THERMAL PERFORMANCE - VERTICAL WINDOWS & DOORS

Refer to Architectural Drawings

4.4 AIR INFILTRATION

For NZS 4211, table 3 **Air infiltration**.

Non-air conditioned zones: Refer to Building Services Drawings and Specifications
Air conditioned zones: Refer to Building Services Drawings and Specifications

4.5 WIND DESIGN PARAMETERS - DESIGN BY CONTRACTOR

Refer to general section 1220 PROJECT for project wind design parameters.

Starke Ambiance Inline uPVC Window System Window & Door

4.6 STARKE AMBIANCE INLINE uPVC WINDOW SYSTEM - FIXED WINDOW

Location: Refer to Architectural Drawings
Brand: Stärke Ambiance Inline uPVC Window System Suite
Type: Stärke Ambiance Inline Window System Fixed window sash with up to 41mm glazing pocket
Window No: Refer to Architectural Drawings
uPVC colour: TBC by Architect
Glazing system: Refer to Architectural Drawings

4.7 STARKE AMBIANCE INLINE uPVC WINDOW SYSTEM - AWNING/CASEMENT WINDOW

Location: Refer to Architectural Drawings
Brand: Stärke Ambiance Inline uPVC Window System Suite
Type: Stärke Ambiance Inline Window System ~ Window sash with up to 41mm glazing pocket
Window No: Refer to Architectural Drawings
uPVC colour: TBC by Architect
Glazing system: Refer to Architectural Drawings
Hardware/finish: TBC by Architect

4.8 STARKE AMBIANCE INLINE uPVC WINDOW SYSTEM - TILT/TURN WINDOW

Location: Refer to Architectural Drawings
Brand: Stärke Ambiance Inline uPVC Window System Suite
Type: Stärke Ambiance Inline Window System Tilt/Turn Window sash with up to 41mm glazing pocket
Window No: Refer to Architectural Drawings
uPVC colour: TBC by Architect
Glazing system: Refer to Architectural Drawings
Hardware/finish: TBC by Architect

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4.9 STARKE AMBIANCE INLINE uPVC WINDOW SYSTEM - HINGED DOOR

Location:	Refer to Architectural Drawings
Brand:	Stärke Ambiance Inline uPVC Window System Suite
Type:	Stärke Ambiance Inline Window System ~ hinged door with up to 41mm glazing pocket
Door No.:	Refer to Architectural Drawings
uPVC colour:	TBC by Architect
Glazing system:	Refer to Architectural Drawings
Hardware/finish:	TBC by Architect

Reveals

4.10 WINDOW AND DOOR REVEALS - TIMBER

Type:	Timber paint quality pine
Note:	Refer to 5151 INTERNAL TRIMS for timber reveals.

Glazing

4.11 GLASS

Refer to relevant glazing section(s) for type and thickness.

4.12 MANIFESTATIONS

Location:	Refer to Architectural Drawings
Type/details:	Refer to Architectural Drawings

Accessories

4.13 FLASHINGS

Location:	Refer to Architectural Drawings
Material/type:	Refer to Architectural Drawings
Finish /colour:	TBC by Architect
Details:	Formed to suit details provided

4.14 WEATHERING SEALANT

Type:	1-part polyurethane moisture curing, elastic joint sealant
Colour:	TBC by Architect
Backing rod:	PEF to suit

4.15 AIRTIGHTNESS TAPE

Type/brand:	Refer to Architectural Drawings

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4610 GLAZING RESIDENTIAL

1 GENERAL

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

- windows and doors
- frameless shower and bath screens
- splashbacks, wall linings
- balustrade systems, pool fences
- mirrors and mirror frames

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
CIP	Cast in place

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 636	Protecting Glass From Damage

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

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

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Performance

1.4 THERMAL PERFORMANCE - EXTERNAL GLAZING

Provide external glazing to comply with H1 Energy efficiency requirements of NZBC H1/AS1 or H1/AS2 and NZBC H1/VM1 or H1/VM2.

Refer to RELATED WORK sections for Construction R-values for complete windows / glazed doors / curtain walls and/or skylights including glazing.

2 PRODUCTS

Materials

2.1 TEXTURED, PATTERNED OR OBSCURE GLASS

Translucent, annealed, rolled glass with a decorative pattern on one surface.

2.2 LAMINATED GLASS

Grade A Safety Glass to AS/NZS 2208 with PVB or CIP resin interlayer.

2.3 TOUGHENED GLASS

Grade A Safety Glass to AS/NZS 2208.

Heat soaked toughened glass to NZS 4223.1, Appendix E required for critical areas.
Refer to SELECTIONS.

2.4 INSULATING GLASS UNITS (IGU'S)

To AS/NZS 4666, NZS 4223.2 and the IGU Manufacturers Association (IGUMA) requirements.

Marking to NZS 4223.2 as modified by NZBC B2/AS1, 3.4.3 Insulating glass units.
Refer to SELECTIONS for specified surfaces of the IGU.
Surface numbering order for glass panes in an IGU are #1, #2, #3, and #4 as follows:
- Surface #1 - outer face of exterior pane
- Surface #2 - cavity face of the exterior pane
- Surface #3 - cavity face of the interior pane
- Surface #4 - outer face of the interior pane

Materials, mirrors

2.5 SAFETY MIRROR GLASS

4mm, 5mm and 6mm annealed float glass mirror vinyl back safety glazing material to AS/NZS 2208.

Materials, screens

2.6 GLASS SCREENS SHOWER & BATH

Proprietary shower / bath screens, formed to shape before toughening, complete with matching hardware.

Components, aluminium and uPVC glazing

2.7 GLAZING TAPE AND GASKETS

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

2.8 SETTING BLOCKS

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

Components, wall mounted glass (mirrors and splashbacks)

2.9 GLASS ADHESIVE

Adhesive mirror-mastic and double-sided adhesive tape.

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3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.3, NZS 4223.4. All external glazing to be wind and watertight on completion.

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 636.

3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces.

3.4 GLASS THICKNESS

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

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

3.5 REBATE DIMENSIONS

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

3.6 JOINTING, PUTTY AND SEALING MATERIAL COMPATIBILITY

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

Conditions - human impact safety requirements

3.7 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 for thickness and maximum areas of safety glass.

3.8 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in NZS 4223.3, that also comply with the relevant requirements of AS/NZS 2208. Ensure material is permanently marked and if cut by the distributor or installer mark each piece to NZS 4223.3, 2.8 Identification.

3.9 CONTAINMENT

Edge cover to comply with NZS 4223.1, Section 4 Glazing, table 5. Otherwise to NZS 4223.3, 2.3 Edge cover.

Assembly

3.10 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.11 EDGE WORK AND BEVELLING

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

3.12 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.13 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

3.14 INSTALL SAFETY GLASS

To NZS 4223.3.

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Application uPVC

3.15 INSTALL GLASS TO UPVC FRAMES

Install glass to NZS 4223.1.

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

Application - wall mounted glass (mirrors and splashbacks)

3.16 WALL MOUNTED GLASS, SCREW FIXED

For mirrors and splashbacks, fix with proprietary zinc-plated steel countersunk-head screws, fitted with black neoprene washers with fine-threaded upstands to receive chrome plated dome screw covers.

3.17 WALL MOUNTED GLASS, ADHESIVE FIXED

For mirrors and splashbacks, fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive area 0.2 m2 per 1 m2 of glass to NZS 4223.3.

Application miscellaneous

3.18 INSTALL GLASS SHOWER & BATH SCREENS

Install shower and bath screens and doors to manufacturer's requirements.

Finishing

3.19 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

3.20 MANIFESTATIONS

To NZS 4223.3, 2.2 Manifestation (making glass visible).

Completion

3.21 TRADE CLEAN

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

3.22 REPLACE

Replace damaged, cracked or marked glass.

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

Performance - wind

4.1 WIND ZONE - NON-SPECIFIC DESIGN

Building wind zone: Very High (as determined from NZS 3604, NZS 4223.4)

Glass by type

4.2 TEXTURED, PATTERNED OR OBSCURE GLASS

Location:	Refer to Architectural Drawings
Brand/pattern:	Refer to Architectural Drawings
Pattern:	Refer to Architectural Drawings
Thickness:	Refer to Architectural Drawings

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4.3 PVB LAMINATED GLASS

Location:	Refer to Architectural Drawings
Brand/type:	Refer to Architectural Drawings
Colour:	TBC
Interlayer:	0.38mm Standard
Thickness:	Refer to Architectural Drawings

4.4 TOUGHENED GLASS

Location:	Refer to Architectural Drawings
Brand/type:	Refer to Architectural Drawings
Thickness:	Refer to Architectural Drawings

4.5 INSULATING GLASS UNITS (IGU'S)

Location:	Refer to Architectural Drawings
Brand/type:	Refer to Architectural Drawings
Outer glass type:	Refer to Architectural Drawings
Coated surface:	Refer to Architectural Drawings

4.6 LOW EMISSIVITY (LOW E) COATED LAMINATED GLASS

Location:	Refer to Architectural Drawings
Brand/type:	Refer to Architectural Drawings
Coating:	Low E
Interlayer:	PVB Laminate
Thickness:	Refer to Architectural Drawings
Colour:	TBC

Mirrors

4.7 MIRROR

Location:	TBC by Architect
Brand/type:	TBC by Architect
Dimensions:	TBC by Architect
Thickness:	TBC by Architect
Fixing method:	TBC by Architect
Screw holes:	TBC by Architect
Edgework:	TBC by Architect

Bath and shower screens and doors

4.8 FRAMELESS GLASS SHOWER SCREENS AND DOORS

Location:	TBC by Architect
Brand/type:	TBC by Architect
Glass name:	TBC by Architect
Thickness:	TBC by Architect
Hardware:	TBC by Architect
Accessories:	TBC by Architect

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4711 THERMAL INSULATION

1 GENERAL

This section relates to materials installed, laid, hung or fitted as thermal insulation to the building fabric.

1.1 RELATED WORK

Refer to 4721 ACOUSTIC INSULATION for acoustic insulation.

Refer to 4161 UNDERLAYS, FOIL AND DPC for wall underlays, roofing underlays, foils and films. Refer to roofing sections for roofing underlays.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BIB	Building Insulation Blanket (term used by some manufacturers)
EPS	Expanded polystyrene sheets

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 3000	Electrical installations (Known as the Australian/New Zealand Wiring Rules)
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.

Health and Safety at Work Act 2015

1.4 WARRANTY - MANUFACTURER/SUPPLIER

(TBC) years	For (TBC)

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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2 PRODUCTS

Materials

2.1 GLASS FIBRE THERMAL INSULATING PADS

Glass fibres bonded with a thermosetting resin to form a rectangular insulating pad.

NOTE: When insulation abutting or covering recessed downlights is intended to be in contact with IC, CA 80, CA 135 luminaires the insulation must withstand a 30s Needle Flame test to AS/NZS 60695.11.5.

2.2 GLASS FIBRE THERMAL BLANKET/ROLL

Glass fibres bonded with a thermosetting resin to form a flexible blanket roll.

NOTE: When insulation abutting or covering recessed downlights is intended to be in contact with IC, CA 80, CA 135 luminaires the insulation must withstand a 30s Needle Flame test to AS/NZS 60695.11.5.

2.3 ELECTRIC HOT WATER CYLINDER WRAP

Refer to SELECTIONS for type.

Components

2.4 NAILS

Galvanized steel clouts, 25mm gauge.

2.5 STAPLES

Stainless steel gauge and length to suit application and to manufacturer's requirements.

2.6 PLASTIC STRAPPING TAPES

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

For drained cavities where stud spaces are greater than 450mm and only flexible underlay is used, strapping required to NZBC E2/AS1, paragraph 9.1.1.5.

2.7 ADHESIVE TAPE

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

3.4 HAZARD & RISK MANAGEMENT

To Health and Safety at Work Act 2015 and take all safety precautions necessary to reduce potential hazards and risks.

3.5 INSPECTION

Before starting installation of blankets and pads, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, netting, underlays and vapour barriers are in place.

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Application

3.6 INSTALL INSULATION - GENERAL

Lay, install, fit and fix insulation without gaps, tucks, folds and over compaction to NZBC H1/AS1 or AS2 and insulation manufacturer's requirements. For all housing and buildings up to 300m², install in accordance to NZS 4246 sections 5 Walls, 6 Ceilings & Roofs, 7 Underfloor - Suspended Framed Floors and 10 Concrete Slab-on-Ground Insulation, for residential light timber or steel framed buildings. Allow insulation to re-loft/relax prior to installation. Do not cover vents. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

3.7 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to AS/NZS 3000, 4.5.2.3.5;

- Existing fittings or retrofit situations, fittings maybe unmarked
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F & IC-4

Refer to clause INSULATION CLEARANCES GENERALLY for clearances.

3.8 INSULATION CLEARANCES GENERALLY

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

The following tables are subject to:

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

LIGHT FITTINGS

Type of fitting	Minimum insulation clearance	Comments
Recessed, marked NON-IC, or unmarked	100mm (increase if over 100W)	NON-IC fittings and new or old unmarked & unknown fittings, and/or insulation. Secure insulation.
Recessed, CA 80, CA 90 or CA 135	Abut fittings	Do NOT cover the fittings
Recessed, IC, IC-F or IC-4	Abut & cover fittings	Ensure insulation complies
Recessed, marked Do-Not-Cover	Manufacturers clearances	Do not cover the fittings
Independent control gear	Place on top of insulation & 50mm from fitting	If not on top allow 50mm clearance to insulation, do not cover. Includes, transformers, ballasts & drivers etc.
Surface fittings not exposed to insulation	Nil	Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.

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Surface fittings & exposed insulation	200mm	This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Secure insulation.

EXTRACTS, VENTS, PIPES & ROOF UNDERLAY

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

3.9 LAY PLASTIC STRAPPING TAPE

Lay at right angles across the framing at a minimum of 300mm centres, staple tape to each framing member with stainless steel staples.

3.10 ADHESIVE TAPES

Fully seal all laps and all penetrations with adhesive tape.

3.11 FIT INSULATING PADS

Friction fit insulating pads in place to completely fill the whole of the cavities. Slightly oversize for friction fit to framing and each other. Use smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating segments over the whole of the installation.

3.12 FIT INSULATING BLANKET/ROLL

Friction fit insulating blanket in place to completely fill the whole of the cavities. Slightly oversize for friction fit to framing. Use smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating blanket over the whole of the installation.

3.13 FIT INSULATING BLANKET/ROLL/BIB OVER PURLINS

Ensure mesh/vapour barrier are laid over and draped between the purlins to the manufacturer's requirements. Lay blanket on and in the same direction as the mesh/vapour barrier, firmly butting edges together. Carefully size blanket to maintain firmly butted edges and ends. Maintain full thickness of the blanket over the draped areas, except where detailed otherwise.

3.14 ELECTRIC HOT WATER CYLINDER WRAP

Install to NZS 4246 and to the wrap manufacturer's instructions.

Completion

3.15 COMPLETION MATTERS

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

3.16 CHECK WALL AND ROOF UNDERLAYS

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

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4 SELECTIONS

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

4.1 THERMAL INSULATING PADS

Location:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings
Material:	Refer to Architectural Drawings
R Value	Refer to Architectural Drawings
Thickness:	Refer to Architectural Drawings

4.2 THERMAL BLANKET

Location:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings
Material/Type:	Refer to Architectural Drawings
R Value:	Refer to Architectural Drawings
Thickness:	Refer to Architectural Drawings

4.3 ELECTRIC HOT WATER CYLINDER WRAP

Manufacturer:	Refer to Building Services Drawings and Specifications
Brand:	Refer to Building Services Drawings and Specifications

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4811S SIKA SEALANTS

1 GENERAL

This section relates to the selection of Sika sealants/adhesives and appropriate application methods for sealants nominated in other work sections.

It includes:

- Sika sealants
- Sika fire rated sealants
- Sika adhesives
- All required associated primers, cleaners and accessories necessary for installation.

1.1 ABBREVIATIONS

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

VOC	Volatile Organic Compound

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS 1530.4:2005	Methods for fire tests on building materials, components & structures. Part 4: Fire resistance test of elements of construction
ASTM C719	Standard test method for adhesion and cohesion of elastomeric joint sealants under cyclic movement
EN 1366.4	Fire resistance tests for service installations. Linear joint seals.
ISO11600	Building construction - Jointing products - Classification and requirements for sealants

1.3 MANUFACTURER'S DOCUMENTS

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

Relevant Sika Product	Technical Data Sheets
Relevant Sika Product	Safety Data Sheets
CETEC Test Certificates	For VOC content of selected Sika sealants
CSIRO Test certificates	For fire rating of various Sika sealants
EXOVA Test certificates	For fire rating of various Sika sealants
BRANZ Appraisal 311 [2024]	Sikaflex® MS (Building Sealant)
BRANZ Appraisal 613 [2024]	Sikaflex® AT - Facade Sealant

Manufacturer/supplier contact details:

Company:	Sika (NZ) Ltd
Web:	nzl.sika.com
Email:	info@nz.sika.com
Telephone:	0800 SIKA NZ, 0800 745 269

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Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years: For Sika sealants and adhesives

- Provide this warranty on the Sika standard form. (For materials only. Warranty excludes application)
- Commence the warranty from the date of practical completion of the contract works.
- **Sika** (NZ) Ltd will warrant that Sika sealant products will perform in accordance with the information stated in **Sika** (NZ) Ltd current Technical Data Sheets.
- Refer to **Sika** (NZ) Ltd for further information on warranty.

Refer to the general section 1237 WARRANTIES for additional requirements

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years: For installation

- Provide the warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

Sealant work, including preparation, to be carried out by competent and experienced sealant applicators.

1.7 SEALANT SELECTION

Refer to the **Sika** (NZ) Ltd current Technical Data Sheet before commencing sealant installation. Ensure that the correct sealant has been selected for the intended application and substrates. Check that the joint design allows for movement and or substrate thermal expansion and contraction, and is within the sealants range of service.

1.8 NO SUBSTITUTIONS

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

1.9 MAINTENANCE CONTRACT PROPOSAL

Provide a priced proposed maintenance contract for annual inspection, cleaning and repairing of sealant joints.

2 PRODUCTS

Joint Substrate Primers & Accessories

2.1 POROUS SUBSTRATE PRIMER - TO IMPROVE SEALANT ADHESION

Sika Primer-3N, transparent solvent based, one component, reactive epoxy resin primer for use on a wide range of porous substrates. For use with Sika products only.

2.2 BACKING ROD - TO CONTROL DEPTH OF JOINT SEALANT

Sika PEF Backing Rod is a closed cell polyethene foam backing rod used to fill the base of a joint to control depth of applied sealant. Available in a range of diameters.

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Facade sealants

2.3 FACADE SEALANT - MEDIUM MOVEMENT, HYBRID, PAINTABLE

Sikaflex® AT-Facade is a one component hybrid (silane terminating polymer), low VOC, moisture curing sealant with good weathering and a joint movement capacity +/-25%. Conforms to ISO 11600 Type F, class 25LM and has a BRANZ Appraisal 613.

Can be over-painted with a range of paints and coatings.

2.4 FIRE RATED INTERIOR SEALANT - MEDIUM MOVEMENT, MS, PAINTABLE

Sikaflex® MS is a one component MS (silane modified polymer), low VOC, moisture curing sealant with good weathering and a joint movement capacity +/-25%. Conforms to ISO 11600 Type F, Class 25LM and has a BRANZ Appraisal 311. Complies with NZBC E2/AS1, 9.1.5 Air seals, for use as an air seal around exterior windows and doors.

Can be over-painted with a range of paints and coatings.

2.5 FIRE RATED INTERIOR SEALANT - MEDIUM MOVEMENT

Sikaflex®-400 Fire is a one-part, moisture-curing, fire resistant polyurethane elastic joint sealant for fire rated movement joints, connection joints and penetrations to porous and non-porous substrates. The sealant is suitable for internal and external applications and has a movement capability of ±35% when tested to ASTM C719, and ±25% when tested to ISO 9047.
Sikaflex®-400 Fire provides up to 4 hours fire resistance when installed in accordance with the relevant tested system, including AS 1530.4 and EN 1366-4 tested configurations. Use for CLT-to-floor and fire rated construction joints only where the joint width, joint depth, backing material, substrate preparation and sealant installation are in accordance with Sika's current Product Data Sheet, Passive Fire Protection Handbook, approved test reports, and the project fire engineer's requirements.
The product is supplied ready to use, has good adhesion to many substrates, good workability and a long open time. Sikaflex®-400 Fire can be over-painted with most conventional façade paint coating systems, subject to compatibility testing and allowing the sealant to fully cure before coating.

Roofing sealants

2.6 ROOFING SEALANT - METAL ROOFING PROFILES & FLASHINGS

Sikasil® Roofing and Plumbing, a one component neutral curing silicone sealant with movement joint capacity of +/-25%. Non-corrosive to metals and has excellent adhesion to many substrates including copper and zinc. Conforms to ISO 11600 Type F, class 25LM.

Interior sealants / adhesives

2.7 BATHROOM ADHESIVE - ACRYLIC SHOWER LINERS & BATHWARE

Sika Showerbond, a one component solvent based, fast grab, gun grade adhesive, specifically formulated for bonding plastic shower linings to unpainted gypsum plasterboard or fibre cement wall linings.

2.8 BATHROOM SEALANT - ACRYLIC BATHWARE

Sikasil ® NG, a one component, neutral curing silicone sealant formulated for use with acrylic, ASB and polycarbonate bathware.

2.9 INTERIOR GENERAL SEALANT - WALL PANELS, MOULDINGS ETC

Sikasil ® Wet Areas is a one component, neutral curing wet area silicone sealant with joint movement capacity of +/-25%. Good durability and adhesion to a wide range of substrates including standard wet area substrates. Conforms to ISO 11600 Type F & G, class 25LM.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

3.4 CONDITIONS FOR APPLICATION

Ensure conditions for application are clean, dry and dust free as possible. Avoid dust, dirt, water and other contamination settling on the cleaned and prepared joint substrate.

Ensure adequate ventilation is maintained during the preparation and application of sealant work and all relevant health and safety equipment is utilised.

Ensure application of Sika products occurs when the ambient and substrate temperature is in accordance with the appropriate Product Data Sheet.

3.5 JOINT DESIGN

Ensure that joints to be filled are in accordance with the current best practice such as BRANZ Bulletin 584 and in accordance to joint requirements stated in the relevant Product Data Sheet.

Unless stated otherwise in relevant Product Data Sheet, a typical joint should be configured on a 2:1 width to depth ratio. Minimum joint width should be not less than 10mm and should not exceed 50mm.

A Sika PEF backing rod should be applied to the base of all open backed joints and a generic bond breaker tape should be adhered to the base of all shallow joints to prevent 3-sided adhesion.

3.6 COMPATIBILITY

Ensure compatibility by using only Sika branded sealants with Sika branded products including cleaners, primers, sealants, adhesives, filler and backing rods. Products should not be substituted without the prior approval of the specifier.

3.7 SUBSTRATE STAINING

Note that some sealants can cause staining on porous substrates such as concrete, masonry and natural stone. If in doubt, compatibility testing should be undertaken to confirm suitability prior to application.

3.8 SEALANT PAINTABILITY

Ensure that a paintable sealant is selected when the sealant joint requires painting. The overpainting of sealant will reduce its flexibility at the coating interface. If in doubt about the sealant / over-coating compatibility, testing should be undertaken to confirm suitability prior to application.

NOTE: This excludes silicon based sealants which are not paintable.

3.9 COLOURS

Refer to SELECTIONS for colour option/s. Where colour is not specified, choose sealant colours from the **Sika** standard/special colour ranges.

3.10 LIMITATIONS

All relevant and current Sika Technical Data Sheets must be consulted prior to application, to ensure that the specified product is suitable based on the actual site / joint conditions observed. All current technical literature is available on nzl.sika.com or by phoning 0800 SIKANZ.

Installation/application

3.11 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

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Preparatory work

3.12 PRE-COMMENCEMENT CHECK

Ensure that joints to receive Sika sealants are suitable for the proposed application and are within the specified width to depth ratios in accordance with the relevant and current Product Data Sheet.

Ensure that surfaces are sound, dry, free from dust, dirt, scale, laitance, corrosion or other loose material, oil, grease, paint, release agents or other contaminants which may affect the bond, or the performance of the sealing material.

3.13 TEST SUBSTRATES

If in doubt about the suitability of substrate, test the affected substrate for indications of poor adhesion, staining and contamination.

If poor adhesion is evident from initial tests, consult **Sika** about the application of a suitable cleaning and preparation process and the application of a primer. Only use combinations of sealants and substrates for which favourable adhesion and compatibility have been confirmed.

3.14 SUBSTRATE CLEANING & PREPARATION

Prepare and clean joint substrates in accordance with the relevant and current Product Data Sheet. Protect adjacent surfaces from abrasion or other damage.

Typically concrete surfaces should be ground to remove concrete laitance and other surface contaminates. Non-porous surfaces such as metal to be cleaned with a Sika approved cleaner / activator to remove any contaminating films or barriers.

Apply a suitable masking tape to the adjacent surfaces along the length of joints to prevent contamination during application. Mask off any surfaces which would be difficult to clean if smeared with sealant, or where excess sealant could not be neatly trimmed off or removed.

Application - sealants / adhesives

3.15 INSTALLATION BACKING ROD

Insert a Sika PEF backing rod to the specified depth within the cleaned and prepared joint to provide a solid base for the sealant application.

The diameter of the Sika PEF backing rod should be 25% larger than the gap width and compressed evenly into the joint using a blunt instrument to avoid puncturing or damaging the rod. Do not twist the rod during application. Punctured rod may lead to 'out-gassing' which can cause the bubbling during sealant curing.

The rod should be consistently and evenly installed without any gaps. The midpoint of the installed rod should be sitting at the specified depth for each joint.

3.16 PRIMING - POROUS SUBSTRATES

Confirm the porous primer selection with the selected sealant current Product Data Sheet. Generally, porous substrates such as concrete, masonry or unpainted timber, apply by brush a uniform, thin film of Sika Primer 3N to the substrate. The primer seals, densifies and increases the surface area of substrate to promote adhesion of the selected sealant.

Allow primer to dry for the recommended time, at least 30 minutes before the application of sealant and should be left no more than 8 hours. Do not prime more than can be sealed in one day. Primed joints that have been left for more than specified time (or overnight) or have become contaminated will need to be cleaned and re-primed prior to sealant application.

Do not contaminate the bond breaker tape or backing rod with primer.

3.17 SEALANT APPLICATION

Sika sealants are supplied ready to use, insert the cartridge / uni-pack into a sealant pressure gun. After the necessary substrate / joint preparation and priming, extrude uniformly the selected sealant into the joint cavity.

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Apply sealant to ensure full contact with the substrate on each side of the joint with no voids or pockets of entrapped air. There should be a minimum amount of overfill.

3.18 SEALANT TOOLING & FINISHING

Tool sealant as soon as practical after application and prior to the sealant surface forming a skin. Tool sealant face firmly to compact into the joint to form a smooth, flat or concave profile, to give the desired effect when cured.

Tooling must be carried out carefully, ensuring that the sealant minimum depth profile is not compromised.

A compatible tooling agent or fresh clean water can be used sparingly to assist with the smoothing of the tooled surface. Do not use products containing solvent, alcohol or fuel, as these products will inhibit the curing of the sealant.

Remove masking immediately after tooling and remove excess sealant from adjoining surfaces before sealant surface starts to skin. Refer to the relevant and current Product Data Sheet for information on curing times. Note skinning times are temperature dependent.

Any cured sealant can only be removed mechanically and care must be taken to avoid damage of surrounding surfaces.

3.19 ADHESIVE APPLICATION

Apply selected Sika adhesive for bonding shower liners and wall panels such as seratone and hardiglaze in accordance with Sika NZ Ltd instruction and the relevant and current Product Data Sheets.

3.20 SURROUNDING WORK

Leave surrounding surfaces in a neat, clean condition with no evidence of spill over.

Completion

3.21 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to nzl.sika.com.
Substitutions are not permitted to the following, unless stated otherwise.

Facade joints - Timber, fibre-cement sheets & boards

4.1 SIKAFLEX AT FACADE - FACADE SEALANT FOR TIMBER / FIBRE CEMENT

Location:	Refer to Architectural Drawings
Application detail:	Exterior Facade Joints
Product:	Sikaflex® AT Facade
Product colour:	TBC by Architect
Joint width:	Refer to Architectural Drawings
Substrates:	Refer to Architectural Drawings
Primer/cleaner:	Sika Primer 3N - for porous substrates
Backing:	Sika PEF Backing rod - (diameter - 25% wider than joint)

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Roof sealant

4.2 SIKASIL® ROOFING AND PLUMBING - METAL ROOFING PROFILES & FLASHINGS

Location:	Refer to Architectural Drawings
Application detail:	Use for roofing and plumbing applications including metal roofing systems, flashings, joints, peripheral joints, gutters, downpipes, etc.
Product:	Sikasil® Roofing and Plumbing
Product colour:	Translucent
Substrates:	CLT timber floor
Primer/cleaner:	Sika Primer 3N - for porous substrates

Interior sealants and adhesives

4.3 SIKAFLEX® MS SEALANT - CLT FLOOR JOINTS

Location:	Refer to Architectural Drawings
Application detail:	CLT Floor Joints
Product:	Sikaflex® MS
Product colour:	TBC
Substrates:	Refer to Architectural Drawings
Primer/cleaner:	None

4.4 SIKA TBC - FIRE RATED CLT STAIR TO WALL JUNCTIONS

Location:	Refer to Architectural Drawings
Application detail:	Fire rated CLT Stair to wall junctions
Product:	Sikaflex®-400 Fire
Product colour:	TBC
Substrates:	CLT timber floor
Primer/cleaner:	Sika Primer 3N - for porous substrates

4.5 SIKA SHOWERBOND - ACRYLIC SHOWER LINERS & BATHWARE

Location:	Refer to Architectural Drawings
Application detail:	Use for bonding acrylic, ABS and polycarbonate shower linings onto wall linings.
Product:	Sika Showerbond
Product colour:	Green
Substrates:	Refer to Architectural Drawings
Primer/cleaner:	None

4.6 SIKASIL® NG - SEALANT FOR ACRYLIC BATHWARE

Location:	Refer to Architectural Drawings
Application detail:	Use for sealing around acrylic, ABS and polycarbonate bathware including shower linings, baths, basins and adjacent building components.
Product:	Sikasil® NG
Product colour:	TBC
Substrates:	Refer to Architectural Drawings
Primer/cleaner:	None

4.7 SIKASIL WET AREAS - GENERAL INTERIOR SEALANT

Location:	Refer to Architectural Drawings
Application detail:	Use for general purpose silicone in wet areas such as around wall panels, mouldings, fittings etc
Product:	Sikasil ® Wet Areas
Product colour:	TBC
Substrate:	Refer to Architectural Drawings
Primer/cleaner:	None

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4821 FLASHINGS

1 GENERAL

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

Documents

1.1 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries - General requirements and mechanical properties
NZS 3604	Timber-framed buildings
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

Requirements

1.2 QUALIFICATIONS

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

1.3 VERIFY DIMENSIONS

Verify dimensions against site measurements prior to fabrication.

Standards of performance

1.4 DURABILITY REQUIREMENTS

Design and install the flashings appropriate for the durability applications in accordance with NZBC B2/AS1. The Building Code B2, 3.2 requires that all hidden elements have at least the same durability as that of the element that covers it. Refer to NZBC B2/AS1, Table C.1.1.1 and NZBC E2/AS1, Table C.1.1.1A: Material selection.

1.5 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with NZBC E2/AS1, Table C.1.1.1A: Material selection, to minimise corrosion. Refer to either NZS 3604 Clause 4.2 or AS/NZS 2728 for the relevant exposure conditions. For compatibility of materials in contact and subject to run-off, refer to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off.

1.6 PROTOTYPES - REVIEW

Refer to the general section 1270 CONSTRUCTION for details of how prototypes will be reviewed and how instructions to proceed will be given. For flashings where there are no specific details or drawings, provide full size prototypes of the flashings to integrate components into the weathertight system. Co-ordinate with the trades affected by the installation. Provide the prototype flashings to the contract administrator for review.

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2 PRODUCTS

2.1 FLASHING MATERIALS

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

2.2 FLASHING FABRICATION

Fabricate flashings generally to NZBC E2/AS1, 4.0 Flashings, from a ductile grade of metal designed for lateral strength by folding, stiffening or ribbing on external edges, having a maximum un-stiffened width of 300mm. Provide all hooks, hems, kick outs, bird's beaks, stop ends, soft edges and turn downs etc. to NZBC E2/AS1, 4.0 Flashings, or as shown on the drawings.

2.3 FIXINGS

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

2.4 JOINTS - 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 4.5.1.1: General dimensions of metal flashings and other flashings as listed, for general dimensions of flashings.

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3.9 FIXINGS

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

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

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

3.10 JOINTING - SEALANTS

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

3.11 FINAL INSPECTION

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

Completion

3.12 PROTECT

Protect new work from damage.

3.13 REPLACE

Replace all damaged or marked elements.

3.14 LEAVE

Leave work to the standard required for following procedures.

3.15 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 FLASHINGS

Type	Material and finish/colour
General flashings:	Refer to Architectural Drawings
Window/doors:	Refer to Architectural Drawings
- Head:	Refer to Architectural Drawings
- Sill:	Refer to Architectural Drawings
Cladding:	Refer to Architectural Drawings
- External corner:	Refer to Architectural Drawings
- Internal corner:	Refer to Architectural Drawings
Soffit:	Refer to Architectural Drawings
Wall/roof junctions:	Refer to Architectural Drawings
Barge:	Refer to Architectural Drawings
Apron:	Refer to Architectural Drawings
Parapet capping:	Refer to Architectural Drawings
Saddle:	Refer to Architectural Drawings
Gutter apron:	Refer to Architectural Drawings
Roof penetrations:	Refer to Architectural Drawings

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4824SG SEISMIC GUYS - EXPANSION JOINT SYSTEMS

1 GENERAL

This section relates to the supply and installation of expansion joint systems, by **Seismic Guys Limited**, for residential, commercial, and industrial applications.
It includes:

- Thermal and seismic expansion joints;
- Interior and exterior applications - floor, wall, ceiling, soffit, and roof;
- Fire barriers & fire blankets.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

DFT	Dry Film Thickness
AAMA	American Architectural Manufacturers Association
ASTM	American Society for Testing and Materials
SSL	Structural Slab Level.
SBR	Styrene Butadiene Rubber
NR	Natural Rubber

Documents

1.2 DOCUMENTS

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

NZBC B1/VM1	Structural design of buildings
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.0	Structural design actions - Part 0: General principles
AS/NZS 1170.1	Structural design actions - Part 1: Permanent, imposed and other actions
AS/NZS 1170.2:2011	Structural design actions - Part 2: Wind actions
NZS 1170.5	Structural design actions - Part 5: Earthquake actions - New Zealand
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
UL 2079	Tests for fire resistance of building joint systems
ASTM B 221	Standard specifications for Aluminium and Aluminium-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
ASTM E119	Standard test methods for fire tests of building construction and materials
ASTM E1399	Standard test method for cyclic movement and measuring the minimum and maximum joint widths in architectural joint systems maximum joint widths of architectural joint systems
ASTM E1966	Standard test method for fire-resistive joint systems
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.

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1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

- Prospec Specialties - Catalogue
- Prospec Specialties - Technical Datasheets
- Prospec Specialties - Technical Specifications
- Prospec Joint Systems - Installation Instructions
- Prospec Specialties - Drawings, construction details
- Prospec Specialties - Material Safety Data Sheets
- Boss FlexiCoat-MAK - Technical Data Sheet
- BRANZ Fire Assessment Report - FAR 4002. Fire resistance of Emseal Expansion Joint Systems to AS 1530.4 (2005).
- Certificate of Compliance (certificate no.20201016) UL certification
- ISO 9001:2015 certificate awarded to Prospec Specialties (Gulf). Certificate No. ASU-1007

Manufacturer/supplier contact details

Company:	Seismic Guys Limited
Web:	https://www.seismicguys.co.nz/
Contact:	Po Downing (Managing Director)
Email:	po@seismicguys.co.nz
Telephone:	021 070 5195

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

3 years	For materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For installation

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Compliance information

1.6 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer / supplier warranty
- Installer / applicator warranty
- Producer Statement - Construction (PS3) from the applicator / installer
- Producer Statement - Construction Review (PS4) from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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1.8 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.9 NO SUBSTITUTIONS

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

1.10 SHOP DRAWINGS

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

Provide shop drawings to show the general arrangement.

Submit shop drawings for review to the Project Manager/Architect.

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

1.11 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

Provide this information prior to practical completion.

1.12 LOADING CODE REQUIREMENT

Design loads and actions (permanent (deadload), imposed (live load), wind, snow, and earthquake) to AS/NZS 1170.0, AS/NZS 1170.1, AS/NZS 1170.2:2011, NZS 1170.5, NZBC B1/VM1.

1.13 ENVIRONMENTAL REQUIREMENTS

Durability to NZBC B2/AS1. Select movement joint system to suit the environment for use over its expected life without deterioration.
Refer to SELECTIONS.

Performance - fire rated joint systems

1.14 FIRE STOPS - PROPOSED ALTERNATIVE SOLUTION

Prospec Fire Barriers tested and certified to UL 2079 hose stream test, and meets the requirements of ASTM E 119, ASTM E1399 and ASTM E 1966.

Quality control and assurance

1.15 INSPECTIONS

TBC by the Project Manager

2 PRODUCTS

Expansion joints - Seismic

2.1 PROSPEC CB SERIES - INTERIOR/EXTERIOR WALL/CEILING/SOFFIT SEISMIC EXPANSION JOINT

Comprising of frames, cover plates, and glide plate, all extruded aluminium grade 6063-T6 to ASTM B 221. Designed for surface mounting across seismic expansion joints 25mm - 152mm wide, prior to application of 16mm plaster or cladding for flush finish. The glide plate is held in place by extruded elastomeric membranes. Designed for full range of seismic movement. Available in mill-finish, anodised, or powder coat finish.

Refer to SELECTIONS.

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2.2 PROSPEC DA SERIES - EXTERIOR ROOF SEISMIC EXPANSION JOINT

Comprising of center plate and base frames, all extruded aluminium grade 6063-T6 to ASTM B 221. Centre plate is held in place by water tight centre screw and centering bar. Centre plate and base frame junction waterproofed by extruded elastomeric seals. Base frames are mounted onto timber fillets securing the Prospec EPDM Vapour Barrier bridging the expansion joint. Designed for full seismic movement across expansion joints 51mm - 305mm wide. Available in anodised or powder coat finish.

Refer to SELECTIONS.

2.3 PROSPEC DM SERIES - INTERIOR/EXTERIOR WALL/CEILING/SOFFIT/ROOF SEISMIC EXPANSION JOINT

Comprising of a centre plate aluminium grade 6063-T6, over extruded surface mounted frames aluminium grade 6063-T6 to ASTM B 221. Centre plate is held with flat head centre screws and steel centering bar, compressing the centre plate onto extruded elastomeric seals. Designed for full seismic movement across expansion joints 51mm - 305mm wide. Available in anodised and powder coat finishes.

Refer to SELECTIONS.

2.4 PROSPEC BW SERIES - INTERIOR FLOOR SEISMIC EXPANSION JOINT

Comprising of recessed pan and frames and frame retainer/corner frame extruded aluminium grade 6063-T5 to ASTM B 221. Recessed pan is held in place with compressed spring assembly and steel centering bar. Designed for full seismic movement across expansion joints 51mm - 508mm wide. The frames are surface mounted onto the structural slab prior to 50mm/62mm slab topping or floor finish. The recessed pan is concealed by floor finishes insert. No Bump ADA compliant threshold. Aluminium sections are available in clear mill finish.

Refer to SELECTIONS.

Vapour Barrier (VB)

2.5 PROSPEC VAPOUR BARRIER (VB)

Vapour Barrier (VB) is a water resistant, cured single-ply synthetic EPDM membrane manufactured from ethylene, propylene, diene, terpolymer. Standard thickness is 1.5mm. Colour is black.

Finishes

2.6 POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER (TO AAMA 2603)

Polyester powder organic coating in accordance with WGANZ PQAS, AS 3715, and AAMA 2603.

Refer to SELECTIONS

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

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3.5 INSTALLATION

Install to Prospec Joint Systems - Installation Instructions, and Prospec Specialties - Technical Datasheets.

Completion

3.6 COMPLETION MATTERS

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

3.7 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

4 SELECTIONS

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

Expansion joints - Seismic

4.1 PROSPEC CB SERIES - INTERIOR/EXTERIOR WALL/CEILING/SOFFIT SEISMIC EXPANSION JOINT

Location:	Refer to Architectural Drawings
Brand/Type:	Prospec CB series
Application:	Refer to Architectural Drawings
Gap width:	150 mm, 250mm
Movement:	Full seismic movement
Load rating:	Refer to Structural Engineers Documents
Profile material:	Aluminium 6063-T6 grade
Finish:	TBC
Fire barrier:	Refer to Architectural Drawings
Water barrier:	Refer to Architectural Drawings

4.2 PROSPEC DA SERIES - EXTERIOR ROOF SEISMIC EXPANSION JOINT

Location:	Refer to Architectural Drawings
Brand/Type:	Prospec DA series
Application:	Roof joint
Gap width:	150 mm, 250mm
Movement:	Full seismic movement
Centre plate:	Aluminium 6063-T6 grade
Base frames:	Aluminium 6063-T6 grade
Finish:	TBC
Seals:	extruded elastomeric seals
Vapour barrier:	Prospec EPDM vapour barrier
Fire barrier:	Refer to Architectural Drawings

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4.3 PROSPEC DM SERIES - INTERIOR/EXTERIOR WALL/CEILING/SOFFIT/ROOF SEISMIC EXPANSION JOINT

Location:	Refer to Architectural Drawings
Brand/Type:	Prospec DM series
Application:	Wall Joint
Gap width:	150 mm, 250mm
Movement:	Full seismic movement
Centre plate:	Aluminium grade 6063-T6
Surface mounted frames:	Aluminium grade 6063-T6
Finish:	TBC
Seals:	extruded elastomeric seals
Load rating:	Refer to Structural Engineers Documents
Fire barrier:	Refer to Architectural Drawings
Water barrier:	Refer to Architectural Drawings

4.4 PROSPEC BW SERIES - INTERIOR FLOOR SEISMIC EXPANSION JOINT

Location:	Refer to Architectural Drawings
Brand/Type:	Prospec BW series
Application:	Interior floor joint
Gap width:	150 mm, 250mm
Movement:	Full seismic movement
Recessed pan:	Refer to Architectural Drawings
Recessed frames:	Aluminium grade 6063-T5
Finish:	Clear mill finish (aluminium only)
Load rating:	Refer to Structural Engineers Documents
ADA Compliance:	No Bump ADA Compliant.
Fire barrier:	Refer to Architectural Drawings
Water barrier:	Refer to Architectural Drawings

Vapour Barrier (VB)

4.5 PROSPEC VAPOUR BARRIER (VB)

Location:	Refer to Architectural Drawings
Type/Brand:	Prospec Vapour Barrier (VB)
Material:	EPDM base
Colour:	Black
Thickness:	1.5 mm

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4933 ALUMINIUM METALWORK

1 GENERAL

This section relates to the fabrication and installation of aluminium items of a general nature.

Related work

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
BRANZ BU 567	E2/AS1 Flashing Requirements

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

Requirements

1.2 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Metalworkers to be experienced in working with aluminium and the techniques specified.

1.3 SHOP DRAWINGS

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

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

- plans, elevations and sections
- methods of fixing
- methods of joint forming
- finishing techniques
- methods of fabrication and site assembly of large units.

If requested provide the following additional information:

Submit shop drawings for review to the Project Manager/Architect.

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

2 PRODUCTS

Materials

2.1 ALUMINIUM SHEET

Pre-finished/anodised/plain finish sheet/strip to AS/NZS 1734.

2.2 ALUMINIUM SECTIONS

Refer to SELECTIONS.

Components

2.3 SCREWS

Grade 316 stainless steel self-tapping screws with type of head, length, gauge and thread to suit the work and its location.

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2.4 BOLTS

Grade 316 stainless steel, selecting type and size to suit the work and its location.

2.5 RIVETS

Domed with similar composition and mechanical properties to the parent metal.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Do not deliver any elements to the site which cannot be unloaded immediately into suitable storage conditions. Avoid distortion of elements during transit, storage and handling. Prevent surfaces rubbing together, and any contact with mud, plaster or cement. Keep protective coverings dry.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PREPARATION

Ensure location and substrate is ready to receive the elements and will allow work of the required standard.

3.4 FLASHINGS

Select and use sheet metals suited to the element, process or finish specified, jointing them as necessary to allow full development of their expected durability with a minimising of corrosion and to BRANZ BU 567.

Assembly

3.5 PROTECTION

During fabrication protect all surfaces which will be visible in completed work.

3.6 COLD FORMED

Ensure cold formed work is free from warping, buckling and fractures. Form bends with a brake press or by cold rolling.

3.7 CORNERS

Unless specified otherwise, mitre junctions of identical sections.

3.8 HOLES

Form without distortion of surrounding metal.

3.9 MOVING PARTS

When assembled, all moving parts must move freely and without binding.

3.10 CLEANING

Remove all burrs and sharp arrises which would be visible after fixing, or a hazard to the user.

3.11 BONDING

Prepare surfaces of metals to receive adhesives by degreasing and abrading mechanically or chemically. Use adhesives in accordance with the manufacturer's requirements. Form bond under pressure.

3.12 RIVETED JOINTS

Draw riveted joints tightly together, with rivets closed to completely fill holes.

3.13 MECHANICAL JOINTS

Ensure mechanical joints are tight with no visible gaps.

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3.14 MECHANICAL JOINTS - ELEMENTS

Bed in mastic all mechanical joints of elements which will be located externally, including all mating surfaces, cleats and other fixings.

3.15 MECHANICAL JOINTS - CLEATS

Unless specified otherwise connect cleats to frames with countersunk screws where they will be visible after the component has been fixed and where raised heads would interfere with any moving part.

3.16 WELDING OF ALUMINIUM

Grind flush visible welds.

Application

3.17 INSTALLATION

Locate plugs accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the specified standards, the reviewed shop drawings and installation details, including brackets, bolts, fixings, bedding compounds and sealants.

3.18 LOADING

Elements must not carry any structural load unless designed to do so. Do not use railings, balustrades, or similar elements as strutting or support when in place.

Assembly - sheet aluminium

3.19 FABRICATE

Fabricate and assemble in a workshop wherever practicable.

3.20 MARK OUT

Mark out the work accurately, square and true to line allowing for correct radius folds and laps to give the dimensions required for neat, close fits when in place. Use marking methods that do not damage, deface or cause future corrosive attack to the sheet metal being worked.

3.21 CUT SHEETS

Cut sheets by mechanical methods leaving edges true to line, square, smooth and free from all burrs.

3.22 FORMING

Use mechanical methods wherever possible and form and fold sheets square and true to line and face, free of all deformation and defects. Minimise cold-working and stress build-up and their effects by limiting the amount of working and avoiding sharp radius bends (minimum 1 x sheet thickness).

3.23 PRE-ASSEMBLE

Pre-assemble in the workshop and match mark items being assembled or erected on site. Do not strain, twist, bend or open such items to force them into the correct position while assembling or erecting.

3.24 SEPARATION

Isolate dissimilar materials (metal and non-metal) in close proximity by painting the surfaces or fitting separator strips. Place isolators between aluminium and treated timber and cement-based materials. Do not use unpainted lead sheet in contact with or allow water run-off onto aluminium. Refer also to BRANZ BU 567.

3.25 JOINING ALUMINIUM SHEET

Use self-secured seams, aluminium pop rivets, bolts and welding as best suits the form and location of the work.

3.26 INSTALLATION

Locate fixings accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the installation details and complete with bedding compounds and sealants.

3.27 LOADING

Ensure all elements are fully supported unless designed to be self-supporting.

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Finishing

3.28 PREPARATION FOR COATINGS

Before applying coatings remove all welding slag, weld spatter, anti-splatter compounds, paints, grease, flux, rust, burrs and sharp arrises. Make good all defects which would show after application of coating. Finish surfaces smooth.

3.29 EARTHING OR EQUIPOTENTIAL BONDING METALWORK

If it is a project electrical requirement, ensure that any electrically at-risk metalwork, is earthed or equipotential bonded (or at least conductor cable attached) before enclosure.

Completion

3.30 COMPLETION MATTERS

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

4 SELECTIONS

4.1 ALUMINIUM SECTIONS

Alloy designation:	Refer to Aluminium Features Suppliers Drawings
Temper:	Refer to Aluminium Features Suppliers Drawings
Dimensions:	Refer to Aluminium Features Suppliers Drawings

4.2 ALUMINIUM SHEET

Alloy designation:	Refer to Aluminium Features Suppliers Drawings
Temper:	Refer to Aluminium Features Suppliers Drawings
Thickness:	Refer to Aluminium Features Suppliers Drawings

Anodic colour/finish: TBC

4.3 ALUMINIUM METALWORK MANUFACTURED ELEMENT

Refer to Aluminium Features Suppliers Drawings

4.4 HARDWARE

Refer to Aluminium Features Suppliers Drawings

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5113G GIB® PLASTERBOARD LININGS

1 GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber and steel framed walls and ceilings to form:

- standard systems
- superior finish quality systems
- bracing systems
- fire rated garage boundary wall systems
- wet area systems
- GIBFix® Framing systems

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section:

GIB® Site Guide (April 2024)
GIB® Noise Control Systems (September 2017)
GIB® Fire Rated Systems (September 2024)
GIB® Wet Area Systems (February 2021
GIB Toughline® Aqua (July 2018)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIBFix® Framing System (August 2016)
GIB Rondo® Metal Batten System (September 2024)
GIB RocTape®
GIB® Goldline™ Platinum Tape-on Trims
GIB® UltraFlex high impact corner mould
GIB® Tough Systems (November 2014)
BRANZ Appraisal 289 (2024) GIB® Fire Rated Systems
BRANZ Appraisal 394 (2025) GIB® Noise Control Systems
BRANZ Appraisal 427 (2021) GIB® Wet Area Systems
BRANZ Appraisal 928 (2021) GIB EzyBrace® Systems

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Manufacturer/supplier contact details
Company: Winstone Wallboards
Web: www.gib.co.nz
Telephone: 0800 100 442

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
- before applying finish coatings or decorative papers,

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

1.7 FIRE RATING REQUIREMENTS

Provide the GIB® fire resistant rated garage boundary wall systems. Refer to SELECTIONS for system/FRR.

1.8 SOUND INSULATION REQUIREMENTS

Provide the GIB® Noise Control Systems. Refer to SELECTIONS for system/STC. Include for forming and treating of perimeters of openings and penetrations in the elements to ensure the specified performance. Ensure absence of adjoining flanking paths.

Compliance

1.9 COMPLIANCE - BRANZ APPRAISAL 289

GIB® Fire Rated Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 289.

1.10 COMPLIANCE - BRANZ APPRAISAL 394

GIB® Noise Control Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 394.

1.11 COMPLIANCE - BRANZ APPRAISAL 427

GIB® Wet Area Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 427.

1.12 COMPLIANCE - BRANZ APPRAISAL 928

GIB EzyBrace® Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 928.

Performance

1.13 BRACING REQUIREMENTS

Braced wall systems to NZS 3604 when tested to BRANZ Technical Paper P21, using:

- GIB Ezybrace® Systems and/or GIB Ezybrace® Bracing Design Software
- GIB Ezybrace® Bracing Supplement Document
- GIB Ezybrace® for Steel Frame Housing (NASH) Software (to NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria)

Refer to drawings for location and type.

1.14 SURFACE FIRE PROPERTIES - UNFINISHED BOARD

All GIB® unfinished plasterboard sheet materials achieve a Group Classification of, Group 1-S to NZBC C/AS2, Table 4.12.1.1: Maximum permitted Group Number for internal surface finishes, following testing in accordance with ISO 5660.1 and ISO 5660.2.

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2 PRODUCTS

Materials

2.1 GIB® PLASTERBOARD

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

GIB® Standard plasterboard
GIB Wideline® plasterboard
GIB Fyreline® fire resistant plasterboard
GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard
GIB Aqualine® wet area plasterboard
GIB Toughline®
GIB Toughline® Aqua

Components

2.2 CEILING BATTENS

GIB® Rondo® metal ceiling battens, batten joiners and perimeter channel.

2.3 GIBFIX® ANGLES

GIBFix® Angles, 45mm x 45mm angles, 2.4m or 2.7m long.

2.4 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.

2.5 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

GIB® UltraFlex® high impact corner mould
GIB® Levelline® Tape on Trim

2.6 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.7 CONTROL JOINTS

GIB® Rondo® P35 control joints.

GIB® Goldline™ tape-on trims
GIB® plastic W-profile control joints.

Accessories

2.8 ADHESIVE

Timber frame and/or steel frame:

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

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2.9 JOINTING COMPOUND

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

2.10 JOINTING TAPE

GIB® jointing tape.

2.11 FIRE/ACOUSTIC SEALANT

GIB Fire Soundseal® ultra low VOC, mulit use acoustic sealant that resists passage of smoke and fire.

2.12 GAP FILLER

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.

3.4 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

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

Framing substrates shall be in accordance to AS/NZS 2589, GIB® Site Guide and GIB X-Block® Radiation Shielding Systems literature.

Check timber framing moisture content is in accordance with requirements of AS/NZS 2589. Refer to NZBC E2/AS1 and GIB® Site Guide.

Timber framing:	18% maximum for fixing plasterboard to timber (8-12% recommended for fixing plasterboard to timber framing if air conditioning and/or central heating are to be installed)

If GIB EzyBrace® systems are used in conjunction with GIBFix® Framing System, ensure that the positioning of the GIB HandiBrac® panel hold-down brackets are to the manufacturers recommended placements for the GIBFix® Framing System.

3.5 PRE-INSTALLATION REQUIREMENTS - STEEL FRAMING

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

Framing substrates shall be in accordance to AS/NZS 2589, GIB® Site Guide and GIB X-Block® Radiation Shielding Systems requirement. Refer to GIB® Site Guide.

3.6 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

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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.

3.7 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide.

Application

3.8 INSTALL CEILING BATTENS

Install to GIB® Rondo® Ceiling Batten Systems requirements.

3.9 INSTALL GIBFIX® ANGLES

Install GIBFix® Angles to the wall and ceiling junctions to the GIBFix® Framing System requirements. Install GIBFix® Angles before installation of GIB® plasterboard linings.

Run GIBFix® Angles as continuous lengths between framing members. If joints are necessary for the GIBFix® Angles, overlap the angles by a minimum of 300mm and fix as per manufacturers requirements. When jointing GIBFix® Angles, locate the shorter section at the top of the stud.

3.10 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide. Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.11 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.

3.12 BOARD INSTALLATION FOR GIBFIX® SYSTEM

Fix the GIB® plasterboard to the GIBFix® Angle side over the stud first and then fix the GIB® plasterboard to the GIBFix® Angle only side (not over the stud). If the GIBFix® Angle only side must be fastened off first, provide additional fixings for the GIBFix® Angle to the stud, to the manufacturers requirements.

3.13 FORM FIRE RATED SYSTEMS

Form to GIB® Fire Rated Systems requirements.

3.14 FORM NOISE CONTROL SYSTEMS

Form to GIB® Noise Control Systems requirements.

3.15 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.16 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems.

3.17 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide requirements.

3.18 INSTALL TAPE-ON TRIMS

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

Finishing

3.19 FINISHING GENERALLY

To GIB® Site Guide and AS/NZS 2589.

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Completion & Commissioning

3.20 COMPLETION MATTERS

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

4 SELECTIONS

Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to Architectural Drawings	GIB® Standard plasterboard	10mm	4
Refer to Architectural Drawings	GIB® Standard plasterboard	13mm	4

4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to Architectural Drawings	GIB Aqualine® plasterboard	10mm	4
Refer to Architectural Drawings	GIB Aqualine® plasterboard	13mm	4

4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to Architectural Drawings	GIB® Standard plasterboard	13mm	4

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to Architectural Drawings	GIB Aqualine® plasterboard	13mm	4

4.5 GIB® SOUND RATED SYSTEMS

Refer to GIB® Noise Control Systems

Location	Plasterboard type / Lining requirements	STC / System specification	Finish Level
Refer to Architectural Drawings	Various Gib plasterboard products. Refer to Architectural Drawings	Refer to Architectural Drawings	4 unless not exposed

4.6 GIB® FIRE RATED SYSTEMS

Refer to GIB® Residential Garage Boundary Walls.

Location / Type	Plasterboard type / Lining requirements	FRR / System specification	Finish Level
Refer to Architectural Drawings	GIB Fyreline® plasterboard	Refer to Architectural Drawings	4

4.7 GIB® BRACING SYSTEMS

Refer to:

- GIB Ezybrace® Systems

For bracing element location refer to drawn documentation.

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Accessories

4.8 GIB® RONDO® CEILING BATTENS

Location:	Refer to Architectural Drawings
Brand/type:	GIB® Rondo® Ceiling battens
Batten type:	Refer to Architectural Drawings
Clip type:	Refer to Architectural Drawings

4.9 GIBFIX® FRAMING SYSTEM COMPONENTS

Brand/type:	GIBFix® Angles
Fixings:	GIB® Grabber® Dual Head Screws

4.10 GIB® TAPE ON EDGE OR CORNER TRIMS

Brand/type:	As required

4.11 GIB® EDGE PROFILES

Brand/type:	As required

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5151 INTERNAL TRIM

1 GENERAL

This section relates to simple lengths of trim fixed on site as of isolated internal members, with simple end joints.
It includes:

- timber
- MDF

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3610	Specification for profiles of mouldings and joinery

Performance

1.3 FIRE PROPERTIES

For all Risk Groups covered by NZBC C/AS2.

All trim to have the appropriate Group Number to match that of the wall or ceiling to NZBC C/AS2, Table 4.12.1.1: Maximum permitted Group Number for internal surface finishes. Except that, there is no requirement for trim that does not exceed 5% of the wall or ceiling area to NZBC C/AS2, paragraph 4.12.4.1 (d).

2 PRODUCTS

Materials

2.1 TIMBER TRIM

To NZS 3610 and to profiles detailed on the drawings. Timber species, grade and treatment to NZS 3602.

Components

2.2 NAILS

Bright steel to dimension requirements of NZS 3604. Use galvanized where prone to dampness.

2.3 BRADS

Bright steel of a length three times the thickness of the member being fixed. Use cadmium plated where prone to dampness.

2.4 SCREWS, STEEL

Bright steel of a length to penetrate the substrate up to the shank. Use stainless steel in wet areas.

2.5 SCREWS, CHROME PLATED

Chrome plated of a length to penetrate the substrate up to the shank.

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3 EXECUTION

Conditions

3.1 GENERALLY

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

3.2 STORAGE

Take delivery of trims undamaged and unmarked and store on site under cover, away from moisture, heat and direct sunlight in adequately ventilated area and clear of areas where work is in progress, to ensure materials are of the required standard when fixed in place.

3.3 ACCLIMATISE MATERIALS

Remove materials from packaging, separate and allow to acclimatise in the proposed installation area for 48 hours minimum prior to installation.

3.4 ENSURE

Ensure that the substrate to trims will allow work of the required standard. If it does not, do not proceed until the substrate has been remedied.

Application - Generally

3.5 INSTALL TIMBER TRIM

Use full lengths. Fit with scribed internal joints, mitred external joints and, mitred and returned at stop ends. Fix plumb, level and true to line and face using nails or brads to suit. Leave secure and with no movement possible.

Finishing

3.6 PUNCH

Punch all nail heads below the face of trim ready to receive stopping, as specified under painting preparation.

3.7 COUNTERSINK

Countersink screw heads not less than 2mm below the faces of trim to be painted. Stop and finish off flush with the face, as specified under painting preparation.

3.8 PELLETING

Countersink screw head 6mm below the faces of trim which is to be clear finished. Glue in grain-matched pellets not less than 6mm thick and cut from matching timber. Finish off flush with the face.

Completion

3.9 LEAVE

Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following procedures.

3.10 PROTECTION

Protect the completed work and make good before any surface finish is applied.

3.11 REPLACE

Replace damaged or marked elements.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

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4 SELECTIONS

4.1 INTERNAL TIMBER TRIM

Manufacturer: TBC
Species/grade: Paint Quality Pine
Finish: TBC by Client

Member	**Reference**	
Architrave	Refer to Architectural Drawings	
Skirting	Refer to Architectural Drawings	
Cornice	Refer to Architectural Drawings	
Mould	Refer to Architectural Drawings	
Bead	Refer to Architectural Drawings	

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5171 PLASTERBOARD SOUND & FIRE LININGS

1 GENERAL

This section relates to the supply, fixing and jointing of plasterboard linings and accessories to timber and steel framed walls and ceilings to form:

- fire rated systems
- sound rated systems

1.1 RELATED WORK

Refer to 5113 PLASTERBOARD LININGS for standard linings

1.2 ABBREVIATIONS

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

FRR	Fire resistance rating
IIC	Impact insulation class
STC	Sound transmission class
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	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G6/VM1	Airborne and impact sound
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3602	Timber and wood based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber framed buildings
AS/NZS 4600:2005	Cold-formed steel structures

NASH Standard Part 2: Light steel framed buildings

Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications. Plasterboard fixers and stoppers to be experienced competent workers, familiar with materials and techniques specified. Submit evidence of experience on request. For example:

- National Certificate of Interior Systems; or
- Certified Business members of AWCINZ.

Performance

1.5 INSPECTIONS AND ACCEPTANCE

Inspect the finished surface of the installed plasterboard:

- before applying sealer and
- before applying finish coatings or decorative papers,

so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

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Performance - fire rated systems

1.6 FIRE RATING REQUIREMENTS

Provide fire rated wall systems listed in SELECTIONS for requirements.

1.7 CERTIFICATES, FIRE RATING

Provide certificates and other evidence that the fire rated wall system offered will comply with the standards of performance specified.

Performance - sound rated systems

1.8 SOUND RATING REQUIREMENTS

Provide sound rated wall and floor or ceiling systems listed in SELECTIONS for requirements.

Form and treat perimeters of openings and penetrations in the elements to ensure the specified performance. Ensure absence of adjoining leak paths.

1.9 SOUND CONTROL SITE TEST

Site test each sound rated element to NZBC G6/VM1 to ensure that the specified sound transmission loss has been achieved; using a nominated acoustic consultant. Carry out sound tests wall by wall to certify compliance. Rectify any element that does not meet the specified STC/IIC figure.

1.10 CERTIFICATES, SOUND CONTROL

Provide certificates and other evidence that the sound rated wall system offered will comply with the standards of performance specified.

2 PRODUCTS

Materials

2.1 GYPSUM PLASTERBOARD

Gypsum plaster core encased in a durable face and backing paper formed for standard use to AS/NZS 2588.

2.2 GYPSUM PLASTERBOARD, FIRE RESISTANT SYSTEMS

Gypsum plaster core encased in a durable face and backing paper formed for standard and fire rated use to AS/NZS 2588.

2.3 GYPSUM PLASTERBOARD, SOUND CONTROL SYSTEMS

High density gypsum plaster core encased in a durable face and backing paper formed for sound control use to AS/NZS 2588.

2.4 CORNICE

Plasterboard, scotia pattern.

Components

2.5 CEILING BATTENS, METAL

0.55mm galvanized steel (275 g/m² zinc coating) battens and matching perimeter channels.

2.6 SCREWS, TIMBER FRAME

10mm plasterboard:	Type S gypsum screws 25mm x 6 gauge
13mm plasterboard:	Type S gypsum screws 32mm x 6 gauge
2 x 10mm plasterboard:	Type S gypsum screws 41mm x 6 gauge (inner layer) Type S gypsum screws 51mm x 7 gauge (outer layer)
2 x 13mm plasterboard:	Type S gypsum screws 51mm x 7 gauge (inner layer) Type S gypsum screws 63mm x 8 gauge (outer layer)
2 x 16mm plasterboard:	Type S gypsum screws 51mm x 7 gauge (inner layer) Type S gypsum screws 63mm x 8 gauge (outer layer)

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Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.7 NAILS, TIMBER FRAME

10mm plasterboard:	30mm x 2.5mm galvanized drywall clouts
13mm plasterboard:	40mm x 2.5mm galvanized drywall clouts

Nails for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

Nails for perimeter nailing for bracing systems complete with 15mm galvanized steel washers as required by the sheet manufacturer's approved specification.

2.8 SECTIONS AND TRIM MATERIAL

Form from galvanized steel of a coating class not less than ZM275 to AS 1397 and fix with 30mm x 2.5mm galvanized clouts.

2.9 EXTERNAL ANGLE

Perforated.

2.10 INTERNAL REINFORCING ANGLE

Perforated.

2.11 CONTROL JOINT

With plastic protective tape.

2.12 CASING BEAD

To suit sheet thickness.

2.13 RESILIENT RAIL

To Z profile for sound rated systems. Fix with 25mm x 6 gauge countersunk screws.

2.14 J MOULD

Extruded uPVC dimensioned to suit the sheet thickness and fixed with 25mm x 1.6mm nickel panel pins.

2.15 TAPE ON EDGE TRIMS

Tape-on paper tape and galvanized steel trims and edges.

2.16 EDGE PROFILES

Pre-formed aluminium profiles, with perforated edge trims.

Accessories

2.17 ADHESIVE

Multi-purpose water based wallboard adhesive.

2.18 JOINTING COMPOUNDS

System match bedding compound and finishing compound. Refer to the sheet manufacturer's literature and follow their requirements on which compounds to use with which accessory and in which location, to achieve the required level of finish.

2.19 TAPE

System match reinforcing tape.

2.20 SOUND RATED SEALANT

To be part of the sound rated wall system offered.

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3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Do not commence work until the substrate is plumb, level and to the standard required by AS/NZS 2589 and the sheet manufacturer's requirements.

Do not begin installation until the building is closed in, fully glazed, the roof watertight and the atmospheric conditions within the plasterboard manufacturer guidelines.

3.4 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

Ensure that the timber framing to which plasterboard lining is fixed, shall comply with NZS 3602, NZS 3603 & NZS 3604. Where adhesion of gypsum linings is required, surfaces shall be free of oil, grease, dust and other foreign materials.

Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to NZBC E2/AS1, 10.0 Construction Moisture.

3.5 PRE-INSTALLATION REQUIREMENTS - METAL FRAMING

Ensure that the metal framing to which gypsum lining is fixed, shall comply with AS 1397, AS/NZS 4600 or NASH Standard Part 2, as applicable. Where adhesion of gypsum linings is required, surfaces shall be free of oil, grease, dust and other foreign materials. Refer to the metal framing manufacturers specifications where high density gypsum linings (>800 kg/m³) are specified for fixing to light gauge steel framing.

3.6 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative Levels of Finish specified in AS/NZS 2589.

3.7 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping plasterboard prior to the application of a range of decorative finishes under various lighting conditions.

3.8 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

3.9 GENERAL REQUIREMENTS

Leave a 10mm gap at floor level. Do not break the face paper. Position sheets to a "touch fit" with no forcing or springing into place. Run sheets over doors and under and over window openings. Apply adhesive in daubs 25mm diameter and 10mm thick. Do not place daubs at sheet perimeters or under nail and screw fixings.

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Application - general

3.10 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.11 INSTALL CEILING BATTENS

Install in accordance with the batten manufacturer's requirements.

3.12 LINE CEILINGS AND WALLS

Line ceilings and walls with the various sheets and fix to the sheet manufacturer's details and requirements, using tapered edge joints as far as possible.

3.13 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.

3.14 END BUTT JOINTS

When end butt joints are unavoidable, locate staggered off the framing, back block, fix and stop to the sheet manufacturer's details and requirements.

Application - sound rated systems

3.15 SOUND RATED WALL AND CEILING SYSTEMS

Line both sides and undersides with the various sheets layers and thicknesses to the sheet manufacturer's details and requirements for the required Sound Transmission Class rating.

3.16 PLACE SOUND RATED SEALANT

Place full continuous runs of sealant around perimeters where directed and to the sheet manufacturer's details and requirements.

3.17 FIX RESILIENT RAIL

Screw fix horizontally to walls to the sheet manufacturer's details and requirements.

3.18 ELECTRICAL OUTLETS

Return to site after others have completed their "first fix" work and line backs and sides of outlet boxes and recessed lights with plasterboard and seal around with sound rated sealant to the sheet manufacturer's details and requirements. Do not fit outlet boxes back to back.

3.19 SEAL SERVICE PIPES

Return to site after others have completed their "first fix" work and seal completely around service pipes and other penetrations with sound rated sealant to the sheet manufacturer's details and requirements.

Application - fire rated systems

3.20 FIRE RATED WALL SYSTEMS

Line both sides with the various sheets, layers and thicknesses to the sheet manufacturer's details and approved specifications.

3.21 FIRE RATED FLOOR TO CEILING SYSTEMS

Line the underside of load bearing timber floors with the various sheets, layers and thicknesses to the sheet manufacturer's details and approved specifications.

Application - finishing sections and trim

3.22 FIX EXTERNAL ANGLE

Fix full length to external corners with clouts at 100mm centres each side staggered to the sheet manufacturer's details and requirements.

3.23 FIX INTERNAL REINFORCING ANGLE

Fix full length to internal corners with clouts at 100mm centres each side staggered to the sheet manufacturer's details and requirements.



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3.24 FIX CASING BEAD

Fix between dissimilar materials and caulk with sound rated sealant to the sheet manufacturer's details and requirements.

3.25 FIX J MOULD

Fix between dissimilar materials and caulk with sound rated sealant to the drawings supplied.

3.26 FORM CONTROL JOINTS

Provide at maximum 9 metre centres in long unbroken walls and 12 metre centres to ceilings to the sheet manufacturer's details and requirements. Fix control joint section into joint by staples at 150mm both sides. Fill gap in voids with sound rated sealant. Remove plastic tape after stopping.

3.27 FIX COVER MOULDS

Fix to the sheet manufacturer's details and requirements and to the drawings supplied.

3.28 FIX CORNICE

Fix with adhesive required by the sheet manufacturer and joints mitred to the sheet manufacturer's details and requirements

3.29 FORM SQUARE STOPPED CORNERS

Form taped reinforced square stopped ceiling-to-wall angles to the sheet manufacturer's requirements.

3.30 INSTALL TAPE-ON TRIMS

Install in accordance with the trim manufacturer's requirements.

3.31 INSTALL SPECIAL EDGES AND BANDS

Install in accordance with the edging manufacturer's requirements.

Finishing - stopping

3.32 FORM JOINTS

Fill recess with bedding compound, centre the reinforcing tape, apply a second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off, to the sheet manufacturer's details and requirements.

3.33 STOPPING NAILS AND SCREWS

Apply two successive coats of bedding compound and a coat of finishing compound to the sheet manufacturer's requirements.

3.34 SQUARE STOPPED CORNERS

Fill with bedding compound, centre reinforcing tape into internal angle and apply a coat of finishing compound and complete to the sheet manufacturer's details and requirements.

3.35 EXTERNAL ANGLES

Apply two coats of bedding compound followed by a coat of finishing compound to the sheet manufacturer's requirements.

3.36 END BUTT JOINTS

Fill, tape and coat as for tapered edge joints except that each stage is doubled in width.

Completion

3.37 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

Performance

4.1 SURFACE FIRE PROPERTIES

Group Number to NZBC C/AS2, Table 4.12.1.1: Maximum permitted Group Number for internal surface finishes.

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Group Number	Board/finish	Location
Refer to Fire Report	Refer to Architectural Drawings	Refer to Architectural Drawings

System

4.2 PLASTERBOARD LINING - SOUND RATED SYSTEM

Location: Refer to Architectural Drawings
Board Brand: Refer to Architectural Drawings
Board Type: Refer to Architectural Drawings
Board thickness: Refer to Architectural Drawings
Layers: Refer to Architectural Drawings
System STC: Refer to Architectural Drawings
Insulation: Refer to Architectural Drawings
Finish: Level 4

4.3 PLASTERBOARD LINING - FIRE RATED SYSTEM

Location: Refer to Architectural Drawings
Board Brand: Refer to Architectural Drawings
Board Type: Refer to Architectural Drawings
Board thickness: Refer to Architectural Drawings
Layers: Refer to Architectural Drawings
System FRR: Refer to Architectural Drawings
Insulation: Refer to Architectural Drawings
Finish: Level 4

4.4 PLASTERBOARD LINING - COMBINED FIRE AND SOUND RATED SYSTEM

Location: Refer to Architectural Drawings
Board Brand: Refer to Architectural Drawings
Board Type: Refer to Architectural Drawings
Board thickness: Refer to Architectural Drawings
Layers: Refer to Architectural Drawings
System STC: Refer to Architectural Drawings
System FRR: Refer to Architectural Drawings
Insulation: Refer to Architectural Drawings
Finish: Level 4

4.5 PLASTERBOARD LINING - COMBINED FIRE AND SOUND RATED FLOOR AND CEILING SYSTEM

Location: Refer to Architectural Drawings
Board Brand: Refer to Architectural Drawings
Board Type: Refer to Architectural Drawings
Board thickness: Refer to Architectural Drawings
Layers: Refer to Architectural Drawings
System STC: Refer to Architectural Drawings
System IIC: Refer to Architectural Drawings
System FRR: Refer to Architectural Drawings
Insulation: Refer to Architectural Drawings
Finish: Level 4

Accessories

4.6 CEILING BATTENS

Brand/type: Refer to Architectural Drawings

4.7 CORNICE

Brand/type: Refer to Architectural Drawings
Size: Refer to Architectural Drawings

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5231 INTERIOR DOORS & WINDOWS

1 GENERAL

This section relates to the supply and installation of interior:

- doors
- windows
- doors and frames
- doorsets

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

AS/NZS 1170.1	Structural design actions - Permanent, imposed and other actions
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3610	Specification for profiles of mouldings and joinery
NZS 4223.3	Glazing in buildings - Human impact safety requirements

Window & Glass Association NZ (WGANZ) documents:

PQAS	Powder Coating Quality Assurance System
SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)

Requirements

1.3 SHOP DRAWINGS

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Provide shop drawings to show the general arrangement.

Submit shop drawings for review to the Project Manager/Architect (TBC) working days (at least) before fabrication is planned to commence.

Complete shop drawing review before commencing fabrication.

Performance - doorsets

1.4 PERFORMANCE REQUIREMENTS

Refer to 5241 FIRE AND ACOUSTIC INTERIOR DOORS AND WINDOWS for fire and acoustic performance details.

2 PRODUCTS

Materials - door and window frames general

2.1 TIMBER DOORS AND WINDOWS

To NZS 3602. Moisture content 10-14%. To NZS 3610.

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Materials - doors general

2.2 TIMBER
To NZS 3602. Moisture content 10-14%. To NZS 3610. Solid or hollow core.

Materials - doorsets

2.3 STANDARD DOORSETS, SIDE HUNG DOOR
Frames to profile as detailed and dimensioned, fitted with solid or hollow core door.
Refer to SELECTIONS.

Components

2.4 WINDOW AND DOOR FURNITURE
Refer to 5521 HARDWARE for type and finish.

2.5 SCREWS
Stainless steel or non-corrodible metal. Length sufficient to penetrate into the background support up to the shank. Screws for fixing hinges, hardware or furniture to match the item being attached.

2.6 NAILS
Length sufficient to penetrate into the background support at least half the nail length, except if into radiata pine then three-fifths their length.

2.7 DOOR HINGES
Size and gauge to carry door size and weight. 3 hinges per door.

Type:	Loose pin
Size:	89mm
Material:	Zinc-plated steel
Pin:	Loose-pin zinc-plated steel

2.8 DOOR SKIN (FACINGS)
Doors skins as detailed and dimensioned.

Finish

2.9 TIMBER - PAINT FINISH
Factory applied coating system.

2.10 TIMBER - CLEAR FINISH
Factory applied coating system.

2.11 TIMBER - LACQUER FINISH
Factory applied coating system.

3 EXECUTION

Conditions

3.1 GENERALLY
Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.2 DO NOT DELIVER
Do not deliver any elements which cannot be unloaded immediately into suitable storage conditions.

3.3 HANDLE
Handle, unload and store elements without distortion and avoiding pre-finished surfaces rubbing together, and contact with mud, moisture and other damaging materials.

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3.4 PROTECT

Protect all elements against damage to arrises and glazing beads. Store frames and doors flat and away from moisture or direct sunlight.

3.5 FABRICATE DOORSETS

Fabricate doorsets and windows in the factory with doors hung, provision for furniture made, finishes applied and fully operable.

3.6 FABRICATE DOORS

Fabricate doors in the factory, with provision for door furniture.

3.7 CHECK ALL OPENINGS

To NZS 3604.Check all openings on site for size and standard of execution before installing window or door frames. Installation tolerances of windows subject to earthquake design to comply with AS/NZS 1170.1.

Assembly

3.8 FABRICATION GENERALLY

Manufacture and fabricate frames and doors as detailed. Install hinges and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

Application - generally

3.9 FIXING FRAMES

Fix and assemble frames rigidly in place, plumb, level and true to line and face without distortion and with all opening sashes fully and easily operating. Fit architraves.

3.10 DISTORTION

Do not distort frames when wedging or other packing, or when tightening fixings. If necessary adjust packing and fixings to eliminate binding. Do not cut, plane or sand frames to remedy distortion.

3.11 FIXINGS

Fix frames so that nail heads are covered by applied stops and beads. Punch all nail heads below timber surfaces which will be visible in completed work. Ensure that at least one frame fixing is adjacent to each hanging point.

Application - doorsets

3.12 PROPRIETARY ELEMENTS

Fix in accordance with the door manufacturer's requirements.

3.13 INSTALLATION GENERALLY

Wedge frames into opening and fix through into the wall framing. Locate all wedges and fixing at hinge positions and opposite, with one fixing in the vicinity of the lock. Fixings concealed behind planted stops.

Hang doors on hinges, sliding or bi-fold gear as specified and to operate freely. Fit all hardware and door furniture.

3.14 TIMBER STUD WALLS - TIMBER FRAMES

Wedge into opening and nail through into the studs. All wedges and fixing to be at hinge positions and opposite, with one fixing in the vicinity of the lock.

3.15 BOTTOM CLEARANCE

Provide for specified floor coverings plus 5mm clearance at any point of swing. When floor covering is not specified, allow 25mm total.

For ventilated and/or air conditioned spaces allow 20mm clearance above finished floor coverings for supply/return air.

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3.16 REMOVE DOORS

Remove doors from the frames if necessary to protect them, or for re-finishing, store safely and near completion refit them, all without any damage.

3.17 INSTALL PANELS

Prime rebates and beads, install sealant backing strips or silicone. Install dry beading to outside of panels as selected. Do not mitre corners of beads.

3.18 INSTALL FURNITURE

Install latches, locks and door furniture as scheduled.

3.19 CHECK

Check and adjust operation of all doors, hardware and furniture.

Application - windows

Completion

3.20 PROTECTION

Protect all finishes against damage from adjacent and following work.

3.21 REPLACE

Replace damaged, cracked or marked elements.

3.22 TRADE CLEAN

Clean off or remove safety indicators at completion of the building.

3.23 LEAVE

Leave work to the standard required for following procedures.

3.24 REMOVE

Remove safety indicators and protective coverings, and wipe down all doorsets thoroughly to leave them perfectly clean. Remove all debris, unused materials and elements from the site.

4 SELECTIONS

Frames

4.1 DOOR FRAMES - TIMBER

Location:	Refer to Architectural Drawings
Door reference:	Refer to Architectural Drawings
Timber species:	TBC
Grade:	TBC
Treatment:	TBC
Finish:	TBC
Leaf size:	Refer to Architectural Drawings
Thickness:	TBC

4.2 WINDOW FRAMES - TIMBER

Location:	Refer to Architectural Drawings
Window reference:	Refer to Architectural Drawings
Timber species:	TBC
Grade:	TBC
Treatment:	TBC
Finish:	TBC
Size:	Refer to Architectural Drawings

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4.3 DOOR LINERS - TIMBER

Location:	Refer to Architectural Drawings
Door reference:	Refer to Architectural Drawings
Timber species:	TBC
Grade:	TBC
Treatment:	TBC
Finish:	TBC
Leaf size:	Refer to Architectural Drawings
Thickness:	TBC

Doors

4.4 STANDARD DOORS

Manufacturer:	TBC
Door type:	TBC
Material:	TBC
Door leaf size:	Refer to Architectural Drawings
Edge clashing:	TBC
Door finish:	TBC
Hinge type/finish:	TBC

4.5 STANDARD DOORSETS, SIDE HUNG DOOR

Manufacturer:	TBC
Door type:	TBC
Material:	TBC
Door leaf size:	Refer to Architectural Drawings
Edge clashing:	TBC
Door finish:	TBC
Frame:	TBC
Frame finish:	TBC
Hinge type/finish:	TBC

Finish

4.6 PAINT FINISH

Brand:	TBC
System name:	TBC
Finish/colours:	TBC

4.7 CLEAR FINISH

Brand:	TBC
System name:	TBC
Finish:	TBC

Hardware

4.8 HARDWARE SCHEDULE

Location	Type of hardware	Number off
TBC	TBC	TBC

4.9 HARDWARE

Refer to 5521 HARDWARE section.

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5241 FIRE & ACOUSTIC INTERIOR DOORS & WINDOWS

1 GENERAL

This section relates to the manufacture, supply and installation of fire, smokestop and acoustic:

- windows
- doors, frames
- doorsets

1.1 ABBREVIATIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FRR	Fire-resistance rating
FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification
Sm	Smoke stopping capability level
STC	Sound transmission class

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

BPS	Building Product Specifications
NZBC F8/AS1	Signs
AS 1191	Acoustics - method of laboratory measurement of airborne sound transmission insulation of building elements.
AS 1530.4:2005	Methods for fire tests on building materials, components and structures - Fire-resistance test of elements of construction
NZS 3602	Timber and wood-based products for use in building
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4232.2	Performance criteria for fire resisting enclosures - Fire resisting glazing systems
NZS 4520	Fire resistant doorsets
AS/NZS 4666	Insulating glass units
ISO 717.1	Acoustics - rating of sound insulation in buildings and of building elements - airborne sound insulation.
ISO 2063	Thermal spraying - Metallic and other inorganic coatings - Zinc, aluminium and their alloys

Warranties

1.3 WARRANTY

Provide warranty for:

5 years	Materials
5 years	Execution

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.4 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the joinery system materials and techniques specified.

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1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.6 CERTIFY COATINGS

Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to AS 3894.3, and retest where any dispute arises as to the thickness provided.

Performance

1.7 CERTIFY PERFORMANCE

Provide certificate of compliance with the requirements of this specification for fire and/or acoustics.

Performance - fire - doorsets and windows

1.8 FIRE REQUIREMENTS

To BPS, 8.3 Closures including fire doors, smoke control doors, glazing, and dampers, and BPS, 8.3 Closures including fire doors, smoke control doors, glazing, and dampers. Provide doorsets of the scheduled fire resistance rating, tested to NZS 4520.

1.9 VARIATIONS FROM STANDARD

Submit before manufacture a written opinion from a registered testing laboratory, that any variation from a production model satisfies the criteria laid down in NZS 4520.

1.10 FIRE DOORSETS REGISTER

Manufacturer to list doorsets in their "Register of Doorsets" to NZS 4520. Supply to building owner at practical completion.

1.11 EVIDENCE OF COMPLIANCE

When installation is completed provide written confirmation to NZS 4520, 6.4.2.

1.12 FIRE AND SMOKE SEALS

To BPS, 8.3 Closures including fire doors, smoke control doors, glazing, and dampers, and BPS, 8.3 Closures including fire doors, smoke control doors, glazing, and dampers.

Performance - acoustic - doorsets and windows

1.13 ACOUSTIC REQUIREMENTS

To AS 1191, and ISO 717.1. Manufactured to meet required STC rating. Complete with perimeter and bottom seals if required.

1.14 ACOUSTIC DOOR SEALS

To AS 1191and ISO 717.1.

2 PRODUCTS

Materials - general - fire

2.1 INTERIOR TIMBER

To NZS 3602. Moisture content 8 to 14%.

2.2 FIRE DOORS

To comply with NZS 4520, supplied with frame. Refer to SELECTIONS for details.

2.3 FIRE DOORSETS

To comply with NZS 4520. Frames to profile as detailed and dimensioned. Refer to SELECTIONS for details.

Make provision for the scheduled fire-rated hardware to be supplied and fitted. Make arrangements on delivery to the site, for the installer's certificate to be returned to the manufacturer.

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2.4 SMOKESTOP DOORSETS

To comply with NZS 4520 and BPS, 8.3.2 Smoke control doors, and BPS, 8.3.2 Smoke control door,. Frames to profile as detailed and dimensioned.

Refer to SELECTIONS for details.

2.5 GLAZING

Tested and approved glass to NZS 4232.2 and AS 1530.4 in the specified fire rated window, door and doorset system assembly Glass to NZS 4223.3 for areas subject to human impact. Refer to glazing section for details.

2.6 FIRE RATED HARDWARE

Make provision for the scheduled fire-rated hardware to be supplied and fitted. Make arrangements on delivery to the site, for the installer's certificate to be returned to the manufacturer.

Materials - general - acoustic

2.7 ACOUSTIC DOORS

Frames to profile as detailed and dimensioned. Refer to SELECTIONS for details.

2.8 ACOUSTIC DOORSETS

Frames to profile as detailed and dimensioned. Refer to SELECTIONS for details.

Components

2.9 WINDOW AND DOOR FURNITURE

Refer to 5521 HARDWARE for hardware selections and/or to SELECTIONS for type.

2.10 SCREWS

Zinc plate, zinc chromate, nickel plate or stainless steel. Length sufficient to penetrate into the background support up to the shank. Screws for fixing hinges, hardware or furniture to match the item being attached.

2.11 NAILS

Length sufficient to penetrate into the background support at least half the nail length, except if into radiata pine then three-fifths their length.

2.12 INSERTS, BOLTS AND FASTENERS

Items to be built into corrosive environments, to be hot-dip galvanized to AS/NZS 4680.

2.13 DOOR HINGES

Tested and approved with size and gauge to carry door size and weight. Refer to SELECTIONS for details.

2.14 FIRE AND SMOKE SEALS

PVC or silicone, suitable for plain or rebated frames.

2.15 ACOUSTIC DOOR SEALS

PVC or silicone, suitable for plain or rebated frames.

Finishes - General

2.16 PAINT FINISH PRIMER

Steel to be abrasive blasted prior to application of Epoxy Primer to paint manufacturers recommendations. Refer PAINT section for details.

2.17 PAINT FINISH

Refer PAINT section for details.



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3 EXECUTION

Conditions

3.1 GENERALLY

Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, and stairs).

3.2 CHECK ALL OPENINGS

Check all openings prior to manufacture for size and standard of execution before installing frames.

3.3 DELIVERY, STORAGE AND HANDLING

Take delivery of materials and goods and store on site and protect from damage.

Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufactures requirements.
Reject and replace goods that are damaged or will not provide the required finish

3.4 CONFIRM PREPARATION OF WALL OPENINGS

Confirm that wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

3.5 PROTECT

Protect all elements against damage to arrises and glazing beads. Store frames and doors flat on pallet or upright at an angle no greater than 15 degrees from perpendicular, and away from moisture or direct sunlight.

Assembly

3.6 FABRICATION GENERALLY

Manufacture and fabricate frames and doors as detailed. Install hinges and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

3.7 FABRICATE DOORSETS

Fabricate doorsets in the factory with doors hung and provision for furniture made as required.

3.8 FABRICATE DOORS

Fabricate doors in the factory, with provision for door furniture.

3.9 ANCHORAGES

Install all required anchorages to the manufacturers requirements, for the fire rated windows and doors, including sleeves, concrete inserts, anchor bolts and items with integral anchors that are to be embedded in concrete and/or masonry.

3.10 HARDWARE GENERALLY

Make provision for the scheduled fire-rated hardware to be supplied and fitted either in the factory or on site. Key alike all lockable hardware able to be keyed alike, including other interior doors. Account for all keys and deliver separately to the site manager.

Make arrangements on delivery to the site, for the installer's certificate to be returned to the manufacturer.

3.11 HINGES

Fit hinges to doors to support the door size and weight with a minimum of:

3 hinges	Doors up to 2.1 metres
4 hinges	Doors 2.1 - 2.4 metres
5 hinges	Doors 2.4 - 3.0 metres

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3.12 FACTORY FINISHING

Brace square and provide protection to assemblies during delivery to site. Where factory glazed, indicate the presence of transparent glasses with whiting, tape or signs compatible with the glass type.

3.13 ON SITE FINISHING - TIMBER FRAMES

Before installation:

- Prime both faces and all edges of timber doors not primed with an alkyd wood primer.
- Re-prime any subsequently cut edge.
- Refer to painting section/s for finishing.

Installation - generally

3.14 INSTALL FIRE WINDOWS, DOORS AND DOORSETS

Install and fix to comply with NZS 4520, NZS 4232.2, the stated fire rating requirements and the manufacturer installation details.

3.15 INSTALL ACOUSTIC WINDOWS, DOORS AND DOORSETS

Install and fix to comply with the stated STC rating requirements and the manufacturer installation details.

3.16 FIXING FRAMES

Fix and assemble frames rigidly in place, plumb, level and true to line and face without distortion to the manufacturer requirements.

3.17 DISTORTION

Do not distort frames when wedging or other packing, or when tightening fixings. If necessary adjust packing and fixings to eliminate binding. Do not cut, plane or sand frames to remedy distortion.

3.18 FIXINGS - TIMBER FRAMES

Fix frames to manufacturers requirements. Punch all nail heads below timber surfaces which will be visible in completed work. Ensure that at least one frame fixing is adjacent to each hanging point when fixing timber frames.

3.19 ANCHORAGES

Install all required anchorages to the manufacturers requirements, for the fire rated windows and doors, including sleeves, concrete inserts, anchor bolts and items with integral anchors that are to be embedded in concrete and/or masonry.

3.20 TOLERANCES

Install the finished prehung door to a dimensional accuracy of ± 2mm.

Installation - fire and acoustic doorsets and windows

3.21 INSTALL FIRE, SMOKESTOP AND ACOUSTIC FRAMES

Fix in accordance with NZS 4520 and the manufacturer instructions.

3.22 TIMBER STUD WALLS - TIMBER FRAMES

Wedge into opening and nail through into the studs. All wedges and fixing to be at hinge positions and opposite, with one fixing in the vicinity of the lock. Seal between back of frame and wall lining with, intumescent sealant for fire walls and acoustic sealant for acoustic walls.

3.23 HANG DOORS

Hang doors on hinges as specified and to operate freely.

3.24 BOTTOM CLEARANCE

Provide for specified floor coverings plus 7mm clearance at any point of swing. When floor covering is not specified, allow 25mm total.

For fire and smokestop doorsets, this clearance above finished floor coverings must not exceed 10mm. Jambs to be cut down to suit if necessary.

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3.25 REMOVE DOORS

Remove doors from the frames prior to, or on installation, and immediately seal on all 6 sides. Finish as required, store safely and near completion refit to avoid any damage.

3.26 GLAZING

Install selected glazing to NZS 4232.2 and AS 1530.4 into the specified window, door and doorset system assembly.

3.27 INSTALL FURNITURE

Install to NZS 4520. Install latches, locks and door furniture as scheduled.

Finishing

3.28 CHECK

Check and adjust operation of all doors.

3.29 MARKING OF FIRE-RATED DOORSETS

The marking of fire-rated doorsets to be according to NZS 4520, 6 **Marking and Documentation**.

3.30 FIRE-RATED DOORSET SIGNS

To NZBC F8/AS1, 5.2,**Fire and smoke control doors**.

3.31 SAFETY

Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Masking tape must not be used for this purpose.

Completion

3.32 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused materials and elements from the site.

3.33 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

3.34 REMOVE

Remove safety indicators and protective coverings, and wipe down all joinery thoroughly to leave it perfectly clean. Remove debris, unused materials and elements from the site.

4 SELECTIONS

Where there is a NO SUBSTITUTIONS clause in GENERAL, no substitutions are permitted to any of the specified systems, components and associated products listed in the following SELECTIONS.

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Fire

4.1 DOORSET - FIRE AND SMOKESTOP DOORS

Door Reference:	Refer to Architectural Drawings
Manufacturer:	TBC
Door function:	Refer to Architectural Drawings
Type:	Refer to Architectural Drawings
FRR/Sm:	Refer to Architectural Drawings and Fire Report
Leaf size:	Refer to Architectural Drawings
Thickness:	Refer to Architectural Drawings
Leaf material:	TBC
Leaf core:	Solid
Leaf skin:	TBC
Leaf facing:	TBC
Leaf finish:	TBC
Edge clashing:	Clashed 2 vertical edges
Frame material:	TBC
Frame finish:	TBC
Seals:	Refer to Architectural Drawings
Glass:	TBC

Acoustic

Glazing

4.2 GLAZING - FIRE AND SMOKESTOP

Refer to glazing section.

Hardware

4.3 HARDWARE SCHEDULE

Item	Type of hardware	Number off
Lockset & latch	TBC	TBC
Roller catch	TBC	TBC
Door closer	TBC	TBC
Push/pull handles	TBC	TBC
Eye viewers	TBC	TBC
Magnetic clamps	TBC	TBC
Power transfer	TBC	TBC
Door coordinator	TBC	TBC
Jamb seals	TBC	TBC
Sill seals	TBC	TBC
Grilles	TBC	TBC

4.4 HARDWARE

Refer to 5521 HARDWARE section.

4.5 HINGES

Type:	Radius
Size:	TBC
Pin:	Loose pin
Material:	TBC

4.6 KICK PLATES

Brand:	TBC
Size:	TBC
Material:	TBC

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Finishes

4.7 PRIMER

Brand/type: To suit

4.8 PAINTING

Refer to painting section/s for painting.

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5316RC RONDO DIRECT-FIX CEILINGS - RESIDENTIAL

1 GENERAL

This section relates to the manufacture, supply and installation of:

- Concealed direct-fix ceiling systems for residential type buildings, to meet acoustic, fire-rated, wind loading and seismic design applications, and strong enough to support layer(s) of sheet ceiling linings e.g. plasterboard, fibre cement sheet.

This section includes:

- Rondo KEY-LOCK® Direct Fix Ceiling System
- Rondo SCREWFIX® Concealed Ceiling System
- Rondo XPRESS® Drywall Grid Ceiling System

1.1 RELATED WORK

Refer to 5113 PLASTERBOARD LININGS for ceiling lining.

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 of New Zealand Inc
~	~

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

BPS	Building Product Specifications
NZBC B1/VM1	Structural design of buildings
NZBC B2/AS1	Durability provisions for building elements
NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 1170.0	Structural design actions - General principles
AS/NZS 1170.1	Structural design actions - Part 1: Permanent, imposed and other actions
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 2785	Suspended ceilings - Design and Installation
NZS 4219	Seismic performance of engineering systems in buildings
NZS 4541	Automatic fire sprinkler systems
AS 1397	Continuous hot-dipped metallic coated steel sheet and strip - Coating of zinc and zinc alloyed with aluminium and magnesium.

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Rondo KEY-LOCK® design manual
Rondo KEY-LOCK® installation guide
Rondo KEY-LOCK® online Seismic Wizard

Rondo SCREWFIX® design manual
Rondo SCREWFIX® installation guide
Rondo SCREWFIX® online Seismic Wizard
Rondo XPRESS® design manual
Rondo XPRESS® installation guide
Rondo XPRESS® online Seismic Wizard
Certificate of Licence for New Zealand Made trademark - Licence No. 806965

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Manufacturer/supplier contact details

Company:	**Rondo Building Services Pty Ltd**
Web:	www.rondo.co.nz
Email:	steve.hardy@rondo.co.nz
Telephone:	09 636 5110

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For Rondo branded products against defects in materials under normal use.
15 years	In addition, Rondo warrants that the Rondo KEY-LOCK® direct-fix, Rondo SCREWFIX DF®, Rondo XPRESS® systems will remain structurally sound.

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For workmanship

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS - GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.
Installers are to be members of the AWCINZ. Provide evidence of experience, listing completed projects of similar size and complexity.

1.8 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

Compliance information

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer / supplier warranty
- Internal Rondo engineered design - Refer to SELECTIONS
- Producer Statement (PS1) - Design from supplier independent engineer
- Producer Statement (PS3) - Construction from the applicator / installer.
- Producer Statement (PS4) - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.10 LOADING CODE REQUIREMENT

To AS/NZS 2785, comply with the requirements of: AS/NZS 1170.0, AS/NZS 1170.1, AS/NZS 1170.2, NZS 1170.5, NZBC B1/VM1, as appropriate.

1.11 CERTIFICATION

Provide:

- Certificates and other evidence that the system complies with the standards of performance specified.
- Producer Statements

1.12 ENVIRONMENTAL REQUIREMENTS

To NZBC B2/AS1, Durability.
Refer to SELECTIONS

1.13 FIRE GROUP NUMBERS

The Group Number Classification to NZBC C/AS2, Table 4.12.1.1: Maximum permitted Group Number for internal surface finishes, has been determined in accordance with BPS, 8.5.1 Group Numbers, following testing and data reduction to ISO 5660.1.

Refer to SELECTIONS

1.14 FIRE RATING REQUIREMENT

Design the ceiling system so that together with the floor and ceiling lining system, it is to BPS, 8.2 Fire resistance, and BPS, 8.2.1 Fire resistance ratings. Refer to SELECTIONS

Quality control and assurance

1.15 INSPECTIONS

TBC by Project Manager

2 PRODUCTS

2.1 RONDO KEY-LOCK® DIRECT-FIX CEILING SYSTEM

KEY-LOCK® direct fix system designed to AS/NZS 2785, and Rondo KEY-LOCK® design manual. Primary (Top Cross Rail), secondary components (Furring Channel), furring channels, battens, and snap in sections all hot-dipped (Z275) galvanized steel to AS 1397, manufactured from G2 BlueScope base metal.
Provide diagonal bracing for lateral stability where required. Perimeter trim, expansion joints and seismic joints etc. to AS/NZS 2785.
Refer to SELECTIONS.

Components

2.2 RONDO DIRECT-FIX BRACKETS

Rondo Direct-Fix Brackets manufactured from G2 BlueScope Steel, hot-dipped galvanized (Z275), to AS 1397.
Refer to SELECTIONS

2.3 RONDO PRIMARY AND SECONDARY SUPPORT MEMBERS

Rondo primary and secondary support members manufactured from G2 BlueScope Steel, hot-dipped galvanized (Z275) to AS 1397.

Refer to SELECTIONS

2.4 SECTION JOINERS

Rondo section joiners manufactured from G2 BlueScope Steel, hot-dipped galvanized (Z275) to AS 1397.
Refer to SELECTIONS

2.5 EXPANSION JOINTS

Flexible backing strip by others, and EXANGLE Plaster Stopping Bead, to Rondo XPRESS® technical brochure

2.6 CONTROL JOINTS

to Rondo XPRESS® technical brochure

2.7 RONDO WALL TRIM

Rondo wall trim sections manufactured from G2 BlueScope Steel, hot-dipped galvanized (Z275) to AS 1397.

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Accessories

2.8 ACCESS PANEL
Refer to SELECTIONS

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS
Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 SUBSTRATE
Ensure substrate is plumb, level and in true alignment. Do not start erection if the substrate will not allow work of the required standard.

Complete any remedial work found necessary before framing erection.

3.4 CO-ORDINATE SERVICES
Co-ordinate and co-operate with electrical and mechanical work to avoid conflict between suspension members and luminaires, diffusers, pipework and ducting. Confirm the provision of extra hangers and fixings.

Ensure co-operation with work in and above the ceiling, including the marking of specific major access points to above-ceiling services. Colour coded markings to follow the standards laid down by mechanical and electrical services.
Services and other attachments, attached to or supported by the ceiling grid system to AS/NZS 2785, ensure that:

- items over 7.5kg and items under 7.5kg, but falling greater than 3m, require a tether to AS/NZS 2785, anchored to structure.
- items attached to the ceiling grid must be under 10kg mass, items over 10kg cannot be attached to the grid and must be independently supported.
- unless designed otherwise, the ceiling system total load of services and other attachments must not exceed 3kg/m².
- light fittings installed to AS/NZS 2785 and NZS 4219.
- Ceiling system clearances to structure and services etc. that are not attached to the ceiling system to NZS 4219, and/or NZS 4541 for sprinklers.

3.5 SITE CONDITIONS
To AS/NZS 2785: Appendix C2, Site Conditions and time of installation; Appendix C4, Inspection.

Installation generally

3.6 STANDARDS AND TOLERANCES
Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 INSTALLATION - GENERAL
Install the system to AS/NZS 2785, and Rondo Professional Design Manual and Rondo Building Services Pty Ltd requirements.

Fix, erect and fit to finish rigid, plumb, square and true to line and face.

3.8 SETTING OUT
Set out the framing work true to line and square before starting erection.

3.9 ISOLATE
Isolate dissimilar metals with neoprene sheeting, or tape.

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3.10 ACCESSIBILITY

Provide access hatches where required to the ceiling system to enable servicing, maintenance, and removal of any part can be carried out without damage to the ceiling system or lining.

3.11 PENETRATIONS

To AS/NZS 2785 and NZS 4219 generally, with sprinkler systems to NZS 4219 and/or NZS 4541. Accommodate recessed light fittings, and services that are fixed to or pass through the ceiling system. Provide independent support for these as necessary.

3.12 BULKHEADS

Form bulkheads to manufacturer requirements. Diagonally brace at regular intervals to provide lateral stability.

3.13 PROTECT EXISTING WORK

Protect adjacent existing work from damage during the installation.

Completion

3.14 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go to www.rondo.co.nz
Substitutions are not permitted.

Performance

4.1 FIRE GROUP NUMBER

Title	Location	Group Number
Refer to Fire Report	Refer to Architectural Drawings and Fire Report	Fire to Fire Report

4.2 FIRE RATING REQUIREMENT

FRR (minimum)	Ceiling	Floor system	Location
Refer to Architectural Drawings and Fire Report	Refer to Architectural Drawings and Fire Report	Refer to Architectural Drawings and Fire Report	Refer to Architectural Drawings and Fire Report

Rondo KEY-LOCK® System - direct-Fix

4.3 RONDO KEY-LOCK® DIRECT-FIX CEILING SYSTEM

Location:	Refer to Architectural Drawings
Type/Brand:	KEY-LOCK® Direct-Fix Ceiling System
Furring Channels (FC):	Refer to Architectural Drawings
Perimeter Trims:	Refer to Architectural Drawings
Fasteners direct fix:	Refer to Architectural Drawings
Ceiling height:	Refer to Architectural Drawings
Fire rating:	Refer to Architectural Drawings

Components

4.4 PLASTERBOARD SHEET LINING

refer to 5113 PLASTERBOARD LININGS section

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4.5 CEILING LINING

Location:	Refer to Architectural Drawings
Brand / type:	Refer to Architectural Drawings
Thickness:	Refer to Architectural Drawings
Grade:	Refer to Architectural Drawings
Fixing type:	Refer to Architectural Drawings
Joint type:	Refer to Architectural Drawings
Finish:	Refer to Architectural Drawings

Accessories

4.6 ACCESS PANEL

Location:	Refer to Architectural Drawings
Brand:	Refer to Architectural Drawings
Panel Type:	Refer to Architectural Drawings
Part number:	Refer to Architectural Drawings
Edge detail:	Refer to Architectural Drawings
Panel Finish/colour:	TBC
Size:	Refer to Architectural Drawings
Fire Rating:	Refer to Architectural Drawings
Sound Rating:	N/A
Hardware/Security:	TBC

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5511 JOINERY & CABINETRY FIXTURES

1 GENERAL

This section relates to custom joinery fittings and cabinetwork, purpose made in a factory and fitted on site.

1.1 RELATED WORKS

Refer to 5521 HARDWARE for hardware separately specified.

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for fittings for bathrooms, toilets and washrooms.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

Documents

1.3 DOCUMENTS REFERRED TO

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

AS/NZS 1859.1	Reconstituted wood based panels - Specifications - Particleboard
AS/NZS 1859.2	Reconstituted wood based panels - Specifications - Dry processed fibreboard
AS/NZS 1859.3	Reconstituted wood based panels - Specifications - decorative overlaid wood panels
AS/NZS 4386.1	Domestic kitchen assemblies - Kitchen units
AS/NZS 4386.2	Domestic kitchen assemblies - Installation

1.4 WARRANTY - MANUFACTUER/SUPPLIER

Provide a material manufacturer/supplier warranty:

(TBC) years	For (TBC)

- Provide this warranty on the manufacturer/supplier standard form (if not available, then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installed/applicator warranty:

2 years	For installation

- Provide this warranty on the installer/applicator standard form (if not available, then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

2 PRODUCTS

Materials

2.1 TIMBER BOARDS AND FRAMES

Boards and frames carefully sawn to minimise the inherent warping, twisting and bowing of the selected species and to give a finish suitable for clear finishing.

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Components

2.2 BENCHTOPS

As detailed on the drawings and as required for specified fittings and appliances.

2.3 CARCASE CONNECTORS

One-piece steel, straight deep-cut thread, fibre board screws with press fit plastic trim cap.

2.4 CARCASE FASTENERS

Knock down type centric sphere zinc alloy connectors with connecting bolts, sleeves and dowels, to suit each particular fastening location.

2.5 BUTT HINGES

Butt, broad butt, flush butt or overlay steel or brass, to suit the location, or as detailed.

2.6 CONCEALED HINGES

All-metal zinc alloy with automatic spring and screw-fixed. Door stops of plastic foam with self adhesive backs, or plastic buttons clear or coloured to match unit.

2.7 GLASS DOOR HINGES

All-metal zinc alloy body and metal/plastic glass cup, with automatic spring, screw-fixed and with matching door pulls.

2.8 FLAP HINGES

All-metal, flush-fitted and screw-fixed with no gap when the flap is down.

2.9 FLAP STAY

All-metal, slide/folding and screw fixed.

2.10 DRAWER RUNNERS

Under mounted type, precision running ball-mounted full extension, bright steel finish system.

Accessories

2.11 ADHESIVES

As approved by the manufacturer for the timber product or pre-finished timber product joint being used.

3 EXECUTION

Conditions

3.1 JOINERY FIXTURES GENERALLY

Execution to include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs). Take responsibility for the completed joinery fixtures including fittings included within fixtures and the on site installation.

3.2 DOMESTIC KITCHEN ASSEMBLIES

Unless otherwise specified / detailed, domestic kitchens to be constructed to AS/NZS 4386.1 and installed to AS/NZS 4386.2

3.3 SITE MEASURE

Site check and confirm dimensions after wall linings have been fixed. Verify positions of electric power outlets, wiring to light fittings included in joinery fixtures, water supplies and waste pipe locations.

3.4 SHRINKAGE

Arrange jointing and fixing so that shrinkage in any part and direction does not impair the strength or appearance of the finished work or damage the adjoining work.

3.5 TOLERANCES

Provide reasonable tolerances at connections between the joinery fittings and the building fabric so that any irregularities are adequately compensated for in the site fixing.

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3.6 NATURAL FINISH TIMBER

Select timber for match or uniformity or symmetry of colour or grain of adjacent pieces. Finish to same standard on all faces.

Conditions - site

3.7 TRANSIT

Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather.

3.8 DELIVERY

Deliver fittings to the site only when floor, wall and ceiling surfaces are in place and the fittings can be immediately placed in their final location.

Assembly

3.9 MACHINING

Carry out machining within the practices required for the particular timber, wood product or pre-finished wood product being used. Machine drill holes, cut recesses and form joints ready for assembly to the componentry manufacturer's requirements. Ensure work is accurate, square and true to line.

3.10 MAKE CUT OUTS FOR APPLIANCES AND FITTINGS

Obtain fitting templates from the appliances and other fittings to be installed within joinery fixtures and bench tops. Ensure appliances and fittings can be installed with the required tolerances and clearances. Where bench tops are being provided under other work sections, provide templates and confirm dimensions to others.

3.11 ASSEMBLY

Carry out gluing, dowelling, and other operations necessary for the proper assembly of the fittings as detailed with fixings concealed unless detailed otherwise. Scribe fit adjustable shelves with 4 shelf pins to each and with force fit pin holes at 50mm maximum centres in solid cheeks. Construct drawers and using groove mounting runners, fit them with 3mm clearance into drawer space. Hang doors on concealed hinges with 115 degree openings except where detailed for 170 degrees.

3.12 GLUE JOINTS

Use glue joints where provision for shrinkage is not required. Cross-tongue or otherwise reinforce. Surfaces in contact to have an even sawn or planed finish and be free of contamination. Mix, apply and set to the glue manufacturer's requirements with adequate pressure applied to ensure intimate contact that will be maintained while the glue sets.

3.13 CONNECTOR JOINTS

Locate and drive connectors to the board manufacturer's requirements. Fit plastic trim cap where detailed. Conceal or hide from sight other connector heads.

3.14 FASTENER JOINTS

Locate and drive connecting bolts to the board manufacturer's requirements. Form joint and fit and rotate centric sphere connector to finish it rigid and tightly fitting over the whole length of the joint.

Application

3.15 FIXING ON SITE

- Scribe fit and conceal fix rigidly in place square, level, plumb and true to line and face as detailed and to the required standard.
- Assemble fittings on-site if brought in sections.
- Fit counter and bench tops and upstands.
- Complete with moveable parts in place and freely moving in their proper range.

3.16 PROTECT

Protect finished surfaces from damage, particularly benchtops.

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Completion

3.17 REPLACE
Replace damaged or marked elements.

3.18 LEAVE
Leave work complete, clean and without blemish and to the standard required by following procedures.

3.19 REMOVE
Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 TIMBER BOARDS AND FRAMES
TBC by Architect.

4.2 BENCH TOP
TBC by Architect.

4.3 CARCASE CONNECTORS
TBC by Architect.

4.4 CARCASE FASTENERS
TBC by Architect.

4.5 BUTT HINGES
TBC by Architect.

4.6 CONCEALED HINGES
TBC by Architect.

4.7 GLASS DOOR HINGES
TBC by Architect.

4.8 FLAP HINGES
TBC by Architect.

4.9 FLAP STAY
TBC by Architect.

4.10 DRAWER RUNNERS
TBC by Architect.

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5521 HARDWARE

1 GENERAL

This section covers the supply and installation of door and window hardware and furniture.

1.1 RELATED WORK

Refer to 4541SU STARKE AMBIENCE INLINE UPVC WINDOW SYSTEM for hardware and furniture for exterior aluminium windows and doors.

Refer to 5231 INTERIOR DOORS AND WINDOWS for hardware and furniture for interior timber windows and doors.

Refer to 5511 JOINERY AND CABINETRY FIXTURES for handles and furniture for built in furniture, cabinet work and joinery items.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS.

Requirements

1.3 SUPPLIER

A specialist in the supply of hardware, employing an experienced architectural hardware representative available to assist during the course of the hardware installation.

1.4 SUBMIT A SUPPLIER'S SCHEDULE

TBC by Architect

2 PRODUCTS

2.1 DOOR HARDWARE

Refer to SELECTIONS for product selection.

2.2 WINDOW HARDWARE

Refer to SELECTIONS for product selection.

2.3 CABINET WORK HARDWARE

Refer to SELECTIONS for product selection.

Components

2.4 FIXINGS

Provide matching fixings, including screws, clips, bolts and brackets for hardware supplied.

3 EXECUTION

Conditions

3.1 RETAIN

Retain hardware in the manufacturer's original packaging. Ensure that units are complete with fixings and installation instructions. Label each unit separately with its hardware number and door/window number to match the submitted and approved schedule.

3.2 PACKAGE

Package required hardware units in clear plastic and label each package with its hardware and door/window number and location to match the drawings and the submitted and approved schedule. Place packages in cartons selected for "level", "location", and/or "sector" and label the packages and the cartons similarly.

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3.3 STORE

Store hardware packages in a shelved, dry and securely locked area. Provide supervision when the secure area is unlocked and packages and cartons are being distributed; signing off each package from the schedule as released.

Installation

3.4 INSPECTION

Before starting the hardware installation, check frames, doors, sashes and adjacent finishes are ready for the proper installation of the hardware.

3.5 LOCATE

Locate hardware units at heights and/or locations shown on the drawings, or as required to comply with relevant Codes and Standards. Before proceeding, confirm any dimension not shown or known.

3.6 CUTTING AND FITTING

Carry out cutting and fitting of the substrate necessary for installing any hardware unit before painting or finishing of that surface. Remove hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

3.7 INSTALL HARDWARE

Install each hardware unit in accordance with the hardware manufacturer's requirements using templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with all moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion

3.8 ADJUST

Adjust and check each operating hardware unit for correct and smooth functioning. Replace those units that cannot be adjusted if they do not function correctly. Clean units and adjoining surfaces upon completing their installation. Only use lubricant if and when recommended by the hardware manufacturer/supplier.

3.9 REPLACE

Replace damaged or marked elements.

3.10 LEAVE

Leave work with parts fully and freely working and to the standard required by following procedures.

3.11 REMOVE

Remove debris, unused materials and elements from the site.

3.12 PROTECT

Protect hardware units from damage or marking.

3.13 FINAL ADJUSTMENT

Where hardware is installed more than a month prior to project completion, return and make a final check and adjustment of hardware units to ensure they are operating correctly, fitted properly and are undamaged.

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4 SELECTIONS

4.1 DOOR HARDWARE
TBC by Architect.

4.2 WINDOW HARDWARE
TBC by Architect.

4.3 CABINET WORK HARDWARE
TBC by Architect.

4.4 SUNDRY HARDWARE
TBC by Architect.

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5571 TIMBER STAIRS

1 GENERAL

This section relates to the fabrication and installation of interior timber stairs and landings.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC D1/AS1	Access routes
AS/NZS 1860.1	Particleboard flooring - Specifications
BRANZ BU 497	Stair construction

2 PRODUCTS

Materials

2.1 SOLID TIMBER COMPONENTS

Refer to SELECTIONS/DRAWINGS.

3 EXECUTION

Conditions

3.1 GENERALLY

Execution to include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

Check site dimensions. Carry out machining within the practices recommended for the particular timber, wood product or pre-finished wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's recommendations. Work to be accurate, square and true to line and face.

Application

3.2 FABRICATE AND INSTALL TIMBER STAIRS

Fabricate and install stair flights and landings to comply with NZBC acceptable solution D1/AS1:4.0 Stairways, and unless detailed otherwise to BRANZ BU 497. House and wedge treads and risers 15mm into strings, all glued, wedged and blocked. Form nosing overhangs of 25mm by splaying risers forward to finish flush with the front of the treads.

Completion

3.3 LEAVE

Leave work to the standard required by following procedures.

3.4 REMOVE

Remove all debris, unused materials and elements from the site.

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4 SELECTIONS

4.1 TIMBER STAIRS

Strings:	Refer to Architectural Drawings and Structural Engineers Drawings.
Treads:	Refer to Architectural Drawings and Structural Engineers Drawings.
Risers:	Refer to Architectural Drawings and Structural Engineers Drawings.
Finish:	Refer to Architectural Drawings.

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6411 VINYL SURFACING

1 GENERAL

This section relates to the supply and installation of vinyl surfacing including skirtings, nosings, trims and edges.
It includes:

- PVC sheet
- PVC tiles

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC D1/AS1	Access routes
NZS/AS 1884	Floor coverings - Resilient sheet and tiles - Installation practices
BPS	Building Product Specifications

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

(TBC) years: For materials

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 years: For execution

- 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

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

Performance

1.7 SURFACE FIRE PROPERTIES FOR FLOORING

Flooring to be non-combustible or have a Critical Radiant Flux to NZBC C/AS2, Table 4.12.3.1: Critical radiant flux requirements for flooring (kW/m2). Refer to SELECTIONS.

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Performance - Slip resistance

1.8 TEST - SLIP RESISTANCE

Test walking surfaces for slip resistance, refer to SELECTIONS for test condition.

2 PRODUCTS

Materials

2.1 VINYL SHEET

High vinyl content homogeneous monolayer flexible PVC sheet flooring.

2.2 COVINGS

Commercial applications:	Pencil cove with butterfly mitres to all external and internal corners. Fillet cove for safety flooring.
Domestic applications:	Pencil or fillet cove method.

2.3 TRIMS AND EDGING

PVC as supplied by the sheet manufacturer to complete the work.

Accessories

2.4 ADHESIVE

Standard acrylic adhesive to suit the material and substrate and to the vinyl manufacturer's requirements.

2.5 PRIMER AND SEALER

To the adhesive manufacturer's requirements for the particular substrate.

2.6 FLOOR LEVELLING COMPOUND

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Maintain rolls of sheet, packages of tiles and accessories undamaged and dry. Store rolls upright with other material on level surfaces in non-traffic, non-work areas that are enclosed, clean and dry.

Avoid distortion, stretching, marking and damage to edges while shifting, unrolling and handling sheet, tiles and accessories.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Confirm moisture content of substrate in accordance with NZS/AS 1884. Appendix A and for pH for concrete substrates in accordance with NZS/AS 1884. Appendix B. Do not commence laying vinyl until readings for the whole area are within acceptable levels as follows:

Moisture content:	

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	Timber substrate - 8 -12% for air conditioned buildings - 10 -14% for intermittently heated buildings - 12 -16% for unheated buildings
	Concrete substrate 75%RH
pH:	Concrete substrate 9-10pH

3.4 BEFORE COMMENCING WORK

Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, before starting work.

3.5 PREPARATION

Check that each colour supplied is from the same batch. Follow the vinyl manufacturer's requirements for conditioning of rolls and the working temperatures and conditions before, during and after laying. Protect work from solar heat gain and switch off under-floor heating during and for 48 hours either side, of the work period.

3.6 PROTECTION

Protect adjoining work surfaces and finishes during the installation.

3.7 LAYING GENERALLY

Carry out the whole of the work to NZS/AS 1884, and to the flooring manufacturer's requirements.

3.8 LAYOUT

Before beginning the installation confirm the proposed layout of material, location of seams and other visual considerations of the finished work.

Application - General / substrate preparation

3.9 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.10 PREPARATION NEW CONCRETE

Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind level, then vacuum to remove all dust.

3.11 PREPARATION, NEW PLYWOOD OR PARTICLEBOARD

Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind smooth, then vacuum to remove all dust.

3.12 PREPARATION FOR WALL LININGS

Prepare wall linings to requirements of wall lining manufacturer and vinyl manufacturer,for vinyl over.

3.13 INSTALL FLOOR LEVELLING COMPOUND

Install floor levelling compound in accordance with manufacturer’s requirements.

3.14 APPLY PRIMER OR SEALER FOR VINYL SHEET

Prime and/or seal porous plaster, concrete and timber substrates to the adhesive manufacturer's requirements.

Application - laying

3.15 LAYING VINYL SHEET

Roll out, cut, leave to condition and install sheet vinyl to the vinyl manufacturer's requirements. Ensure there are no air bubbles or twisting, that the seams are kept clear of adhesive, and immediately the sheet is adhered roll with a 68 kg roller.

3.16 THERMO-WELDING VINYL SHEET

Machine groove and thermo-weld all seams in specified areas, heating the sheet and weld rod to a sufficient temperature to melt and fuse them together into a single mass. Trim the weld to leave a smooth, flush surface with the sheet.

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3.17 CROSS JOINS

Plan and allow cuts to avoid cross joins. Obtain written approval of the owner before proceeding if cross joins are unavoidable. Cross joins are not acceptable in wet areas.

3.18 COVE VINYL

Pencil cove flooring to the specified height and finish off as detailed.

3.19 MITRES

Perform butterfly method to internal and external mitres. Thermo-weld all mitres.

3.20 FIT VINYL SKIRTING

Fit skirting in accordance with the skirting manufacturer's requirements.

Cleaning

3.21 CLEAN VINYL

Leave vinyl flooring surfaces free of adhesive, dirt and debris. Clean and finish vinyl to manufacturer's requirements.

Completion

3.22 PROTECTION

Provide the following temporary protection of the finished work:

3.23 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Test

4.1 TEST - SLIP RESISTANCE

Test walking surface for slip resistance to comply with NZBC D1/AS1, 2.1 Slip resistance. Refer to 1278SR SCHEDULE OF SLIP RESISTANCE TESTING for test method, minimum test value required and general reporting requirements.

Location:	Testing off site
Surface:	Vinyl
Test condition:	TBC
Level / slope:	TBC
Specific reporting requirements:	TBC

Performance – Fire Surface Properties

4.2 SURFACE FIRE PROPERTIES FOR FLOORING

Critical Radiant Flux	Flooring	Location
Refer to Fire Report	TBC	Refer to Architectural Drawings

Materials

4.3 VINYL SHEET FLOORING

Location:	TBC
Manufacturer/brand:	TBC
Colour/number:	TBC
Gauge:	TBC

4.4 VINYL COVINGS

Location:	TBC
Height:	TBC

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4.5 TRIMS AND EDGING

Location: TBC
Profile: TBC
Colour: TBC

Accessories

4.6 FLOOR LEVELLING COMPOUND

Location: TBC
Brand/type: TBC

4.7 ADHESIVE

Location: TBC
Brand/type: TBC

4.8 PRIMER AND SEALER

Location: TBC
Brand/type: TBC

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6511 CARPETING

1 GENERAL

This section relates to the supply and installation of carpet laid conventionally (stretched), direct stuck or double bonded (double direct stuck).
It includes:

- carpet underlay
- woven sheet carpet

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 2270	Plywood and blockboard for interior use
AS/NZS 2455.1	Textile floor coverings - Installation practice - General
BPS	Building Product Specifications

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

1 year: For materials

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year: For execution

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 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.

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

Performance

1.7 SURFACE FIRE PERFORMANCE

Flooring to be non-combustible or have a Critical Radiant Flux to NZBC C/AS2, Table 4.12.3.1: Critical radiant flux requirements for flooring (kW/m2). Refer to SELECTIONS.

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2 PRODUCTS

Materials

2.1 UNDERLAY
To AS/NZS 2455.1 Soft underlay and underlays manufacturer's requirements.
Refer to SELECTIONS for product selection.

2.2 CARPET
To AS/NZS 2455.1 Textile floor coverings.
Refer to SELECTIONS for product selection.

Components

2.3 BINDER BARS
Anodised aluminium section with fluted face.

2.4 DIVIDER STRIPS
Hardwood strips 20mm x 15mm or as specified. Refer to SELECTIONS for type and size.

2.5 EDGE GRIPPER
Timber/plywood to AS/NZS 2270 with steel grippers to carpet manufacturer's requirements, constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6580N over a 1220 mm length.

Accessories

2.6 TAPE
To carpet manufacturer's requirements.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Handle carpet on flat dollies using carpet cradles, with probes on fork- lifts and without sharp bending or folding. Store carpet in flat bins with a maximum height of three rows. Keep dry. Protect from damage.

3.2 ROUTINE MATTERS
Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS
Check work previously carried out and confirm it is of the required standard for this part of the work. Ensure all fittings and fixtures around which the carpet is to be scribed are in place. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Confirm moisture content of substrate in accordance with AS/NZS 2455.1. Appendix B Do not commence laying carpet until readings for the whole area are within acceptable levels as follows:

Moisture Content:	Timber substrate - 8 -12% for air conditioned buildings - 10 -14% for intermittently heated buildings - 12 -16% for unheated buildings
	Concrete substrate 75%RH

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3.4 BEFORE COMMENCING WORK

Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, before starting work.

3.5 TEMPERATURE

Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

3.6 PROTECTION

Protect adjoining work surfaces and finishes during the carpet installation.

3.7 TAPE

Tape for binding and seaming using type and width required by the carpet manufacturer to suit the specified carpet and the standard of performance required.

3.8 LAYING GENERALLY

Carry out the whole of the work to AS/NZS 2455.1 and to the flooring manufacturer's requirements.

3.9 LAYOUT

Plan the general layout so that:

- seams run lengthways
- traffic runs along the seam
- light from windows is not across the seam
- pile faces away from the light source.

Application - general / substrate preparation

3.10 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.11 PREPARING NEW CONCRETE FLOOR

To be level, smooth, clean, cured and dry. Remove loose material and dust.

3.12 PREPARING NEW WOOD PRODUCT FLOOR

To be level, sanded smooth and dry with loose material and dust removed.

Application - carpet laying

3.13 INSTALLATION, UNDERLAY

Installation to underlay manufacturer's requirements. Lay at right angles to the carpet direction.

3.14 INSTALLATION, CONVENTIONAL SYSTEM

Tape carpet joints, fix grippers to floor and install underlay and carpet to AS/NZS 2455.1, section 3. Stretch carpet tight in both width and length evenly without bowing, square with walls.

3.15 FIXING TRIMS

Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to the carpet manufacturer's requirements. Ensure that junctions with other materials are neatly formed, with bars and trim securely fastened to the substrate, 20mm from each end and at a maximum of 100mm centres.

Completion

3.16 PROTECTION

Provide the following temporary protection of the finished work:

3.17 SPECIAL PROTECTION

Self Adhesive carpet protective film: TBC

3.18 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

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Substitutions are not permitted to the following, unless stated otherwise.

Performance – Fire Surface Properties

4.1 SURFACE FIRE PROPERTIES FOR FLOORING

Critical Radiant Flux	Flooring	Location
Refer to Fire Report	TBC	Refer to Architectural Drawings

Materials

4.2 UNDERLAY

Location	Brand	Type/thickness/weight
TBC	TBC	TBC

4.3 CARPET

Location	Brand/type/weight/code	Installation method
TBC	TBC	TBC

Accessories

4.4 BINDER BARS

Brand: TBC
Colour: TBC

4.5 DIVIDER STRIPS

Brand/material: TBC
Dimension: TBC
Finish: TBC

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6512 CARPET TILES

1 GENERAL

This section relates to the supply and installation of carpet tiles.
It includes:

- nylon
- wool fibre
- polymer-backed

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 2455.1	Textile floor coverings - installation practice - General
AS/NZS 2455.2	Textile floor coverings - installation practice - Carpet tiles
BPS	Building Product Specifications

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

(TBC) years: For materials

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 years: For execution

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

Performance

1.6 SURFACE FIRE PROPERTIES FOR FLOORING

Flooring to be non-combustible or have a Critical Radiant Flux to NZBC C/AS2, Table 4.12.3.1: Critical radiant flux requirements for flooring (kW/m2). Refer to SELECTIONS.

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2 PRODUCTS

Materials

2.1 CARPET TILES

Nylon/wool fibre fusion-bonded to a polymer, PVC or bitumen backing.

2.2 ADHESIVE

A pressure release adhesive. Refer to SELECTIONS for brand.

2.3 FLOOR LEVELLING COMPOUND

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products. Keep carpet tiles dry. Protect from damage

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Ensure all fittings and fixtures around which the carpet tiles are to be scribed are in place. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Confirm moisture content of substrate in accordance with AS/NZS 2455.1. Appendix B Do not commence laying carpet tiles until readings for the whole area are within acceptable levels as follows:

Moisture Content:	Timber substrate - 8 -12% for air conditioned buildings - 10 -14% for intermittently heated buildings - 12 -16% for unheated buildings
	Concrete substrate 75%RH

3.4 TEMPERATURE

Floor temperature:	Minimum 16°C.
Concrete pH:	No more than 10.0.
Carpet tiles:	Conditioned at 16°C for a minimum of 24 hours prior to installation.

3.5 BEFORE COMMENCING WORK

Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, before starting work.

3.6 PROTECTION

Protect adjoining work surfaces and finishes during the carpet installation.

3.7 LAYOUT

Plan the general layout to:

- to conform with any special pattern requirements as detailed
- to maximise perimeter and cut module sizes and
- subject to any specific design instructions, to ensure that tiles are laid parallel to the longest wall.

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Application - general / substrate preparation

3.8 STANDARDS AND TOLERANCES
Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 PREPARING NEW CONCRETE FLOOR
To be level, smooth, clean, cured and dry. Remove loose material and dust.

3.10 PREPARING NEW WOOD PRODUCT FLOOR
To be level, sanded smooth and dry with loose material and dust removed.

Application - carpet tile laying

3.11 LAYING GENERALLY
Lay in accordance with AS/NZS 2455.1, AS/NZS 2455.2 and the carpet tile manufacturer's own installation instructions.

3.12 LAYING DIRECTION
Lay in a mono direction, except where specifically instructed otherwise.

3.13 CUTTING OF TILES
Cut tiles from the back, using the carpet tile manufacturer's required cutting technique.

Completion

3.14 PROTECTION
Provide the following temporary protection of the finished work:

3.15 SPECIAL PROTECTION
Self adhesive carpet protective film: TBC.

3.16 COMPLETION MATTERS
Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Performance – Fire Surface Properties

4.1 SURFACE FIRE PROPERTIES FOR FLOORING

Critical Radiant Flux	Flooring	Location
Refer to Fire Report	TBC	Refer to Architectural Drawings

Materials

4.2 CARPET TILES

Location:	Refer to Architectural Drawings
Brand:	TBC
Type:	TBC
Pattern/colour:	TBC
Face yarn:	TBC
Backing:	TBC
Pile weight:	TBC

4.3 ADHESIVE

Brand:	TBC
Type:	TBC

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4.4 FLOOR LEVELLING COMPOUND

Location: TBC
Type/brand: TBC

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6700R RESENE PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to **Resene** painting work.

1.1 RELATED WORK

Refer to 6721R RESENE PAINTING INTERIOR

Refer to 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

AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 9001	Quality management systems - Requirements
MPNZA	Health and Safety Programme

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Resene	Surface Information & Preparation Data Sheets (SIPDS) (hard copy or at www.resene.co.nz)
Resene	Product Data Sheets (hard copy or at www.resene.co.nz)
Resene	Putting your safety first

Copies of the above literature are available from **Resene**

Telephone: 0800 RESENE (0800 737 363)

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal conditions of use against failure referring to the **Resene** Promise of Quality in the **Resene** One-Line specifications and product data manual.

Requirements

This painting specification is written based on information available at the time of writing.

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Resene** coating system, or associated components and products. Do not combine paints from different manufacturers in a paint system.

If in the applicator's own expertise and judgement an amendment to this specification is required, or where a substrate preparation, or required painting system is not covered in this specification, this shall be brought to the attention of the contract administrator and any amendment agreed before work proceeds any further.



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1.7 QUALIFICATIONS

Painters to be experienced competent workers, familiar with the materials and the techniques specified and with the **Resene** coating systems and be members of the Master Painters New Zealand Association Inc.

The applicator is to have the necessary skill, experience and equipment to undertake the work. The applicator remains responsible for ensuring proper completion of the work.

Painters to be selected from the **Resene** Eco Decorator programme. The **Resene** Eco Decorator programme is designed to recognise a nationwide network of environmentally responsible, quality focussed painting contractors.
Refer to www.resene.co.nz/ecodecorator.htm for a list of Eco Decorators in your area.

1.8 PRIOR TO WORK COMMENCING

Before any work commences painters should verify, with Architects or specifying authority, that their paint matches a previously supplied standard card or panel. Differently coloured paints will vary in price, opacity and durability. **Resene** normally only specify two coats of colour but with certain colours, such as yellows and oranges, three coats may be needed. Refer to SELECTIONS for location and type.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

Maintenance guide for **Resene** paint finishes www.resene.co.nz/comn/services/maintenance.htm.

Provide this information prior to practical completion.

1.10 HEALTH AND SAFETY

Refer to and comply with the requirements of the Health and Safety at Work Act 2015 including the obligation to:

- Eliminate hazards and if hazards cannot be eliminated or isolated, then minimise the hazards in this work by using the proper equipment and techniques as required by the MPNZA Health and Safety Programme.
- Supply protective clothing and equipment.
- Inform the contractor as well as the employees and others on site of those hazards and put in place procedures for dealing with emergencies.

1.11 SAFETY DATA SHEETS

Obtain from **Resene** (phone 0800 RESENE, or www.resene.co.nz) the safety data sheet for each product used and comply with the required safety procedures. Keep sheets on site.

Performance

1.12 RESENE INSPECTION

Permit representatives of **Resene** to inspect the work in progress and to take samples of their products from site if requested. **Resene** will take care when inspecting the work, but does not accept any responsibility for the proper completion of the work before or after such inspection.

1.13 INSPECTION OF THE WORK

Inspection of the whole of the work at each of the stages set out in SELECTIONS may be made. Agree on a programme that will facilitate such inspection, including notification when each part and stage of the work is ready for inspection.

2 PRODUCTS

Materials

2.1 MATERIALS GENERALLY

Do not combine paints from different manufacturers in a paint system.

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Use only **Resene** products (which are guaranteed for consistency and performance under AS/NZS ISO 9001 and APAS) prepared, mixed and applied as directed in the **Resene** One-Line Specifications and Product Data Manual. This specification has been written using where practical and available both low/no VOC.

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 AS/NZS 2311.

3.2 TREATED SURFACES

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.

3.3 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior
For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.
Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior
For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish, seal to manufacturer's requirements.
Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.4 ANCILLARY SURFACES

The descriptions of areas in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-faced natural finish is required or items are completely prefinished. In cases of doubt obtain written instructions before proceeding.

3.5 HARDWARE

Do not paint hinges or hardware that cannot be removed. Before commencing work carefully remove hardware, fixtures and fittings, set aside where they cannot be damaged or misplaced and replace on completion. Refer to SELECTIONS for hardware, fixtures and fittings for removal.

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3.6 PROTECTION

Supply, lay and fix drop sheets, coverings and masking necessary to protect adjoining, fixtures, fittings and spaces from paint drops, spots, spray and damage.

Application - preparatory work

3.7 SURFACE PREPARATION

Refer to the **Resene** Surface Information & Preparation Data Sheets (SIPDS) and product data manual for surface preparation sheets (or obtain them by phoning 0800 RESENE, or at www.resene.co.nz) listed in the materials systems schedule clauses. Carry out the preparatory work required by them for each of the substrates.

3.8 SHARP EDGES, CRACKS AND HOLES

Remove and/or repair sharp edges, cracks and holes if present, as outlined in the preamble of the **Resene** One-Line specifications and product data manual.

Elastomeric sealants, if used, should not be painted. The paint film will not match the flexibility of the sealant and may severely limit its effectiveness.

3.9 REMEDIAL WORK

If any substrate or surface, that even with the preparation work called for in this section, cannot be brought up to a standard that will allow painting or clear finishing of the required standard then do not proceed until remedial work is carried out.

3.10 GAP FILLING

Make good cracks, holes, indented and damaged surfaces. Use suitable gap fillers to match the surface being prepared. Any special priming requirements of the fillers must be satisfied. Allow to dry or set before sanding back level with the surface. Prime or seal timber before using putty.

Exterior and wet areas: Use only Portland cement base or water-insoluble organic base gap fillers.

3.11 OFF-SITE WORK

Carry out this work under cover in a suitable environment with suitable lighting. Store items, both before and after coating, in a clean, dry area protected from the weather and mechanical damage, properly stacked and spaced to allow air circulation and to prevent sticking. Specific instructions for transport to site to avoid damage to the factory applied paint system may be required particularly for metallic top coat paints.

3.12 PRIMING JOINERY

Pre-treat any cut surfaces of preservative treated timber before priming. Ensure L.O.S.P treated joinery has dried sufficiently to lose solvent odour. Pre-treat bare timber with **Resene TimberLock** (see Data Sheet D48) to improve the durability of subsequent coats.

Liberally coat end grain, allow to soak in and then recoat.

3.13 CONCEALED JOINERY SURFACES

Where off-site coatings are specified they must be applied to surfaces including those concealed when incorporated into the building.

3.14 CONCEALED METAL SURFACES

Apply primer to suit the coating system to surfaces which will be concealed when incorporated into the building.

3.15 EXTERNAL DOORS

Prime or seal and paint bottom edges before hanging.

3.16 BEAD GLAZING

Stained, varnished, or painted joinery to have the first two coats of a suitable primer and one undercoat, applied to rebates and beads before glazing.

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3.17 PUTTY FRONTING - LINSEED GLAZING PUTTIES

According to the putty manufacturer's instructions allow putty to set, then prime with **Resene Wood Primer** (see Data Sheet D40) or **Resene Enamel Undercoat** (see Data Sheet D44). Fully protect the putty by completing the **Resene** coating system as soon as it is sufficiently firm.

Glazing putties not based on linseed oil to be over coated according to the putty manufacturer's instruction.

Application - generally

3.18 PAINTING GENERALLY

Comply with the **Resene** SIPDS Surface Information & Preparation Data Sheets or **Resene** One-Line specifications and product data manual data sheets and the additional requirements of this work section.

Ensure large wall areas that require more than one container of paint per coat, have enough paint boxed (mixed) together to complete the final coat. This will not apply if a single factory batch of paint, rather than shop tinted paint, is applied.

3.19 MIXING

Although generally supplied ready to use, all paints must be thoroughly mixed to lift any settled pigment and ensure the paint is homogeneous.

3.20 ENVIRONMENT

Defer painting of exterior surfaces until weather conditions are favourable - warm dry days without frost or heavy dews. Avoid painting in direct sunlight any surfaces that absorb heat excessively. As far as possible apply paint in the temperature range 15°C to 25°C. If temperatures fall outside the range of 10°C and 35°C do not paint unless paints with the necessary temperature tolerance have been specified. **Resene Hot Weather Additive** can be added to most **Resene** waterborne top coats to extend open time when application is undertaken at elevated temperatures or conditions that will cause rapid loss of water from the applied wet film. Do not apply solvent borne paint if moisture is present on the surface.

3.21 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- Back painting and pre-installation painting, then post-installation exposed-face painting
- Complete surface preparation before commencing painting.
- Apply primers, sealers, stains, undercoats, paints and clear coatings in the sequences laid down by **Resene**.
- Allow the full drying time between coats laid down by **Resene**.
- Do not expose primers, undercoats and intermediate coats beyond **Resene** recommendations before applying the next coat.
- Finish broad areas before painting trim.
- Ensure batch numbers of tins are matched for whole areas.
- Internally, paint ceilings before walls and walls before joinery, trim and other items.

3.22 APPLICATION

Select brush, roller, or pad and apply coatings to the requirements of **Resene** to obtain a smooth, even coating of the specified thickness, uniform gloss and colour.

3.23 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. A more thorough sanding to provide a mechanical key for the new paint system may be required depending upon the condition or age of the existing paint system..

3.24 DEFECTIVE WORK

Correct defective work immediately and recoat as required, following precisely the **Resene** system being applied. The same applies to transportation damage to site of factory painted items.

3.25 EACH COAT

Each coat of paint and the completed paint system to have the following qualities and properties:

- Uniform finish, colour, texture, sheen and hiding power and the proper number of coats applied.
- No blemishes such as runs, sags, crinkling, fat edges, entrained paint skins, hairs, dust, bare

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or starved patches, cracks, significant brush marks, ladder marks and blistering.
- Proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application.

Completion

3.26 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at the completion of the building works. Clean glass inside and out to a shining finish. Use the **Resene Washwise** on site 'paint equipment clean-up water' reclamation system to minimise the environmental impact of cleaning paint application tools.

3.27 LEAVE

Leave the whole of this work uniform in gloss and colour, of correct thickness, free from painting defects, clean and unmarked and to the standard required by following procedures.

3.28 REMOVE

Remove drop sheets, coverings and masking to leave surrounding surfaces and areas clean, tidy and undamaged. Remove debris, unused materials and elements from the site.

3.29 REPLACE

Replace hardware without damage to it or the adjoining surface and leave hardware properly fitted and in working order.

3.30 DISPOSAL OF PAINTS AND THINNERS

Note: The use and disposal of paint and thinners represents a significant environmental hazard.

Ensure all paint and thinners are disposed of in the following manner:

- When requested hand over part used paint containers to client for maintenance touch ups.
- Recycle leftover paint at a **Resene ColorShop** as part of the **Resene "Paintwise programme"**. Contact your local **Resene ColorShop** for details or view information online at www.resene.co.nz/paintwise.htm.
- Donate left over paint to local community groups.
- Solvent based paints, paint thinners, turpentine, mineral spirits and solvents require special disposal procedures. Do not pour down sewer or stormwater drains, sinks or into the ground. If they cannot be recycled they must be disposed of in a refuse dump licensed to take toxic waste.

3.31 MAINTENANCE

Good maintenance of coating systems involves a routine of regular cleaning as well as regular inspections. Regular inspections of the coating systems are recommended to identify breakdown, accidental damage to or undesirable deterioration of the paint.

Wash down of exterior coatings should be undertaken on an annual basis using **Resene Paint Prep** and **Housewash** (see Data Sheet D812).

Refer the **Resene** Caring for your paint finish brochure and the **Resene** website, www.resene.co.nz/comn/services/maintenance.htm.

4 SELECTIONS

4.1 SELECTIONS

Refer to 6711R RESENE PAINTING EXTERIOR and 6721R RESENE PAINTING INTERIOR for selections.

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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 Paints Ltd architectural and decorative coating systems.

Related work

1.1 RELATED WORK
Refer to 6700R RESENE PAINTING GENERAL for general matters related to painting work.

2 PRODUCTS

Materials

2.1 PRODUCTS
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

For further details on selections go to www.resene.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

4.1 INSPECTION OF WORK

Stage	Resene SIPDS number/system
TBC by Project Manager	TBC

Resene exterior paint systems

Exterior fibre cement cladding - new

4.2 RESENE NEW EXTERIOR FIBRE CEMENT SOFFITS

Surface Prep:	Resene SIPDS No3 and Spec Sheet 3: 4/1
1st coat:	Resene Concrete Primer D405, Acrylic Concrete Primer
2nd coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic
3rd coat:	Resene Sonyx 101 D30, Semi-Gloss Acrylic

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6721R RESENE PAINTING INTERIOR

1 GENERAL

This section relates to the surface preparation, painting and clear finishing of new and existing interior substrates using Resene Paints Ltd architectural and decorative coating systems.

Related work

1.1 RELATED WORK
Refer to 6700R RESENE PAINTING GENERAL for general matters related to painting work.

2 PRODUCTS

Materials

2.1 PRODUCTS
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

For further details on selections go to www.resene.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

4.1 INSPECTION OF WORK

Stage	Resene SIPDS number/system
TBC by Project Manager	TBC

4.2 BACK PAINTING SCHEDULE
Paint 2 coats (including any pre-prime) usually to match exposed face coating. If there is no coating use water resistant clear finish sealer.

Lining type	Extent of back painting
Plasterboard	To lining manufacturer's requirements

4.3 HARDWARE

Hardware for removal:	As required.

Resene interior paint systems

Plasterboard - new

4.4 RESENE NEW INTERIOR PLASTERBOARD, WALLS - DRY AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1: 1/1
Fire rating:	Group 1-S. Test Report FH4967
1st coat	Resene Broadwall D403, Waterborne Wallboard Sealer
2nd coat:	Resene Zylone Sheen D302, Waterborne Low Sheen Acrylic
3rd coat:	Resene Zylone Sheen D302, Waterborne Low Sheen Acrylic

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4.5 RESENE NEW INTERIOR PLASTERBOARD, WALLS - WET AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1A: 1/1
Fire rating:	Group 1-S. Test Report 7-593235-CO
1st coat:	Resene Waterborne Sureseal D42a, Waterborne Pigmented Sealer
2nd coat:	Resene SpaceCote Low Sheen Kitchen & Bathroom D311K Waterborne Enamel
3rd coat:	Resene SpaceCote Low Sheen Kitchen & Bathroom D311K Waterborne Enamel

4.6 RESENE NEW INTERIOR PLASTERBOARD, CEILINGS - DRY AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1: 1/1
Fire rating:	Group 1-S, Test Report FH4967
1st coat:	Resene Broadwall D403, Waterborne Wallboard Sealer
2nd coat:	Resene Ceiling Paint D305, Waterborne Flat Acrylic
3rd coat:	Resene Ceiling Paint D305, Waterborne Flat Acrylic

4.7 RESENE NEW INTERIOR PLASTERBOARD, CEILINGS - WET AREAS

Surface Prep:	Resene SIPDS No1 and Spec Sheet 1A: 1/1
Fire rating:	Group 1-S, Test Report 7-593235-CO
1st coat:	Resene Waterborne Sureseal D42a, Waterborne Pigmented Sealer
2nd coat:	Resene SpaceCote Flat Kitchen & Bathroom D314K, Waterborne Enamel
3rd coat:	Resene SpaceCote Flat Kitchen & Bathroom D314K, Waterborne Enamel

Interior timber - new

4.8 RESENE NEW INTERIOR TIMBER DOORS, JOINERY, SKIRTING

Surface Prep:	Resene SIPDS No2 and Spec Sheet 2: 9/1
1st coat:	Resene Quick Dry D45, Waterborne Acrylic Primer Undercoat
2nd coat:	Resene Lustacryl D310, Semi-Gloss Waterborne Enamel
3rd coat:	Resene Lustacryl D310, Semi-Gloss Waterborne Enamel

4.9 RESENE NEW INTERIOR TIMBER DOORS - HIGH-USE/WEAR AREAS

Surface Prep:	Resene SIPDS No2 and Spec Sheet 2: 9/1
1st coat:	Resene Quick Dry D45, Waterborne Acrylic Primer Undercoat
2nd coat:	Resene Lustacryl D310, Semi-Gloss Waterborne Enamel
3rd coat:	Resene Lustacryl D310, Semi-Gloss Waterborne Enamel
4th coat:	Resene Uracryl GraffitiShield RA58, Semi-Gloss Waterborne Urethane
5th coat:	Resene Uracryl GraffitiShield RA58, Semi-Gloss Waterborne Urethane

Note: Allow Resene Lustacryl to dry for 48 hours prior to applying Resene Uracryl GraffitShield

4.10 RESENE NEW INTERIOR TIMBER WALLS, CEILINGS - (PARTICLE BOARD, MDF, PLYWOOD)

Surface Prep:	Resene SIPDS No2 and Spec Sheet 2: 14/1
Fire rating:	Group 3
1st coat:	Resene Quick Dry D45, Waterborne Acrylic Primer Undercoat
2nd coat:	Resene Spacecote Low Sheen D311, Waterborne Enamel
3rd coat:	Resene Spacecote Low Sheen D311, Waterborne Enamel

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6742A ALTEX FIREPROOFING COATINGS - STEELWORK

1 GENERAL

This section relates to the preparation and painting of **Altex Coatings Ltd** intumescent and fireproofing coating systems providing fire rating protection for steelwork.
It includes:

- interior and exterior structural and miscellaneous steelwork items

1.1 RELATED WORK

Refer to 3411 STRUCTURAL STEELWORK for fabrication of structural steelwork.

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:

AMPP	Association of Materials Protection and Performance
DFT	Dry Film Thickness
FPANZ	Fire Protection Association of New Zealand
FR	Fire Rated
FRR	Fire Resistance Rating
HDG	Hot Dip Galvanizing
MPNZA	Master Painters New Zealand Association Inc
NZ CBIP	New Zealand Certification Board for Inspection Personnel

The following definitions apply specifically to this section:

Durability	The durability information listed in this section is the substrate corrosion protection achieved by the primer, intermediate and/or topcoat coatings(s). Does not include intumescent basecoat.

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZS/BS 476.21	Fire tests on buildings and structures - Method for determination of the fire resistance of load bearing elements of construction
AS 1530.4:2005	Methods for fire tests on building materials, components and structures - Fire resistance test of elements of construction
AS 1627.1	Metal finishing - Preparation and pretreatment of surfaces - Removal of oil, grease and related contamination
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Method selection guide - Abrasive blast cleaning
AS/NZS 2312.1	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Paint coatings
AS/NZS 2312.2	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings – Hot dip galvanizing
AS/NZS 3750	Paints for steel structures
AS/NZS 3750.13	Paints for steel structures - Epoxy primer (2 pack)
AS 3894.3	Site testing of protective coatings. Method 3: Determination of dry film thickness
AS 4089	Priming paint for steel - Single component - General purpose
AS/NZS ISO 9001	Quality management systems - Requirements
FPANZ	Code of Practice for the Specification and Application of Intumescent Coatings for the Fire Protection of Structural Steel.
MPNZA	Health and Safety Programme

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WorkSafe Guidelines for the provision of facilities and general safety in the construction industry

Health and Safety at Work Act 2015

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:

Altex Coatings/Carboline® Product Data Sheets
Altex Coatings/Carboline® Safety Data Sheets
Perlifoc HP Eco+ Product Data Sheet
Nullifire Technical Note NTN026

Manufacturer/supplier contact details

Company:	**Altex Coatings Ltd**
Web:	www.altexcoatings.co.nz
Email:	sales@altexcoatings.co.nz
Telephone:	0800 258 390 07 541 1221

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

(TBC) years For specified Altex fireproofing coating system

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.
- Condition of Warranty - Products must be applied in accordance with application and preparation procedures specified in AS/NZS 2312.1, Altex Coatings Ltd Specification and Product Data Sheets.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

(TBC) years: For application of specified Altex fireproofing coating system

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS

For intumescent coatings, applicators to meet the requirements of FPANZ Code of Practice for the Specification and Application of Intumescent Coatings for the Fire Protection of Structural Steel. If one or more of the FPANZ Code of Practice conditions are not met, an accredited third party coatings inspector should be engaged to oversee application.

For application of Nullifire SC902 applicators to be Altex trained and approved applicators.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified Altex Coatings Ltd Systems, components and associated products listed in this section without the express written approval from Altex Coatings Technical Services.



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1.9 SUPPLY VERIFICATION PRODUCER STATEMENT

Contact Altex Coatings Ltd before the shop or on-site application of fireproofing where a manufacturers product supply verification statement is required.

Compliance information

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Applicators approval certificate from the distributor
- Manufacturer / supplier warranty
- Applicator warranty
- Applicator Quality Assurance Records - applicators QA Procedures and Inspection Test Plan (ITP) & records
- Producer Statement - Construction (PS3) from the applicator including supplier Intumescent Paint manufacturer's - Fire Loading Schedule with the required Dry Film Thicknesses and floor plans identifying location of intumescent coatings.
- Producer Statement - Construction Review (PS4) from consultant engaged by client
- Third Party Inspection certification
- Other information required by the BCA in the Building Consent Approval documents including maintenance, fire rest reports, remedial specification

Performance

1.11 QUALITY ASSURANCE

Maintain quality assurance programmes to AS/NZS ISO 9001 for surface preparation, environment conditions and coating application, as necessary to ensure that work is performed in accordance with this specification and the qualifying requirements of the contract documents.

1.12 NON-CONFORMANCE TO SPECIFICATIONS

Any reduced passive fire protection system performance which may result from the steel preparation and / or selection of specified coatings not being followed in accordance with the specification is outside the control of Altex Coatings Ltd**.**

1.13 GENERAL INSPECTIONS - HOLD POINTS

Notify of Hold Point work/item, do not proceed further with work/item until advised to continue.

Notify:	Contract administrator
Notification:	2 working days prior to work/item being carried out.

Inspection of the work is to take place at each of the stages as scheduled. Refer to SELECTIONS.

Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

1.14 INDEPENDENT THIRD PARTY INSPECTIONS

If qualification requirements are not met, engage a third-party independent accredited inspector to verify that the work has been carried out in accordance with the required standards and provide certification of compliance. Confirm a written programme to facilitate these inspections by an Independent Inspector, including notification when each stage of the work is ready for inspection.

All coatings inspections are to be carried out by a minimum AMPP CIP Level 1 Certified Coating Inspector (or equivalent such as NZ CBIP Protective Coating Inspector) who has experience with intumescent coatings.

1.15 MANUFACTURER'S INSPECTIONS

Permit the paint manufacturer to carry out spot checks, verify QA records and take samples of their products as requested.

1.16 TESTING - DRY FILM THICKNESS

Test for dry film thickness of all intumescent paint system individual coatings and overall system thickness in accordance to AS 3894.3 and in accordance with FPANZ Code of Practice for the Specification and Application of Intumescent Coatings for the Fire Protection of Structural Steel.

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1.17 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as set out in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

1.18 SAFETY DATA SHEETS

Obtain from Altex Coatings Ltd the safety data sheet for each paint product used and comply with the required safety procedures. Keep sheets in application shop and on site.

Conditions

1.19 CONDITIONS - MATERIALS

Use only Altex Coatings Ltd products which are guaranteed for consistency and performance under AS/NZS ISO 9001 and when prepared, mixed and applied as directed in the Altex Coatings Ltd Coatings Manual or refer to www.altexcoatings.co.nz.

2 PRODUCTS

Fireproofing coatings

2.1 THIN FILM INTUMESCENT COATING

Nullifire® SC601, solvent based single component, fast drying intumescent coating, tested to NZS/BS 476.21. Applied by airless spray, it provides fire protection of interior, exterior concealed and exterior sheltered steel against structural failure for up to 90 minutes. Refer to SELECTIONS.

2.2 THIN FILM WATERBORNE INTUMESCENT COATING

Nullifire® SC802 single component fast drying waterborne intumescent coating tested to NZS/BS 476.21. Applied by airless spray, it provides fire protection of interior steel against structural failure for up to 60 minutes. Refer to SELECTIONS.

Intumescent sealer

2.3 INTUMESCENT SEAL COAT

Pro-Seal® Intumescent Seal Coat, a single pack solventborne coating used as a seal coat over Nullifire® SC601 and Nullifire® SC802 base coats to provide protection from weather, rain and moisture as well as seal the intumescent prior to applying finish coats. Also used to promote the cure of Nullifire® SC601 to achieve a Shore D50 level of hardness before finish coating. Refer to SELECTIONS.

Primers

2.4 EPOXY PRIMER

Carboguard® 504, a high performance chemically cured epoxy primer. Complies with AS/NZS 3750.13. May be applied onto mild steel and non-ferrous metals for interior and exterior use. Refer to SELECTIONS.

2.5 ALL PURPOSE EPOXY

Carboguard® 635, a two-component epoxy coating suitable for use as a corrosion resistant primer or as an epoxy intermediate coat. May be applied onto mild steel and hot-dip galvanized steel (HDG), for interior and exterior use. Refer to SELECTIONS.

Polyurethanes

2.6 POLYURETHANE SATIN FINISH

Carbothane® 133 LH, a high performance aliphatic acrylic-polyester polyurethane satin finish. Applied by brush, roller or spray. Suitable for application over a number of Carboline primers and intermediates. Available in a range of colours. Refer to SELECTIONS.

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2.7 POLYURETHANE HIGH GLOSS FINISH

E-Line® 949, a fast dry two component aliphatic polyurethane high gloss finish. Applied by spray, brush or roller. Suitable for application over a number of Carboline primers and intermediates. Available in a range of colours. Refer to SELECTIONS.

Waterborne acrylic

2.8 ACRYLIC ENAMEL SEMI-GLOSS FINISH

Resene Lustacryl, a single pack waterborne acrylic enamel finish. Applied by spray, brush or roller. Suitable for application over a number of Carboline primers and intermediates. Available in a range of colours. Refer to SELECTIONS.

Coating systems

2.9 COATING SYSTEMS

Refer to SELECTIONS for type.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products. Store paint containers in accordance with selected product Technical Data Sheets and any Health and Safety at Work (Hazardous Substances) regulations.

For off-site coated steelwork, implement protective measures and care during transport, storage and erection of steelwork. If off-site steelwork is to be stored for pro-longed periods and exposed to the weather, stack and cover to eliminate ponding of water and periodically wash down to remove surface contamination.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-COATING/FINISHING REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for specified finish. Carry out such additional preparatory work as required to bring the substrate to suitable condition.

3.4 ENVIRONMENTAL CONDITIONS FOR PAINTING - MONITORING

Carry out off-site and on-site preparation and coating application in accordance with conditions as per Technical Data Sheet for specified Altex products. Do not carry out preparation or painting when the ambient relative humidity exceeds 85%, or when the steel surface temperature is within 3°C of the dew point.

For intumescent coating systems, monitor and record environmental conditions before and after application and at maximum 4 hourly intervals as part of the project Q&A documentation. The minimum conditions monitored are:

- Air temperature
- Steel temperature
- Dew point
- Relative humidity

3.5 COATING APPLICATION

Apply coatings strictly in accordance with the manufacturer stated requirements. Ensure that the manufacturer latest product data sheets are available for reference during preparation and painting.

3.6 COMPATIBILITY / CONDITIONS OF EXPOSURE

Ensure that materials used and systems applied are approved by the manufacturer for the particular surface and conditions of exposure, and that materials used within each painting system are compatible with each other and are from the same manufacturer.

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3.7 SEQUENCE OF OPERATIONS

Complete surface preparation before commencing painting. Apply paint in the specified sequence using the specified paint. Allow full drying time between coats to the manufacturer stated requirements. Do not expose primers, undercoats and intermediate coats beyond a few days before applying the next coat.

3.8 DRYING & OVER-COATING TIME

Ensure that surfaces being painted are clean and dry and that ambient conditions are such that condensation does not occur before the paint reaches surface-dry condition.

Before handling or applying the next coat of paint, give each coat the required drying time required by the manufacturer. Where high film builds of intumescent are required, apply in thinner multiple coats according to supplier recommendations.
Ensure that Nullifire SC601 intumescent coated sections are sufficiently cured before over-coating (refer to Altex Coatings).

3.9 FRAMING TIMBER AND CLADDING PANELS TO FIRE-RATED STEEL

In most instances 90mmx45mm framing timber can be fixed directly to Nullifire intumescent coated steelwork up to FRR60 in accordance with supplier directions. Approval for some proprietary panels directly adjacent to Nullifire intumescent coated steelwork may also be obtained from Altex Coatings.

3.10 INSTALLATION OF SUNDRY ATTACHMENTS

Ensure attachments to fire rated structural steelwork are treated in conformance with FPANZ CoP and in line with Altex supplier approvals.

3.11 PROTECT ADJOINING SURFACES

Protect adjoining surfaces and areas to prevent contamination from overspray or fallout of materials.

Application

3.12 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - surface preparation

3.13 UNPAINTED SURFACES

Do not paint:

- Faying face of high strength friction grip (HSFG) bolted joints
- Areas for site welding keeping 75mm clear all round

3.14 SURFACE PREPARATION

Remove all slag.

Refer to AS/NZS 5131, 9.8.4 for the appropriate treatment grades of sharp edges and corners. Unless otherwise stated in the project specification or drawings, a minimum treatment grade P2 shall apply and cut edges shall have a chamfer of at least 1mm in width prior to painting.

The following applies:

For welds exposed to view:	Remove weld splatter and grind to a neat, clean finish
For intumescent fireproofing coating:	Remove rust and mill scale by abrasive blasting to Class Sa 2½ AS1627.4 (SSPC SP10)

Pre-clean steelwork to AS 1627.1, (SSPC SP1), then carry out abrasive blasting after completion of the fabrication. Apply required coating to the coating manufacturer requirements. Apply primer coat within 4 hours of preparation. Work off site wherever possible. Surfaces that are in contact or near contact are to receive specified coating before assembly.

3.15 CONDITIONS FOR PREPARING STEELWORK BEING PAINTED

Prepare steelwork in conditions approved for the application of coatings. Carry out off site preparation and coating applications under cover, in a controlled environment and with adequate lighting.

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3.16 ABRASIVE BLASTING

Remove oil and grease by the use of solvents to AS 1627.1. Abrasive blast clean to Class Sa 2½ finish to AS 1627.4 (SSPC SP10) bright metal. Select a suitable blast media type and equipment such that the prepared surface has an angular blast profile of between 38 and 75 microns. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

3.17 POWER TOOL DISC CLEANING

Remove oil and grease by the use of solvents to AS/NZS 2312.1, 4.2.2. Power tool disc cleaning to AS/NZS 2312.1, 4.2.4, St3 level of finish. Take care not to burnish the surface. Check that no burrs or sharp arrises remain which may prevent full coating thickness being attained.

3.18 PREPARING ZINC PRIMED SURFACES

Zinc primers must be free from zinc salts, remove if present. Remove grease, oil and other solvent-soluble contaminants by solvent wiping with D30 Degreaser/Dewaxer. Allow to dry and proceed with the next operation immediately. All zinc primed surfaces are to be lightly abraded to achieve a surface key. Areas of smooth or glossy surfaces are to be abraded to a matte finish.

Application - general

3.19 EACH COAT

Each coat of paint and completed paint system to have the following qualities and properties:

- Uniform finish, colour, texture, sheen and hiding power
- Correct number of coats applied
- Free of defects such as pin holing, alligatoring, blistering, staining, overspray, peeling, runs, sags and wrinkling.

3.20 PRIMING -GENERALLY

Apply specified Altex primer to prepared steelwork in accordance with the primer manufacturer's Technical Data Sheet and to the required DFT for the specified Intumescent Coating System, refer to SELECTIONS for details. Test and record DFT as part of the project Q&A documentation.

The maximum average thickness of primer (measured according to ASFP TGD 11 guidelines) for an item to be coated with intumescent should not exceed a dry film thickness (DFT) of 150 microns average. Any single spot reading shall not exceed 250 microns and any 3 point average reading should not exceed 200 microns DFT.

If shop primed, allow for patch priming on site after erection.

3.21 PATCH PRIMING

Clean and prepare areas of damaged priming and areas left clear for site jointing to a standard comparable with the shop cleaning specified. Degrease to remove chemical fume deposits resulting from welding as well as other contamination. Apply priming coat/s to same standard as shop primers, ensuring thorough coating of bolts, nuts and connection areas. Re-prime if the primer fails, or more than the specified primer re-coat time has lapsed before the final coating system is applied.

3.22 PRIOR TO INTUMESCENT COATING APPLICATION

Confirm surface preparation is in accordance with Altex Technical Data Sheet for specified intumescent coating. Ensure surface is clean and dry, ready for intumescent coating. Lightly abrade primer coat to provide a key.

If system includes primer, ensure primer condition is suitable and confirm primer is within re-coat time. Ensure primer DFT summary documentation has been provided however the on-site applicator should carry out their own readings to confirm DFT of primer. Proceeding with the application of intumescent coating implicitly accepts the condition and DFT of primer.

Ensure each steel section is adequately identified and required intumescent coating type and thickness confirmed.

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3.23 APPLICATION OF INTUMESCENT COAT - GENERALLY

Apply selected Altex intumescent coat/s to coating manufacturer requirements and the required DFT specified for each fire rated structural steel member. If the on-site application of intermediate and/or finish coats is via brush/roller multiple coats will be required to achieve the nominated dry film thickness.

3.24 BOLTED / WELDED CONNECTIONS AND GALVANIZED BOLTS

For shop applied intumescent coatings, allow to mask off areas within 100mm of steel requiring to be site welded prior to shop application. After site welding has occurred allow to clean and prepare area, apply primer and intumescent coating on-site in accordance with manufacturer's requirements.

For fire rated bolted connections allow to apply Intumescent coating at the same DFT of adjacent beam/column, plus finish coat if required.

For galvanized bolts allow to degrease, abrade and apply an approved primer coat prior to the intumescent coating of galvanized bolts.
Contact Altex Coatings Ltd for FR Galvanized Bolt painting specification.

3.25 INTUMESCENT COAT - DRY FILM THICKNESS

Apply intumescent coating to the required DFT specified for each fire rated structural steel member. Note the DFT's are item specific and are to be obtained from the Fire Loading Schedule issued by Altex Coatings Ltd. If DFT for fire rated sections are not detailed within, contact Altex Coatings Ltd for details. Refer to SELECTIONS for details.

3.26 INTUMESCENT COAT - DRY FILM THICKNESS DEFICIENCY REPAIR

Where DFT testing has confirmed that intumescent coating DFT is less than acceptable criteria, further application of coating is required. Ensure that the application is within the re-coat time of intumescent coating. Ensure surface is clean, dry and free from contamination, then apply intumescent coating to manufacturers requirements.

Where DFT testing has confirmed that intumescent coating DFT is more than manufacturer's acceptable criteria, contact manufacturer for corrective procedures.

3.27 APPLICATION OF TOPCOAT - GENERALLY

For systems with decorative and/or protective (non-intumescent) topcoat, lightly abrade intumescent coat to provide a key. Apply topcoat / coats by spray, brush or roller in accordance with the relevant product Altex Technical Data Sheet and manufacturer's requirements. Refer to SELECTIONS for dry film thickness.

3.28 APPLICATION OF TOPCOAT - ARCHITECTURAL FINISH

For systems with decorative and/or protective (non-intumescent) topcoat, if a high quality aesthetic finish is required, a thorough sand of the Intumescent coating is recommended prior to applying the topcoat. When sanding intumescent coatings always ensure adequate film build is maintained to provide the required DFT.

3.29 WEATHER PROTECTION AND SEAL COATING OF INTUMESCENT COATED STEEL SECTIONS

Unsealed Nullifire SC601 will not withstand prolonged rain/water contact, even under optimum curing conditions during construction. Where exposure to weather, rain and/or water contact may occur, temporary protection is strongly recommended. Application of Altex Pro-Seal intumescent sealer coat will provide weather protection during construction once the required dry film thicknesses are achieved (refer to Altex Coatings).

Also apply Altex Pro-Seal intumescent sealer to Nullifire SC601 in the following situations:
- when shop applying the intumescent or to mitigate the risk with water, rain or weather contact while in laydown areas or during on-site construction.
- when steel sections are adjacent to glazing which will be in direct sun contact
- to promote the hard cure of Nullifire SC601
- to permit the application of a wide range of architectural finishes.

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3.30 PROTECTION OF COATED STEEL SECTIONS

Ensure that unsealed Nullifire SC601, Nullifire® SC802, Perlifoc HP Eco+ and Southwest Type 5GP coated steel sections are not exposed to any water, rain or moisture contact both during application as well as during the design life (refer to Altex Coatings).

Completion

3.31 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

3.32 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

4 SELECTIONS

For further details on selections go to www.altexcoatings.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

4.1 STRUCTURAL STEEL MEMBER SCHEDULE

Refer to Structural Design Features Report for structural steel fire loading schedule.

Inspections

4.2 GENERAL INSPECTIONS - HOLD POINTS

Hold Point Schedule:

Location / Coating system:	Hold point inspection:	Requirement
Shop & on-site	Primer DFT & QA	QA report. Primer DFT baseline readings
On-site	Following intumescent application	QA / DFT reports
On-site	Following sealer or topcoat application	Following sealer or topcoat application

Interior visible fire rated steel

4.3 INTERIOR VISIBLE FR STEEL - EPOXY PRIMER + SOLVENTBORNE INTUMESCENT + FINISH

Location:	Refer to Architectural Drawings
Supplier:	Altex Coatings Ltd
Durability:	15-25 years substrate corrosion protection. “C1: Very Low” AS/NZS 2312.1
System:	Epoxy Primer / Intumescent / Sealer (optional) / Polyurethane Finish
Preparation:	Abrasive blast to AS 1627.4 Class Sa 2½
1st coat:	Altex Carboguard® 635 @ 75 microns DFT (shop applied)
2nd coat:	Altex Nullifire® SC601 @ ~ microns DFT Refer to Altex Coatings Ltd fire loading schedule for required DFT for each structural steel member.
3rd coat:	If required, Altex Pro-Seal® @ 50 microns DFT
4th coat:	Altex E-Line® 949 @ 75 microns DFT
4th coat colour:	TBC
FRR:	30/-/-

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6743ZF ZONE FIREZONE™ INTERIOR INTUMESCENT SYSTEMS

1 GENERAL

This section relates to the application of **Zone Architectural Products** FireZone™ clear and pigmented intumescent coating system to interior timber and plasterboard linings.

FireZone™ 92 clear water-based intumescent coating system for timber:
Substrates include:

- Bare uncoated interior timber
- Previously stained interior timber
- Previously clear coated interior timber

FireZone™ 52 white intumescent coating system for timber and plasterboard:
Substrates include:

- Bare uncoated interior timber
- Previously painted interior timber
- ≥10mm plasterboard linings

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

DFT	Dry Film Thickness
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile Organic Compounds
WFT	Wet Film Thickness
Zone	Zone Architectural Products
FZ52	FireZone™ 52 white intumescent coating
FZ92	FireZone™ 92 clear intumescent coating

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC C/VM2	Framework for Fire Safety Design
AS/NZS 2311	Guide to the painting of buildings
EN 13501-1	Fire classification of construction products and building elements
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate
BPS	Building Product Specifications
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
MPNZA	Health and Safety Programme
HSWA	Health and Safety at Work Act 2015

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

FireZone™ 92 Product Data Sheet
FireZone™ 92 Material Safety Data Sheet

Manufacturer/supplier contact details

Company:	**Zone Architectural Products**
Web:	www.zone.net.nz
Email:	specification@zone.net.nz

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Telephone: 09 623 1699 Auckland
Freephone: 0800 508 800

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years For materials

- Provide this warranty on the **Zone Architectural Products** standard form (if unavailable, use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of Practical Completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years For application

- Provide this warranty on the installer/applicator standard form (if unavailable, use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of Practical Completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any of the **Zone Architectural Products** specified systems, components or associated product listed in this section.

1.7 QUALIFICATIONS

Applicators to be experienced in the application of FireZone™ intumescent coatings and approved by **Zone Architectural Products**. If requested provide evidence of qualification / experience prior to commencing work. Contact **Zone Architectural Products** for a current list of FireZone™ preferred applicators.

1.8 QUALITY ASSURANCE RECORD

Maintain quality assurance programmes to **Zone Architectural Products** requirements for preparation, painting/coating, applied coating thickness, and as necessary to assure that work is performed in accordance with this specification and the manufacturer's requirements.

1.9 INTUMESCENT COATING CERTIFICATE

Apply for and obtain intumescent coating certificates from **Zone Architectural Products**. Certificates will only be issued once all work has been completed to the standard required by the specification and supporting evidence of such is provided to **Zone Architectural Products** by the applicator.

1.10 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as set out in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

1.11 ENVIRONMENT

Refer to **Zone Architectural Products** for up to date VOC levels, as these are subject to change.

1.12 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of general operation and maintenance information as electronic PDF format documents. Information to include the expected life of the system, maintenance requirements and anticipated topcoat recoat timeframes.

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Provide this information prior to Practical Completion.

Compliance information

1.13 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer's, importer's or distributor's warranty
- Intumescent coating certificate - from **Zone Architectural Products**
- Applicator's QA documentation
- Applicator's warranty
- Producer Statement - Construction from the Applicator
- Producer Statement - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance - fire

1.14 FIREZONE™ 92 FIRE GROUP NUMBER

The Group Number Classification to Table 4.12.1.1: Maximum permitted Group Number for internal surface finishes, has been determined in accordance with testing to EN 13501-1 to BPS, Table 8.5.3.1A: Group Numbers based on classifications from BS EN 13501-1:2018,

System	Group Number
FireZone™ 92 system on interior solid timber substrate ≥ 9mm thick and ≥ 338kg/m³	Group 1-S (achieves highest performance)

2 PRODUCTS

Materials - FireZone™ 92

2.1 INTUMESCENT BASECOAT

FireZone™ 92 FZ-92 BC is a water based, clear intumescent basecoat. VOC ≤ 25g/L.

2.2 TOPCOAT

FireZone™ 92 FZ-92 TC is a water based, clear intumescent topcoat. VOC = 76g/L.

3 EXECUTION

Conditions - General

3.1 DELIVERY, STORAGE AND HANDLING

Move/handle and store goods in accordance with **Zone Architectural Products** requirements.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Check the substrate meets the requirements as required by **Zone Architectural Products**. Ensure that surfaces being coated are clean, dry and that ambient conditions are such that condensation does not occur before the paint reaches surface-dry condition.

Ensure moisture content is:
Moisture content timber less than 15% maximum

3.4 COATING APPLICATION

Apply coatings strictly in accordance with **Zone Architectural Products** stated requirements and AS/NZS 2311. Thinning of the FireZone™ product and the use of additives is not allowed.

3.5 ADJACENT SURFACES

Protect all adjacent surfaces. Clean up any drips, runs or spills immediately, do not allow to dry.

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3.6 RECORD

Check and record air temperature, humidity and substrate moisture levels at regular intervals during application.

3.7 COMPATIBILITY

Ensure that materials are as required by their manufacturer for the particular surface and conditions of exposure.

3.8 SEQUENCE OF OPERATIONS

Complete surface preparation before commencing painting. Apply coating in the specified sequence.

3.9 DRYING TIME

Before handling or applying the next coat, give each coat the required drying time required by **Zone Architectural Products**. Protect surfaces from being exposed to direct sunlight, excessive heat, low temperature, condensation and contamination.

Preparation - FireZone™ 92

3.10 FIREZONE™ 92 PREPARATION - BARE UNCOATED TIMBER

Lightly sand to provide a smooth surface suitable for a clear coating. Perform an adhesion test and sample for opacity to ensure the substrate is compatible with FireZone™ 92. Fill holes, cracks and surface imperfections with an appropriate filler. Sand to a smooth, clean, dry finish, free of any contamination to ensure proper adhesion. Remove any contaminates by wiping with methylated spirits, or clean dust off surface with a damp cloth. Check moisture content of timber is below 15% prior to application of FireZone™ 92 coating system.

Application conditions

3.11 STIR COATING

Ensure coating is vigourously stirred prior to and during application to **Zone Architectural Products** requirements.

3.12 FIREZONE™ 92 APPLICATION CONDITIONS - TIMBER SUBSTRATES

Application conditions:

- Ensure room and substrate temperature is at least 15°C and rising 20°C to 25°C being the recommended temperature range for application. Do not apply if temperature will fall below 15°C within 2 hours of application.
- Ensure adequate ventilation in all application areas. Use forced air heaters, fans and / or dehumidifiers if required.
- Maximum relative humidity for application 70%.
- Ensure substrate moisture levels are less than 15%.

Application - FireZone™ 92 equipment

3.13 APPLICATION EQUIPMENT - BRUSH WARE

Apply product with quality synthetic filament brush ware, in accordance with **Zone Architectural Products** instructions.

3.14 APPLICATION EQUIPMENT - ROLLER

Apply product with Dacron or microfibre roller sleeves, in accordance with **Zone Architectural Products** instructions.

Application - FireZone™ 92

3.15 APPLY COATING - BARE UNCOATED TIMBER

Apply intumescent coating system in accordance with **Zone Architectural Products** specific requirements, refer to SELECTIONS for details.

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Application - Wet film thickness

3.16 MONITOR WET FILM THICKNESS

Monitor coating thickness during application to ensure the correct WFTs are achieved. Use a **Zone Architectural Products** provided wet film gauge. Press the teeth of gauge into the wet paint, holding the gauge at right angles to the surface. The last wet tooth denotes the wet film thickness in microns. Keep the gauge clean and do not let paint dry on it.

Application - Recoating

3.17 RECOATING TIMES - FIREZONE™ 92 COATING SYSTEM

Refer to **Zone Architectural Products** for recoat times. As a minimum allow 4 hours between each application to ensure each coat is fully dry through before proceeding with subsequent coats. Do not recoat surface unless it is clear, feels firm, dry and does not deform under moderate thumb pressure.

Completion

3.18 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

Leave the whole of this work uniform in gloss, texture and colour, free from coating defects, clean and unmarked, and to the standard required by following procedures.

4 SELECTIONS

For further details on selections go to **www.zone.net.nz**
Substitutions are not permitted to the following **Zone Architectural Products** systems, components or associated product listed in this section.

FireZone 92 Intumescent clear coating systems - Timber substrates

4.1 FIREZONE™ 92 SYSTEM TO BARE UNCOATED TIMBER

Location:	Refer to Architectural Drawings.
Substrate:	Xlam Cross Laminated Timber Floor
Substrate thickness:	130mm
Manufacturer:	**Zone Architectural Products**
System:	FZ-92.1S
Performance:	1-S Group Number
Coating type:	Water-based
Colour:	Clear

System FZ-92.1S	Product	Theoretical Spread Rate	WFT
Basecoat	FZ-92 BC	10m²/litre	100µ
2nd Basecoat	FZ-92 BC	10m²/litre	100µ
Topcoat	FZ-92 TC	12m²/litre	83µ

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6813SD SOUNDDOWN™ ACOUSTIC FLOOR SYSTEMS

1 GENERAL

This section relates to SoundDown™ acoustic floor systems.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

LVL	Laminated veneer lumber
MgO	Magnesium oxide
OSB	Oriented strand board

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC G6/VM1	Airborne and Impact Sound

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
SoundDown™ Legato & Tranquillo Acoustic Flooring Systems Installation Guide

SoundDown™ Tranquillo Acoustic Flooring System Batten Layout Details
SoundDown™ Acoustic Battens Fixing Sheet - Door Transitions & Firestop Details Sheet

SoundDown™ PAB BPIR Declaration Tranquillo and Legato
SoundDown™ Warranty General Terms - Supply
SoundDown™ Warranty General Terms - Installation
SoundDown™ Installer check list
SoundDown™ Acoustic Flooring System Installation Record
Gannon Fire and Risk Engineering - Engineering Assessment 2026-0043-EA01

Manufacturer/supplier contact details

Company:	Build Anatomy Ltd
Web:	sounddown.co.nz
Email:	enquiry@buildanatomy.com
Telephone:	+64 22 377 2162

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For SoundDown™ Acoustic Floor System

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from date of dispatch from Build Anatomy's SoundDown™ manufacturing or storage facility.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

10 years	for installation by Build Anatomy Ltd installers

- Provide this warranty on the installer/applicator standard form (if not available then use the

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standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of installation as recorded on the SoundDown™ Acoustic Flooring Installation Record.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.8 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.9 QUALITY CONTROL SYSTEM - MANUFACTURER / SUPPLIER REQUIREMENTS

Installer / Applicator to maintain quality control system to manufacturer / supplier requirements, including but not limited to:

- Complete and submit SoundDown™ Installer check list
- Complete applicator/installer installation declaration
- Complete the SoundDown™ Acoustic Flooring System Installation Record as the work progresses. include photographs as nominated in the Installation Guide.

Make available quality control records if requested by the contract administrator or consenting authority.

1.10 INSPECTIONS

Type:	TBC by Project Manager
Requirement:	TBC by Project Manager
Location:	TBC by Project Manager
Notify:	Contract administrator
Notification:	2 working days prior to work/item being carried out.

Requirements - Testing

1.11 FIELD TEST - ACOUSTIC SYSTEMS

Carry out field testing to NZBC G6/VM1 requirements, to verify specified performance of noise control systems is met.

Location/description:	TBC by Project Manager
Acoustic System:	TBC by Project Manager
Test:	TBC by Project Manager
Reporting requirements:	TBC by Project Manager

Field test results to be within 5dB of the performance requirements. If noise control systems do not meet the required values, rectify elements and re-test.

Performance

1.12 FIRE RESISTANCE RATINGS - FRR SYSTEM

Gannon Fire and Risk Limited expresses the technical opinion that the SoundDown In-Floor Fire Stop installed as illustrated in the Engineering Assessment 2026-0043-EA01 can maintain an integrity and insulation performance for up to 90minutes.

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2 PRODUCTS

SoundDown™ Tranquillo System

2.1 SOUNDDOWN™ TRANQUILLO ACOUSTIC FLOOR SYSTEM

The SoundDown™ Tranquillo system comprises a layer of flooring panel laid on pre-assembled battens which are sandwiched between rubber isolation strips. Mammoth Acoustic blanket (minimum thickness 50mm, minimum density 14.75kg/m³) inserted between the battens.

2.2 OSB FLOORING

20mm OSB flooring. High-density, engineered structural panel. Available in various sizes.

2.3 CONSTRUCTION ADHESIVE - OSB FLOORING

Selleys Liquid Nails solvent-based construction adhesive.

2.4 FIRE & ACOUSTIC SEALANT

Refer to SELECTIONS.

2.5 SOUNDDOWN IN-FLOOR FIRESTOP BATTENS

Prefabricated batten with 20mm Magnedure board top, 16mm GIB Fyreline sides, acoustic rubber feet and an LVL carrier.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.
Timber substrate: 18% maximum moisture content.

3.4 DELIVERY OF PRODUCTS

Confirm products delivered match items and quantities listed on delivery documents.

Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 INSTALLATION GENERALLY

Install SoundDown™ Acoustic Flooring Systems in accordance with the SoundDown™ Acoustic Flooring Systems Installation Guides.

Installation - Tranquillo & Legato

3.7 INSTALL SOUNDDOWN™ PERIMETER ISOLATION STRIP

Install isolation strip firmly against the wall so that the top of the strip is level with the middle of the flooring panel. Install the isolation strip in conjunction with the perimeter batten to hold the isolation strip in place.

3.8 SETOUT

Maintain a 10mm gap to perimeter of space to allow for PEF rod.

3.9 INSTALL IN-FLOOR FIRESTOP BATTENS

Install and fix in-floor firestop battens as detailed.

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3.10 INSTALL PERIMETER BATTENS

Install the perimeter battens against the perimeter strip with a 10 to 40mm gap between battens.

3.11 INSTALL INFILL BATTENS

Install battens between perimeter battens at centres to suit sheet flooring size and fixing centres with a 10 to 40mm gap between battens. Use SoundDown™ Setting Out Sticks to aid in setting out and to maintain position of battens.

3.12 INSTALL BATTENS AT DOOR OPENINGS

Install and fix battens at door openings as detailed, with a 10 to 40mm gap between battens.

3.13 INSTALL INSULATION

Use insulation slightly wider (up to 5mm) than the cavity it is going into. Install by gently pushing insulation into cavity maintaining its loft and without undue compression, folds and tucks. Butt tightly leaving no gaps. Fill all voids. Cut/tear insulation to fit the space and around penetrations, use offcuts for smaller spaces.

3.14 INSTALL FLOORING PANELS

Lay out the flooring panels. Glue and mechanically screw fix flooring panels in accordance with the manufacturers requirements.

3.15 INSTALL FLOORING PANELS - DOOR OPENINGS

Cut panel to utilise a single panel at door openings, allowing the cut panel to extend past opening each side and to project into opening to abut uncut edge of perimeter panel in adjacent space as detailed.

3.16 CONTROL JOINTS

Form a 2mm wide control joint between flooring panels every 20m. Mechanically fix this joint only.

3.17 INSTALL PEF ROD

Install PEF rod to perimeter compressing rod by approximately 25% to fit into gap.

3.18 APPLY SEALANT

Apply sealant to the perimeter, finish flush with the surface of the panels.

Completion & Commissioning

3.19 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

For further details on selections go to https://sounddown.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

SoundDown™ systems

4.1 SOUNDDOWN™ TRANQUILLO ACOUSTIC FLOOR - OSB

Location:	Refer to Architectural Drawings
Brand:	SoundDown™
Supplier:	Build Anatomy Ltd
Type:	Tranquillo
Top layer (flooring):	20mm OSB
Flooring adhesive:	Selleys Liquid Nails
Batten type/size:	Refer to Architectural Drawings
Door transition detail:	Refer to Architectural Drawings
Insulation:	Mammoth Acoustic blanket (minimum thickness 50mm, minimum density 14.75kg/m³)
Fire and acoustic sealant:	SabreSeal FRA + Fire & Acoustic Rated Acrylic Sealant - Grey 600ml or similar approved
Screws:	Simpson strong tie collated screws WSV subfloor screw zinc coated 10mm x 50mm

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4.2 SOUNDDOWN™ IN - FLOOR FIRESTOP BATTENS

Location:	Refer to Architectural Drawings
Brand:	SoundDown™
Supplier:	Build Anatomy Ltd
Type:	In-floor firestop battens
Batten size:	to suit application

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7123 HOT & COLD WATER SYSTEM

1 GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

1.1 RELATED WORK

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC G4/AS1	Ventilation of buildings
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS 1432	Copper tubes for plumbing, gas fittings and drainage applications
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2345	Dezincification resistance of copper alloys
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.1	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) General
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2537.3	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) fitness for purpose of system
AS/NZS 2537.4	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) Guidance for the assessment of conformity
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe fittings - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation
AS 3688	Water supply and gas systems - metallic fittings and end connectors

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AS/NZS 3879	Solvent cements and priming fluids for PVC (PVC-U and PVC-M and ABS and ASA pipes and fittings
AS 4032.2	Water supply - Valves for the control of heated water supply temperatures - Tempering valves and end-of-line temperature actuated devices
AS/NZS 4129	Fittings for polyethylene (PE) pipes for pressure applications.
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4606.1	Storage water heaters. General requirements
NZS 4606.2	Storage water heaters. Specific requirements for water heaters with single shells.
NZS 4606.3	Storage water heaters. Specific requirements for water heaters with composite shells.
NZS 4607	Installation of thermal storage electric water heaters: valve vented Systems
NZS 4617	Tempering (3-port mixing) valves
AS 4809	Copper pipe and fittings. Installation and commissioning
AS 5200 part 053	Plumbing and drainage products, Stainless steel pipes and tubes for pressure applications.
AS/NZS 5601.1	Gas installations - general installations
AS/NZS 60335.2.35	Household and similar electrical appliances. Safety - Pat 2.35 Particular requirements for instantaneous water heaters

Gas (Safety and Measurement) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006

NZ Backflow Testing Standard:	NZ Backflow Testing Standard 2019, Field testing of backflow prevention devices and verification of air gaps

Warranties

1.3 WARRANTY

Provide warranty for:

2 years:	For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.4 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.5 PIPEWORK LAYOUTS

To be provided by Building Services Engineer.

1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

1.7 HOT WATER TEMPERATURES

To NZBC G12/AS1, 6.14

Storage water heaters to store water at not less than 60ºC.

Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

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For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed:

- 45ºC - for early child hood centres, schools, elderly facilities, hospitals, psychiatric or disabled institutions.
- 50ºC - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

1.8 QUALITY CONTROL SYSTEM - LEAD FREE

If requested, by the contract administrator or consenting authority, provide test reports from IANZ or equivalent accredited testing facility confirming products that contain copper alloy and are used in contact with potable water for human consumption are lead free.

Performance

1.9 TESTING - TO AS/NZS 3500

Test to AS/NZS 3500.1 as modified by NZBC G12/AS3, Section 17, Testing and commissioning, for cold water.

- Test reticulation system to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.1, 17.3.1 Hydrostatic test. Test storage tanks to AS/NZS 3500.1, 17.3.2 Storage tanks (except rain water tanks).

and
AS/NZS 3500.4 as modified by NZBC G12/AS3, Section 9, Testing and commissioning, for hot water.

- Test reticulation system (excluding tanks, water heaters, and some fixtures, valves etc) to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.4, 9.3 Testing. Test complete system (including valves, pumps, water heaters etc) under normal working conditions for a minimum of 48 hours, then check visually, to AS/NZS 3500.4, 9.3 Testing.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

2 PRODUCTS

Materials

2.1 POLYETHYLENE PIPE

To NZBC G12/AS1, 2 Materials. Polyethylene pipes to AS/NZS 4130 and fittings to AS/NZS 4129. Except for solid black PE, protect from sunlight. For cold water applications only.

2.2 DE-ZINCIFICATION RESISTANT WATER SUPPLY SYSTEM COMPONENTS

All copper alloy components to comply with G12/AS1 clause 2.2.3 and AS 2345.

2.3 WATER METER

To the requirements of the network utility operator.

2.4 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1.

2.5 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to AS/NZS 2845.1 where it is possible for water or contaminants to backflow into the potable water supply. Refer to NZBC G12/ AS1 3.4 Backflow protection, 3.5 Containment Backflow protection, table 2, Selection of Backflow Protection and table 2A Containment Backflow Protection.

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2.6 TEMPERING VALVE

Tempering valve to NZS 4617 or AS 4032.2 to NZBC G12/AS1.

Materials - Hot water heating appliances

2.7 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305, NZS 4606.1, NZS 4606.2 and NZS 4606.3,electric storage cylinder, insulated and complete with required fittings.

Components

2.8 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZS 4305 and AS/NZS 3500.4.

2.9 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

Fire resistant accessories

2.10 FIRE STOPPING SYSTEMS

Refer to 7382 FIRE STOPPING SYSTEMS for fire stopping systems of pipe penetrations through fire walls and floors.

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3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/AS1 or AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3.

3.2 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Pipework installation

3.10 WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1.

3.11 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

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3.12 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 9 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings.

Lag all pipes with rigid insulation to the manufacturer's requirements and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1.

3.13 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) to NZBC G12/AS1, 9.0.

3.14 PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Application - Hot water systems

3.15 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation or NZS 4606 for Valve-vented systems.

3.16 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation or AS/NZS 3500.4, 5.5.4 Seismic restraints.

3.17 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to NZS 4305, AS/NZS 3500.4, 8.2 Thermal Insulation, and to the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs.

3.18 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.11 or NZS 4607 for Valve-vented systems.

3.19 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.20 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

Application - Fire resistant work

3.21 FIRE STOPPING SYSTEMS

Refer to 7382 FIRE STOPPING SYSTEMS for fire stopping devices for pipe penetrations through fire walls and floors.

Installation - valves

3.22 INSTALLING BELOW GROUND ISOLATING VALVE

Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

3.23 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED

Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

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3.24 INSTALLING BACKFLOW PREVENTION DEVICE

Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or NZ Backflow Testing Standard.

Completion

3.25 LABEL

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.26 REPLACE

Replace damaged or marked elements.

3.27 LEAVE

Leave work to the standard required by following procedures.

3.28 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Water main

4.1 POLYETHYLENE WATER MAIN

Size:	25mm outside diameter (i.e. DN 25 in AS/NZS 4130)

Pipework

4.2 EXPOSED PIPES

Type:	Refer to Building Services Drawings and Specifications.
Accessories:	Refer to Building Services Drawings and Specifications.
Manufacturer:	Refer to Building Services Drawings and Specifications.
Brand:	Refer to Building Services Drawings and Specifications.

4.3 PIPEWORK INSULATION

Brand:	Refer to Building Services Drawings and Specifications and Acoustic Engineers Documents.
Material:	Refer to Building Services Drawings and Specifications and Acoustic Engineers Documents.
Wall thickness:	Refer to Building Services Drawings and Specifications and Acoustic Engineers Documents.
Finish:	Refer to Building Services Drawings and Specifications and Acoustic Engineers Documents.

Hot water systems

4.4 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

Brand:	Refer to Building Services Drawings and Specifications.
Model size:	Refer to Building Services Drawings and Specifications.

Valves and accessories

4.5 MAIN ISOLATING VALVE

Location:	Refer to Building Services Drawings and Specifications.
Brand/type:	Refer to Building Services Drawings and Specifications.

4.6 FLOOR/ZONE ISOLATING VALVES

Location:	Refer to Building Services Drawings and Specifications.
Brand/type:	Refer to Building Services Drawings and Specifications.

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4.7 APPLIANCE ISOLATING VALVES - CONCEALED

Appliance: Refer to Building Services Drawings and Specifications.
Brand/type: Refer to Building Services Drawings and Specifications.

4.8 APPLIANCE ISOLATING VALVES - EXPOSED

Appliance: Washing machine
Brand/type: Refer to tapware selections

4.9 TEMPERING VALVE

Location: Refer to Building Services Drawings and Specifications.
Brand/type: Refer to Building Services Drawings and Specifications.

4.10 BACKFLOW PREVENTION DEVICE

Location: Refer to Building Services Drawings and Specifications.
Brand/type: Refer to Building Services Drawings and Specifications.

Fire resistant work

4.11 FIRE STOPPING SYSTEMS

Refer to 7382 FIRE STOPPING SYSTEMS for fire stopping devices for pipe penetrations through fire walls and floors.

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7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES

1 GENERAL

This section relates to the supply and installation of sanitary fixtures, tapware and sanitary accessories.

1.1 RELATED WORK

Refer to 7120 or 7123 HOT AND COLD WATER SYSTEM for hot water cylinders.

Refer to 7420 or 7421 SANITARY SYSTEMS for the supply and fitting of waste disposal pipework
Refer to the electrical section/s for electrical connection of accessories.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E3/AS1	Internal moisture
NZBC G1/AS1	Personal hygiene
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
NZBC G13/AS1	Foul water
NZBC G13/AS3	Plumbing and drainage
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.1	Plumbing and drainage - water services
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 4223.3	Glazing in buildings - Human impact safety requirements

Plumbers, Gasfitters and Drainlayers Act 2006

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

(TBC) years	For sanitary fixtures tapware and accessories

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT.)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For installation

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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1.6 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Workers or supervisors of work are required to be a Certifying Plumber under the Plumbers, Gasfitters and Drainlayers Act 2006. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.8 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

Provide this information prior to practical completion

1.10 QUALITY CONTROL SYSTEM - LEAD FREE

If requested, by the contract administrator or consenting authority, provide test reports from IANZ or equivalent accredited testing facility confirming products that contain copper alloy and are used in contact with potable water for human consumption are lead free.

2 PRODUCTS

2.1 SANITARY FIXTURES

Refer to SELECTIONS for product selection.

2.2 TAPWARE

Refer to SELECTIONS for product selection.

2.3 SANITARY APPLIANCES

Refer to SELECTIONS for product selection.

2.4 SANITARY ACCESSORIES

Refer to SELECTIONS for product selection.

2.5 ELECTRICAL SANITARY ACCESSORIES

Refer to SELECTIONS for product selection.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

Ensure water supply and drainage pipework match the requirements of selected fixtures without force or distortion.

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

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3.5 INSTALLATION REQUIREMENTS INCLUDING AS/NZS 3500.2

Install to NZBC G1/AS1, AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3, NZBC G12/AS1, NZBC E3/AS1, AS/NZS 3500.2, as modified by NZBC G13/AS3, and to the fixture manufacturer's installation requirements for each component.

3.6 INSTALLATION SANITARY FIXTURES

Carry out preparatory and assembly work, including connections to supply and drainage services and the application of all required slurries/bedding and sealants in sequence.

Fit the sanitary fixture in position, plumb, level, flush and rigid without stressing the attachment points of the component. Fixings to be corrosive resistant.

Seal between all sanitary fixtures and floors, wall linings, fixtures and the tops they are in, the tops and wall linings, to NZBC E3/AS1, 3.2. Fixtures include toilets, urinals, baths, basins, tubs, sinks. Tops include, vanities, bath surrounds, sink benches, etc, and their upstands. Form joint or seal between shower bases or urinals and impervious wall linings to NZBC E3/AS1, 3.3.

3.7 INSTALLING URINALS - WATERLESS

Ensure discharge will not go through metal pipework/drains. Install the cartridge in each unit, charge with fluid and test for proper operation.

3.8 INSTALLING SPA BATHS

Connect up interconnected discharge jets to supply, connect waste and overflow to drainage services. Fit electric motor and pump so as to prevent vibration and noise.

3.9 INSTALLING SHOWER OR BATH DOOR AND SCREEN

To NZS 4223.3 and to the product manufacturer's requirements. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating.

3.10 INSTALLATION TAPWARE

In accordance with the manufacturer's requirements. Maintain safe water temperatures to comply with NZBC G12/AS1, 6.14 Safe water temperatures.

3.11 SEAL SHOWER TAPWARE

Seal shower wall lining penetrations such as shower head, shower hose, mixer, taps etc to NZBC E3/AS1, Fig. 6.

3.12 SANITARY APPLIANCES

Install and provide all required connections to sanitary appliances in accordance with manufacturers requirements.

3.13 EARTHING OR EQUIPOTENTIAL BONDING METALLIC FIXTURES

Before enclosing, ensure equipotential bonding is provided to metallic water pipes and metallic sanitary fixtures using an earth bonding conductor to requirements of NZBC G12/AS1, 9.0 Equipotential bonding and/or AS/NZS 3000, 5.6 Equipotential bonding.

Application - sanitary accessories

3.14 INSTALLING ACCESSORIES

Fit specified fittings firmly in place, all plumb and level.

Locate at heights and/or locations shown on the drawings, or as required to comply with NZBC G1/AS1. For any dimension not shown or known, request direction before proceeding

3.15 CUTTING AND FITTING

Where cutting and fitting of the substrate is necessary for installing any unit, carry out this work before the painting or finishing of that surface. Remove any hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

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3.16 INSTALLING UNITS

Install each unit in accordance with the proprietary fixture manufacturer's requirements, using the templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion & Commissioning

3.17 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

4.1 SANITARY FITTING SCHEDULE

Supplier:	TBC
Refer to:	Sanitaryware Fixtures and Fittings Schedule provided by Client/Architect.

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7352 AUTOMATIC FIRE & SMOKE ALARM SYSTEM

1 GENERAL

This section relates to the design, installation and commissioning of automatic fire alarm systems types 3, 4, 5, 7 and 7e as described in NZBC C/AS2 Appendix C Fire safety systems.

1.1 ABBREVIATIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FRR	Fire Resistance Rating

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC F8/AS1	Signs
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NZS 4512	Fire detection and alarm systems in buildings
AS/NZS 5000.2	Electric cables - polymeric insulated - For working voltages up to and including 450/750V

Fire Protection Association register of approved equipment
Building Regulations 1992

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

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Fire alarm installers to be a Fire Protection Association of New Zealand certified fire alarm contractor, employing experienced competent workers, familiar with the materials and the techniques specified.

1.4 AS BUILT DOCUMENTS

Refer to the general section 1238 AS BUILT DOCUMENTATION for the requirements for submission and review of as built documents and records.

Provide as built documents and records in accordance with NZS 4512, part 8 System Documentation and Records.

- Provide draft as built information prior to practical completion
- Provide final as built information prior to the end of the defects liability period

1.5 SHOP DRAWINGS

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Provide outline drawings and preliminary installation details for evaluation.

Then provide shop drawings to show the general arrangement including, but not be limited to:

- layout and location of all equipment, manual call points, alerting devices, indicating panel and all ancillary services provided and to be provided by others before manufacture.

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If requested provide the following additional information:

Submit shop drawings for review to the Project Manager/Architect.

- (TBC) working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication and/or installation.

1.6 OPERATION AND MAINTENANCE MANUALS

Supply maintenance manual information to requirements set out in the general section 1239 OPERATION & MAINTENANCE and including the following:

The manual is to set out the monthly and annual checking and testing of the system as required by NZS 4512, part 6: "Maintaining systems in compliance and good working order", for the compliance schedule required by the second schedule of the Building Regulations 1992 and a copy of the certificate of compliance.

1.7 MAINTENANCE CONTRACT PROPOSAL

Provide a priced proposed maintenance contract for the ongoing servicing of the fire alarm system specified to NZS 4512, part 6 "Maintaining systems in compliance and good working order". Refer to SELECTIONS.

1.8 APPROVED EQUIPMENT

Select equipment from the Fire Protection Association register of approved equipment.

Performance

1.9 FIRE AND EMERGENCY NEW ZEALAND APPROVAL

Submit to the Fire and Emergency New Zealand, details of the proposed location of the fire detection indicator and the layout of the fire indicating panel and any mimic panels for their approval. Advise any required variation from the installation detailed.

1.10 COMMISSIONING

The completed system to be fully tested and commissioned in accordance with NZS 4512 part 5 "Commissioning" and as necessary to ensure the system is complete. The installer shall perform report on examinations and tests including:

- visual examination
- testing the electrical equipment and
- testing to verify correct operation and function.

Carry out in the same manner as an annual survey. Installer to complete NZS 4512, appendix M "Installer's Declaration of Completion for Alarm System."

An accredited inspection body shall carry out inspection and testing and provide an inspection report in accordance to NZS 4512, section 5.5 Inspection, testing and compliance certification.

1.11 CERTIFICATE

An accredited inspection body shall provide a certificate of compliance for the fire alarm system to NZS 4512, appendix N "Certificate of Compliance for Fire Alarm System."

2 PRODUCTS

Manufactured units

2.1 FIRE ALARM SYSTEM, TYPE 4 FIRE SAFETY PRECAUTION

Type 4 automatic fire alarm system activated by smoke detectors and manual call points to comply with the requirements of NZBC C/AS2, Appendix C Fire safety systems and NZS 4512. System with provision for automatic signaling to a remote receiving centre.

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2.2 FIRE ALARM SYSTEM, TYPE 5 FIRE SAFETY PRECAUTION

Type 5 automatic fire alarm system permitting part of the smoke detection component to activate only a local alarm. The system to be activated by smoke detectors, modified smoke detectors or heat sensors and/or manual call points to NZBC C/AS2, Appendix C Fire safety systems and NZS 4512.

2.3 FIRE ALARM SYSTEM, TYPE 7 FIRE SAFETY PRECAUTION

Automatic sprinkler system with a Type 4 or Type 5 automatic fire alarm system activated by smoke detectors and/or manual call points to comply with the requirements of NZBC C/AS2, Appendix C Fire safety systems and NZS 4512.

2.4 FIRE AND EMERGENCY NZ CONNECTION

Refer to SELECTIONS for required type of connection.

Materials

2.5 CABLE

To AS/NZS 5000.2.

Accessories

2.6 FIRE RESISTANT SEALER

Gunnable inorganic or silicone elastomer sealant, packed to maintain the specified fire resistance rating of the ceiling or wall to NZBC C/AS2, 4.3.2 Fire stopping.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 COMPLY

Comply with the requirements of NZS 4512, part 4 **Installation** and the following.

Multizone systems:	To NZS 4512 part 2 Design and construction - Multizone fire alarm systems
Single zone systems:	To NZS 4512 part 3 Single zone fire alarm systems

3.4 PROVIDE FOR

Provide for the system by way of conduit, chases, penetrations, spaces for equipment and trimming out for same.

3.5 CONFIRM LOCATION

Confirm location of equipment and their visual impact relative to surrounding materials and finishes.

Application

3.6 RUN CABLE

Run cabling concealed, using conduit, chases and penetrations, located and provided previously to NZS 4512.

3.7 INSTALL INDICATING PANEL

Set rigidly in place plumb and true to line and face in the space provided. Fit neatly and without damage to the surrounding finish.

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3.8 INSTALL MANUAL CALL POINTS

Set rigidly in place plumb and true to line and face. Fit neatly and without damage to the surrounding finish.

3.9 INSTALL DETECTORS

Install detectors to the detector manufacturer's requirements fitted neatly and without damage to the surrounding finish. Wire back to the control panel to the requirements of AS/NZS 3000, and NZS 4512.

3.10 INSTALL ALERTING DEVICES

Install devices to the device manufacturer's requirements rigid plumb and true to line and face, and without damage to the surrounding finish. Wire back to the control panel to the requirements of AS/NZS 3000, and NZS 4512.

3.11 SIGNS

Install signs as required by NZBC F8/AS1: Signs, where required information is not already on the call point.

3.12 DC SUPPLY

Supply and fix the primary and secondary batteries and battery charger to the requirements of NZS 4512 and the fire alarm system offered. Indelibly mark batteries with the date of installation.

Application - fire resistant work

3.13 FIRE RESISTANT SEALER TO PENETRATIONS

Thoroughly clean the penetration of the ceiling or wall. Pack if necessary to support the sealant. Implant the sealant to the manufacturer's requirements to ensure full penetration and to obtain the required fire resistance rating. Tool the surface flush and smooth and allow to cure. Refer to SELECTION for details.

Service penetrations through fire rated construction to NZBC C/AS2, 4.3.2 Fire stopping and the project-specific Fire Resistance Rating (FRR).

Completion

3.14 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

3.15 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

3.16 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

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4 SELECTIONS

4.1 AUTOMATIC FIRE ALARM SYSTEM TYPE

System type: Type 7

4.2 MAINTENANCE CONTRACT PROPOSAL

The maintenance contract is to commence from: TBC by Project Manager.
The period for this maintenance contract to be: TBC by Project Manager.

4.3 FIRE AND EMERGENCY NZ CONNECTION

Means of alerting Fire and Emergency NZ: TBC by Fire Protection Specialist.

4.4 CONTROL PANEL

Brand/type: TBC by Fire Protection Specialist.

4.5 DETECTORS, SMOKE

Brand/type: TBC by Fire Protection Specialist.

4.6 MANUAL CALL POINTS

Brand/type: TBC by Fire Protection Specialist.

4.7 ALERTING DEVICES, AUDIBLE

Brand/type: TBC by Fire Protection Specialist.

4.8 ALERTING DEVICES, VISUAL

Brand/type: TBC by Fire Protection Specialist.

4.9 FIRE RESISTANT SEALER TO PENETRATIONS

Location: Refer to Architectural Drawings, Building Services Drawings and Specifications and Passive Fire Specification.
FRR: Refer to Fire Report and Passive Fire Specification.
Manufacture/type: Refer to Architectural Drawings, Building Services Drawings and Specifications and Passive Fire Specification.

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7372 FIRE HYDRANT SYSTEMS FOR BUILDINGS

1 GENERAL

This section relates to the design, approval, installation and commissioning of fire hydrant systems for buildings.

1.1 RELATED WORK

Refer to 7352 AUTOMATIC FIRE AND SMOKE ALARM SYSTEM for types 3, 4, 5, 7 or 7e fire alarms

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FRR	Fire Resistance Rating
HSC	Hydrant System Certifier

Documents

1.3 DOCUMENTS

Documents referred to in this section are:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 1170.0	Structural design actions - General principles
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 2980	Qualification of welders for fusion welding of steel - Additional requirements for Australia and New Zealand
NZS 4510	Fire hydrant systems for buildings

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

Warranties

1.4 WARRANTY

Provide warranty for:

1 year:	For materials and execution

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.5 QUALIFICATIONS

Employ only companies listed with a Hydrant System Certifier and holding current competency to design, supply, erect and maintain fire hydrants in buildings system installations.

1.6 SHOP DRAWINGS

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Provide shop drawings to show the general arrangement including, but not be limited to:

- All necessary drawings, calculations and other descriptive information in accordance with NZS 4510, clause 2.7.1
- Shop drawings to include the installation of hydrant outlets and enclosures as called for in NZS 4510.
- Include all the requirements of the project Fire Report.

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Submit shop drawings for review to Hydrant System Certifier (HSC) and Project Manager/Architect.

- (TBC) working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication and/or installation.

1.7 AS BUILT DOCUMENTS

Refer to the general section 1238 AS BUILT DOCUMENTATION for the requirements for submission and review of as built documents and records.

Provide the following as built documents and records:
Provide as built documents and records in accordance with NZS 4510, clause 5.6 Fire Brigade Reference Documents.

- Provide as built information prior to final inspection by Hydrant System Certifier (HSC) .

1.8 NOTICES AND FEES

Give notices and obtain from authorities and network utility operators permits, authorization and approvals required for the carrying out of this work. Pay fees and levies in respect of the same and including inspection and re-inspection fees.

1.9 INFORMATION FOR MAINTENANCE MANUAL

Supply maintenance manual information to requirements set out in the general section 1239 OPERATION & MAINTENANCE and any notes relating to the provision of a compliance schedule by the Territorial Authority.

1.10 REGULAR MAINTENANCE PROPOSAL

Provide a proposed contract for the ongoing servicing of the fire hydrants in buildings system specified, to NZS 4510, 9. Refer to SELECTIONS.

1.11 DURING CONSTRUCTION OR DEMOLITION

During new construction, once beyond the appropriate limits prescribed in NZBC C/AS2 2.2 Fire safety systems, the hydrant system must be enlivened progressively (including pumps, if required) as construction advances.

During alteration work any existing hydrant system must be maintained, any additional hydrant enlivened progressively as construction advances and any unwanted hydrant deactivated and removed as they are not required.
During demolition any existing hydrant system must be maintained and progressively deactivated and removed as demolition advances. Once below the appropriate limits prescribed in NZBC C/AS2 2.2 Fire safety systems, the whole remaining system can be removed.
Compliant temporary facilities may be required during this work.

Compliance information

1.12 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Compliance schedule - All relevant details covering Scope, Inspections and Maintenance for the Compliance Schedule
- Warranty
- Producer Statement - Construction from the installer
- Completion Certificate - from Hydrant System Certifier

Performance

1.13 CONTROL VALVE LOCATION

Obtain Fire and Emergency New Zealand approval of the building hydrant inlet connection location.

1.14 WELD TESTING

Test welds hydrostatically to 1.5 times the working pressure as part of the final commissioning tests.

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1.15 SYSTEM DESIGN - ACCEPTABLE SOLUTION

Design by a fire hydrants in buildings systems designer listed with a Hydrant System Certifier, designed in accordance with NZS 4510, the appropriate Acceptable Solution(s) of NZBC C/AS2 and the project Fire Report.

1.16 SEISMIC RESISTANCE

Design and support, pipes and units to NZS 4510, AS/NZS 1170.0 and NZS 1170.5.

1.17 APPROVAL OF COMPLIANCE

Before commencing installation, obtain approval from a Hydrant System Certifier (HSC) that the proposed fire hydrants in buildings system does comply, and pay required fees. Supply them with the basic design decisions, drawings, calculation and other descriptive information as required by NZS 4510, clause 2.7.1.

1.18 FINAL INSPECTION

Prior to final inspection at completion, supply to the Hydrant System Certifier (HSC), a notice of completion, drawings, calculation and other descriptive information as required by NZS 4510, clause 5.6 Fire Brigade Reference Documents.

Notify the HSC, as per NZS 4510, when the installation is ready for final inspection and attend upon them for the operation of any pumps or equipment. A written Certificate of Compliance shall be issued by the HSC.

2 PRODUCTS

Materials

2.1 BUILDING HYDRANT INLET

To NZS 4510, 5 to the approval of Fire and Emergency New Zealand. Provide enclosure with glazed anodized aluminium access door and frame.

2.2 PIPEWORK DOWNSTREAM OF BUILDING HYDRANT INLET

Steel, copper, stainless steel and other approved pipe to NZS 4510, 2.3.

2.3 PIPE SUPPORTS

Heat and corrosion resistant to NZS 4510, 2.3.3.

2.4 BUILDING HYDRANT OUTLETS

To NZS 4510, 4, with number and spacing to suit building.

2.5 PRESSURE GAUGES

To indicate pressure at test points for each hydrant system zone to NZS 4510, 6.

2.6 PRESSURE CONTROL DEVICES

Pressure control devices are incorporated in the design to meet the permissible pressure range as per NZS 4510, 6.2.

2.7 PUMP UNITS

To consist of an approved pump, approved electric motor or diesel engine, approved controller and unit frame to the duty characteristics and operational requirements of NZS 4510, 7.

Accessories

2.8 FIRE RESISTANT SEALER

Gunnable inorganic or silicone elastomer sealant, packed to maintain the specified fire resistance rating of the floor/ceiling or wall to NZBC C/AS2, 4.3.2 Fire stopping.

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3 EXECUTION

Conditions

3.1 CONFORM

Fire hydrants for buildings system to conform to the required standard in all parts so that it completely fulfils its designed function.

3.2 APPROVALS

Ensure materials and elements used in the fire hydrants for buildings system are to the approval of the Hydrant System Certifier (HSC).

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of the pipework. Complete required fire resistance ratings.

Application - pipework

3.4 PIPEWORK INSTALLATION

Locate and lay out pipework parallel with, square to and co-ordinated with the form of the building and its structure. Fix rigidly in place, allowing for drainage of the system to NZS 4510 and support to NZS 4510, 2.

3.5 WELDING

Welders to hold current certification under AS/NZS 2980.

3.6 SITE WELD

Pipes of 50mm nominal bore and above may be welded on site.

3.7 CONCEALMENT

Confirm the location of riser, distribution and range pipes that need concealing within the interior design elements of the building.

3.8 PROTECTION

Protect those parts of the fire hydrants for buildings system subject to damage by building use.

Application - controls

3.9 VALVES

Locate stop valves, non-return valves, pressure reducing valves to NZS 4510, and fit to the valve manufacturer's requirements.

3.10 INSTALLATION CONTROL

Provide fire service inlets and valves to NZS 4510, 5. Provide an enclosure as required by NZS 4510, 5.2.

3.11 PRESSURE GAUGES

Locate to NZS 4510 and fit to the gauge manufacturer's requirements.

3.12 PRESSURE CONTROL DEVICES

Fit pressure control devices to NZS 4510, 6.2.

3.13 BUILDING HYDRANT OUTLETS

Fit to NZS 4510 building hydrant outlet assemblies in approved locations with clearances to NZS 4510, 4.2.

Application - water supply

3.14 PRESSURISED WATER SOURCE

Provide a permanently piped connection from a reliable pressurised water source or an electric motor or diesel driven pump, to keep the pipework charged, to NZS 4510.

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3.15 INSTALL PUMP UNIT

Install a pumping unit comprising of pump, diesel engine and controller to the pump manufacturer's requirements and the requirements of NZS 4510 for boosted supply to meet the pressure and flow requirement for every building hydrant outlet.

3.16 BUILDING HYDRANT INLET

To consist of an inlet pipe to the fire hydrants for buildings system complete with hose connection, stop valves, check valves and pressure gauges to NZS 4510. Fit where shown on the drawings to the requirements of NZS 4510, 5.

Application - fire resistant work

3.17 FIRE RESISTANT SEALER

Thoroughly clean the penetration of the floor/ceiling or wall. Pack if necessary to support the sealant. Implant the sealant to the manufacturer's requirements to ensure full penetration and to obtain the required fire resistance rating. Tool the surface flush and smooth and allow to cure.

Finishing

3.18 PAINTING OF PIPES

Prime pipe and fittings with approved primer, and paint exposed pipe and fittings with one coat of approved solvent based paint.

3.19 PROTECT FROM CORROSION

Protect those parts of the system that may be subject to corrosion by the building use with a proprietary coating system.

Completion

3.20 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused materials and elements from the site.

3.21 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

Leave the whole of the system in full operational order ready for final inspection.

3.22 PROTECTION

Provide the following temporary protection of the finished work:

~

4 SELECTIONS

4.1 REGULAR MAINTENANCE PROPOSAL

Contract to commence from: TBC by Project Manager
Contract period: TBC by Project Manager

4.2 PAINTING OF PIPES

Brand: TBC by Fire Protection Engineer.
Primer: TBC by Fire Protection Engineer.
Top coat: TBC by Fire Protection Engineer.

4.3 PROTECT FROM CORROSION

Brand: TBC by Fire Protection Engineer.

Fire resistant sealers

4.4 FIRE RESISTANT SEALER

Manufacturer: TBC by Fire Protection Engineer.
Type/number: TBC by Fire Protection Engineer.

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7382 FIRE STOPPING SYSTEMS

1 GENERAL

This section relates to fire rated service penetration systems and control joint fire stopping systems and includes:

- fire resistant barrier for seismic and other movement gaps
- formulated compound of incombustible fibres
- fire-stop composite sheets
- fire-stop collars, grilles and dampers
- fire-stop wraps and pillows
- fire-stop sealants and foams
- fire-stop mortars
- cavity construction intumescent barriers

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
BSEN 1366.4	Fire resistance tests for service installations. Linear joint seals
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS 1530.4:2005	Methods for fire tests on building materials, components and structures - Fire resistance test of elements of construction
AS 1668.1	The use of ventilation and airconditioning in buildings - Fire and smoke control in buildings
AS 4072.1	Components for the protection of openings in fire-resistant separating elements - Service penetrations and control joints
AS 1682.1	Fire dampers Specification
AS 1682.2	Fire dampers Installation
NZS 4520	Fire resistant doorsets
ASTM C1519 - 10	Standard Test Method for Evaluating Durability of Building Construction Sealants by Laboratory Accelerated Weathering Procedures
BPS	Building Product Specifications

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

(TBC) years: For manufacture/supply of fire stopping systems

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

(TBC) years: For installation of fire stopping systems

- 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.

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Requirements

1.4 QUALIFICATIONS

Installers to be experienced, competent trades people familiar with the materials and techniques specified.

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.6 MANUFACTURERS INFORMATION

Submit type test certificates for each combination of fire stopping system, application, type of service, and substrate and penetration orientation. Include drawings of tested details.

- Submit report to AS 4072.1 appendix C.
- Submit evidence that systems specified without reference to brand conform to specified requirements.
- Submit copies of relevant manufacturers' instructions, for systems specified without reference to brand.
- Material data sheets (MSDS): Submit MSDS for systems specified without references to brand.
- Give notice if substrate or penetrations or both are not suitable for fire stopping.

1.7 LABELLING OF FIRE RATED SERVICES PENETRATIONS

All service penetrations to fire cells and fire separation systems are required to comply with all the designed fire integrity of the specified systems. Label all fire rated service penetrations to AS 4072.1 using the Certified Identification System provided by CID International Ltd.

Each fire stopping installation to have a permanently fixed tag or label containing the following information:

- Manufacturer's name
- Name and address of installer
- Date of installation

Refer to CID International Ltd at www.cidcert.com to record all service penetrations.

1.8 INSPECTIONS

Give sufficient notice so that inspections may be made of the following:

- Service penetrations completed and ready for fire stopping.
- Finish fire stopping, before being concealed.

Compliance information

1.9 FIRE STOPPING SYSTEM COMPLIANCE

To NZBC C/AS2, 2.3 Fire resistance ratings, NZBC C/AS2, 4.3.2 Fire stopping, and NZBC C/AS2, 4.3 **Fire cell construction f**or interior elements, and NZBC C/AS2, 5.5.3 Cavity barriers.

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer's, and or supplier's warranty
- Installer's warranty
- Producer Statement - Construction from the installer
- Other information required by the BCA in the Building Consent Approval documents.

1.11 CERTIFICATION

Submit evidence of compliance, to the recommendations of AS 4072.1 Appendix B.

Submit a certification document for installed fire stopping penetration and control joints.

- Form: To figure B1 of AS 4072.1

Schedule: Submit a schedule of installed fire stopped penetrations and control joints.

- Form: To figure B2 of AS 4072.1

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2 PRODUCTS

Materials

2.1 COMPRESSIBLE FIRE STOPPING

Fire resistant barrier comprising of water resistant intumescent strips between layers of flexible foam. For seismic gaps fit fixing brackets to manufacturer's instructions. Fire tested to AS 1530.4. Butt joints and end seals to be stopped with fire rated sealant. Refer to SELECTIONS for type.

2.2 FIRE GRILLES/DAMPERS

Ventilation grills for walls comprising of a moisture resistant intumescent core within a galvanized or stainless steel frame tested to AS 1530.4, AS 1668.1, AS 1682.1 and NZS 4520. Refer to SELECTIONS for type.

2.3 FIRE COLLARS

Consists of intumescent material encased in a steel collar with fixing tabs, tested to AS 1530.4, and AS 4072.1. Refer to SELECTIONS for type.

2.4 FIRE BARRIERS - VENTILATED CAVITY CONSTRUCTION

Exterior Ventilated Cavity Fire Barrier Strips comprising of a moisture resistant, rigid, high expansion intumescent core encased in aluminium foil, tested to AS 1530.4. Refer to SELECTIONS for type.

2.5 FIRE AND ACOUSTIC SEALANT

One part sealant to AS 1530.4, AS 4072.1 and BSEN 1366.4 to provide up to 4 hours fire integrity and up to 3 hours insulation. Tested to ASTM C1519 - 10 for Dynamic movement and artificial age test. Refer to SELECTIONS for type.

2.6 FIRE RATED EXPANDING FOAM

Expanding polyurethane foam to AS 1530.4 and AS 4072.1. Do not use around plastic or insulated pipes or cables. Refer to SELECTIONS for type.

3 EXECUTION

3.1 DELIVERY, STORAGE AND HANDLING

Take delivery of materials and goods and store on site and protect from damage.
Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufactures requirements.
Reject and replace goods that are damaged or will not provide the required finish.

3.2 GENERAL PREPARATION

Fire stopping after services have been installed through penetrations and properly spaced and supported, after sleeving where appropriate, and after removal of temporary lines, but before restricting access to the penetrations, including before dry lining.

Supply ventilation for non-aqueous solvent-cured materials. Apply fire stopping material to uniform density. Finish surfaces to a uniform and level condition. Maintain cable separation. Protect adjacent surfaces from damage arising through installation of fire stopping.

Allow for thermal movement for the pipes and ducts. Reinforce or support fire stopping materials with non combustible materials when:

- The unsupported span of the fire stopping materials > 100mm.
- The fire stopping materials are non-rigid.

To large openings provide fire stopping capable of supporting the same loads as the surrounding element or provide similar structural support around the opening.

Fire stopping

3.3 INSTALLATION OF COMPRESSIBLE FIRE STOPPING

To NZBC C/AS2, 4.3 Firecell construction. Ensure any rough protrusions in gap/joint to be removed before incursion of fire rated strip.

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Fire grilles and dampers

3.4 INSTALLATION OF FIRE GRILLES AND DAMPERS

To AS 1682.2 Fire dampers Installation.

Prepare unit by sealing around edges with fire rated sealant before placing into the centre of the opening. Fit with fixing brackets provided with the unit. Seal around the perimeter of both faces to the wall with fire rated sealant.

Fire collars

3.5 INSTALLATION OF FIRE COLLARS

Ensure substrate around pipe penetration is flat and free from obstructions.

Face fix fire collars with structural fixings to each exposed side of the fire rated plasterboard lined wall to solid in-wall blockings.

Face fix fire collars to only the underside of concrete floor penetrations using appropriate size masonry anchors.

Seal around pipes with acoustic fire rated sealant to provide smoke and acoustic seal.

Installation of penetrations through fire walls

3.6 INSTALLATION OF MULTI-CABLE TRANSITS

Encase and separate cables with fire rated sleeve system. Fill remaining space with the sleeves and seal with water repellent UV resistant fire sealant to a depth of 20mm each face. Hollow structures to have a metal cavity constraint system to constrain sealing product.

3.7 INSTALLATION OF CABLE TRAY PENETRATIONS

Separate cables from each other with appropriate size flame retardant rubber sheets. Fill remaining space with flame retardant rubber sheets. If gas and water tightness is required, seal with water repellent UV resistant fire sealant to a depth of 10mm to each exposed face of the sheets. Hollow structures to have a metal cavity constraint system to constrain sealing product.

3.8 INSTALLATION OF MULTI-MIX TRANSITS FOR CABLES AND PIPES

Sleeve cables and pipes with fitting intumescent sleeves Plastic pipes to be sleeved with crushing material. Fill remaining space with filler sleeves and seal with water repellent UV resistant fire sealant to a depth of 20mm each face. Hollow structures to have a metal cavity constraint system to constrain sealing product.

3.9 INSTALLATION OF CABLE, STEEL, COPPER AND PLASTIC PIPE PENETRATIONS

Fit fire resistant plugs to each end of the penetration. Plug to form a tight fit to pipes and cables and to wall of penetration.

Oversized holes or out of line conduit or pipes to be wrapped with intumescent (crushing for plastic pipe) material with excess space filled with fire retardant rubber and sealed with water repellent UV resistant fire sealant to a depth of 20mm.

Fire rated sealants/foams

3.10 INSTALLATION OF FIRE AND ACOUSTIC SEALANTS/FOAMS

Clean all surfaces from dust , dirt or other contaminants. Mask adjacent areas and remove immediately after tooling. Prime edges if required by sealant manufacturer. Fill all joints to required depth with a backing rod or bond breaker tape prior to sealant application.

Fire rated expandable polyurethane foam to 15mm wide joints maximum in fire walls.

Fire barriers for ventilated cavity construction

3.11 FIRE BARRIERS - VENTILATED CAVITY CONSTRUCTION

Ensure substrate is suitable to fix strips to and strip is suitable for cavity width. Fix strips to the back of cavity between battens as indicated. Install to Manufacturers installation requirements.

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Completion

3.12 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused materials and elements from the site.

3.13 DEFECTIVE OR DAMAGED WORK

Repair damaged elements. Replace damaged where repair is not possible or will not be acceptable. Leave fire stopping system to the standard required for following trades.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Fire stop barriers

4.1 COMPRESSIBLE FIRE STOPPING

Location: Refer to Architectural Drawings, Building Services Drawings and Passive Fire Schedule.

Type/Brand: Refer to Architectural Drawings, Building Services Drawings and Passive Fire Schedule.

Fire grilles, dampers, collars and wraps

4.2 FIRE GRILLES/DAMPERS

Location: Refer to Architectural Drawings, Building Services Drawings and Passive Fire Schedule.

Type/Brand: Refer to Architectural Drawings, Building Services Drawings and Passive Fire Schedule.

4.3 FIRE COLLARS

Location: Refer to Architectural Drawings, Building Services Drawings and Passive Fire Schedule.

Type/Brand: Refer to Architectural Drawings, Building Services Drawings and Passive Fire Schedule.

Fire barriers for ventilated cavity construction

4.4 FIRE BARRIERS - VENTILATED CAVITY CONSTRUCTION

Location: Refer to Architectural Drawings.

Type/Brand: Refer to Architectural Drawings.

Fire stop mortars, sealants and foams

4.5 FIRE AND ACOUSTIC SEALANT

Location: Refer to Architectural Drawings.

Type/Brand: Refer to Architectural Drawings.

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7411M METALCRAFT ROOFING RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to **Metalcraft Roofing** rainwater disposal systems including gutters fascias and downpipes.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
Gutter	In this section includes spouting

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Are available on the website or by contacting Metalcraft Roofing.

For technical assistance contact **Metalcraft Roofing**

Web: www.metalcraftroofing.co.nz

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years:	Failure of coating adhesion (manufacturer's standard warranty)
10 years:	Weatherproofing failure caused by material penetration as a result of corrosion (manufacturer's standard warranty)

- Provide this warranty on the manufacturer/supplier standard form
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

3 years	For workmanship

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

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Requirements

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

1.7 QUALIFICATIONS

Installers to be experienced competent gutter installers, familiar with the **MetalcraftRoofing** materials and the techniques specified.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide one copy of all relevant **Metalcraft Roofing** maintenance information on completion of the roofing work.

Performance

1.9 TEST - NZBC E1/AS1

Test the completed rainwater disposal system with water to ensure gutters are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in gutters. Comply with NZBC E1/AS1.

1.10 TEST - AS/NZS 3500.3 & NZBC E1/AS2

Test the completed rainwater disposal system with water to ensure gutters are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in gutters. Comply with AS/NZS 3500.3 as modified by NZBC E1/AS2.

2 PRODUCTS

Materials

2.1 GUTTERS

Complete with matching brackets with fixing screws to suit the gutter / fascia. Refer to SELECTIONS for type.

2.2 DOWNPIPES - METAL

Metalcraft metal downpipes, circular or rectangular. Refer to SELECTIONS.

Components

2.3 DROPPERS

Steel or plastic droppers, sized to fit inside the downpipe.

2.4 DOMES

Wire mesh in round form with legs to clip inside the outlet opening to the downpipe.

2.5 GUTTER MESH

Flexible plastic mesh fitted into the gutter to the mesh manufacturer's requirements.

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store downpipes, spouting and accessories to avoid damage. Store on site under cover, on a clean level area, stacked to eliminate movement and away from work in progress. Avoid exposure to sunlight if strippable film is still on the product.

3.2 SUBSTRATE

Check that fascia, barges or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

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3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 12 metres in length for steel gutter.

3.4 CORROSION

Separate metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

Check compatibility of metals used for rainwater goods, against the materials being used for roofing and flashings.

Application - metal

3.5 INSTALL METAL GUTTER AND FASCIA

Establish minimum falls necessary (minimum 1:500) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum. In areas where snow fall is possible and or high wind areas, the centres should be reduced to 600mm. Lap spouting joints in direction of flow, a minimum of 40mm to seal between and over the top of joint and seal with silicone sealant and fix with rivets. Ensure the joint is fixed over its full girth. Cut out neatly for and fit the pre-formed downpipe dropper and rivet and seal around the joint. All installation to Metalcraft Roofing details and NZMRM CoP recommendations.

3.6 INSTALL METAL DOWNPIPES

Form downpipes complete with offsets and shoes as needed with all joints lapped and sealed as required. Screw fix with matching pipe clips to rigidly stand plumb to the wall, and discharging into the stormwater gully or pipe inlet. All installation to Metalcraft Roofing details and NZMRM CoP recommendations, section 5.7,Outlets & Downpipes.

3.7 INSTALL RAINWATER HEADS

Install using rivets where required to detail as shown on drawings. Ensure colour matched blind aluminium rivets are used when joining metal surfaces.

3.8 INSTALL OVERFLOWS

Install as close as practical to downpipe locations, at a height allowing water to discharge to the outside and not into the building.

3.9 INSTALL PROTECTION

Fit wire mesh domes to downpipe outlets and plastic mesh to spouting to the spouting manufacturer's requirements.

Completion

3.10 REPLACE

Replace damaged or marked elements.

3.11 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.metalcraftroofing.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

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4.1 METALCRAFT ROOFING GUTTER SYSTEMS

Profile:	Refer to Architectural Drawings.
Base material:	steel
BMT:	0.55mm
Coating system:	COLORSTEEL® Maxam™
Colour:	TBC by Architect

4.2 METALCRAFT METAL DOWNPIPES

Profile:	Round
Size:	Refer to Architectural Drawings.
Material:	Steel
BMT:	0.55mm
Coating system:	COLORSTEEL® Maxam™
Colour:	TBC by Architect

4.3 PROTECTION

Type/brand	N/A.

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7421 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures.

Refer to 7123 HOT AND COLD WATER SYSTEM for potable water systems.
Refer to 7431 DRAINAGE COMMON REQUIREMENTS for underground drains.
Refer to 7142 GREYWATER SYSTEMS for greywater systems.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G1/AS1	Personal hygiene
NZBC G12/AS1	Water supplies
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS 1589	Copper and copper alloy waste fittings
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
AS/NZS 4401	Plastic piping systems for soil and waste discharge (low and high temperature) inside buildings - polyethylene (PE)
AS/NZS 7671	Plastic piping systems for soil and waste discharge (low and high temperature) inside buildings - Polypropylene (PP)
BS EN 1124 .1	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. Requirements, testing, quality control.
BS EN 1124 .2	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. System S, forms and dimensions.

Plumbers, Gasfitters and Drainlayers Act 2006

Requirements

1.3 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.4 OPERATION AND MAINTENANCE MANUALS

Supply maintenance manual information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

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Performance

1.5 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

2 PRODUCTS

Materials

2.1 PVC-U WASTE PIPES AND TRAPS

To AS/NZS 1260, complete with fittings and accessories to the pipe manufacturer's requirements, all brand matched.

2.2 PVC-U VENT PIPE

To AS/NZS 1260, complete with fittings and accessories to the pipe manufacturer's requirements and all brand matched.

2.3 STAINLESS STEEL PIPES & FITTINGS

Stainless Steel pipe and fittings to BS EN 1124.1 and BS EN 1124.2.

Components

2.4 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

Accessories

2.5 FIRE RESISTANT COLLARS

Corrosion resistant collar or canister with intumescent packing to maintain the specified fire resistant rating of the floor or wall.

3 EXECUTION

Conditions

3.1 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2, as modified by NZBC G13/AS3, and complete all tests to AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

3.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

3.3 EQUIPOTENTIAL BONDING METALLIC WASTE PIPES

If it is an electrical requirement, before enclosing, ensure metallic waste pipes connected to metallic drains and attached metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) similar to NZBC G12/AS1, 9.0.

3.4 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site under cover on a clean level area, stacked to eliminate movement and away from work in progress.

3.5 SETTING OUT

Set out location of all stacks, discharge pipes, fittings and vent pipes and the completeness of their discharge into the drainage system.

3.6 CORE HOLES AND SLEEVES

Fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Sleeve diameter to be 25mm larger than outside diameter of pipe accommodated. Strip core holes and make good after installation of pipework.

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3.7 PIPE ACCESS

Fit and fix stacks, wastes and pipes in ducts independent of all other services so they are easily replaceable for their full length. Wrap or tape pipes buried in concrete.

3.8 FITTINGS ACCESS

Fit and fix traps and wastes to enable access for cleaning and for maintaining the total system.

3.9 CONFIRM LOCATIONS

Unless the location and height are clearly delineated on the drawings, confirm installation height and plan locations of sanitary fittings before commencing the piping installation.

3.10 TRAPS AND WASTES

Conceal traps and wastes in the fabric of the building unless detailed otherwise. Fit and fix satin chrome plated exposed pipes, traps and wastes unless detailed otherwise.

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for locations and types of traps.

3.11 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.

Application - jointing

3.12 JOINTING PVC-U PIPE

Prime and solvent weld joints using spigots and sockets, flanged joints and seal ring compression joints to AS/NZS 2032.

Application - fixing

3.13 THERMAL MOVEMENT

Accommodate longitudinal movement in pipes resulting from temperature changes. Incorporate expansion joints in copper and PVC-U pipes. Install PVC pipes to AS/NZS 2032. Take particular care to allow for movement at horizontal take-off locations from stacks.

3.14 TRAPS AND FIXTURE DISCHARGE PIPES - AS/NZS 3500.2

Size traps and pipes as required for each fixture or appliance. Establish the developed length of waste pipes. Vent and allow access for cleaning as required. Follow the most direct line with the least number of bends to AS/NZS 3500.2, table 3.3.1, for fixture loading and AS/NZS 3500.2, table 10.2.1, distance between supports.

3.15 DISCHARGE STACKS AND VENTS - AS/NZS 3500.2

Size stacks and vents to AS/NZS 3500.2, table 6.3(A), for fixture discharge pipe sizes and discharge units and AS/NZS 3500.2, table 3.9.3.1, vent pipe sizes. Extend up past the highest branch to form a discharge stack vent terminating to AS/NZS 3500.2, section 6.9 Vents, and finishing at the base with a 45 degree bend. Support system to AS/NZS 3500.2, table 10.2.1, for distances between supports.

3.16 FLASH ROOF PENETRATIONS

Flash or arrange for roofer to flash all penetrations to NZBC E2/AS1.

For profiled metal roofs, fit proprietary EPDM pipe collar flashings to NZBC E2/AS1, 8.4.12 Roof penetrations, and manufacturer's requirements.

Application - fire resistant penetrations

3.17 FIRE RESISTANT COLLARS

Insert circular type collars into holes provided in the concrete. Supply canister type collars. Locate and fix to the boxing before concrete is placed. Comply with the collar manufacturer's requirements for use of these elements, complete with accessories, tapes and sealants required for each particular situation.

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Completion

3.18 REPLACE

Replace damaged or marked elements.

3.19 LEAVE

Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following procedures.

3.20 REMOVE

Remove debris, unused materials and elements from site.

4 SELECTIONS

4.1 SANITARY SYSTEMS - PVC-U WASTE PIPES AND TRAPS

Location:	Refer to Building Services Drawings and Specifications.
Manufacturer/Brand:	TBC

4.2 SANITARY SYSTEMS - PVC-U VENT PIPE

Manufacturer:	TBC
Brand:	TBC

4.3 SANITARY SYSTEMS - STAINLESS STEEL PIPES AND FITTINGS

Location:	TBC
Manufacturer/brand:	TBC

4.4 SANITARY SYSTEMS - PROTECTIVE TAPE

Brand:	TBC
Width:	Refer to Building Services Drawings and Specifications.

Fire stopping

4.5 FIRE RESISTANT COLLARS

Manufacturer:	Ryanfire
Type/number:	Refer to Passive Fire Schedule

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7431 DRAINAGE COMMON REQUIREMENTS

1 GENERAL

This section relates to common requirements to do with the supply and laying of gravity subsoil, surface water and foul water drains.

1.1 RELATED WORK

Refer to 7441 GROUNDWATER DRAINAGE for subsoil drainage

Refer to 7451 SURFACE WATER DRAINAGE for storm/surface water drainage
Refer to 7461 FOUL WATER DRAINAGE for waste/foul water drainage

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC G13/AS2	Foul water
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
WorkSafe	Good Practice Guidelines - Excavation Safety

Plumbers, Gasfitters and Drainlayers Act 2006
Health and Safety at Work Act 2015
Health and Safety at Work (Hazardous Substances) Regulations 2017

Requirements

1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.4 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance manual information to requirements set out in the general section 1239 OPERATION & MAINTENANCE.

1.5 AS BUILT DOCUMENTS

Supply as-built drawings to requirements set out in the general section 1238 AS BUILT DOCUMENTATION.

Performance

1.6 SITE MEETING

Meet with the territorial authority drainage inspector to confirm the drainage layout in relation to site conditions. Confirm changes resulting and seek written site instruction before carrying out any work.

1.7 CHECK LOCATION

Check the location of existing on and off-site, private and public services with the network utility operator. Follow their requirements for safety and protection where laying drainage.

1.8 SITE CONDITIONS

Before starting work check on site the drainage layout, dimensions, levels and invert levels and ensure that line, level, falls and cover are correct.

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1.9 ADJOINING PROPERTIES

Take precautions to protect adjoining property from damage or risk of damage arising from excavation and drainage work.

1.10 SAFETY

To the Health and Safety at Work Act 2015.

Carry out excavation and trenching to WorkSafe, Good Practice Guidelines - Excavation Safety. Prevent material rolling into trenches.

1.11 EXPLOSIVES

Do not use explosives except with the written approval of the territorial authority / WorkSafe. Comply with their safety requirements and use construction blasters holding a current, appropriate Approved Handler Certificate and Controlled Substance Licence issued by WorkSafe, to the Health and Safety at Work (Hazardous Substances) Regulations 2017.

1.12 TESTS

Using the method agreed with the territorial authority inspector, test and inspect pipelines before backfilling to ensure required acceptance levels are achieved. Test again after backfilling to confirm acceptance levels and for final acceptance of the works.

Refer to RELATED WORK sections for specific requirements.

1.13 RECORDS

Records to be kept of all tests.

2 PRODUCTS

2.1 PRODUCTS

Refer to the RELATED WORK sections for products.

3 EXECUTION

Application

3.1 EXCAVATION

Open not more than 120 metres of trench at any one time. Excavated trench to a minimum width of pipe diameter plus 300mm. Do not batter or cut the trench wider above the top of the pipe.

For deep excavation, trench width to be sufficient to provide safe access and to accommodate shoring to WorkSafe, Good Practice Guidelines - Excavation Safety. Width of bottom of trench up to 300mm above top of pipe to be pipe diameter plus 300mm.
Maintain free of water and free of all falling material.

3.2 TRENCHING - PARALLEL TO FOUNDATIONS TO NZS 3604 OR NZS 4229

Trenches running parallel, below and close to foundations of buildings to NZS 3604 or NZS 4229 to be separated to:

- NZBC E1/AS1, 3.9.7, Proximity of Trench to Building, for stormwater and subsoil drains.
- AS/NZS 3500.3, 6.2.8, Installation near and under buildings, as modified by NZBC E1/AS2.
- NZBC G13/AS2, 5.6, Proximity of Trench to Building, for foul water drains.

3.3 TEMPORARY BRIDGES

Provide temporary bridges over trenches to prevent heavy construction traffic damaging pipes after backfilling.

3.4 CLEAN

Clean and flush out the whole installation and remove all silt and debris before handing over.

Completion

3.5 REPLACE

Replace damaged or marked elements.

3.6 LEAVE

Leave work to the standard required by following procedures.

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3.7 REMOVE

Remove debris, unused materials and elements from the site.



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7441 GROUNDWATER DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity flow groundwater drains for:

- ground water removal

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters

Refer to 7451 SURFACE WATER DRAINAGE for storm/surface water drainage
Refer to 7461 FOUL WATER DRAINAGE for waste/foul water drainage
Refer to 7462 WASTEWATER TREATMENT SYSTEM for waste water disposal

Documents

1.2 DOCUMENTS

Documents referred to in this and the above sections are:

AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3111	Methods of test for water and aggregate for concrete
NZS 4402.2	Methods of testing soils for civil engineering purposes - Soil classification tests
NZTA F2	Specification for pipe subsoil drain construction

2 PRODUCTS

Materials

2.1 PERFORATED GROUNDWATER PIPING

Perforated corrugated coil high density polyethylene groundwater drainage pipe to AS 2439.1 with polypropylene geotextile filter sock over.

Accessories

2.2 FILTER FABRIC

Polymeric fabric formed from a plastic yarn or a long chain synthetic polymer composed of at least 85% by weight of propylene, ethylene, amide, ester or vinylidene chloride. Fibres to be rot proof, chemically stable and have low water absorbency.

The filter network, (woven or non-woven) must be dimensionally stable and resistant to delamination.

2.3 DRAINAGE MATERIAL

Free draining crushed stone, 7mm to 20mm in size.

2.4 DRAINAGE MATERIAL - SIMPLE STANDALONE CONCRETE MASONRY RETAINING WALLS

Free draining imported hardfill to the NZTA F2 specification.

Filter material comprised of clean, durable stone having a crushing resistance of not less than 100 kN when tested in accordance with NZS 3111, or a mixture of such material with clean hard sand. The filter material when tested in accordance with NZS 4402.2, shall comply with the following gradings:

TEST SIEVE APERTURE	PERCENTAGE PASSING
26.5mm	100
13.2mm	85-100
9.5mm	80-95
4.75mm	65-85
2.36mm	50-70

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1.18mm	35-55
600µm	18-40
300µm	3-25
150µm	8 maximum
75µm	0

3 EXECUTION

Conditions

3.1 EXISTING DRAINS/SERVICES

Report existence of existing drains/services to the contract administrator for direction.

Application

3.2 HANDLING

Store and handle perforated groundwater drainage piping as per the manufacturer's requirements. Reject any damaged product.

3.3 SETTING OUT

Use string line, boning rod or laser equipment methods.

3.4 APPLICATION GENERALLY

To AS/NZS 3500.3, 6.4 Subsoil Drains.

3.5 FILTER FABRIC TO DRAINAGE MATERIAL

Where details require drainage material to be encapsulated in filter fabric to prevent fines from blocking the aggregate, place fabric and carefully hold in place by pinning and/or by controlled use of aggregate as ballast. After drain installation and required backfilling, complete encapsulation with fabric. Ensure filter fabric is correctly placed, sufficiently overlapped and pinned and/or secured.

3.6 LAY PERFORATED DRAINAGE PIPING TO BASEMENT WALLS

Ensure any required waterproofing and protection sheets are in place before starting work.

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. The pipe must not excessively elongate during installation. Lay in straight runs to 1:150 gradients with invert of the highest horizontal point 50mm minimum below floor slab level, discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.7 LAY PERFORATED DRAINAGE PIPING TO RETAINING WALLS

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage metal comprising of filter material to the NZTA F2 specification. Pipe bedding not less than 75mm deep. Backfill not less than 300mm deep. The pipe must not excessively elongate during installation. Lay in straight runs to correct gradients , discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Place granular fill in layers not exceeding 150 mm thick loose depth, to full height of wall, with an allowance for the thickness of the surface finish. Compact to provide support of not less than that of the adjacent material. Where geocomposite drain is used, the backfill shall follow the manufacturer's recommendations. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.8 BACKFILLING

Complete backfilling with drainage material.

3.9 CLEAN OUT PIPING INSTALLATION

Clean and flush out the whole piping installation and remove silt and debris before handing over.

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4 SELECTIONS

4.1 PERFORATED DRAINAGE PIPING

Pipe brand/type:	TBC
Diameter:	110mm
Sock brand/type:	TBC

4.2 DRAINAGE MATERIAL

Location:	Refer to Architectural Drawings and Structural Drawings.
Type:	Free draining crushed stone, 7mm to 20mm in size

4.3 TRENCH BACKFILLING MATERIAL

Location:	Refer to Architectural Drawings and Structural Drawings.
Type:	Free draining crushed stone, 7mm to 20mm in size

4.4 FILTER FABRIC

Brand:	TBC
Type:	TBC

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7451 SURFACE WATER DRAINAGE

1 GENERAL

This section relates to below ground, gravity flow stormwater pipework complete with maintenance access and fittings and connected to network utility operators system.

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters

Refer to 7441 GROUNDWATER DRAINAGE for sub-soil drainage
Refer to 7461 FOUL WATER DRAINAGE for waste/foul water drainage

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC G13/AS2	Foul water
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3104	Specification for concrete production
AS/NZS 4058	Precast concrete pipe (pressure & non pressure)
NZS 4442	Welded steel pipes and fittings for water, sewage and pressure gas
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications

Performance

1.3 TESTING - NZBC E1/AS1

Complete all tests to NZBC E1/AS1, 8.0, Drain Leakage Tests.

1.4 TESTING - AS/NZS 3500.3 & NZBC E1/AS2

Complete all tests to AS/NZS 3500.3 as modified by NZBC E1/AS2.

2 PRODUCTS

Materials

2.1 REINFORCING STEEL

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

2.2 PVC-U PIPES AND FITTINGS

Unplasticised PVC pipe and fittings to AS/NZS 1254.

Underground PVC-U pipe to comply with AS/NZS 1254 and Classified as follows:

Classification	Use
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

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2.3 SURFACE WATER SUMPS - NZBC E1/AS1

Precast concrete complete with lift-up cast iron grate and frame to NZBC E1/AS1 3.6, Surface water inlets to drains.

2.4 SURFACE WATER SUMPS - AS/NZS 3500.3 & NZBC E1/AS2

Precast concrete complete with lift-up cast iron grate and frame to AS/NZS 3500.3 as modified by NZBC E1/AS2.

2.5 CHANNEL DRAIN, GRATING AND SUMPS

Proprietary PVC channel or precast concrete drain complete with friction fit grating sections and matching sumps.

2.6 INSPECTION CHAMBERS - NZBC E1/AS1

Circular precast concrete or plastic to NZBC E1/AS1, 3.7, Access for maintenance, complete with removable cast iron lid and frame.

2.7 INSPECTION CHAMBERS - AS/NZS 3500.3 & NZBC E1/AS2

Circular precast concrete or plastic to AS/NZS 3500.3 as modified by NZBC E1/AS2, complete with removable cast iron lid and frame.

2.8 ACCESS CHAMBERS - NZBC E1/AS1

Circular precast concrete or plastic to NZBC E1/AS1, 3.7,Access for maintenance, complete with lift up cast iron lid and frame.

2.9 ACCESS CHAMBERS - AS/NZS 3500.3 & NZBC E1/AS2

Circular precast concrete or plastic to AS/NZS 3500.3 as modified by NZBC E1/AS2, complete with lift up cast iron lid and frame.

Accessories

2.10 BEDDING SURROUND AND FILLING MATERIALS

Granular:	Clean gravel or crushed stone or a blend of these. Particle size from minimum 7mm to maximum 20mm.
Selected:	Fine grain soil or granular material suitable for bedding and excluding topsoil, organic matter and rubbish.
Ordinary:	Top soil or other excavated materials excluding organic matter and rubbish.

2.11 CONCRETE

To NZS 3104.

Prescribed mix 17.5 MPa:	For in situ bases, anchors and pipe surrounds.
Prescribed mix 14 MPa:	For bedding only.

3 EXECUTION

3.1 EXECUTION GENERALLY - NZBC E1/AS1

Carry out this work to NZBC E1/AS1 and complete all tests to E1/AS1, 8.0, Drain Leakage Tests.

3.2 EXECUTION GENERALLY - AS/NZS 3500.3 & NZBC E1/AS2

Carry out this work to AS/NZS 3500.3 as modified by NZBC E1/AS2 and complete all tests to AS/NZS 3500.3, section 9, as modified by NZBC E1/AS2.

Application

3.3 BEDDING - NZBC E1/AS1

Place to NZBC E1/AS1, 3.9, Bedding and backfilling, using compacted granular material to avoid differential settlement and to obtain longitudinal support of the pipe.

3.4 BEDDING - AS/NZS 3500.3 & NZBC E1/AS2

Place to AS/NZS 3500.3 as modified by NZBC E1/AS2, using compacted granular material to avoid differential settlement and to obtain longitudinal support of the pipe.

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3.5 SURROUND AND BACKFILL - NZBC E1/AS1

Place to NZBC E1/AS1, 3.9, Bedding and backfilling, using compacted granular material and compacted fill. Compact in layers not exceeding 100mm.

3.6 SURROUND AND BACKFILL - AS/NZS 3500.3 & NZBC E1/AS2

Place to AS/NZS 3500.3 as modified by NZBC E1/AS2, using compacted granular material and compacted fill. Compact in layers not exceeding 100mm.

3.7 SETTING OUT

Use string line, boning rod or laser equipment methods. Use surveying and levelling equipment to accurately set out design invert levels.

3.8 LAYING AND JOINTING

Lay in straight lines between changes of line or grade from the lower end of the pipeline with sockets pointing uphill, each pipe set true to line and grade and each joint completed before the next pipe is laid. Install PVC Pipes to AS/NZS 2032 or AS/NZS 2566.1 and AS/NZS 2566.2. Install polyethylene Pipes to AS/NZS 2033. To prevent entry of foreign matter cap ends of uncompleted runs each day. Test drains and backfill progressively to minimise site disruption. Concrete cap trenches to all drains with less than 375mm cover.

3.9 LAYING STORM WATER SYSTEM

From the building rainwater system, sealed yard areas and including all access chambers, sumps, bends and junctions, lay the drainage system as detailed to discharge into the network utility operator water system and to their requirements.

3.10 DIFFERENTIAL SETTLEMENT

Provide flexible jointing, bedding and surrounding of pipes at junctions with manholes, foundation walls and other points where differential settlement may occur.

Application - fittings

3.11 CONSTRUCT ACCESS CHAMBERS - NZBC E1/AS1

Construct as detailed on a poured concrete footing to NZBC E1/AS1, 3.7, Access for maintenance. Provide all necessary haunching to channels.

3.12 CONSTRUCT ACCESS CHAMBERS - AS/NZS 3500.3 & NZBC E1/AS2

Construct as detailed on a poured concrete footing to AS/NZS 3500.3 as modified by NZBC E1/AS2. Provide all necessary haunching to channels.

3.13 CONSTRUCT INSPECTION CHAMBERS - NZBC E1/AS1

Construct as detailed on a poured concrete footing to NZBC E1/AS1, 3.7, Access for maintenance. Provide all necessary haunching to channels.

3.14 CONSTRUCT INSPECTION CHAMBERS - AS/NZS 3500.3 & NZBC E1/AS2

Construct as detailed on a poured concrete footing to AS/NZS 3500.3 as modified by NZBC E1/AS2. Provide all necessary haunching to channels.

3.15 CONSTRUCT SUMPS

Bed in concrete to the manufacturer's recommendations.

3.16 INSTALL CHANNEL DRAIN

Excavate for, provide bedding to fall and install channel drains and sumps complete with grated covers, to the manufacturer's requirements.

Application - connections

3.17 CONNECT TO SURFACE WATER - PUBLIC MAINS

Locate, excavate and expose the existing drain, connect new pipework to existing drain to the requirements of the network utility operator.

3.18 CONNECT TO SURFACE WATER - PUBLIC MAINS ACCESS OR INSPECTION CHAMBER

Locate, excavate and break into the existing chamber, modify as necessary and connect new pipes to the requirements of the network utility operator.

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3.19 CONNECT TO SURFACE WATER - ON SITE

Locate, excavate and expose the existing drain, connect new pipework to existing drain using a 'Y' junction, to meet the standards of the new work.

3.20 CONNECT TO ON-SITE WATER STORAGE

Connect to on-site water storage system. Refer to 7112 WATER STORAGE TANKS.

3.21 CONNECT TO ON-SITE SURFACE WATER DISPOSAL SYSTEM

Connect to on-site surface water disposal system as detailed.

4 SELECTIONS

4.1 SURFACE WATER SUMPS

Manufacturer:	Refer to Architectural and Civil Drawings.
Type:	Refer to Architectural and Civil Drawings.
Size:	Refer to Architectural and Civil Drawings.

4.2 SURFACE WATER CHANNEL DRAIN, GRATING AND SUMPS

Manufacturer/brand: ~

Model:	Refer to Architectural and Civil Drawings.
Sump size/model:	Refer to Architectural and Civil Drawings.

4.3 SURFACE WATER INSPECTION CHAMBERS

Diameter:	Refer to Architectural and Civil Drawings.
Type:	Refer to Architectural and Civil Drawings.

4.4 SURFACE WATER ACCESS CHAMBERS

Diameter:	Refer to Architectural and Civil Drawings.
Type:	Refer to Architectural and Civil Drawings.

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7461 FOUL WATER DRAINAGE

1 GENERAL

This section relates to below ground, non-pressure foul water pipework complete with all maintenance access and fittings and connected to network utility operator sewers.

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters

Refer to 7421 SANITARY SYSTEMS for above ground pipework
Refer to 7441 GROUNDWATER DRAINAGE for sub-soil drainage
Refer to 7451 SURFACE WATER DRAINAGE for storm/surface water drainage

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC G13/AS2	Foul water - Drainage
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
NZS 3104	Specification for concrete production
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
AS/NZS 4058	Precast concrete pipe (pressure & non pressure)
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
BS EN 1124 .1	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. Requirements, testing, quality control.
BS EN 1124 .2	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. System S, forms and dimensions.

Performance

1.3 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS2,6.1 Testing or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

2 PRODUCTS

Materials

2.1 PVC-U PIPES AND FITTINGS

Unplasticised PVC pipe and fittings to AS/NZS 1260, buried pipes classified as follows:

Classification	Use
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas

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SN16	Public roads & high load areas

2.2 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to AS/NZS 3500.2, 4.6 Gullies, as modified by NZBC G13/AS3.

2.3 INSPECTION OPENINGS & SMALL CHAMBERS - AS/NZS 3500.2

Circular precast concrete or plastic to AS/NZS 3500.2, 4.7 Inspection Openings and/or 4.8 Inspection Chambers, as modified by NZBC G13/AS3, complete with cast iron lid and frame. All joints watertight (base/pipes, base/riser, riser/riser, riser/lid, lid throat and throat/frame). Use epoxy mortar joints in concrete chambers. Use ring seals in plastic chambers.

Accessories

2.4 TRENCH BACKFILLING MATERIAL - NZBC G13/AS2

Bedding and backfilling material to NZBC G13/AS2, 2.0 Materials, or methods shown in NZBC G13/AS2, figure 7, Bedding and backfilling.

2.5 TRENCH BACKFILLING MATERIAL - AS/NZS 3500.2

Bedding and backfilling material to AS/NZS 3500.2, 5.4, Bedding of drains, and for concrete, if required, AS/NZS 3500.2, 5.3 Concrete Support.

2.6 CONCRETE

To NZS 3104.

Prescribed mix 17.5 MPa:	For in situ bases, anchors and pipe surrounds.
Prescribed mix 14 MPa:	For bedding only.

3 EXECUTION

Conditions

3.1 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2 as modified by NZBC G13/AS3 and complete all tests to AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

Bedding, backfilling and encasement

3.2 TRENCH BACKFILLING GENERALLY - FOUL & SURFACE WATER

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

3.3 FOUL WATER TRENCH BACKFILLING - NZBC G13/AS2

Carry out foul water trench backfilling to NZBC G13/AS2, 5.3 to 5.5 and fig 7.

UPVC pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.4 FOUL WATER TRENCH BACKFILLING - AS/NZS 3500.2

Carry out foul water trench backfilling to AS/NZS 3500.2, 5.1, 5.2 and 5.5 as modified by NZBC G13/AS3.

UPVC pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.5 CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

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Application

3.6 SETTING OUT

Use string line, boning rod or laser equipment methods. Use surveying and levelling equipment to accurately set out design invert levels.

3.7 LAYING AND JOINTING

Lay in straight lines between changes of line or grade from the lower end of the drain with sockets pointing uphill. Set each pipe true to line and grade and each joint completed before the next pipe is laid. Install PVC-U pipes to AS/NZS 2032 or AS/NZS 2566.1 and AS/NZS 2566.2. Install polyethylene Pipes to AS/NZS 2033. Cap ends of uncompleted runs each day to prevent entry of foreign matter. Test drains and backfill progressively to minimise site disruption. Concrete cap trenches to drains with less than 375mm cover.

3.8 LAYING FOUL WATER DRAINS

Lay the drainage system from soil stacks and gully traps, including access chambers, inspection chambers, bends, junction inspections, and vents (fresh air inlets). Discharge into the network utility operator foul water system to their requirements.

3.9 DIFFERENTIAL SETTLEMENT

Provide flexible jointing, bedding and surrounding of pipes at junctions with manholes, foundation walls and other points where differential settlement may occur.

Application - fittings

3.10 CONSTRUCT GULLY TRAPS - AS/NZS 3500.2

Set in a minimum 100mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to AS/NZS 3500.2, 4.6,Gullies.

3.11 CONSTRUCT SMALL INSPECTION CHAMBERS - AS/NZS 3500.2

Construct as detailed on a poured concrete footing to AS/NZS 3500.2, 4.7 Inspection openings and 4.8 Inspection chambers, as modified by NZBC G13/AS3. Provide all necessary haunching to channels.

Application - connections

3.12 CONNECTION TO FOUL WATER - PUBLIC MAINS

Locate, excavate and expose the existing drain, connect new pipework to existing drain to the requirements of the network utility operator.

3.13 CONNECTION TO FOUL WATER - PUBLIC MAINS ACCESS CHAMBER

Locate, excavate and break into the existing chamber, modify as necessary and connect new pipes to the requirements of the network utility operator.

4 SELECTIONS

4.1 GULLY TRAPS

Manufacturer:	TBC
Material:	TBC
Type:	TBC

4.2 INSPECTION OPENINGS & SMALL CHAMBERS - AS/NZS 3500.2

Diameter:	TBC
Type:	TBC

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7612 RESIDENTIAL EXTRACT SYSTEMS

1 GENERAL

This section relates to the supply and installation of extract systems for residential applications. It includes:

- Kitchen extract systems
- Bathroom and laundry extract systems

1.1 RELATED WORK

Refer to the electrical section(s) for general electrical requirements.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E3/AS1	Internal moisture
NZBC G4/AS1	Ventilation of buildings
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 60335.1	Household and similar electrical appliances - Safety - General requirements

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

(TBC) years TBC

- 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.

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

(TBC) years TBC

- 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

1.5 CO-ORDINATE WORK

Co-ordinate all items with the main contractor, in particular cutting of penetrations and waterproofing. Exterior penetrations to NZBC E2/AS1 as consistent with the project requirements.

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 ELECTRICAL QUALIFICATION

Registered electrician to carry out work to Electricity (Safety) Regulations 2010.

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1.8 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1234 DOCUMENTATION for provision of the following general operation and maintenance information as electronic PDF format documents:

Provide this information prior to practical completion.

1.10 EXTRACT FLOW RATES

To NZBC G4/AS1.

Extract fans (including associated ducts) to have a minimum flow rate of:

- 25 L/s for showers and baths
- 50 L/s for cooktops

Compliance information

1.11 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer, importers or distributors warranty
- Installer warranty
- Other information required by the BCA in the Building Consent Approval documents.

Quality control and assurance

1.12 INSPECTIONS

TBC by Project Manager

2 PRODUCTS

Kitchen extract systems

2.1 KITCHEN RANGEHOOD EXTRACT - TO ROOF

Mechanical rangehood extract system comprised of rangehood canopy, extract fan, filter, lighting, controls, metal ducting, proprietary roof flashing and cowl.

Refer to SELECTIONS for options.

2.2 KITCHEN RANGEHOOD EXTRACT - TO EXTERIOR WALL / SOFFIT

Mechanical rangehood extract system comprised of rangehood canopy, extract fan, filters, lighting, controls, metal ducting, solid duct wall sleeve, exterior grille and weatherproof cowl.

Refer to SELECTIONS for options.

Bathroom and laundry extract systems

2.3 CEILING MOUNTED FAN, DUCTED TO EXTERIOR WALL / SOFFIT

Mechanical fan ducted system comprised of ceiling fan, filters, controls, aluminium foil flexi ducting joined to a solid duct sleeve sloped to remove condensation, exterior weatherproof grille and flashing.

Refer to SELECTIONS for options.

2.4 WALL MOUNTED FAN, DUCTED TO EXTERIOR WALL / SOFFIT

Mechanical fan ducted system comprised of wall fan, solid duct sleeve sloped to remove condensation, exterior weatherproof grille and flashing.

Refer to SELECTIONS for options.

2.5 LAUNDRY DRYER VENT, DUCTED TO EXTERIOR WALL

Laundry dryer vent comprised of, filter, metal ducting, exterior weatherproof grille and flashing.

Refer to SELECTIONS for options.

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Component

2.6 ELECTRICAL FAN SWITCH

Independent switch connected to socket outlet located near fan / unit.

Refer to SELECTIONS for run on timer requirements.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

Installation - mechanical ventilation

3.3 INSTALL KITCHEN RANGEHOOD

Install rangehood to AS/NZS 3000, AS/NZS 60335.1 and manufacturer installation instructions. Connect unit with ducting to exit either through roof or exterior wall / soffit. Plug into electrical socket.

3.4 INSTALL BATHROOM / TOILET / LAUNDRY EXTRACT FANS

Install exterior ducted fans to manufacturer requirements to AS/NZS 3000 and NZBC G4/AS1. Duct through to roof or exterior wall / soffit. Plug into electrical socket.

3.5 INSTALL LAUNDRY DRYER VENT, DUCTED TO EXTERIOR WALL

Install exterior ducted fans to manufacturer requirements.

3.6 INSULATION CLEARANCE

Provide 50mm clearance between insulation and motor unit / electrical enclosure. Insulation can abut ducts.

3.7 ELECTRICAL INSTALLATION

Install switch and socket outlets to AS/NZS 3000 and AS/NZS 60335.1. Refer to electrical section(s) for requirements.

Completion & commissioning

3.8 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

3.9 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

3.10 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

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4 SELECTIONS

Kitchen extract systems

4.1 KITCHEN RANGEHOOD EXTRACT - TO EXTERIOR WALL / SOFFIT

Location:	Refer to Building Services Drawings and Specifications.
Manufacturer:	Refer to Building Services Drawings and Specifications.
Product/model:	Refer to Building Services Drawings and Specifications.
Duct type/size:	Refer to Building Services Drawings and Specifications.
Cladding:	Aluminium cladding.
Wall grille type/size:	Refer to Building Services Drawings and Specifications.
Cowl type:	Refer to Building Services Drawings and Specifications.

Bathroom and laundry extract systems

4.2 CEILING MOUNTED FAN, DUCTED TO EXTERIOR WALL / SOFFIT

Location:	Refer to Building Services Drawings and Specifications.
Manufacturer:	Refer to Building Services Drawings and Specifications.
Product/model:	Refer to Building Services Drawings and Specifications.
Fan type/size:	Refer to Building Services Drawings and Specifications.
Diffuser type:	Refer to Building Services Drawings and Specifications.
Switch type:	Refer to Building Services Drawings and Specifications.
Duct type/size:	Refer to Building Services Drawings and Specifications.
Grille type/size:	Refer to Building Services Drawings and Specifications.
Cladding:	Aluminium cladding.
Cowl type:	Refer to Building Services Drawings and Specifications.

4.3 WALL MOUNTED FAN, DUCTED TO EXTERIOR WALL / SOFFIT

Location:	Refer to Building Services Drawings and Specifications.
Manufacturer:	Refer to Building Services Drawings and Specifications.
Product/model:	Refer to Building Services Drawings and Specifications.
Fan type/size:	Refer to Building Services Drawings and Specifications.
Switch type:	Refer to Building Services Drawings and Specifications.
Duct type/size:	Refer to Building Services Drawings and Specifications.
Grille type/size:	Refer to Building Services Drawings and Specifications.
Cladding:	Aluminium Cladding
Cowl type:	Refer to Building Services Drawings and Specifications.

4.4 LAUNDRY DRYER VENT, DUCTED TO EXTERIOR WALL

Location:	Refer to Building Services Drawings and Specifications.
Manufacturer:	Refer to Building Services Drawings and Specifications.
Product/model:	Refer to Building Services Drawings and Specifications.
Duct type/size:	Refer to Building Services Drawings and Specifications.
Grille type/size:	Refer to Building Services Drawings and Specifications.
Cladding:	Aluminium Cladding
Flashing:	To suit specified cladding type.

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7673 SPLIT UNIT HEAT PUMP SYSTEMS

1 GENERAL

This section relates to heat pump air conditioning systems.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

L10 :	Centile Level, sound level that is equalled or exceeded for 10% of the time.
HFC:	Hydro-fluorocarbon
mm Hg:	mm mercury - unit of pressure
NIWA	National Institute of Water and Atmospheric Research
ASHRAE	American Society of Heating and Air Conditioning Engineers
IRHACE	Institute of Refrigeration, Heating and Air Conditioning Engineers

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G4/AS1	Ventilation of buildings
AS 1324.2	Air filters for use in general ventilation and air conditioning - methods of test
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1571	Copper - seamless tubes for air conditioning and refrigeration
AS/NZS 2107	Acoustics - Recommended design sound levels and reverberation times for building interiors
AS/NZS 3666.1	Air handling and water systems of buildings - Microbial control - Design, installation and commissioning
AS/NZS 3823.1.1	Performance of electrical appliances - Airconditioners and heat pumps - Part 1.1: Non-ducted airconditioners and heat pumps - Testing and rating for performance
AS/NZS 3823.1.2	Performance of electrical appliances - Airconditioners and heat pumps - Part 1.2: Ducted airconditioners and air-to-air heat pumps - Testing and rating for performance
AS/NZS 3823.2	Performance of electrical appliances - Air conditioners and heat pumps - Energy labelling and minimum energy performance standard (MEPS) requirements
AS 4254.1	Ductwork for air handling systems in buildings - Flexible duct
NZS 4303	Ventilation for acceptable indoor air quality
AIRAH DA9, ASHRAE or Carrier	Manual calculation methods
ACADS-BSG Camel, Carrier E20	Electronic calculation methods

Warranties

1.3 WARRANTY - INSTALLER/APPLICATOR

Installer's warranty for the system under normal environmental and use conditions against failure.

(TBC) years	Execution warranty

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Provide this warranty on the installer's standard form.

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Manufacturer's warranty for the system under normal environmental and use conditions against failure.

(TBC) years: Warranty

Provide this warranty on the manufacturer's standard form.

Requirements

1.5 CO-ORDINATE WORK

Co-ordinate all items with the main contractor, in particular cutting of penetrations and waterproofing. Exterior penetrations to NZBC E2/AS1 as consistent with the project requirements.

1.6 DRAWINGS AND BROCHURES

Submit, on request for review drawings and brochures of units, grilles and any other elements that affect the interior finishes.

1.7 QUALIFICATIONS

Work to be carried out by approved trades people, qualified, experienced, competent and familiar with the equipment, systems, materials and techniques specified.

Handling or recovering refrigerant to be carried out by the appropriate Approved Filler and/or Handler, with a test certificate under the HNSO Act.

1.8 AIR CONDITIONING LOAD CALCULATIONS

General: Calculate the cooling and heating loads using one of the following:

- Manual methods: AIRAH DA9, ASHRAE or Carrier.
- Electronic methods: ACADS-BSG Camel, or Carrier E20

1.9 AIR CONDITIONING DESIGN BASIS

General

Outside design conditions: Use outdoor design conditions listed in publications from NIWA, ASHRAE, IRHACE or other reliable sources for weather data, for the location geographically closest and most relevant to the site.

Inside design conditions

Summer: 22°C dry bulb, 50% relative humidity.
Winter: 21°C dry bulb.
Limit the temperature difference in air conditioned spaces served by the same zone or system to ± 1.5°C when measured:

- Between any 2 points in the space from floor level to 1500mm above floor level, > 2000mm from cooking equipment and > 1000mm from any other appliance.
- When outside conditions are in the range specified above.
- After the plant has been operating for one hour.
- In the same 5 minute period.

Divide the systems into temperature controlled zones to meet the specified permissible temperature variation and documented system divisions.
Where ventilation requirements are not met by natural means and do not comply with NZBC G4/AS1, supply fresh air to spaces with air conditioning systems via the air handling system, or separate mechanical ventilation system in accordance with NZS 4303.

Heating

Reverse cycle.

Building Enclosure

Refer to drawings for construction of windows, walls, floors, roofs and insulation.

External window shading: Refer to Architectural Drawings

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Internal window shading:	Refer to Architectural Drawings

Noise
Indoor noise emitted - to AS/NZS 2107, depending on space served, occupancy and activity. Noise received in all habitable rooms shall not exceed that permitted by the applicable Territorial Authority for the time of day or day of the week for the zoning of the site. Not more than L10: 35dbA between 2300 and 0700 hours. This shall apply to both the property in question and the neighbouring properties.

1.10 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

All units, filters, controls, pumps, traps, drain trays, refrigerant

1.11 MAINTENANCE CONTRACT PROPOSAL

Provide a proposed contract for the ongoing servicing of the heat pump system. Refer to SELECTIONS.

2 PRODUCTS

Material

2.1 REVERSE CYCLE UNITS

Split system heat pumps shall meet the requirements of AS/NZS 3823.1.1 and AS/NZS 3823.1.2 with minimum energy performance standards (MEPS) in accordance with AS/NZS 3823.2.

Provide effective outdoor coil defrost facility that prevents room temperature dropping more than 2°C during defrost.

2.2 CABINETS

Aluminium, powder coated steel or moulded acrylonitrile-butadiene-styrene (ABS) plastic with zinc - coated steel or stainless steel fasteners. Insulate and vapour seal cabinet and drain trays to prevent external condensation under all operating conditions.

2.3 DRAIN TRAYS

Aluminium, stainless steel or plastic to collect all moisture inside indoor and outdoor units.

2.4 FILTERS

Washable panel type.(85% of arrestance when tested to AS 1324.2, Test Dust No.4 or Class EU2 rated.

2.5 COILS

Copper tube with aluminium plate fins.

2.6 CONTROLS

Provide as a minimum the following functions:

- Temperature control for each zone located to accurately sense zone temperature.
- Fan speed selection for multi and variable speed fans.
- Day/night zone changeover if scheduled.
- Time switch for each system with (6 temperature programs per day, separate programs for each day of the week, manual set point over ride and 'Vacation' or 'Holiday' temperature set back.

2.7 REFRIGERATION PIPEWORK KIT

Split system manufacturer's standard pre-charged piping kit.

2.8 REFRIGERATION PIPEWORK CUSTOM

Copper tubing, de-oxidised seamless refrigeration quality, either half hard or soft drawn. Jointing shall be brazed or flared connections to equipment.

2.9 REFRIGERANT

Refrigerant HFC type with no phase out date, such as R410a or R407a, unless approved otherwise.

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3 EXECUTION

Conditions

3.1 DELIVERY

Keep materials and equipment dry in transit. Take delivery of materials and equipment in an undamaged condition. Reject all damaged materials.

3.2 STORAGE

Store materials and accessories on a level, firm base, in dry conditions, out of direct sunlight and completely protected from weather and damage. Ensure storage areas are away from current work areas. Cover to keep dry until installed.

3.3 CONFIRM LAYOUT

Before commencing work confirm the proposed location of pipes, ducts and controls.

3.4 CONCEALED PIPING

All refrigeration and condensate piping shall be concealed within the building structure unless stated otherwise.

3.5 CO-ORDINATE SERVICES

Co-ordinate and co-operate with other sub-trades to avoid any conflict with the installation of the system with other subcontractors work.

3.6 PROTECT SURFACES

Protect surfaces, equipment and finishes already in place from the possibility of damage during the installation process.

Application

3.7 INSTALLATION PIPE WORK

Install general pipe work to AS/NZS 1571

Purge the system at all times with dry nitrogen when brazing or heating pipework.

Pipes to be installed to manufacturer's requirements, adequately supported, also arranged and sized to prevent excessive pressure drop and ensure correct circulation of refrigerant and oil.

All refrigeration pipework test to 1800 kPa.

Insulate all refrigerant and drain piping that may sweat with chemically blown closed cell elastomeric insulation. Suction lines are to be insulated over the entire length between connections to indoor and outdoor units. Protect insulation from sunlight and mechanical damage.
Insulation thickness: 13mm for pipes < DN 20, 19mm otherwise.

Provide trapped (DN 20 condensate drains to AS/NZS 3666.1 from each indoor coil and safety tray, to an approved drain point. Provide drains from each reverse cycle outdoor coil unless casing freely drains to a roof or other location where condensate will not cause damage or pond.

3.8 INSTALLATION UNIT

Provide clearance around outdoor units for condenser air flow and maintenance access, to manufacturer's requirements. Ensure discharge air does not short-circuit to condenser intake.

For equipment at ground level, ensure they are mounted on 100mm level concrete plinth or equivalent impervious material.
Provide internal or external flexible duct connections at indoor unit.

For vibration isolation of suspended units, provide (4 metal spring or rubber-in - shear isolation mountings with (25mm static deflection and 98% isolation efficiency. For floor mounted units, provide neoprene waffle pads. Bolt in place.

If leaks or condensation from equipment could cause nuisance or damage to the building or its contents provide a galvanized steel safety tray under the equipment.

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3.9 INSTALLATION REFRIGERANT

The completed system including all pipework, to be evacuated to 0.2mm Hg or better with a vacuum pump and maintained at this pressure for 2 hours, then broken with refrigerant.

Completion

3.10 COMMISSIONING

Commission the systems to manufacturer's recommendations using instruments calibrated in the last 12 months. Submit signed commissioning check list on completion.

3.11 CLEANING

Clean filters, outdoor coils, grilles and diffusers.

Remove debris, unused materials and elements from the site. Clean soiled or marked work. Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following procedures.

3.12 PROTECT

Protect new work from damage.

4 SELECTIONS

4.1 SPLIT UNIT HEAT PUMP MANUFACTURER / MODEL

Manufacturer:	Refer to Building Services Drawings and Specifications
Indoor Unit Model:	Refer to Building Services Drawings and Specifications
Outdoor Unit Model:	Refer to Building Services Drawings and Specifications

4.2 MAINTENANCE CONTRACT PROPOSAL

Contract to commence from:	TBC
Contract period:	1 year

4.3 NON-DUCTED AIR CONDITIONING

Plant location:	Refer to Building Services Drawings and Specifications
Room served:	Refer to Building Services Drawings and Specifications
System:	Refer to Building Services Drawings and Specifications
Outdoor plant location:	Refer to Building Services Drawings and Specifications

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7702 ELECTRICAL STANDARD

1 GENERAL

This section relates to the wiring for complex/large residential and medium scale commercial/industrial installations, including:

- supply - national grid
- supply - electricity generation systems
- distribution & protection
- switches & sockets
- lighting circuits - residential
- light fittings
- exterior light fittings, switches, & sockets
- alarms - residential
- heating systems
- mechanical
- electrical automation system
- security system
- fire rated sealers and liners
- fire rated accessories

1.1 RELATED WORK

Refer to ~ for ~.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

AFDD	Arc Fault Detection Device
ELV	Extra Low Voltage
GLS	General Lighting Service
IP	International (ingress) Protection classification
NUO	Network Utility Operator
PCB	Printed Circuit Board
PIR	Passive InfraRed
RCBO	Residential current operated Circuit Breaker with Over-current protection
RCCB	Residential Current operated Circuit-Breakers with integral overcurrent protection for household and similar uses
RCD	Residual Current Device
SIA	Security Integration Architecture
TCF	Telecommunications Carriers' Forum
FFL	Finished Floor Level
TPS	Tough Plastic Sheathed

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F6/AS1	Visibility in escape routes
NZBC F8/AS1	Signs
NZBC G4/AS1	Ventilation of buildings
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord

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AS/NZS 1768	Lightning protection
AS/NZS 2053.2	Conduits and fittings for electrical installations - Rigid plain conduits and fittings of insulated material
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3100	Approval and test specification-general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
AS/NZS 3190	Approval and test specification - Residual current devices (current-operated earth-leakage devices)
AS/NZS 3439.1	Low voltage switchgear and controlgear assemblies - Type-tested and partially type-tested assemblies
AS/NZS 3439.3	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
AS 3786	Smoke alarms using scattered light, transmitted light or ionization
NZS 4219	Seismic performance of engineering systems in buildings
NZS 4514	Interconnected smoke alarms for houses
NZS 4246	Energy efficiency - installing bulk thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 5139	Electrical installations - Safety of battery system for use with power conversion equipment
AS/NZS 60335.1	Household and similar electrical appliances - Safety - General requirements
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
AS/NZS 61439.1	Low-voltage switchgear and controlgear assemblies - Part 1: General rules.
AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61643	Low-voltage surge protective devices

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).
TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

Warranties

1.4 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:	Warranty period

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Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

Requirements

1.5 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services for listed and prescribed work and with the utility network operator requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Carry out work under the supervision of an electrical licensed supervisor.

1.7 QUALIFICATIONS - SECURITY SYSTEM

Installation by an installer licensed under the Private Investigators and Security Guards Act. Installation of all security equipment to comply with AS/NZS 2201.1 Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance.

1.8 CONFIRM SELECTIONS

Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

1.9 SAFETY OF INSTALLATION - DESIGN BY ELECTRICAL ENGINEER

Before installation work commences obtain from the electrical engineer a Certified Design. The Certified Design is to comply with the Electricity (Safety) Regulations (2010), regulation 58.

1.10 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

Before installation work commences provide a Certified Design. The Certified Design is to comply with the Electricity (Safety) Regulations (2010), regulations 58. It must be signed by the designer of the installation.

1.11 ELECTRICAL CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations (2010), prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect high-risk electrical work as required by regulation 70.

1.12 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

1.13 PRODUCER STATEMENTS

Provide a 'producer statement - design' and 'producer statement - construction' to the satisfaction of the Building Consent Authority, for the complete electrical installation.

1.14 COMPLIANCE SCHEDULES

Provide compliance schedules for the installation to the satisfaction of the territorial authority, in accordance with the New Zealand Building Code requirements for the complete electrical installation.

Quality control and assurance

1.15 INSPECTIONS

TBC by Project Manager.	TBC

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2 PRODUCTS

Supply, distribution, and protection

2.1 MAINS SUPPLY

Tough plastic sheathed neutral screened cable to AS/NZS 5000.2 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLE LADDERS

Fabricated from galvanized steel and/or aluminium with rungs at 300mm centres and complete with ladder manufacturer standard bends, risers, curves and reducers and of sufficient strength for the envisaged cabling without deflection. Size 20% over width for designed cable loading including spaces between to avoid de-rating cables. Form fixing holes and slots before galvanizing. Allow for expansion joints where necessary.

2.3 HEAVY DUTY RIGID PVC CONDUIT

For underground wiring to AS/NZS 2053.2, with corrosion proof fittings and accessories, brand matched to the conduit manufacturer requirements.

2.4 RIGID PVC CONDUIT

High impact, cold setting medium duty to AS/NZS 2053.2, jointed together and to fittings with solvent cement to the conduit manufacturer requirements. Fittings and accessories brand matched to the conduit manufacturer requirements.

2.5 CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0mm², and to AS/NZS 3008.1.2. Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive Voltage drop.

Lighting circuits:	Domestic: 1.5mm² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm² on 16 amp MCBs
Power circuits:	2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction 2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity 2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction 2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm² on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm² high temperature cable on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C (roof spaces above insulation etc).

2.6 METER BOX

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

Refer to SELECTIONS

2.7 SWITCHBOARD - RESIDENTIAL

Manufactured to AS/NZS 3439.3 or AS/NZS 61439.3 and installed in accordance with AS/NZS 3000. Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Switchboards to have 20% spare capacity for future additions and alterations.

Refer to SELECTIONS

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2.8 SWITCHBOARD - NON-RESIDENTIAL

To AS/NZS 3439.1 or AS/NZS 61439.1 and manufactured from heavy gauge steel with baked enamel finish in approved colour. Switchboards to have 20% spare capacity for future additions and alterations.

- Main switchboard: form 3
- Distribution boards: form 1

Fault rating graded to suit maximum prospective fault from network utility operator

- minimum 22kA, 1.0 seconds for main switchboards
- minimum 20kA, 0.1 seconds for distribution switchboards.

Complete, fully wired, factory tested of sizes to suit space allocated, designed to give easy access to and removal of component parts and constructed to contain equipment to the approval of the network utility operator and/or independently qualified person.

Design the installation for full discrimination between switchboards.

For emergency lighting provide test facilities to AS 2293.1.

Refer to SELECTIONS

2.9 SURGE PROTECTION

Provide surge protection device(s) to AS/NZS 3000, Appendix F. IEC 61643 Class ll surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class lll surge protection to switched socket outlets.

2.10 DEGREES OF PROTECTION - DAMP CONDITIONS

For electrical equipment installed in classified zones (baths, showers, and other fixed water containers), provide a degree of protection to AS/NZS 3000, clause 6.2.4.1.

Zone 0	IPX7
Zones 1 and 2	IPX4
Zone 3	no specific degree of protection

Switches & sockets - interior

2.11 WALL BOXES

Standard grid size or equivalent to be manufactured from plastic or metal, with 2 or more gang size to be metal with steel inserts for accessory securing screws. Screw fixed.

2.12 SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 Volt a.c. polycarbonate flushplate units.

Label all switch units that control electrical equipment or special lighting circuits by proprietary engraved switch mechanisms where applicable.
Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.
Refer to SELECTIONS.

2.13 SWITCH PANELS

To accommodate switches to separate circuits and phases and flush mounted within a metal wall box with selected colour powder coated flush plate 2.5mm thick. Switches individually secured within a mounting plate behind the flush plate. Engrave the flush plate to indicate the use of each switch. Permanently label circuit numbers on back of plate.

2.14 SWITCHED SOCKET-OUTLETS - RESIDENTIAL

10 amp minimum, 230 Volt a.c., flat 3 pin socket outlets fitted with safety shutters to AS/NZS 3112 clause 3.12. Socket-outlet manufactured, tested, and approved to AS/NZS 3112, and AS/NZS 3100. Single or multi-gang as detailed.

For mounting height and orientation, refer to SELECTIONS.

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2.15 SWITCHED SOCKET-OUTLETS - INDUSTRIAL/NON-RESIDENTIAL

Socket outlets manufactured, tested, and approved to AS/NZS 3123, and AS/NZS 3100.

For mounting height and orientation, refer to SELECTIONS.

2.16 SWITCHED SOCKET-OUTLETS - STATIONARY APPLIANCES

Manufactured to AS/NZS 3100, safety and testing requirements to AS/NZS 3131.

For mounting height and orientation, refer to SELECTIONS.

2.17 SWITCHES AND SOCKET-OUTLETS - PERSONS WITH DISABILITIES

In addition to clause SWITCH UNITS and SWITCHED SOCKET OUTLETS, units shall comply with NZBC G9/AS1, clause 2.0.

Light fittings - interior

2.18 LIGHT FITTINGS

Fluorescent and High Intensity Discharge fittings with low loss control or electronic gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 240V rated, bayonet cap; Linear fluorescent triphosphor and CFL - 2700K (domestic) and 4,000K (commercial); halogen ELV 12V dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.

2.19 CEILING ROSES

White plastic mounting base with screwed cover, manufactured to AS/NZS 3113. Terminal type. Suspended fittings to have sheathed round flexible cord to AS/NZS 3008.1.2. Refer to SELECTIONS.

2.20 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.21 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to AS/NZS 3000, 4.5.2.3.5:

- Existing fittings or retrofit situations, fittings maybe unmarked.
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F, & IC-4.

Refer to clause INSULATION & GENERAL CLEARANCES for clearances from insulation and other elements.

2.22 RECESSED LIGHT FITTINGS - NON-RESIDENTIAL

Non-residential recessed light fittings to AS/NZS 3000, 4.5.2.3.5:

- Existing fittings or retrofit situations, fittings maybe unmarked.
- New fittings can only be labelled - NON-IC, Do-not Cover, CA 80, CA 90, CA 135, IC, IC-4, and IC-F.

Refer to clause INSULATION & GENERAL CLEARANCES for clearances from insulation and other elements.

2.23 EMERGENCY LIGHT FITTINGS

Emergency escape lighting and exit signs for buildings to AS 2293.3 and NZBC F8/AS1. Fittings may be, ceiling or wall mounted or recessed, refer to SELECTIONS.

Note: Photoluminescent exit signage requires adequate charging to NZBC F8/AS1, 4.5.4, for the required time to NZBC F6.

Light fittings - exterior

2.24 LIGHT FITTINGS - EXTERIOR

Using materials with superior UV protection, impact strength, and addition chemical resistance.

Weather protection minimums:

- IP54 for protected areas under eaves or verandahs etc.
- IP55 for exposed areas not subject to pressurised water (hoses).
- IP66 for areas subject to pressurised water or major splashing.
- IP67 for inground lights
- IP68 for submerged pool fittings

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Alarms - residential

2.25 FIRE & SMOKE ALARM SYSTEM

Refer to SELECTIONS.

2.26 DOOR BELL SYSTEM - RESIDENTIAL

Complete with transformer for mounting on distribution board.

Heating systems

2.27 SPACE HEATERS

Fixed wired room heaters radiant or convector, and compliant with AS/NZS 60335.1. Flush or surface mount, fitted with safety cut-outs.

2.28 HEATED TOWEL RAILS

Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with AS/NZS 60335.1, scratch resistant powdercoated or chrome finish.

2.29 HAND DRYERS

Fixed wired hand dryers, wall mounted scratch resistant welded steel enclosure with baked polymer finish, infra red operation and high performance blower.

Mechanical

2.30 SUPPLY AND EXHAUST FANS

Ceiling, wall or duct mounted supply/exhaust fans for ventilation to NZBC G4/AS1, and compliant with AS/NZS 60335.1.

Electrical automation system

2.31 ELECTRICAL AUTOMATION SYSTEM

Electrical automation system designed to enable if required:

- Lighting - automated control and dimming timer control.
- Heating including heated towel rails and ventilation systems.
- Security - programmable to simulate lights and other devices to give appearance home is occupied - ability to interface with security system and smoke detectors to activate lights.
- Energy efficiency - automatically switch circuits off when not required or on during low tariff times.
- Appliances.
- Spa pools.
- Irrigation systems.

Security system

2.32 CONTROL PANEL

Control panel system with a minimum of one installer code, one master code, 6 zones minimum and 6 user codes. The installer to select codes to suit installation.

2.33 DETECTORS

There are two main types of detectors:

- Standard passive infrared sensors: Install in stable environments with no wind flow and no direct bright sunlight.
- Passive infrared/ microwave sensors: Install in area where environmental stability is an issue.

2.34 AUDIBLE DEVICES

Internal sirens can be either a 12V Piezo Siren or a Horn speaker with a sound pressure level of no less than 95dB.

External siren can be either a stainless steel design or have hardened plastic casing. Both designs to be fully weatherproof but not limited to IP66 Rating. The siren box to contain a strobe diffuser in either blue or red. The siren shall contain a horn speaker, 12v speaker or an electronic siren. The external siren box to have both a cover and rear wall tamper mechanism.

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2.35 CABLING

Security alarm wiring to AS/NZS 2201.1 for installation.

Security alarm wiring to NZS/AS 1125 for cables.
Security alarm wiring to be multi stranded and not single stranded, minimum 0.5mm².

2.36 PERIPHERALS

Fit anti-tamper devices to detectors, control panels and equipment housings, programmed to give a tamper indication when the system is unset and a tamper alarm when the system is set.

Standard keypad manufactured of moulded hardened plastic with either a LED or LCD screen, to match the style of the wiring accessories in diameter, colour and aesthetics.

2.37 COMMUNICATIONS

Digital dialler to be built into the PCB of all control panels, with the options for both monitoring and remote dial in windows based software. Digital dialler to comply with all the industry standard communication formats including contact I.D and SIA, and NZ Telepermit certification.

Remote software able to upload / download programming changes and or history events and change status of the security alarm with the ability to be turned off if required.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.3 CONNECTIONS TO ELECTRICAL EQUIPMENT

To AS/NZS 3000, Section 4.3, connections between installation wiring and electrical equipment must be as close as practicable, and protected against mechanical damage or interference. Electrical accessories to AS/NZS 3015, AS/NZS 3122, or AS/NZS 3199 are not permitted for connecting equipment wiring to installation wiring.

Installation

3.4 MAINS SUPPLY

Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.

3.5 METER BOX

Fit to meter box manufacturer and Electricity Retailer requirements. Recess into external wall in sheltered area and flash to weatherproof to NZBC E2/AS1, Figure 9.1.8.3B: General meterbox and similar penetrations. Arrange for meter installation and connection.

3.6 SWITCHBOARD

Location and installation to AS/NZS 3000 and board manufacturer requirements. Recess into wall, surface or floor mount plumb and level, with seismic restraints to NZS 4219. Ensure fire containment properties of the enclosure are maintained.

3.7 EARTHING CONDUCTIVE STRUCTURE & MATERIALS

Earth all at risk structural metalwork and conductive building materials to AS/NZS 3000, 5.4.6, and the Electricity (Safety) Regulations 2010.

If they form part of the building, this includes:

- Structural steel frames or members
- Light steel framing
- Exposed conductive materials, like metal sink/tub or vanity benches etc, with attached

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electrical units or equipment

3.8 EQUIPOTENTIAL BONDING

Equipotential Bond extraneous conductive parts together and to the electrical installation earthing system to AS/NZS 3000, 5.6, and the Electricity (Safety) Regulations 2010 and the fitting manufacturer requirements.

If they form part of the building, this includes:

- Conductive water piping (including tap etc) and exposed related connected conductive surfaces (like metal sink benches or metal cladding etc). Not required where isolated by non-conductors (plastic pipe etc) from the mass of earth.
- Other conductive piping (not earthed by other means) and exposed related connected conductive surfaces.
- Concrete reinforcing - for floor or wall forming part of a room with a shower or bath, or the shell and surround of a swimming/spa pool.
- Built-in Swimming pool and spa pool - exposed conductive parts of electrical equipment, as well as exposed conductive, fixtures, fittings and pool structures within 1.25m of pool edge.

3.9 MAIN EARTH

Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.10 EARTH LEAKAGE PROTECTION

Install RCD protection to AS/NZS 3000.

3.11 RCD - RESIDENTIAL INSTALLATIONS

Install 30mA, Type A, RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to AS/NZS 3000.

3.12 RCD-AFDD COMBINED - RESIDENTIAL INSTALLATIONS

Install a 30mA RCD-AFDD combined device (RCD Type II) at the switchboard for all final sub circuits not exceeding 20A, to control and protect outlets and lighting to AS/NZS 3000, (2018, 2.6 & 2.9). Protect over 20A to 32A final sub circuits with separate RCD and to AS/NZS 3000.

3.13 RCD - NON-RESIDENTIAL INSTALLATIONS

Install 30mA RCD Type II protection at the switchboard to suit location and use, to AS/NZS 3000.

3.14 RCD-AFDD COMBINED - NON-RESIDENTIAL INSTALLATIONS

Install a 30mA RCD-AFDD combined device (RCD Type II) at the switchboard for all final sub-circuits not exceeding 20A, to suit location and use, to AS/NZS 3000, (2018, 2.6 & 2.9). Protect over 20A to 32A final sub-circuits with separate RCD and to AS/NZS 3000.

3.15 RCD - SPECIFIC INSTALLATIONS

Install fixed wired RCD protected outlets (SRCD) in the following higher risk areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

3.16 SURGE PROTECTION

Install surge protection devices to manufacturer requirements and in accordance with AS/NZS 3000 and AS/NZS 1768. When fitting IEC 61643 Class II protection at the switchboard, protect the device by a dedicated MCB.

3.17 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

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3.18 CABLING

Install wiring systems to AS/NZS 3000. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings run cabling attached to catenary wires.

3.19 CABLING CIRCUITS

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of, 8 light switch units or 8 amps, or 4 double or single switched socket-outlets, on any circuit. Minimum 2 lighting circuits per domestic floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits. Dedicated circuits for security systems, fire panels, data panels etc.

3.20 WALL BOXES

Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.

3.21 SWITCHES AND SOCKET-OUTLETS

Fit all switch units and socket-outlets to the manufacturer requirements with heights and mounting directions as indicated in SELECTIONS.

3.22 SWITCHES AND SOCKET-OUTLETS - PERSON WITH DISABILITIES

Fit all switch units and socket-outlets to the manufacturer requirements with heights (& mounting direction) and location to NZBC G9/AS1 and SELECTIONS.

3.23 PERMANENTLY CONNECTED EQUIPMENT

Supply and set into position. Install an isolating switch of the correct current rating, weatherproof flush mounted in a metal wall box, flush plate or protected type surface mounted to suit the location, with conductors between conduit and equipment enclosed in PVC flexible conduit.

3.24 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

3.25 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer requirements. Fix fittings through lining into framing.

3.26 EXTRA-LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

3.27 INSULATION & GENERAL CLEARANCES

Some electrical and mechanical services, and equipment may need to have a gap to insulation and some building elements. The gaps should be to the NZS 4246 based tables below or to the equipment manufacturers requirements if they require larger gaps. Smaller gaps to manufacturers requirements can be used for equipment specifically manufactured with heat shielding or similar (excludes light fittings).

Installed gap not to be more than 50mm bigger than the required gap.
The following tables are subject to:

- The requirements of NZS 4246 for insulation.
- The insulation is exposed to the source of heat or equipment etc.
- Insulation, has passed the needle flame test to AS/NZS 60695.11.5 and/or is non-combustible.
- Gaps to hot surfaces may have to be increased with non-compliant insulation and plastic/polymeric type insulation (EPS, XPS, rigid Polyiso foam, etc), check with insulation manufacturer.
- Gaps to hot surfaces may be able to be reduced with non-combustible insulation, check with equipment manufacturer.

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- "Secure insulation" if required means, glue, mechanical fix, or provide fixed barriers at gap edge of insulation to hold in place. Rigid or semi rigid insulation may only need a firm friction fit (secure loose pieces).
- Loose fill insulation will require fixed barriers to NZS 4246 to maintain gaps.

3.28 LIGHT FITTINGS TO INSULATION

Type of fitting	Minimum insulation clearance	Comments
Recessed, marked NON-IC, or unmarked	100mm (increase if over 100W)	To NZS 4246. NON-IC fittings and new or old unmarked & unknown fittings, and/or insulation. Insulation to be secured.
Recessed, CA 80, CA 90, or CA 135.	Abut fittings	To NZS 4246. Do not cover the fittings.
Recessed, IC, IC-F, or IC-4.	Abut & cover fittings.	To NZS 4246. Ensure insulation complies.
Recessed, marked Do-Not-Cover	Manufacturer clearances	To NZS 4246. Do not cover the fittings.
Independent control gear	Place on top of insulation & 50mm from fittings	To NZS 4246. If not on top allow 50mm clearance to insulation, do not cover. Includes, transformers, ballasts & drivers etc.
Surface fittings not exposed to insulation	Nil	To NZS 4246. Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.
Surface fittings & exposed insulation	200mm	To NZS 4246. This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Insulation to be secured.

3.29 RECESSED LIGHT FITTINGS TO COMBUSTIBLE BUILDING ELEMENTS

Type of recessed fitting	Minimum building element clearance**	Comments
Marked NON-IC, or unmarked, ≤100W	100mm, vertical & horizontal	To AS/NZS 3000:2018
Marked NON-IC, or unmarked, >100W	200mm, vertical & horizontal	To AS/NZS 3000:2007
CA 80, CA 90 or CA 135	100mm, vertical & horizontal	To AS/NZS 3000:2018
IC, IC-F or IC-4	100mm, horizontal NA, vertical	To AS/NZS 3000:2018 To be NA vertical, fitting must be covered by insulation. If not covered use 100mm clearance.
Marked Do-Not-Cover	100mm, vertical & horizontal	To AS/NZS 3000:2018. Manufacturer clearances if greater than 100mm

**Combustible building elements exclude metal elements, but include timber framing or other timber based elements, and normal linings etc. Highly flammable materials & those likely to melt will need more clearance.

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3.30 INBUILT RECESSED HOT APPLIANCES TO INSULATION

Appliance	Minimum insulation clearance	Comments
Electrical heaters	Manufacturer clearances	To NZS 4246.
Electrical heaters	100mm	Manufacturer clearances not known. To NZS 4246. Clearance may be able to be reduced with non-combustible insulation. Insulation to be secured.
Heat producing appliances & equipment	Manufacturer clearances	To NZS 4246.
Heat producing appliances & equipment	50mm	Manufacturers clearances not known. To NZS 4246. Clearance may be able to be reduced with non-combustible insulation. Insulation to be secured.

Note - Appliances and equipment excludes cables, junction boxes, light switches & power sockets etc

3.31 EXTRACTS, VENTS & ROOF UNDERLAY TO INSULATION

Appliance	Minimum insulation clearance	Comments
Ducted fan motors	50mm	To NZS 4246. Includes ducted rangehoods, extractors etc. Applies to the motor unit and electrical enclosures (not the ducts).
Ducted fan ducts	Abut	To NZS 4246. Excludes motor unit and electrical enclosures.
Unducted fan motors usually discharging to ceiling space	200mm	To NZS 4246. Includes unducted, rangehoods, extractors etc, discharging into roof space. To prevent debris falling into motor. Clearance may be able to be reduced, by providing a fixed barrier around the vent.
Roofing material/underlay	25mm	To NZS 4246. Maintain clearance from underside of roofing or flexible roofing underlay, to prevent wicking.

3.32 EMERGENCY LIGHTING

Emergency escape lighting and exit signs for buildings to AS 2293.1 and NZBC F6/AS1. Fit emergency light fittings to manufacturer specifications. Refer to plans for position of fittings.

3.33 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

3.34 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

Heated towel rails:	Install to manufacturer requirements and installed in accordance with AS/NZS 3000.
Mirror demisters:	Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
Exhaust fans:	Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.
Hair dryers:	Install to manufacturer requirements.
Hand dryers:	Install to manufacturer requirements.

3.35 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer recommendations:

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Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.

Use the appropriate rated fittings for power control and power supply. Weather protected switches and sockets to IP56. Install to manufacturer specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

Refer to SELECTIONS

3.36 ELECTRICAL AUTOMATION SYSTEM

Fit distribution cabinet in wall, cut-out to finish flush with the wall surface, or surface mounted. Configure installation to manufacturer instructions. Provide adequate user training and operating manual to the owner.

3.37 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

3.38 SEISMIC RESTRAINT

Seismically restrain electrical service equipment, including recessed light fittings, switchboards, cabinets, machinery and racks to NZS 4219.

Security system

3.39 SECURITY SYSTEM

Install to the system manufacturer requirements, control panel, detectors and associated equipment fitted neatly and without damage to surrounding finishes. Installation of security equipment to AS/NZS 2201.1 Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance. All 230v mains power connections to the security panel are to be in accordance with AS/NZS 3000. The 230V power is to be switched using a dedicated single gang Isolator switch or similar.

Completion & Commissioning

3.40 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements

3.41 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

Certificate of Compliance:	To Electricity (Safety) Regulations 2010; Verification Records to AS/NZS 3000, clause 8.4.
Submit results to:	Project Manager/Architect

3.42 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

Certificate of Compliance:	To Electricity (Safety) Regulations 2010; Verification Records to AS/NZS 3000, clause 8.4.
Submit results to:	Project Manager/Architect

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4 SELECTIONS

Materials

4.1 METER BOX

Location:	Refer to Building Services Drawings and Specifications.
Brand / type:	Refer to Building Services Drawings and Specifications.
IP and IK rating:	Refer to Building Services Drawings and Specifications.

4.2 SWITCHBOARD

Location:	Refer to Building Services Drawings and Specifications.
Brand / type:	Refer to Building Services Drawings and Specifications.
MCB:	Refer to Building Services Drawings and Specifications.
RCCB:	Refer to Building Services Drawings and Specifications.
RCBO:	Refer to Building Services Drawings and Specifications.
RCD	Refer to Building Services Drawings and Specifications.
RCD-AFDD	Refer to Building Services Drawings and Specifications.
AFDD	Refer to Building Services Drawings and Specifications.
Surge protectors:	Refer to Building Services Drawings and Specifications.
Modular contactors:	Refer to Building Services Drawings and Specifications.
Main switch:	Refer to Building Services Drawings and Specifications.
Timers:	Refer to Building Services Drawings and Specifications.
Enclosure type:	Refer to Building Services Drawings and Specifications.

4.3 FIRE & SMOKE ALARM SYSTEM

Refer to appropriate fire and smoke alarm section:

7352 AUTOMATIC FIRE & SMOKE ALARM SYSTEM for automatic fire alarm systems types 3, 4, 5, 7 and 7e.

4.4 ELECTRICAL AUTOMATION SYSTEM

Location:	Refer to Building Services Drawings and Specifications.
Brand / type:	Refer to Building Services Drawings and Specifications.

4.5 SECURITY SYSTEM

Location	Brand / type	Detector
TBC	TBC	TBC

Switch & socket-outlets - fittings

4.6 SWITCHES & SOCKET-OUTLETS - INTERIOR (PERSONS WITH DISABILITIES)

In addition to clause INTERIOR OUTLETS, unit set out shall comply with NZBC G9/AS1, 2.0.1.

Switches and door handles to align.

Item	Height to centre of unit	Orientation	Location
Switch	1000mm above FFL	vertical	Refer to drawings
Switch narrow	1000mm above FFL	vertical	Refer to drawings
Socket outlet	600mm above FFL	horizontal	Refer to drawings
Socket outlet	150mm above bench top	horizontal	Refer to drawings

Item:	Brand / Type
Switch / socket outlets:	TBC
Coverplate colour:	TBC
Switch module colour:	TBC

Note:

- Light switches to be horizontally aligned with door handles.

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- Bedrooms to have at least one light switched from bedside.
- Socket outlets shall be at least 500mm from internal corners.

4.7 SWITCHES & SOCKET-OUTLETS - INTERIOR (DAMP/WET CONDITIONS)

Interior damp/wet conditions - heights of units with restrictions subject to exclusion zones and/or protected unit/equipment, to AS/NZS 3000, 6.0 Damp Situations.

Item	Height to centre of unit	Orientation	Location
Switch	1000 mm above FFL	vertical	Refer to drawings
Socket outlet	400 mm above FFL	horizontal	Refer to drawings
Socket outlet	150 mm above bench top	horizontal	Refer to drawings

Item:	Brand / type / protection:	Location:
Switch / socket outlets:	TBC	Refer to drawings
Coverplate colour:	TBC	Refer to drawings
Switch module colour:	TBC	Refer to drawings

Item:	Brand / type / protection:	Location:
Light dimmers:	TBC	Refer to drawings
Timer switch:	TBC	Refer to drawings
Push button switch:	TBC	Refer to drawings
Symbol switch:	TBC	Refer to drawings
PIR sensor switch:	TBC	Refer to drawings

Item - RCD:	Brand / type / protection:	Location:
Socket outlet:	TBC	Refer to drawings
Shaver outlet:	TBC	Refer to drawings
Safety switch:	TBC	Refer to drawings

4.8 LIGHT FITTINGS - INTERIOR

Fittings	Brand / type	Controls
Pendant lights:	TBC	TBC
Pendant chord:	TBC	TBC
Ceiling lights:	TBC	TBC
Recessed ceiling lights:	TBC	TBC
Recessed wall lights:	TBC	TBC
Recessed floor lights:	TBC	TBC
Wall lights:	TBC	TBC
Spotlights:	TBC	TBC
Grid ceiling lights:	TBC	TBC
Strip lights:	TBC	TBC
High/low bay lights:	TBC	TBC
Emergency lights:	TBC	TBC

4.9 LIGHT FITTINGS - EXTERIOR

Fitting	Brand / type / protection	Controls
Wall lights:	TBC	TBC
Bulkhead lights:	TBC	TBC
Spotlights:	TBC	TBC
Recessed lights:	TBC	TBC
Strip Lights:	TBC	TBC
Floodlights:	TBC	TBC
Pole lights:	TBC	TBC
Security lights:	TBC	TBC
Pool lights:	TBC	TBC

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4.10 MISCELLANEOUS ITEMS

Item	**Brand / type**
Door bell system:	TBC
Extractor fan:	TBC
Air supply:	TBC
Hand dryer:	TBC
Water heating	TBC

4.11 HEATED TOWEL RAILS

Location:	Brand / type
Refer to drawings	TBC

4.12 BATHROOM FANS AND HEATERS

Location:	**Brand / type**
Bathroom / ensuite-Heating	TBC
Bathroom / ensuite-Extract	TBC

4.13 APPLIANCES

Item	**Brand / type**
Range:	TBC
Wall oven:	TBC
Cooker top/hob:	TBC
Waste disposal unit:	TBC
Range hood:	TBC

4.14 OWNER SUPPLY ITEMS

Item	**Brand / type**
TBC	TBC

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7811 COMMUNICATIONS CABLING

1 GENERAL

This section relates to generic structured communications cabling systems for commercial projects.

Related work

1.1 RELATED SECTIONS

Refer to electrical section/s

Documents

1.2 DOCUMENTS

Documents referred to in this section are:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3080	Information technology - Generic cabling for customer premises
AS/NZS 3084	Telecommunications installations - Telecommunications pathways and spaces for commercial premises
AS/NZS 3085.1	Telecommunications installations - Basic requirements
AS/CA S009	Installation requirements for customer cabling (Wiring Rules)

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).

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 COMPLY

Comply with Electricity (Safety) Regulations 2010, AS/CA S009, AS/NZS 3000, AS/NZS 3080, AS/NZS 3084, AS/NZS 3085.1, and the manufacturer's requirements. Arrange for the required manufacturer inspections of the listed work

1.4 QUALIFICATIONS

Communications cabling installation to be carried out by competent workers experienced with the materials and in the techniques specified and accredited to work on the proposed manufacturer's system.

Warranties

1.5 WARRANTY

Warrant this part of the work under normal environmental and use conditions against failure of materials and execution.

2 years: Warranty period

Refer to general section 1237WA WARRANTY AGREEMENT for the required format and details of when completed warranty must be submitted.

1.6 WARRANTY - MANUFACTURER/SUPPLIER

Manufacture's warranty for the performance of the system under normal environmental and use conditions against failure.

~ years: Warranty

Provide this warranty on the manufacture's standard form.

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2 PRODUCTS

Components

2.1 COMMON COMPONENTS

All system components (distributors, cabling and outlets), where possible, to be of a common manufacturer and every component to meet the required level of performance.

2.2 DEMARCATION FRAME

Supply and install to the Telecommunications Service Provider's requirements

2.3 CABLE DISTRIBUTOR

Wall mounted cable distributor or rack mounted 8-pin modular patch fields for incoming voice cables (1 pair terminated per jack) and outgoing outlet field cables (4 pair terminated per jack). Provide rack space and check that power outlets are provided and suitably located. Provide cable management rings and jumper bars. Minimum 30% spare space capacity in each field and overall rack capacity.

2.4 EQUIPMENT CORDS

Install equipment cords between the wall-mounted distributor and the equipment rack, or supply patch cords, for connecting between the equipment and the jack fields.

2.5 OUTLETS

Telecommunications outlets:	100 ohm balanced category 6 - multiple outlets on common faceplates.
Outlet face plates:	To match electrical socket outlet faceplates. Refer to SELECTIONS.

2.6 TV AERIAL

Aerial suitable for both VHF, UHF, analogue and digital reception, of all local free-to-air broadcast and pay channels.

3 EXECUTION

Application

3.1 NETWORK CONNECTION

Arrange for Telecommunication Service Provider (TSP) to supply conduit for lead-in cable. Install conduit to location nominated by TSP. Arrange for TSP to install and terminate the lead-in cable.

3.2 DISTRIBUTORS

Install to the manufacturer's requirements.

3.3 CABLES

Install to the manufacturer's requirements.

Backbone cable:	From demarcation point to distributor or enclosure. Multi-pair voice grade (Category 3), terminate one pair per jack. From distributor or enclosure, to PABX. Multi-pair voice grade (Category 3), terminate one pair per jack.
Horizontal cable:	4 pair 100 ohm balanced Category 6, per outlet, terminate 4 pair per jack.

3.4 CABLE INSTALLATION

Comply with AS/CA S009. Conceal all cables. Support all cables clear of hot and sharp surfaces without placing unnecessary strain on the cables or terminations. Earthed or insulated high tensile catenaries or cable trays in ceiling/floor cavities. Cable trays for greater than 24 cables in a common route. Cables run parallel to power cables separated by 300mm and cross at right angles with segregation. Do not share cable supports or penetrations with other services.

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3.5 OUTLETS

Quantities and locations as drawn. Allow to move up to 2 metres prior to installation. Confirm all locations prior to installation. Mount at 400mm above finished floor level unless noted otherwise. Mount aligned with electrical socket outlets where present, separated at 100mm centres. Mount on Category 6 compliant skirting trunking where indicated.

3.6 CONNECTING HARDWARE

To AS/NZS 3080 and the manufacturer's requirements.

3.7 TV AERIAL AND CABLING

Fix aerial, and ensure the system is suitable for high quality reception of all VHF, UHF, digital and satellite channels - Sky satellite TV installation practices minimum. Test to ensure adequate TV/video at every outlet with a RF field strength meter. Cable penetrations through the cladding to be weatherproofed to comply with NZBC E2/AS1.

Completion

3.8 TESTING

At completion test to manufacturer's requirements and provide a certified copy of the results. Correct or replace any sub-standard items and re-test.

3.9 LABELLING

To AS/NZS 3085.1. Common and consistent labelling on each outlet and at the Distributor. Machine made permanent labels. Arrange numbering sequentially by floor, then by room and then around the walls of each room.

3.10 REPLACE DAMAGED WORK

Replace damaged, cracked or marked elements. Jointing cables is not permitted - replace any damaged or short cables.

3.11 LEAVE CLEAN

Leave work clean, undamaged, in full working order and to the standard required by following procedures.

3.12 REMOVE DEBRIS

Remove debris, unused materials and elements from inside enclosures and from the rest of the site.

4 SELECTIONS

Materials

4.1 COMMUNICATIONS CABLING ENCLOSURES

Manufacturer: TBC
Brand/catalogue number: TBC

4.2 DISTRIBUTORS

Manufacturer: TBC
Brand/catalogue number: TBC

4.3 COMMUNICATIONS CABLES

Cable	Manufacturer / Type
Multi-pair voice grade (Category 3):	TBC
4 pair 100 ohm balanced Category 6:	TBC

4.4 COMMUNICATIONS OUTLETS

Manufacturer: TBC
Brand/catalogue number: TBC (8 position modular sockets)
Colour: TBC

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4.5 MISCELLANEOUS ITEMS

Item	Brand / type
TV aerial:	TBC
TV aerial amplifier:	TBC
Satellite dish:	TBC

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7835 ACCESS CONTROL

1 GENERAL

This section relates to electronic access control systems.

Related work

1.1 RELATED SECTIONS

Refer to 7836 INTRUDER DETECTION SYSTEMS for detection and control devices.

Documents

1.2 DOCUMENTS

Documents referred to in this section are:

AS/NZS 2053.1	Conduits and fittings for electrical installations - General requirements
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019)

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 COMPLIANCE

All work carried out to Electricity (Safety) Regulations 2010, AS/NZS 3000 (for segregation for electrical safety) and the manufacturer requirements.

1.4 QUALIFICATIONS

Installers to be trained to work on the proposed manufacturer system.

Warranties

1.5 WARRANTY

Warrant this part of the work under normal environmental and use conditions against failure of materials and execution.

Warranty period: 1 years

Refer to the GENERAL section for the required form and details of when completed warranty must be submitted.

2 PRODUCTS

Materials

2.1 COMMON COMPONENTS

All system components to be of a common manufacturer.

2.2 CENTRAL CONTROL SYSTEM

Suitable for the number and type of inputs indicated, the number of credentials/PIN codes indicated, plus 50% spare capacity.

Components

2.3 CREDENTIAL READER

Short range proximity card type. Refer to SELECTIONS for options.

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2.4 CREDENTIAL

Suitable for the credential reader. Refer to SELECTIONS.

2.5 PIN PAD

Back illuminated 10 digit personal identification number pad. Capacity for 20 concurrent different 4 digit codes with the ability to program out and introduce new codes using a master code at the PIN pad.

2.6 DOOR CONTROL DEVICES

Equipment as drawn/scheduled including electric strikes, electric latches, drop bolts, motorised door operators, magnetic clamp locks, over ride press buttons and associated sundries. Automatic fire alarm override to release all doors on paths of egress. Doors fail safe (unlock) in a power fail condition.

2.7 DOOR MONITORING

Recessed reed switch to each door leaf with 2 heavy duty surface reed switches to base of vehicle doors, monitored to raise an alarm at the central station if an invalid entry or door ajar (timed) condition is detected.

2.8 LIFT CONTROL

Credential reader in each lift.

Lift access control unit located inside the lift machine room in a position approved by the lift supplier.

Control features:

- Time of day, time of week and floor-by-floor access control levels separately attributable to each credential.
- Free access at all times to the main lobby.
- Fire alarm override as required.

2.9 INTERCOM

IP56 rated brushed aluminium master station with individual press to call button for each tenancy. Self illuminated label slot for each button. Colour CCTV camera in-built with suitable lighting, microphone & speaker.

Slave station in each tenancy with a colour CCTV monitor, microphone & speaker and remote door release button. Button to release the front door adjacent the master panel and enable lift access to the tenant's floor.

2.10 CABLING

To manufacturer's recommendations.

2.11 CABLE SUPPORT SYSTEMS

Conduits to AS/NZS 2053.1.

3 EXECUTION

Application

3.1 SYSTEM

To manufacturers' recommendations.

3.2 CENTRAL CONTROL SYSTEM

Locate as indicated.

3.3 CREDENTIAL READER

Flush mount.

3.4 PIN PAD

Surface wall mount.

3.5 DOOR CONTROL DEVICES

Install to manufacturer's recommendations. Conceal where possible.

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3.6 DOOR MONITORING

Monitor to raise an alarm at the Central Station if an invalid entry or door ajar (timed) condition is detected.

3.7 LIFT CONTROL

Liaise with lift supplier to ensure they supply space in the lift car control panel, sufficient cores in the travelling cable and connection and interface to the lift access control unit.

Install credential readers and terminate to travelling cable.

Lift access control unit located inside the lift machine room in a position approved by the lift supplier.

3.8 INTERCOM

Recess wall mount the master station.
Surface wall mount slave station in each tenancy. Remote release button to release the front door adjacent the master panel and enable lift access to the tenant's floor.

3.9 CABLING

Run concealed in a tidy fashion, separated from other cabled systems. Where more than 7 cables are run together, supply and install cable tray, otherwise run on separate catenaries or loose in concealed spaces which are not trafficable.

Completion

3.10 COMMISSIONING

Liaise with the tenants to ascertain the initial credential, security group and time zoning needs. Set up the initial database, program all devices and the allocated credentials. Supply a type written report detailing all aspects of the programmed database.

3.11 TESTING

At completion test to the manufacturers' recommendations. Rectify any sub-standard items and re-test.

3.12 REPLACE DAMAGED WORK

Replace damaged, cracked or marked elements. Jointing cables is not permitted - replace any damaged or short cables.

3.13 LEAVE CLEAN

Leave systems and equipment for the complete installation operating correctly and to manufacturer's requirements. Leave work clean, undamaged, in full working order and to the standard required by following procedures.

3.14 REMOVE DEBRIS

Remove debris, unused materials and elements from inside frames and from the rest of the site.

4 SELECTIONS

4.1 CREDENTIAL READERS

Refer to Building Services Drawings and Specifications.

4.2 CREDENTIALS

Refer to Building Services Drawings and Specifications.

4.3 DOOR CONTROL DEVICES

Refer to Building Services Drawings and Specifications.

4.4 INTERCOM AUDIO/ VIDEO

Refer to Building Services Drawings and Specifications.

Spares & maintenance products

4.5 SPARES & MAINTENANCE PRODUCTS

Refer to the general section 1270 CONSTRUCTION for details of how spares and maintenance products will be handled. Provide the following spares and maintenance products:

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Item:	Refer to Building Services Drawings and Specifications.
Quantity:	Refer to Building Services Drawings and Specifications.
Location:	Refer to 1270 CONSTRUCTION

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7910 LIFT - LOW SPEED OR PLATFORM

1 GENERAL

This section relates to a passenger lift, including the supply, installation, commissioning and initial maintenance of:

- Low speed lift

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC D2/AS2	Platform lifts and low speed lifts
NZS 4121	Design for access and mobility: Buildings and associated facilities
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4334	Platform lifts and low-speed lifts
BPS	Building Product Specifications

1.2 WARRANTY

Warrant the complete lift installation under normal environmental and use conditions against failure of materials and execution.

1 year:	From the date of Practical Completion of the contract works

Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.

Requirements

1.3 DETAILED PROPOSAL

Provide full details of the proposed lift including any proposed departures or substitutions from what has been specified. Advise all options yet to be selected and the date by which selections must be made. Submit to the Contract Administrator for review and confirmation before placing order or commencing manufacture.

Lift and installation to NZBC D2/AS2. NZS 4334 is the means of compliance with NZS D2/AS2.

1.4 ACCESSIBILITY REQUIREMENTS

Where required comply with requirements of NZS 4121.

1.5 SHOP DRAWINGS

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Provide shop drawings to show the general arrangement including, but not be limited to:

If requested provide the following additional information:

Submit shop drawings for review to the Project Manager/Architect.

- (TBC) working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication and/or installation.

1.6 MAINTENANCE

Provide all required routine maintenance and servicing during the defects notification/liability period. Where the defects notification/liability period is less than 12 months, provide routine maintenance and servicing for a period of 12 months from the date of practical completion

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Where the lift installation is a standalone contract, provide routine maintenance and servicing for a period of 12 months from the date the lift is available to be used by the owner/occupier.

1.7 MAINTENANCE CONTRACT PROPOSAL

Provide to the owner an on-going maintenance contract for the period following the expiry of the maintenance required as a condition of the installation contract. The owner is not required to accept this contract and may seek offers from others.

2 PRODUCTS

2.1 LIFT TYPE / OPTIONS

Lift to comply with NZS 4334. Refer to SELECTIONS for specific details and options.

3 EXECUTION

Conditions

3.1 DELIVERY

Keep materials dry in transit. Take delivery of materials in an undamaged in condition. Reject all damaged materials.

3.2 OFF SITE STORAGE

Where goods are not able to be immediately installed or stored on site, store the goods off site in a secure covered area. Where required for payment to be made, provide details of the goods including where they are store. Ensure goods are covered by insurance. Provide access when required for inspection of the goods by the Contract Administrator.

3.3 CHECK PREPARATORY WORK

Check that the lift shaft and associated spaces have been constructed to the required dimensions and tolerances. Advise the main contractor / Contract administrator of any parts of the work that are not to the required specification or standard.

Checks to include: -

- Lift shaft, pit and overruns are of the required dimensions and plumb within defined tolerances
- Suitable lifting points have been provided
- Pits are waterproof and dry
- Temporary power is available for construction purposes
- Provision has been made for required telephone connection and power supply for the operation of the lift and associated requirements

Installation

3.4 INSTALLATION

Install to manufacturers requirements and to NZS 4334.

Completion

3.5 CLEANING

Remove debris, unused materials and elements from the site. Clean soiled or marked work. Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following procedures.

3.6 PROTECT FINISHED INSTALLATION

Protect the lift from following procedures. Unless the lift is required for construction purposes, keep it locked off and not able to be operated. Where the lift is required for following construction purposes, provide suitable protection to walls floor and ceiling.

3.7 COMMISSIONING AND CERTIFICATION

Arrange and pay for inspections required for commissioning of the lift. Provide a copy of the certification documentation to the Contract Administrator.

3.8 COMPLIANCE SCHEDULE AND MAINTENANCE REQUIREMENTS

Provide all information that is required for any Compliance Schedule required as a condition of the Building Consent.

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4 SELECTIONS

4.1 PASSENGER LIFT

Brand/manufacturer	TBC
Type/description:	TBC
Service classification:	Passenger
Drive type:	Refer to Lift Specification.
Load	Refer to Lift Specification.
Class of loading:	Passenger
Levels served:	3
Travel:	Refer to Lift Specification.
Lift well plan size:	Refer to Lift Specification.
Pit depth:	Refer to Lift Specification.
Headroom:	Refer to Lift Specification.

4.2 LIFT ENTRANCE

Number of car entrances:	1
Entrance type:	Refer to Lift Specification.
Entrance size:	Refer to Lift Specification.
Door finish:	TBC
Door frame finish:	TBC

4.3 LIFT CAR SIZE

Internal size:	Refer to Lift Specification.
Internal height:	Refer to Lift Specification.

4.4 LIFT CAR FINISHES

Front wall returns:	TBC
Side walls:	TBC
Rear wall:	TBC
Ceiling:	TBC
Lighting:	TBC
Floor:	TBC
Handrails:	TBC
Skirting panels:	TBC

4.5 LIFT CAR AND LANDING FIXTURES

Car control button panels:	1
Car position indicator:	Refer to Lift Specification.
Landing call panels:	Refer to Lift Specification.
Lift indicator position:	Refer to Lift Specification.

4.6 LIFT EMERGENCY SYSTEMS

Emergency telephone:	Refer to Lift Specification.
Emergency lighting:	Refer to Lift Specification.

4.7 MISCELLANEOUS

Pit sump dimensions:	Refer to Lift Specification.
Landing rough opening:	Refer to Lift Specification.
Lift controller location:	Refer to Lift Specification.
Lift controller door type:	Refer to Lift Specification.

4.8 ELECTRICAL REQUIREMENTS

Lift mains supply:	10A Dedicated circuit
Lift pit power outlets:	2
Sump pump power outlets:	1 x permanent connection
Emergency telephone:	Cabling terminating in the lift controller

4.9 FIRE PERFORMANCE REQUIREMENTS

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With a protected shaft, the following fire performance requirements apply:

Lift shaft:	30/30/30 FRR for walls
Shaft doors - fire:	30/~/30 FRR
Shaft doors - smoke:	Smoke seals are not required (refer to Fire Report for confirmation).

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8320 SOIL PREPARATION, PLANTING & TURFING

1 GENERAL

This section relates to the supply, preparation and placement of plant mix and soil, and the planting of:

- trees
- shrubs
- lawns
- installation of irrigation systems
- sowing or turfing of lawns

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

AS/NZS 1477	PVC pipes and fittings for pressure applications
NZS 3604	Timber-framed buildings
AS/NZS 3500	Plumbing and drainage Part 1: Water services

Requirements

1.2 QUALIFICATIONS

Landscapers to be experienced competent workers, familiar with the materials and the techniques specified. Supply evidence of experience and competence on request.

1.3 MYRTLE RUST

For identification and treatment of myrtle rust and the growing, transporting and planting plants in the myrtle family (family Myrtaceae) follow the protocols and precautions of the NZ Plant Producers Inc. (NZPPI) website guidelines: www.nzppi.co.nz/myrtlerust.

Ensure:

- Plants from a commercial nursery have the appropriate completed copies of the NZPPI Nursery Management Declaration form and Plant Transport Declaration form.
- Treatment records are provided for non-commercially sourced plants
- Myrtaceous plants are within the effective period of cover for the treatment used at time of dispatch (different treatments and cover periods are on the NZPPI website).

Any suspected myrtle rust finds must be reported immediately to the Project Administrator. On direction of the Project Administrator immediately notify the Ministry for Primary Industries (MPI) Exotic Pest and Disease Hotline on 0800 80 99 66.

2 PRODUCTS

Materials

2.1 TOPSOIL

Good quality loam of a workable consistency stripped from its original location to a maximum depth of 200mm:

- free of pernicious weeds, straw, stones, sticks, clay lumps
- free of foreign matter exceeding 25mm dimension.
- pH value between 6.5 and 7.5
- humus content greater than 50%.

2.2 PLANT MIX

Thoroughly mixed medium of 60% compost and 40% bark, pumice and fertiliser by volume.

2.3 BACKFILLING

Thoroughly mixed medium of 30% peat and 70% topsoil by volume.

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2.4 TREES, SHRUBS, PLANTS

As selected. Best nursery stock, healthy and vigorous with well developed root systems in balance with the amount of foliage growth, well branched and symmetrically shaped and all tagged with the grower's own tag. Reject all root bound plants or those with badly spiralling root systems. Refer to SELECTIONS for type and size.

2.5 STAKES

Rough sawn radiata pine H4 treated.

Size/length:	50mm x 50mm, length to suit tree/plant size
	20mm x 20mm, length to suit tree/plant size

2.6 MULCH

Refer to SELECTIONS for type.

2.7 FERTILISER - GENERAL

Pre-plant, slow release, non-burning complete NPK (nitrogen, phosphorous, potassium) ratio of 5:5.5:4.1, with added micro-nutrients iron, sulphur and magnesium. Add gypsum, blood and bone and potash where required by soil composition or plant type.

2.8 GRASS, SOWN

Certified mixture of grass seed to suit local site conditions, with a high germination rate, fungicide and bird-repellent treated. Supply for review the proposed mixture and area of use. Refer to SELECTIONS for seed mix and rate.

2.9 FERTILISER - GRASS SEEDING OR TURFING

Pre-plant, slow release, non-burning complete NPK (nitrogen/phosphorous/potassium) ratio of 20:11:10 with added micro-nutrients iron, sulphur and magnesium.

2.10 WEED MAT

Biodegradable weed suppressant matting or woven construction stabilised polypropylene fabric.

3 EXECUTION

Conditions

3.1 RELATIVE LEVELS

All proposed finished landscaping levels to conform to NZS 3604, section 6.14, **Prevention of dampness** and section 7.5.2, **Finished floor levels and foundation edge construction**, in relation to any adjoining habitable floor levels.

Maintain the required cover over any buried services.

3.2 DELIVERY

Only deliver material to the site that can be immediately placed in its final location from the delivery vehicle. Plant trees, plants and shrubs as soon as possible and no later than 3 days after delivery, keeping the rootball moist.

3.3 QUALITY OF TREES, SHRUBS AND PLANTS

Provide trees, shrubs and plants which are healthy and vigorous, with well developed root systems, in balance with the amount of foliage growth, well branched and symmetrically shaped of a normal habit and all tagged with the growers' own tag. Reject all root bound plants and those with spirally bound root systems.

3.4 EXISTING SERVICES

Check for services in the area of this work. Avoid interference or damage to them.

3.5 ENSURE

Ensure that all areas are clean, ready to be worked and clear of any continuing work by others.

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Application

3.6 PREPARATION OF PLANTING AREAS

Replace substandard soil with 200mm layer of plant mix. Place in 100mm layers, lightly compacted by heeling or rolling and slightly mounded in the centre of the bed.

Thoroughly spray planting areas which contain weed growth with a non-selective herbicide. Apply using protective clothing, in dry, still-air conditions to the spray manufacturer's requirements.

3.7 PREPARATION OF GRASS AREAS

Replace substandard soil with 150mm layer of topsoil. Rotary hoe in two directions to a depth of 150mm and bring up to the required topsoil standard. Rake to a fine tilth, level and smooth with run-offs to drainage outlets. Apply selective herbicide.

Thoroughly spray grass areas which contain weed growth with a non-selective herbicide. Apply using protective clothing, in dry, still-air conditions to the spray manufacturer's requirements.

3.8 SITING

Position and space out trees and shrubs in locations and quantities shown on the drawings. Where layout is not shown on the drawings, confirm layout and spacing with architect or landscape architect. Organise planting to avoid undue compaction of planting areas. Re-cultivate any heavily compacted areas prior to planting.

Report the existence of any buried services or concrete footings restricting the accurate placement of plants to the architect or landscape architect for instruction.

3.9 PREPARATION FOR PLANTING LARGE TREES AND SHRUBS

Excavate planting holes to twice the diameter and 1½ times the depth of the rootball. Where depth exceeds the depth of the topsoil, carry on down into subsoil a further 150mm, breaking it up and mixing in peat or a clay-killer before replacing. Scarify the sides of holes in clay soils. Provide drainage beneath planting in impervious soils. Place plant mix to support the rootball at a level to allow the top to finish flush with surrounding ground.

3.10 PLANTING LARGE TREES AND SHRUBS

Drive two plumb stakes, located to avoid wind-contact with the tree or shrub at opposite sides of the planting hole. Keeping rootball intact place each plant plumb with its best side facing into the prevailing wind. Backfill in 150mm layers using rod or fingers to evenly firm without compaction to a level that will allow the top of the root ball to finish flush with surrounding ground. When completed, firm each plant in by heeling. Tie plants at 2/3 the height of the main stem leaving enough play for a small amount of natural movement. Water in immediately after planting to saturation level in surrounding soil and thoroughly wet all foliage. Spread 75mm to 100mm layer of selected mulch on weed mat over newly planted areas ensuring it is not mounded up around plants and that any drainage material is undisturbed and all buried services are undamaged.

3.11 PREPARING FOR PLANTING SMALL AND MEDIUM SHRUBS

Place plant mix 200mm deep and in 100mm layers, lightly compacted plant mix by heeling or rolling and slightly mounded in the centre of the bed. Excavate planting holes to twice the diameter and 1½ times the depth of the rootball.

3.12 PLANTING SMALL AND MEDIUM SHRUBS

Keeping rootball intact, place each plant plumb with the top of the rootball at the top of the plant mix. Backfill material using fingers to evenly firm without compaction, before finally firming the plant with the base of the palm of the hand. Water in immediately after planting to the saturation level of surrounding soil. Spread 100mm layer of bark mulch on weed mat over newly planted areas.

3.13 SOWING GRASS

Replace unsatisfactory soil with 150mm layer of topsoil. Rotary hoe in two directions to a depth of 150mm. Rake to a fine tilth, level and smooth with run-offs to drainage outlets. Apply selective herbicide. Spread pre-plant fertiliser at the required rate for lawn. Spread grass seed at half the required rate in each of two directions at right angles, using an approved spreader. Lightly rake in and roll. Water deeply and keep moist without any run-off of water until germination is complete. Continue watering as necessary until the end of the contract. First cut only when growth is a minimum of 100mm and only down to 50mm.

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Completion

3.14 CLEAN UP

Clean up around all trees, shrubs, beds and lawns. Remove all surplus soil, unused materials and plants, from the site.

4 SELECTIONS

4.1 SELECTIONS

Refer to Landscaping Drawings.

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8420 MISCELLANEOUS SITE WORKS

1 GENERAL

This section relates to the supply and installation of hard landscaping including:

- paths
- fencing
- other minor structures

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/VM1	Structural design of buildings
NZBC F9/AS1	Means of restricting access to residential pools
NZS 3104	Specification for concrete production
NZS 3114	Specification for concrete surface finishes
NZS 3124	Concrete construction for minor works
AS/NZS 4671	Steel reinforcing materials

Requirements

1.3 QUALIFICATIONS

Landscapers to be experienced, competent trades people familiar with the materials and techniques specified.

2 PRODUCTS

2.1 CONCRETE

Normal concrete or prescribed mix concrete, maximum aggregate size 19mm to NZS 3104.

2.2 SITE MIXED CONCRETE

To NZS 3124. Prescribed mix 17.5 MPa minimum strength, using either separate batching of sand and coarse aggregate to NZS 3104, or builder's mix.

2.3 REINFORCEMENT

To AS/NZS 4671. Welded reinforcing mesh to AS/NZS 4671.

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3 EXECUTION

3.1 CONSTRUCT CONCRETE PATHS AND DRIVEWAYS

Excavate for path thickness and hardfill. Remove plants, tree roots and soft fill to firm subgrade. Compact with a plate vibrator to form a level surface of even bearing. Place and compact a layer of basecourse. Reinforcement where scheduled to AS/NZS 4671. Place concrete with a fall of 1:100 (minimum) and construction joints/saw cuts, thickness and finish to NZS 3114 as scheduled and NZS 3124 Specification for concrete construction for minor works.

3.2 INSTALL INTERLOCKING PAVERS

Loose lay sand using screeds over the prepared basecourse to a depth dependent on the sand and its water content to give a nominal compacted thickness of 30mm. Compact to give a uniform density and thickness. Check the finished level over a small area using paving and then correct the total area before proceeding. Screed the compacted surface to finish completely level.

Lay whole pavers first within the string line grid with joint widths in the range of 2mm to 3mm over 90% of the work and a maximum to minimum of 1mm to 4mm. Using a masonry saw, cut and lay closures to perimeter areas and around penetrations. Compact paving in 2 passes at right angles with a standard plate compactor of 60 to 120 kg static weight and 10-24 KN centrifugal force.

After compaction, spread joint-filling sand dry over the surface and broom in to fill all joints completely. Compact again. Remove any remaining surface sand.

Ensure all cuts are neat and tidy and made with a diamond-tipped saw blade. No paver dimension less than half. Adjust pattern to suit.

3.3 CONSTRUCT TIMBER FENCES

Refer to drawings for set out of timber fences. Confirm position in relation to boundary. Confirm height in relation to Resource Consent. Unless otherwise shown set out boundary fences on the centre line of the legal boundary.

Excavate holes for posts and set posts in concrete, plumb and true to line. Form weed band/mowing strip where scheduled. All fixings to rails and to posts to be galvanized fasteners.

3.4 INSTALL GATES

Hang gates on corrosion resistant hinges/dogs. Check operation of gates to ensure that they swing clear of the ground and other features. Fit scheduled gate hardware.

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4 SELECTIONS

4.1 CONCRETE PATHS

Basecourse thickness:	100mm minimum
Concrete thickness:	75mm minimum
Concrete strength:	17.5 MPa
Reinforcement:	Not required
Finish:	Refer to Architectural Drawings.

4.2 CONCRETE TERRACES AND SLABS FOR PAVING

Basecourse thickness:	100mm minimum
Concrete thickness:	100mm minimum
Concrete strength:	17.5 MPa
Reinforcement:	665 mesh or equivalent
Finish:	Refer to Architectural Drawings.

4.3 PATHS, INTERLOCKING PAVERS

Basecourse thickness:	100mm minimum
Edge restraint:	Refer to Architectural Drawings.
Paver type/thickness/colour:	Refer to Architectural Drawings.
Laying pattern:	Refer to Architectural Drawings.

4.4 TIMBER FENCES

Posts:	100mm x 100mm, radiata pine, treated H4 CCA (preservative code 01 or 02)
Post centres:	2.4 metres maximum
Rails:	100mm x 50mm, radiata pine, treated H3.2 CCA (preservative code 01 or 02)
Palings/fence panels:	Refer to Architectural Drawings.
Weedband/mowing strip:	300mm x 75mm, centre on centreline of posts
Fixings/connectors	Hot-dip galvanized

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