SPECIFICATION

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

Crest Chalets

(project name)

52 Hansen Road, Queenstown, New Zealand

(project address)

(client)

Project Ref: G601

Date: 18 December 2025

Building Consent

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1013 DOCUMENT CONTROL

1 DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

Company:	Designgroup Stapleton Elliott
Postal Address:	L01, 318 Lambton Quay
Street Address:	L01, 318 Lambton Quay
City:	Wellington

1.2 DOCUMENT DETAILS

Project Name:	Crest Chalets
Project Number:	G601
Client:	GibbonsCo

1.3 REVISION CONTROL

Issue:	Building Consent
Revision:	3
Amendment Details:	N/A
Date of Issue:	18.12.25

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1220 PROJECT

1 GENERAL

This general section describes the project including:

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

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK

A residential development consisting of 100 units. To be constructed in 4 stages.

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY

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

Principal's Health & Safety Matters

1.5 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

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

Site

1.6 SITE

The site consists of: A large open area of land
As shown on drawing: A100

1.7 LEGAL DESCRIPTION

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

Site environment - Durability

1.8 EXPOSURE ZONE

The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.
The site zone is: 6

Site environment - Wind

1.9 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

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

Site environment - Seismic

Archaeological discovery

1.10 REPORT FINDING ANY ANTIQUITIES AND ITEMS OF VALUE

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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.

Consultants

1.1 ARCHITECT

Practice:	Designgroup Stapleton Elliott
Represented by:	Rachel Sadowski
Mobile:	0278450694
Email:	r.sadowski@dgse.co.nz

1.2 STRUCTURAL ENGINEER

Practice:	JMA
Represented by:	Edmund De Kock & James Jensen
Mobile:	+64 22 677 8856
Email:	edmund@jma.nz

1.3 CIVIL ENGINEER

Practice:	Mckenzie and Co
Represented by:	Breatrice Zhang
Mobile:	022 637 0897
Email:	beatrice.Zhang@mckenzieandco.co.nz

1.4 FIRE ENGINEER

Practice:	Sure Fire NZ
Represented by:	Andrew Campbell
Mobile:	022 167 6670
Email:	andrew@firehq.co.nz

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1232 INTERPRETATION & DEFINITIONS

1 GENERAL

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

Definitions

1.1 DEFINITIONS

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

1.2 PERSONNEL

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

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

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

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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.

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
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

1235 SHOP DRAWINGS

1 GENERAL

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

1.1 SCHEDULE SECTION

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

1.2 SHOP DRAWING FORMAT

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

1.3 PROGRAMME FOR SHOP DRAWINGS

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

1.4 COMMUNICATION WITH SHOP DRAWING DETAILER

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

1.5 CONTRACTOR COORDINATION OF SHOP DRAWINGS

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

1.6 COORDINATION WITH SITE MEASURE

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

1.7 SHOP DRAWING REVIEW

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

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

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

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

1.8 RESPONSIBILITY

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

1.9 RESUBMISSION OF SHOP DRAWINGS

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

1.10 WORK MAY PROCEED

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

2 SELECTIONS

2.1 SHOP DRAWING FORMAT

Submit the shop drawings in the following format

	Format/Size
Hardcopy	Not required
Electronic copy	PDF
CAD file	Required upon request

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:

4521UA	Uno Aluminium Windows & Doors
4852SP	Spectrum Aluminium & Glass Balustrades
4933	Aluminium Metalwork
5231	Interior Doors & Windows

1.3 SHOP DRAWINGS - ADDITIONAL ITEMS

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

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1237 WARRANTIES

1 GENERAL

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

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

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

1.1 SCHEDULE SECTION

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

Warranties

1.2 PROVIDE WARRANTIES

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

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

1.3 WARRANTIES - INSTALLER/APPLICATOR

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

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

1.4 WARRANTIES - MANUFACTURER/SUPPLIER

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

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

Submission

1.5 REVIEW BY CONTRACTOR

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

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1.6 WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY

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

1.7 WARRANTIES - REQUIRED BY CONTRACT

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

1.8 WARRANTIES - SUBMISSION NZIA SCC CONTRACT

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

1.9 WARRANTIES - SUBMISSION NZS 3902 CONTRACT

Refer to NZS 3902 Housing, alterations and small buildings contract. Submit warranties to the owner no later than the time the builder gives Notice of final completion to the owner.

1.10 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.

1.11 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.

1.12 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.

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

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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:

4161T	Kingspan Thermakraft Underlays, Foils, DPC, DPM, & Tapes
4171GR	GIB Weatherline Rigid Air Barrier
4231HA	James Hardie Axon™ Panel Cladding
4231HO	James Hardie® Oblique™ Weatherboard Cladding
4239JH	James Hardie® Soffits
4241M	Metalcraft Roofing Profiled Cladding
4311M	Metalcraft Profiled Roofing
4422AD	Ardex Undertile Waterproofing Membrane
4521UA	Uno Aluminium Windows & Doors
4554VS	Velux Opening & Fixed Skylights
4610VR	Viridian Glass Residential Glazing
4711	Thermal Insulation
4852BA	Belcanto Attache Balustrades
4852SP	Spectrum Aluminium & Glass Balustrades
5111H	James Hardie® Fibre Cement Sheet Linings
5313KL	Rondo Systems - Plasterboard & Sheet Ceilings
6211	Wall Tiling Systems
6221	Floor Tiling Systems
6221A	ARDEX Tiling Solutions
6311	Timber Strip, Block & Plank Flooring
6511	Carpeting
6700	Painting General
6711	Painting Exterior
6721	Painting Interior
6746D	Dulux Powder & Industrial Coatings
7123	Hot & Cold Water System
7411M	Metalcraft Roofing Rainwater Spouting Systems
7701	Electrical Basic
8432BF	Boundaryline Fencing & Gates

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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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.

1.6 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.

1.7 SELECTIONS INFORMATION - SUBSTITUTIONS

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

Documentation format

1.8 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

1.9 O&M DOCUMENTATION SUBMISSION & REVIEW

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

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

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

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

The reviewer may advise that:

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

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

Final documentation

1.10 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.

1.11 FINAL O&M DOCUMENTATION - HARDCOPY

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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.

1.12 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.

1.13 REVIEW OF FINAL DOCUMENTATION

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

2 SELECTIONS

O&M Documentation

2.1 FINAL DOCUMENTATION - INFORMATION FOR OPERATION AND MAINTENANCE

Provide a complete electronic copy to the contract administrator.

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

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

2.2 FINAL DOCUMENTATION - OPERATION AND MAINTENANCE MANUALS

Provide a complete electronic copy to the contract administrator.

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

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

Maintenance contract proposals

2.3 MAINTENANCE CONTRACT PROPOSALS

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

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1239S1 SCHEDULE OF OPERATION & MAINTENANCE INFO

1 GENERAL

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

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Information for operation and maintenance

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the following sections:

4231HA	James Hardie Axon™ Panel Cladding
4231HO	James Hardie® Oblique™ Weatherboard Cladding
4239JH	James Hardie® Soffits
4311M	Metalcraft Profiled Roofing
4521UA	Uno Aluminium Windows & Doors
4852BA	Belcanto Attache Balustrades
4852SP	Spectrum Aluminium & Glass Balustrades
6746D	Dulux Powder & Industrial Coatings
7123	Hot & Cold Water System
7411M	Metalcraft Roofing Rainwater Spouting Systems
8432BF	Boundaryline Fencing & Gates

Operation and maintenance manuals

1.3 OPERATION AND MAINTENANCE MANUALS

There are no work section requirements.

Maintenance contract proposals

1.4 MAINTENANCE CONTRACT PROPOSALS

There are no work section requirements.

Additional Items

1.5 ADDITIONAL ITEMS

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

1240 ESTABLISHMENT

1 GENERAL

This general section relates to site establishment including:

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

Notices and approvals

1.1 STATUTORY OBLIGATIONS

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

1.2 BUILDING CONSENT AUTHORITY AND NETWORK UTILITY APPROVALS

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

1.3 NOTIFY NETWORK UTILITY OPERATORS

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

Inspections

1.4 CARRY OUT INSPECTIONS

Contractor to carry out full pre-contract inspections to familiarize him or herself with all existing site conditions, existing buildings affected and public adjoining spaces. Carry out inspections of all existing services on site and all municipal services within the site to be protected during construction and note locations

Site preparation

1.5 SITE ACCESS

Access to the site is limited to: TBC

1.6 WORKING AREA

Limited to the following designated working areas on the site: Stage 1 & Stage 2

1.7 SITE AND SOIL SURVEYS

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

Temporary construction

1.8 TEMPORARY BUILDINGS

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

1.9 TEMPORARY SITE FENCING

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

1.10 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

1.11 SITE - PROJECT SIGN

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Obtain approval to, provide and erect a timber framed sign board - client to confirm required size and any additional graphics prior to order. Sign to be, fully painted with vinyl lettering or fully printed, and displaying:

- Title of contract
- Principal's name
- Contractor's name
- Consultants as listed in general section 1222 PROJECT PERSONNEL
- If the contractor wishes, names of subcontractors.

First aid

1.12 FIRST AID EQUIPMENT

Provide first aid equipment.

1250 TEMPORARY WORKS & SERVICES

1 GENERAL

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

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

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

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

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

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

1.4 TEMPORARY ROADS

Provide as necessary all temporary roads, tracks, crossings and hard standing required for the efficient execution of the works and maintain to approval. Manage traffic safety on-site and related traffic off-site, to WorkSafe. Managing Work Site Traffic - Good Practice Guidelines.

1.5 CONSULTANTS TEMPORARY SITE OFFICE

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

1.6 SITE FENCING

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

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

1.7 SITE FENCING - NON-PUBLIC AREAS

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

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

1.8 GANTRIES, PLANKED FOOTWAYS, GUARD RAILS

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

1.9 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

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

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

Provide sediment control by:

- earth bunds constructed across the slope to control and detain run off

- silt fences constructed using filter fabric stretched between posts at a maximum of 1 metre spacing.

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

1.10 PROVIDE CONCRETE WASHWATER RUN OFF PROTECTION

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

Control run off from:

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

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

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

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

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

Spilt or surplus material:

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

Pump washwater away from drains, waterways and adjoining property.

1.11 EXCAVATION SAFETY

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

Scaffolding

1.12 SCAFFOLDING

Provide scaffolding for the efficient execution of the works.
Comply with:

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

Temporary services

1.13 WATER

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

1.14 ELECTRICITY

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

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

1.15 TELEPHONE

Provide on-site temporary telephone facilities.

1.16 COMPUTER FACILITIES

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

1.17 PRINTER

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

1.18 IMAGING

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

Care and protection - Site

1.19 LOCATE AND PROTECT SURVEY MARKS

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

1.20 LOCATE EXISTING SERVICES

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

1.21 PROTECT EXISTING SERVICES

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

1.22 PROTECT EXISTING LANDSCAPE ELEMENTS

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

1.23 MAKE GOOD - SITE

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

Care and protection - Project

1.24 TEMPORARY PROTECTION

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

1.25 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

1.26 SPECIAL PROTECTION PROJECT

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Care and protection - miscellaneous

1.27 CONSTRUCTION KEYING AND SECURITY

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

1.28 TEMPORARY STORAGE

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

Rubbish removal

1.29 PERIODIC RUBBISH REMOVAL

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

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 PROVIDE QUALITY PLAN

Prepare a quality plan for the execution of the contract works and submit a copy of the quality plan to the Contract Administrator within 10 Working Days of the date of award of the contract. The quality plan shall describe the procedures for meeting the requirements of the contract in respect of:

- Materials and workmanship
- Monitoring and maintaining subcontractors' performance
- Record keeping
- The level of documentation for signing off the contract works as complete
- Procedures to ensure that all persons engaged in undertaking the contract works are qualified, experienced and trained for the work they are undertaking
- Inspection and testing required by the contract
- Auditing the quality plan

1.4 REVIEW OF QUALITY PLAN

Within 5 working days of the contractor submitting a quality plan to the contract administrator for review, the contract administrator may advise that:

- they have completed their final review, or
- that they have undertaken a review and require resubmission of the quality plan.

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Review by the contract administrator of the quality plan does not make the quality plan a contract document. The contractor at all times remains responsible for the construction of the Works. If resubmission of a quality plan is required, the contract administrator will give their reasons. The contractor shall take account of the reasons and resubmit a revised quality plan within a period of 5 working days.

1.5 COMMENCEMENT OF WORK

Do not commence any part of the contract works, other than establishment, setting out and site preparation until the contract administrator has completed their final review of the quality plan.

1.6 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.

1.7 NOTIFIABLE WORK

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

Noise and nuisance

1.8 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.

1.9 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.

1.10 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.

1.11 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.

1.12 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.

1.13 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.

1.14 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.

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1.15 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.

1.16 SMOKE FREE REQUIREMENTS

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

1.17 RESTRICTIONS

Do not:

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

Set-out and tolerances

1.18 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.

1.19 DATUM

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

1.20 SET-OUT

Set out the work to conform with the drawings.

1.21 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.

1.22 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.

1.23 USE OF SET-OUT INSTRUMENTS

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

1.24 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.

1.25 TOLERANCES

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

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes

Masonry construction:	To NZS 4210 Masonry construction: Materials and workmanship Clause 2.6.5 Tolerances Table 2.2 Maximum tolerances
Structural steelwork:	To NZS 3404.1 Steel structures standard Section 14.4 Tolerances (after fabrication) Section 15.3 Tolerances (erection)
Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

Execution

1.26 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.

1.27 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.

1.28 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.

1.29 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.

1.30 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.

1.31 MINIMISE DELAYS DUE TO WEATHER

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

Defective or damaged work

1.32 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

1.33 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.

1.34 COMBUSTIBLE MATERIAL

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

1.35 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.

1.36 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.

1.37 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

1.38 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.

1.39 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.

1.40 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.

1.41 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.

1.42 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.

1.43 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.

1.44 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

1.45 NEW PRODUCTS

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

1.46 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.

1.47 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.

1.48 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.

1.49 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.

1.50 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.

1.51 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.52 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

1.53 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.

1.54 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.

1.55 OTHER SAMPLE REQUIREMENTS

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

Prototypes

1.56 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.

1.57 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.

1.58 PROTOTYPES - GENERAL

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

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

Spares & maintenance products

1.59 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

1.60 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.

1.61 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.

1.62 SPECIAL SITE CLEANING

~

Remove protection

1.63 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

1.64 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.65 LEAVE WORK

Leave work to the standard required for the following procedures.

1.66 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.

1.67 REMOVE CONSTRUCTION WASTE

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

1.68 COMPLETE ALL SERVICES

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

1.69 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.

1.70 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

1.71 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.72 MOVING PARTS

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

1.73 COMMISSIONING - TESTS & CERTIFICATION

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

1.74 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.

1.75 SECURITY AT COMPLETION

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

Practical completion submission

1.76 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.

1.77 ADDITIONAL PRACTICAL COMPLETION REQUIREMENTS

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

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

- ~

Defects period submissions

1.78 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

1.79 FINAL COMPLETION - SUBMISSIONS

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

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

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1270S1 SCHEDULE OF SAMPLES & PROTOTYPES

1 GENERAL

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

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Samples

1.2 SAMPLES

Refer to the following sections:

5811	Signs & Displays
6746D	Dulux Powder & Industrial Coatings

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:
6221A ARDEX Tiling Solutions

1.3 SPARES & MAINTENANCE PRODUCTS - ADDITIONAL ITEMS

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

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1278SR SCHEDULE OF SLIP RESISTANCE TESTING

1 GENERAL

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

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

This section includes schedules identifying work sections with:

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

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

Slip resistance - surfaces not requiring testing

1.4 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

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

6221 Floor Tiling Systems

1.5 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

There are no work section requirements.

Slip resistance - surfaces requiring testing

1.6 SLIP RESISTANCE - SURFACES REQUIRING TESTING

There are no work section requirements.

1.7 TEST METHODS & MINIMUM TEST VALUES

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

Test condition:	Minimum test value required:	Test method:
Level access wet	39 SRV	Wet pendulum test method of AS 4586, Appendix A using the Slider 96 rubber.
Sloping access wet	Refer to sloping access wet table below, select BPN value for stated slope.	Wet pendulum test method of AS 4586, Appendix A

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

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

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

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

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

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.

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 CLADDING sections for cavity battens.
Refer to lining sections used in the project.
Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays, foils and DPC.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:
SG Structural grade to NZS 3604, 1.3 **Definitions**

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability
AS/NZS 2904	Damp-proof courses and flashings
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3631	New Zealand timber grading rules
NZS 3640	Chemical preservation of round and sawn timber
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry.
BRANZ BU 582	Structurally fixed cavity battens

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Manufacturer/supplier contact details

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

1.5 DIMENSIONS

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

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

2 PRODUCTS

Materials

2.1 TIMBER FRAMING, TREATED

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

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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 WALL DWANGS, NOGS AND BLOCKING

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

2.5 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

H3.1 Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. Temporary fix battens before being fixed into the framing with the cladding fixings. 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 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

3.4 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).

3.5 SEPARATION

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

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

3.6 FRAMING MOISTURE CONTENT

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

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

3.7 TOLERANCES

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

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

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

- Deviation from vertical position per 3 metres, 3mm

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

Application

3.8 SET-OUT

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

3.9 SET TIMBERS

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

3.10 TIMBER CUTTING

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

3.11 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.

3.12 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.

3.13 CUTTING

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

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 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.

3.21 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.22 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Completion

3.23 COMPLETION MATTERS

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

3.24 CLEAN UP

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

3.25 LEAVE

Leave work to the standard required by following procedures.

3.26 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 SUB-FLOOR FRAMING - RADIATA PINE

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

4.2 FLOOR FRAMING - RADIATA PINE

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

4.3 EXTERIOR WALL FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Exterior walls:	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

4.4 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Rafters:	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

4.5 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

4.6 CEILING FRAMING - RADIATA PINE

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

4.7 EXTERIOR EXPOSED TIMBER

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

Note: All CCA preservative code 01 or 02

4.8 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

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

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4347	Damp-proof courses and flashings - Methods of test
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire

CodeMark CMNZ10002 ver04 - Watergate Plus Wall Underlay
CodeMark CMNZ30028 (Rev J) - Thermakraft Covertek 407 Roof and Wall Underlay
CodeMark CMNZ30030 (Rev J) - Thermakraft Covertek 405 Roof and Wall Underlay
CodeMark CMNZ30069 (Rev I) - Thermakraft Covertek 403 Roof and Wall Underlay

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Thermakraft's Product Data Sheets
Thermakraft's Installation Guides
BRANZ Appraisal 329 (2022) - Supercourse 500 Damp-Proof Course and Concealed Flashing - Amendment 29.08.2023
BRANZ Appraisal 651 (2024) - Thermakraft Covertek 407 Roof and Wall Underlay - Amended 01.07.2025
BRANZ Appraisal 695 (2023) - Watergate Plus Wall Underlay - Amended 01.07.2025
BRANZ Appraisal 743(2025) - Thermakraft Covertek 405 Roof and Wall Underlay
BRANZ Appraisal 878 (2025) - Thermakraft Aluband Window Flashing Tape
BRANZ Appraisal 912 (2021) - Thermakraft 220 Synthetic Wall Underlay - Amended 01.07.2025
BRANZ Appraisal 917(2025) - Thermakraft Covertek 403 Roof and Wall Underlay
BRANZ Appraisal 942 (2022) - OneSeal Multi-fit Pipe and Cable Penetration Seals - Amendment 04.06.2024
BRANZ Appraisal 943 (2021) - Thermakraft Covertek 401 Roof and Wall Underlay - Amended 01.07.2025
BRANZ Appraisal 1000 (2023) - Thermakraft Thermabar 397 Light Diffusing Reflective Underlay - Amended 01.07.2025
BRANZ Appraisal 1029 (2023) - Thermakraft Ausnet Hexagonal Wire Mesh
BRANZ Appraisal 1104 (2020) - Thermathene Orange Concrete Underlay - Amendment 06.09.2024
BRANZ Appraisal 1122 (2020) - Thermaflash Flashing Tape - Amendment 02.09.2024

BRANZ Appraisal 1229 (2023) - Thermakraft Covertek 215 Roof Underlay - Amended 19.06.2025
BRANZ Appraisal 1277 (2025) - Thermakraft RainArmor Self Adhesive Roof Underlay and Wall Underlay

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
15 years For Kingspan Thermakraft product range.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Compliance information - CodeMark certified

1.7 CODEMARK CERTIFICATE - THERMAKRAFT COVERTEK 405

Thermakraft Covertek 405 roof and wall underlay meets the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ30030 (Rev J).

Compliance information - BRANZ appraised

1.8 BRANZ APPRAISED - THERMAKRAFT SUPERCOURSE 500

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

1.9 BRANZ APPRAISED - THERMAKRAFT COVERTEK 405

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

1.10 BRANZ APPRAISED - THERMAKRAFT ALUBAND

Thermakraft Aluband flashing tape has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 878

1.11 BRANZ APPRAISED - THERMAKRAFT THERMATHENE ORANGE

Thermathene Orange DPM has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1104

2 PRODUCTS

DPC

2.1 THERMAKRAFT SUPERCOURSE 500

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

DPM

2.2 THERMAKRAFT THERMATHENE ORANGE

BRANZ appraised, 0.3mm thick x 4000mm wide orange DPM composed of recycled alloyed polythene. Membrane has a vapour flow resistance of at least 90MNs/g to NZS 3604 and NZS 4229 Damp-Proof Membranes. Refer to SELECTIONS.

Synthetic underlays - fire retardant

2.3 THERMAKRAFT COVERTEK 405

CodeMark certified and BRANZ appraised self-supporting synthetic roof and wall underlay, white with yellow logo print, composed of a water resistant vapour permeable film laminated to two layers of non-woven, spun bonded polyolefin sheet. Fire retardant, tested to AS 1530.2 and assigned a Flammability Index of ≤12. Available in 1250mm and 2550mm width. Refer to SELECTIONS.

Components - sealing

2.4 THERMAKRAFT WHITE GENERAL PURPOSE TAPE

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

2.5 THERMAKRAFT PREMIUM JOINING TAPE

75mm wide, black self-adhering multi-layer synthetic construction tape. Refer to SELECTIONS.

2.6 THERMAKRAFT ALUBAND

BRANZ appraised, black, self-adhering polymeric faced bituminous flashing tape. Available in 75mm, 150mm and 200mm width. Refer to SELECTIONS.

Fixings

2.7 FIXINGS - TO TIMBER

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

2.8 FIXINGS - TO STEEL

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation/application - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Installation - DPC

3.5 INSTALL DPC

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

Installation - DPM

3.6 INSTALL DPM - CONCRETE FLOOR

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

3.7 APPLY TAPE TO LAPPED DPM JOINTS

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

Installation - roof underlay

3.8 INSTALL ROOF UNDERLAY - HORIZONTAL

Install underlay to the Installation Guide horizontally and in true alignment over exterior face of roof framing. Place first sheet overlapping guttering (max. 20mm) or if eaves flashing is used terminate on the upper side of the flashing, draw sheet taut and fix at maximum 300mm centres to roof framing members. Install additional sheets in row repeating the process for the first sheet with sheet end laps to be of at least 150mm. Install sheets up to and over the ridge repeating the installation process for the first row and overlapping higher over lower sheets by at least 150mm.

3.9 INSTALL ROOF UNDERLAY - VERTICAL

Install underlay to the Installation Guide vertically and in true alignment over exterior face of roof framing. Place first sheet up the slope to the ridge overlapping guttering (max. 20mm) or if eaves flashing is used terminate on the upper side of the flashing, draw sheet taut and fix at maximum 300mm centres to roof framing members. Install additional sheets repeating the process for the first sheet lapping joints by at least 150mm.

Completion

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

DPC

4.1 DPC - THERMAKRAFT SUPERCOURSE 500

Location:	Refer to drawings
Manufacturer:	Thermakraft
Brand:	Supercourse 500
Type:	Damp proof course
Width:	Refer to drawings

DPM

4.2 DPM - THERMAKRAFT THERMATHENE ORANGE

Location:	Refer to drawings
Manufacturer:	Thermakraft
Brand:	Thermathene Orange
Type:	Damp proof membrane
Width:	4000mm
Joint tape:	~
Maximum UV exposure:	30 days

Synthetic underlays - fire retardant

4.3 ROOF & WALL UNDERLAY - THERMAKRAFT COVERTEK 405

Location:	Refer to drawings
Manufacturer:	Thermakraft
Brand:	Covertek 405
Type:	Synthetic roof and wall underlay
Width:	~
Fixings:	~
Maximum UV exposure:	Walls - 60 days Roofs - 7 days

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 ~ 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:

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 B2/AS1	Durability
NZBC C/AS1-AS2	Protection from fire
NZBC E2/AS1	External moisture
AS/NZS 2589	Gypsum linings - Application and finishing
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 (September 2018)
GIB® Noise Control Systems (September 2017)
GIB® Fire Rated Systems (October 2018)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIB Ezybrace® for Light Steel Frame Systems (March 2017)
GIB Weatherline® Rigid Air Barrier Systems Design and Construction Manual (March 2021)
BRANZ Appraisal 1048 - GIB Weatherline® Rigid Air Barrier Systems

Manufacturer/supplier contact details

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

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:
~ years For ~

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS

GIB Weatherline® fixers to be experienced competent workers, familiar with GIB Weatherline® Rigid Air Barrier Systems installation and finishing techniques. Submit evidence of experience on request. For example:
- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

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

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/AS1.9.1.4, and 9.1.7.2 and Table 23.
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.

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.
Moisture content: ~% maximum

3.4 SUBSTRATE

Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (September 2018).

3.5 TIMBER FRAME MOISTURE CONTENT

Maximum allowable moisture content to AS/NZS 2589 for timber framing, for insulation and internal lining shall be as specified by material lining supplier. Refer to NZBC E2/AS1 and GIB® Site Guide (Sept 2018).

Installation

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 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.

3.8 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.

3.9 INSTALL FLASHING AND SILL TAPE

Install flashing and sill tape in accordance with GIB Weatherline® Rigid Air Barrier Systems Specification and Installation Manual.

3.10 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide (September 2018). Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.11 FORM FIRE RATED SYSTEMS

Form fire rated systems in accordance with GIB Weatherline® Rigid Air Barrier Systems Design & Construction Manual.

Finishing

3.12 FINISHING GENERALLY

To GIB® Site Guide (September 2018) and AS/NZS 2589.

Completion & Commissioning

3.13 COMPLETION MATTERS

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

3.14 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.
~

4 SELECTIONS

GIB Weatherline® Rigid Air Barrier

4.1 STRUCTURAL BATTEN, SCREW & TAPE NZS 3604 - GIB WEATHERLINE® RIGID AIR BARRIER

Product	Weatherline® Rigid Air Barrier
Sheet length:	2750mm
Sheet width:	1200mm
Thickness:	10
Battens:	Verified proprietary cavity battens - refer to drawings for type

Components

4.2 GIB WEATHERLINE® FLASHING TAPE

Brand/type:	GIB Weatherline® flashing tape
Width:	As required

4.3 GIB WEATHERLINE® SILL TAPE

Brand/type:	GIB Weatherline® sill tape
Width:	As required

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4231HA JAMES HARDIE AXON™ PANEL CLADDING

1 GENERAL

This section relates to the supply and fixing of James Hardie Axon™ Panel cladding.

1.1 RELATED WORK

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

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:
LRV: Light Reflectance Value
CLD: Ceramic Low Density

Documents

1.3 DOCUMENTS

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

NZBC C/AS1-AS2	Protection from fire
NZBC E2/AS1	External Moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products-Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
AS/NZS 3837	Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter
NFPA 285:2019	Standard fire test method for evaluation of fire propagation characteristics of exterior wall assemblies containing combustible components

CodeMark Certificate CMNZ30165 - Axon™ Panel Cladding by James Hardie

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:
Axon™ Panel Timber Cavity Batten Technical Specification March 2024
Axon™ Panel Fixed to Hardie™ CLD™ Structural Cavity Batten Technical Specification March 202
Axon™ Panel Direct Fixed Technical Specification March 2024
Hardie™ Flex Sheet technical specification
Fire and Acoustic Design Manual by James Hardie, May 2025
BRANZ Appraisal 1211 [2022] - Axon™ Panel Cladding
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:	Ask James Hardie™ on 0800 808 868.

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For James Hardie Axon™ Panels (refer to James Hardie product warranty)
15 year:	For accessories supplied by James Hardie (refer to James Hardie product warranty)
From:	Date of purchase

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

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 SAFE WORKING

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

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide relevant James Hardie maintenance requirements at completion of the work.

Performance - Wind

1.9 PERFORMANCE - WIND

James Hardie Axon™ Panel is suitable for use in all wind zones up to design wind pressure of 3.2kPa ULS and building height 25m maximum.

Performance - Fire

1.10 EXTERNAL FIRE SPREAD - CLADDING SYSTEM AND MATERIALS

James Hardie Axon™ Panel cladding system is tested to NFPA 285 passing test criteria. Cladding materials achieve Type A classification to AS/NZS 3837 (peak heat release rate ≤ 100 kW/m², total heat release rate ≤ 25 MJ/m²).

2 PRODUCTS

Materials

2.1 RIGID AIR BARRIERS

Refer to section 4171HR JAMES HARDIE RIGID AIR BARRIERS.

2.2 EXTERIOR STRUCTURAL CAVITY BATTENS

Hardie™ CLD™ Structural Cavity Batten, 3000mm long, 70mm wide and 19mm thick manufactured from treated cellulose fibre, Portland cement, sand and water. Cured by high pressure autoclaving and manufactured to AS/NZS 2908.2. James Hardie Axon™ Panel and Hardie™ CLD™ Structur Cavity Batten installed as per the James Hardie technical specification demonstrate compliance with requirements of NZBC Sections B1, B2 and E2. The battens have both faces and all edges presealed.

2.3 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated uPVC, with upstands.

2.4 AXON™ PANEL

James Hardie Axon™ Panel, face primed shiplap jointed panels, 9.0mm and 8.5mm thick, manufactured from cellulose fibre reinforced cement to AS/NZS 2908.2. Refer to SELECTIONS.

2.5 AXENT™ TRIM

Hardie™ Axent™ Trim, 45mm, 70mm and 89mm wide x 19mm thick, manufactured from cellulose fibre reinforced cement to AS/NZS 2908.2. Refer to SELECTIONS.

Components

2.6 FASTENER TYPE

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

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

Zone	Fixings Material
Zone D, Zone E / Microclimates (incl. Geothermal)	Grade 316 Stainless
Zone B, Zone C	Hot-dipped galvanized
Bracing - All zones	Grade 316 Stainless

Check against SED (specific engineering design) requirements for microclimate conditions.

Refer to SELECTIONS.

2.7 NAIL HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN FIXING - TIMBER FRAMINC

Over flexible wall underlay:	65mm x 2.8mm RounDrive ring shank nail
Over 9mm RAB™ Board or where building height >10m:	75mm x 3.06mm RounDrive ring shank nail

Refer to SELECTIONS.

2.8 NAIL - AXON™ PANEL FIXING TO HARDIE™ CLD™ STRUCTURAL CAVITY BATTE

Axon™ Panel fixings to Hardie™ CLD™ Structural Cavity Batten, as follow
For wind pressure up to 3.2kPa:

- stainless steel C-25 'T' Head brad nail.

2.9 NAIL - AXON™ PANEL FIXING TO TIMBER CAVITY BATTEN

Over flexible wall underlay:	65mm x 2.8mm Hardie™Flex nails
Over RAB™ Board:	75mm x 3.15mm Hardie™Flex nails

Refer to SELECTIONS.

2.10 NAIL - AXON™ PANEL DIRECT FIX

40mm x 2.8mm Hardie™Flex nails.

2.11 NAIL - AXENT™ TRIM

40mm brad nails.

Accessories

2.12 FLASHING TAPES - TIMBER CAVITY BATTEN

Inseal® 3259 black compressible medium density closed cell foam tape, 1.5mm thick x 48mm wide for vertical joints, and 1.5mm thick x 80mm wide for internal corners.

2.13 FLASHING TAPES - HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Polypropylene DPC under Hardie™ CLD™ Structural Cavity Batten internal corners. Refer t James Hardie® Axon™ Panel technical specification for selection of required width.

2.14 ALUMINIUM ACCESSORIES

Extruded aluminium etch primed. External box corners and horizontal 'h' flashing suitable for dark paints.

2.15 ADHESIVE FOR HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Adhesive to be applied continuous 6mm thick bead(s) to the face of Hardie™ CLD™ Structura Cavity Batten to adhere the Axon™ Panel.

2.16 SEALANT

Flexible sealant. Refer to the sealant manufacturer's technical literature to confirm suitability for the application.

3 EXECUTION

Conditions

3.1 STORAGE

Take delivery of products dry and undamaged on pallets, and keep on pallet. Protect edges and corners from damage and covered to keep dry until fixed.

3.2 HANDLING

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

3.3 SUBSTRATE

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

Confirm that 70mm minimum framing for vertical joints for timber cavity construction has been correctly installed.

3.4 SEAL EDGES

Seal site cut sheet edges prior to installation. Seal panel edges around window and door openings, meter boxes and at other penetrations.

3.5 SEAL CUT ENDS, HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Site cut batten ends to be between 20 - 45 degrees and sealed with Dulux 1 Step or Resene Quick Dry sealer prior to installation with the butt joint deflecting moisture to the exterior.

Application - particular installations

3.6 FIRE RESISTANCE RATING

Install mineral fibre insulation or glass fibre insulation fitted tightly in the timber framing cavity. Apply fire retardant wall underlay to the exterior face of the framing and fix fibre cement cladding and lining sheets, direct or on cavity. Refer to project drawings for FRR system construction details and Fire and Acoustic Design Manual by James Hardie for further information.

Application - generally

3.7 RIGID AIR BARRIER

Refer to 4171HR JAMES HARDIE RIGID AIR BARRIERS.

3.8 HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN - TIMBER FRAME

Apply 150mm wide strip of DPC vertically to internal corners over continuous air barrier. Fix battens to all studs over the wall underlay using 65mm x 2.8mm RounDrive ring shank nails at fixing centres as per James Hardie Axon™ Panel Fixed to Hardie™ CLD™ Structural Cavity Batten Technic Specification, Table 4: Hardie™ CLD™ Structural Cavity fixings. Refer to Table 6 for durability requirements of fixings.

3.9 PENETRATIONS AND FLASHINGS

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

- Wall underlay appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the wall underlay.
- Wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- Required holes in cladding accurately formed and cut to James Hardie requirements, ensure (if required) services penetration grommets/sleeves/seals/tapes are in place prior to cladding installation.
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

Install Axon™ Panel cladding

3.10 PANEL LAYOUT

All panel edges must be supported by the framing. Fix Axon™ Panels vertically.

3.11 FASTENER - SIZE AND LAYOUT

Fix Axon™ Panels to framing using the fixings specified in James Hardie® Axon™ Panel technica specifications and in accordance with the following requirements:

- Nails must have a minimum clearance of 18mm from sheet edges and a minimum of 75mm vertically and 150mm horizontally from sheet corners.
- Nails must finish flush with sheet surface.

3.12 FIXING - DIRECT FIXED TO FRAME

Fix with 40mm x 2.8mm Hardie™ Flex nails. Fix sheet at 200mm centres at all sheet edges as well as all intermediate framing. Alternatively fix with ND50 brad nails at 150mm centres.

3.13 FIXING - AXON™ PANEL OVER HARDIE™ CLD™ STRUCTURAL CAVITY BATTE

Apply continuous 6mm thick bead(s) of adhesive to the face of Hardie™ CLD™ Structural Cavity Batten to adhere the Axon™ Panel, and fix with C-25 brad nails at 150mm centres. Refer to Axon™ Panel technical specifications.

3.14 GUN NAILING

Axon™ Panels can be fixed using nail guns. The gun nails used must have a full round head to provide the required holding power. The length and gauge of nails must at a minimum be as specified in the James Hardie Axon™ Panel technical specifications.

3.15 VERTICAL JOINT

Joint Axon™ Panels in accordance with James Hardie Axon™ Panel technical specifications

3.16 HORIZONTAL JOINT

Provide a horizontal joint at floor joist levels to accommodate the movement resulting from timber joist shrinkage and settlement. Install a 'z' flashing where drainage is required at floor level. For Axon™ Panels use a Hardie™ 9mm Panel aluminium 'h' mould complete with 'h' mould jointer external corner jointer or a Hardie™ 9mm aluminium angled 't' mould complete with angled 't' mould jointer, external corner jointer or a purpose made 'z' flashing to form a horizontal joint.

3.17 INTERNAL CORNER JOINT - HARDIE™ CLD™ STRUCTURAL CAVITY BATTENS

Apply continuous 10mm beads of adhesive sealant to Hardie™ CLD™ Structural Cavity Battens Seal site cut Axon™ Panel edges. Fix Hardie™ 9mm aluminium internal corner mould through Hardie™ CLD™ Structural Cavity Battens into framing. Position and fix Axon™ Panels throug Hardie™ CLD™ Structural Cavity Battens into framing, fixings 18mm minimum from square edge o sheet in accordance with James Hardie Axon™ Panel Technical Specification details.

3.18 EXTERNAL CORNER JOINT - HARDIE™ CLD™ STRUCTURAL CAVITY BATTENS

Install Hardie™ CLD™ Structural Cavity Battens in accordance with James Hardie Axon™ Pan Technical Specification details. Seal site cut Axon™ Panel edges. Position and fix Axon™ Panels and Hardie™ 9mm Aluminium External Box corner or Hardie™ Alumnium Invert External Corne over battens, fixing in accordance with James Hardie Axon™ Panel Technical Specification details.

3.19 EXTERNAL CORNER JOINT WITH H MOULD

Fit Hardie™ 9mm Panel aluminium horizontal 'h' mould over lower Axon™ Panel and lap the upstand under upper Axon™ Panel. Leave 15mm gap maximum between upper and lower Axon™ Panels at the solid timber floor joist levels.

Fit Hardie™ 9mm Panel aluminium external box corner under the aluminium 'h' mould with flanges removed locally. Mitre the 'h' mould over box corner flashing to cover it. Install "h" mould external corner jointer over. The upper box corner flashings are to be finished flush with the bottom edge of upper Axon™ Panel.

An aluminium corner flashing is required over the Hardie™ 9mm Panel aluminium horizontal flashing where the box corner is terminated under the 'h' mould. Hardie™ 9mm Panel aluminium external box corner flanges to be removed locally over the aluminium 'h' mould and corner underflashing to be lapped under the upper box corner flashing. Lap wall underlay over aluminium 'h' mould or seal to flashing with a flashing tape. Refer to Axon™ Panel technical specifications.

3.20 FIX AXENT™ TRIM

Fix Hardie™ Axent™ Trim to internal corners, external corners, vertical joints and intermediate vertical locations in accordance with James Hardie Axon™ Panel Technical Specification details.

3.21 FINISHING

Refer to painting section/s for protective coating system.

Completion

3.22 REPLACE

Replace all damaged or marked elements.

3.23 LEAVE

Leave work to the standard required for following procedures.

3.24 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 HARDIE™ CLD™ STRUCTURAL CAVITY BATTENS - TIMBER FRAME

Brand/type:	Hardie™ CLD™ Structural Cavity batter
Thickness:	19mm
Fastener type:	75mm x 3.06mm RounDrive ring shank nails
Fastener finish:	Hot-dipped galvanized
Adhesive:	Bostik 'Seal N Flex - 1'

4.2 JAMES HARDIE AXON™ PANELS - SHEET CLADDING PANELS

Brand/type:	James Hardie Axon Panel Smooth
Thickness:	9mm
Fastener type:	C-25 straight 'T' - Head stainless steel brad nail for wind pressure up to 3.2kPa ULS
Fastener finish:	Hot-dipped galvanized
External corner type:	Hardie™ Axent™ Trim

4.3 JAMES HARDIE AXENT™ TRIM

Brand/type:	Hardie™ Axent™ Trim
Thickness:	19mm
Width:	40mm with 70mm & 86mm on corners

Finishing

4.4 PAINTING

Refer to painting section/s for details.

4231HO JAMES HARDIE® OBLIQUE™ WEATHERBOARD CLADDING

1 GENERAL

This section relates to the supply and fixing of Oblique™ Weatherboard cladding.

1.1 RELATED WORK

Refer to ~ for ~
Refer to painting section(s) for the protective coating required to meet the NZBC durability requirements.

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

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC E2/VM1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind loads
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
CodeMark™ CMNZ30147 - Rev B	Oblique™ Weatherboard by James Hardie®

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Oblique™ Weatherboard Horizontal Installation Technical Specification (June 2024)
Oblique™ Weatherboard Vertical Installation Technical Specification (June 2024)
Oblique™ Weatherboard Vertical Installation to Hardie™ 40mm Structural Horizontal Cavity Batten Technical Specification
Fire and Acoustic Design Manual by James Hardie, May 2025
James Hardie® Installation Checklist
BRANZ Appraisal 1231 - Oblique™ Weatherboard (Horizontal) Cavity Cladding
BRANZ Appraisal 1232 - Oblique™ Weatherboard (Vertical) Cavity Cladding
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

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

25 years	For Oblique™ Weatherboard products (refer to James Hardie® product warranty)
15 years	For accessories supplied by James Hardie® (refer to James Hardie® product warranty)

- 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 (check with the manufacturer/supplier).

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 NO SUBSTITUTIONS

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

1.8 SAFE WORKING

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

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:
Oblique™ Weatherboard Care and Maintenance guide.

Provide this information prior to practical completion.

1.10 OBLIQUE™ WEATHERBOARD INSTALLATION CHECKLIST

Installer to complete, sign and provide a James Hardie® Installation Checklist.

Compliance information

1.11 CODEMARK CERTIFICATE

James Hardie® Oblique™ Weatherboard meets the requirements of the NZBC when used within the Conditions and Limitations of its Certificate of conformity CMNZ30147.

Performance - wind

1.12 PERFORMANCE, WIND

The design wind zones are to NZS 3604, up to and including Extra High Wind Zone. James Hardie® Technical Specifications are suitable for these conditions.

1.13 SPECIFIC DESIGN, WIND

The design wind pressures are to AS/NZS 1170.2, for specific design wind pressures up to 3.2kPa, as per James Hardie® design details included in the Technical Specification.

Performance - fire

1.14 EXTERNAL FIRE SPREAD - CLADDING MATERIALS

James Hardie® Oblique™ Weatherboard cladding tested toAS/NZS 3837 and to specific requirements of C/AS1 or C/AS2 achieving Type A classification (peak heat release rate ≤ 100 kW/m², total heat release rate ≤ 25 MJ/m²).

2 PRODUCTS

Materials

2.1 OBLIQUE™ WEATHERBOARDS

Oblique™ Weatherboards, rusticated profile, 14mm thick, available in 200mm or 300mm widths and 3000mm or 4200mm lengths, pre-primed, manufactured to AS/NZS 2908.2 from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving. Tested to the requirements of NZBC E2/VM1 for weathertightness and complying with the NZBC.

2.2 WALL UNDERLAY

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

2.3 HARDIE™ 20MM HORIZONTAL CAVITY BATTEN

Proprietary profiled radiata pine battens, minimum 45mm wide x 20mm thick, H3.1 treated to NZS 3602, Table 1, reference 1D.10. Bevelled top edge with offset grooved rebates at the front and back faces to allow for drainage and ventillation. Requirements for wood-based building components to achieve a 50-year durability performance.

2.4 20MM VENT STRIP/VERMIN-PROOFING

Perforated uPVC, with upstands.

2.5 HARDIE™ 14MM ALUMINIUM JAMB FLASHING

Aluminium moulding used beside window opening to end butt the Oblique™ Weatherboard.

2.6 HARDIE™ 14MM ALUMINIUM TRIMLINE JOINT FLASHING

Aluminium flashing extrusion used behind cladding joints.

2.7 TRIMLINE JOINTERS

Aluminium jointers to joint Oblique™ Trimline Joint Flashings at flashing ends, external corners and internal corners.

2.8 HARDIE™ 14MM ALUMINIUM INTERNAL CORNER

Anodised aluminium extrusion to create internal corners.

2.9 HARDIE™ 14MM ALUMINIUM EXTERNAL BOX CORNER

Anodised aluminium extrusion to flash behind cladding at external corners.

2.10 HARDIE™ AXENT™ TRIM

19mm thick pre-primed fibre cement trim.

2.11 FASTENER TYPE

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

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

Zone	**Fixings Material**
Zone D, Zone E / Microclimates (incl. Geothermal)	Grade 316 Stainless
Zone B, Zone C	Hot-dipped galvanized

Check against SED requirements for microclimate conditions. For fastener type refer to following clause(s).

2.12 CAVITY BATTEN NAILS

40 x 2.8mm Hardie™ Flex nails for fixing timber cavity battens and aluminium flashings.

2.13 HOT DIPPED GALVANIZED NAILS

Hot-dipped galvanized, 65 x 2.87mm D head or 65 x 2.87mm RounDrive ring shank nails for fixing Oblique™ Weatherboards over cavity battens over flexible underlay.

2.14 FLEXIBLE SEALANT

Bostik® Seal N Flex-1™ or Sikaflex® AT Facade or Sikaflex® MS sealants.

2.15 PRIMER

Refer to SELECTIONS.

2.16 EXTERIOR GRADE FILLER

CRC® ADOS® Builders Fill, two part filler to fill over nail holes.

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 of the standard required by James Hardie® for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by NZS 3602 to minimise shrinkage and movement after weatherboards are fixed.

Application - particular installations

3.4 FIRE RESISTANCE RATING

Refer to project drawings for FRR system construction details and Fire and Acoustic Design Manual by James Hardie® for further information.

Application - generally

3.5 INSTALL CAVITY BATTENS - OBLIQUE™ VERTICAL WEATHERBOARDS

Install 20mm thick Hardie™ Horizontal Cavity Battens. Fix horizontal cavity battens to wall framing nogs, fix vertically to studs at corners and openings. The battens are fixed by the cladding fixings which will penetrate the wall framing nogs and studs under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc).

3.6 PENETRATIONS AND FLASHINGS

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

- Wall underlay appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the wall underlay.
- Wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations.
- Required holes in cladding accurately formed and cut to James Hardie® requirements, ensure (if required) services penetration grommets/sleeves/seals/tapes are in place prior to cladding installation.
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

3.7 INSTALL OBLIQUE™ WEATHERBOARDS - VERTICAL INSTALLATION

Cut weatherboards to required lengths. Prime site cut ends that are exposed prior to installation. Fit joint flashing, internal corners and external corners and fix weatherboards as per Oblique™ Weatherboard Vertical technical specifications.

Completion & Commissioning

3.8 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 JAMES HARDIE® OBLIQUE™ WEATHERBOARDS

Location:	Refer drawings
Type/Brand:	Oblique™ Weatherboards
Thickness:	14mm
Width:	200mm and 300mm
Length:	Refer drawings
Construction:	Cavity fix

Fixing:	~

4.2 HARDIE™ 20MM HORIZONTAL CAVITY BATTEN - FOR VERTICAL INSTALLATION

Supplier:	James Hardie®
Timber species:	Radiata pine
Treatment:	H3.1
Thickness:	20mm

4.3 HARDIE™ 14MM ALUMINIUM EXTERNAL BOX CORNER

Location:	Refer drawings
Type/Brand:	Hardie™ 14mm Aluminium External Box Corner
Finish:	Etched primed aluminium extrusion

4.4 HARDIE™ 14MM ALUMINIUM TRIMLINE JOINT FLASHING

Location:	Refer drawings
Type/Brand:	Hardie™ 14mm Trimline Joint Flashing
Finish:	Etched primed aluminium extrusion

4.5 PRIMER

Type:	Dulux 1 Step, Acraprime 501/1, Resene Quick Dry or similar product

Finishing

4.6 PAINTING

Refer to painting section(s) for details.

4239JH JAMES HARDIE® SOFFITS

1 GENERAL

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

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

Documents

1.1 ABBREVIATIONS AND DEFINITIONS

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

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
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.

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
James Hardie® Eaves and Soffit Care and Maintenance

Performance

1.8 PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

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

2 PRODUCTS

Materials

2.1 VILLABOARD™ SOFFIT LINING

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

Components

2.2 FASTENER TYPE

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

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

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

Components - Villaboard™ Soffit Lining

2.3 CONTROL JOINT

Refer to SELECTIONS.

2.4 HARDIE™ DRIVE SCREW

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

2.5 VILLADRIVE SCREW

Villadrive Screw, 30mm x 6g, Class 3

2.6 FIBREZIP® SCREW

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

2.7 HARDIE™ FLEX NAILS

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

2.8 SEALER

Multiplast resin by Plaster systems

2.9 BASE COMPOUND

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

2.10 JOINT REINFORCING TAPE

52mm wide perforated paper tape.

2.11 BEDDING COMPOUND

Hardie™ Base Coat compound powder.

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2.12 FINISHING COMPOUND

Hardie™ Top Coat topping compound premixed.

Components - General

2.13 FLEXIBLE JOINT SEALANT

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.
Moisture content timber framing: 18% maximum

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - general

3.5 SHEET LAYOUT

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

3.6 OFFSET PATTERN SHEET LAYOUT

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

3.7 CUTTING SOFFIT CLADDING

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

3.8 CIRCULAR HOLE FORMING

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

3.9 IRREGULAR HOLE FORMING

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

3.10 INSTALL VILLABOARD™ SOFFIT LINING

Install in accordance with James Hardie® installation manual requirements. Refer to SELECTIONS for fixing and jointing methods.

3.11 SEAL EDGES

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

3.12 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.13 FASTENER - SIZE AND LAYOUT

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

3.14 SEALANTS

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

3.15 FINISHING OVER DRIVEN FASTENERS

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

3.16 VILLABOARD™ JOINT FINISHING - LEVEL 3 FINISH

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

3.17 VILLABOARD™ JOINT FINISHING - LEVEL 4 FINISH

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

3.18 VILLABOARD™ JOINT FINISHING - LEVEL 5 FINISH

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

3.19 PAINTING

Refer to painting section/s for protective coating system.

Completion

3.20 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 VILLABOARD™ SOFFIT LINING - FLUSH JOINTED

Location:	Refer to drawings
Brand/type:	James Hardie® Villaboard™ Soffit Lining
Thickness/Edge:	9mm
Joint:	Flush joint (base compound and topping compound)
Fixing method:	Screw and adhesive
Fixing Type:	Hardie™ Drive Screw, 316 stainless steel, 30mm x 7g
Adhesive:	Sikaflex-11FC by Sika or Seal N Flex-1 by Bostik
Level of Finish:	Level 4
Control joint type:	Expressed control joint with polythene tape

Painting

4.2 PAINTING

Refer to painting section/s for details.

4241M METALCRAFT ROOFING PROFILED CLADDING

1 GENERAL

This section relates to the supply and fixing of **Metalcraft Roofing** profiled cladding complete with accessories.
It includes:

- Trough section cladding profiles
- Asymmetrical and symmetrical rib cladding profiles
- Corrugated cladding profile
- Bevelback weatherboard cladding profile
- Rusticated weatherboard cladding profile
- Translucent cladding

1.1 RELATED WORK

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

1.2 ABBREVIATIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

NZBC C/VM2	Protection from fire
NZBC E2/AS1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - performance requirements
AS 3566	Self-drilling screws for the building and construction industries
NZS 3602	Timber and wood-based products for use in building
ISO 5660.1	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 1 Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 2 Smoke production rate (dynamic measurement)
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Metalcraft Roofing Metdek500 product literature
Metalcraft Roofing Metdek855 product literature
Metalcraft Roofing Metrib760 product literature
Metalcraft Roofing MC760 product literature
Metalcraft Roofing T-Rib product literature
Metalcraft Roofing MC1000+700 product literature
Metalcraft Roofing Metcom7 product literature
Metalcraft Roofing Metcom930+700 product literature
Metalcraft Roofing Metcom965 product literature
Metalcraft Roofing Kahu® product literature
Metalcraft Roofing Metclad850 product literature
Metalcraft Roofing Corrugate product literature
Metalcraft Roofing Bevelback Weatherboard product literature

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Metalcraft Roofing Alsynite Topglass® product literature

Manufacturer/supplier contact details

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

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	Failure of coating adhesion (manufacturer's standard warranty)
~ years	Weatherproofing failure caused by material penetration as a result of corrosion (manufacturer's standard warranty)

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

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years	for workmanship

- Provide this warranty on the material manufacturers standard warranty form.
- Commence the warranty from the date of date of completion of installation.

Include a copy of the Metalcraft Roofing maintenance requirements with the warranty.

Requirements

1.7 NO SUBSTITUTIONS

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

1.8 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Compliance information

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

Performance - General

1.10 CO-ORDINATE

Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the wall cladding.

1.11 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed wall cladding system, including all penetrations through the walls and junctions with other cladding materials and parapets.

Performance - Fire

1.12 EXTERNAL FIRE SPREAD - NON-COMBUSTIBLE MATERIAL

Zincalume®, COLORSTEEL® Maxam™, COLORSTEEL® Maxam™ Dridex® and COLORSTEEl Altimate™ are non-combustible materials with a surface finish no more than 1mm in thickness applied directly to the non-combustible substrate.

1.13 EXTERNAL FIRE SPREAD - CLADDING MATERIAL, CLASSIFICATION

COLORSTEEL® Maxam™ and COLORSTEEL® Maxam™ Dridex® have been tested to ISO 5660.1 and to specific requirements of NZBC C/AS1 or NZBC C/AS2 achieving:

Type A classification (peak heat release rate ≤ 100 kW/m², total heat release rate ≤ 25 MJ/m²).

1.14 SURFACE FIRE PROPERTIES FOR LININGS

Zincalume®, COLORSTEEL® Maxam™, COLORSTEEL® Maxam™ Dridex® and COLORSTEEL® Altimate™ have been tested to ISO 5660.1 & ISO 5660.2 and have been assigned the following Group Numbers in accordance with Appendix A, NZBC C/VM2:

Zincalume®	Group Number 1-S
COLORSTEEL® Maxam™	Group Number 1-S
COLORSTEEL® Maxam™ Dridex®	Group Number 1-S
COLORSTEEL Altimate®	Group Number 1-S

2 PRODUCTS

Materials

2.1 EXTERIOR CAVITY WALL BATTENS - WITH DRAINED CAVITY

Proprietary horizontal cavity batten system.

2.2 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

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

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

Formability steel sheet G550 for roll forming or G300 for flashings, coated to AS 1397. Prefinished /prepainted to AS/NZS 2728.

Fixings

2.4 FASTENERS GENERALLY

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

2.5 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, and wind load as required by Metalcraft Roofing, and with a durability not less than the material fixed.

2.6 RIVETS

Sealed aluminium, minimum diameter 4.8mm.

2.7 FLASHINGS GENERALLY

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

2.8 WALL AND PARAPET FLASHINGS

Supplied by Metalcraft Roofing to match or to suit the cladding.

Accessories

2.9 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.10 SEALANT

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

2.11 CLOSURE STRIPS

Polyurethane profiled closed cell foam strips to fit the sheet profile.

Brand:	Ecofoam
Profile:	To suit selected cladding profile

3 EXECUTION

Conditions

3.1 INSPECTION

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

3.2 FRAMING TIMBER MOISTURE

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

3.3 STORAGE

Take delivery of and accept packs of cladding dry and undamaged on delivery. Reject all damaged material. Store on a level firm base clear of the ground, with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets.

3.4 HANDLING

Avoid distortion and contact with damaging substances, including cement. Do not drag sheets across each other or other materials. Protect edges and surface finishes from damage. Use soft, flat sole shoes when fixing and for all other work on the wall.

3.5 SEPARATION

Isolate dissimilar materials 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.

Application

3.6 FIX INSULATION

Refer to thermal insulation sections.

3.7 VERTICAL SET-OUT

Set cladding to vertical plumb lines and maintain verticality. Carefully set out to allow cover flashings of equal width at the ends of the building. Lay sheets with side laps away from the line of sight ensuring ends of sheets are true to line. Check during fixing to eliminate creep or spread and to keep fastenings in line. Ensure all exposed fastenings are set to a line.

3.8 FORMING

Form stop-ends and downturns to Metalcraft Roofing recommendations.

3.9 END LAPS

End laps are not recommended, except where specifically detailed to Metalcraft Roofing requirements.

3.10 SEAL CUT EDGES

In very severe marine environments seal cut edges of pre-coated steel sheet with edge protection lacquer before fixing to the cladding manufacturer's requirements.

3.11 THERMAL MOVEMENT

Roof fixing and jointing to conform with Metalcraft Roofing requirements for thermal movement.

3.12 FIXING GENERALLY

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

3.13 WALL UNDERLAYS

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Ensure that the appropriate wall underlays have been installed and fixed correctly, before proceeding with installation of the cladding.

3.14 INSTALL DRAINED CAVITY - HORIZONTAL PROPRIETARY CAVITY BATTEN SYSTEM

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

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

3.16 MARKING AND CUTTING

Cut only by shearing tools. Do not use black lead pencils for marking Zincalume®, Colorsteel® products. Use ink pen, chalk line or coloured pencil for marking cladding sheets prior to cutting.

3.17 FIX 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.
Screw-fixed cladding to be screwed through pans.

3.18 FIX FLASHINGS AND CAPPINGS

Flash parapets, walls and penetrations, cap corners and edges to detail in Metalcraft Roofing installation manual and to the NZMRM CoP and Metalcraft Roofing requirements. Cut accurately and fix using sealant and rivets/ screws to detail to form a weatherproof cover. Ensure flashings are designed and installed to avoid water ponding.

Completion

3.19 REPLACE

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

3.20 LEAVE

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

3.21 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

Cladding - asymmetrical rib profile

4.1 METALCRAFT - T-RIB ASYMMETRICAL RIB PROFILE CLADDING

Location:	Refer drawings
Manufacturer:	Metalcraft Roofing
Profile:	T-Rib or similar
Dimensions:	Sheet width 810mm, cover 760mm, rib height 29mm, and roll formed to any length
BMT/material:	0.55mm Steel,
Coating system:	COLORSTEEL® Maxam™
Coating colour:	Refer drawings
Batten material:	Timber
Fixings:	Class 4 12G or 14G with load spreading washer

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:

- Trough section roofing profiles
- Asymmetrical rib roofing profiles
- Corrugated roofing profile
- Translucent roofing

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:

NZBC C/VM2	Protection from fire
NZBC E2/AS1	External moisture
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 Metdek 500 product literature
Metalcraft Roofing Metdek 855 product literature
Metalcraft Roofing Metrib 760 product literature
Metalcraft Roofing MC760 product literature
Metalcraft Roofing T-Rib product literature
Metalcraft Roofing MC1000 product literature
Metalcraft Roofing Metcom 7 product literature
Metalcraft Roofing Metcom 930 product literature
Metalcraft Roofing Metcom 965 product literature
Metalcraft Roofing Kahu® product literature
Metalcraft Roofing Corrugate product literature
Metalcraft Roofing Building Product Information Sheet
COLORSTEEL® Maintenance Recommendations
Alsynite One Translucent Roofing Catalogue
Alsynite One Fibreglass Sheeting BPIR

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Manufacturer/supplier contact details
Company: Metalcraft Roofing Ltd
Web: www.metalcraftgroup.co.nz
Email: technical@metalcraftroofing.co.nz
Telephone: 09 274 0408

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER - METALCRAFT ROOFING

Provide a material manufacturer/supplier warranty:
~ years for failure of coating adhesion
~ 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

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 - GALVANIZED, 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 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.8 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.9 SEALANT

Neutral cure silicone or MS polymer sealant.

2.10 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.

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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:	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.

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:	~
Supplier:	Metalcraft Roofing Ltd
Profile:	T-Rib ~
Dimensions:	Sheet width 810mm, cover 760mm, rib height 29mm
Roof pitch:	~
BMT/material:	~
Coating system:	~
Coating colour:	~
Purlin material:	~
Fixings:	~

Accessories

4.2 FLASHINGS - GENERALLY

Profile:	~
BMT/material:	~
Coating system:	To match roofing
Paint colour:	To match roofing

4383 TIMBER DECKING

1 GENERAL

This section relates to the fabrication and installation of exterior timber

- spaced boarding to decks
- steps and landings

Related work

1.1 RELATED SECTIONS

Refer to ~ for ~.

Documents

1.2 DOCUMENTS

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

NZBC D1/AS1	Access routes
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
BRANZ BU 497	Stair construction

2 PRODUCTS

Materials

2.1 SOLID TIMBER COMPONENTS

Selection to NZS 3602.

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 LAYING TIMBER SPACED BOARDING - EXTERIOR DECKS

Confirm whether the grooved side of the boards is face up or face down. Avoid excessively short or long lengths. Drill for all fixings. Stagger end joints. Space narrow boards (<100mm) a minimum of 2mm apart in general conditions, or minimum 3mm to 4mm apart if wide boards (>100mm) or narrow boards that are likely to swell after fixing, or 5mm apart for wide boards that are likely to swell. Leave a 12mm minimum gap between the exterior wall and the adjacent decking board.

3.3 SCREW FIXING

Pre-drill for all fixings, where the screws allow, use a proprietary deck pre-drilling and countersinking tool.
Use decking screws and power drive into the deck surface to just slightly below the board surface (approx. 0.5mm). Take care to not overdrive the screw as this may result in the screw heads or the boards being damaged. Refer to SELECTIONS.

3.4 CORROSION RISKS

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

Completion

3.5 LEAVE

Leave work to the standard required by following procedures.

3.6 REMOVE

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

4 SELECTIONS

4.1 SCREW FIXING

Location:	Refer to drawings
Decking:	88 x 21 H3.2 Pine decking, grooved tread face down, 4mm gap between boards.
Finish:	Stain finish - refer drawings for colour

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4422AD ARDEX UNDERTILE WATERPROOFING MEMBRANE

1 GENERAL

This section relates to **ARDEX** WPM 1000 weldable undertile waterproofing membrane, bonded to:

- structural plywood
- Strandfloor H3.1®
- concrete
- compressed fibre cement sheet

to produce a fully adhered synthetic rubber external membrane system, overlaid with tiles or pavers. Incorporating ARDEX UD 150 undertile drainage system where required. It includes associated accessories and components.

1.1 RELATED WORK

Refer to ~ for ~.
Refer to appropriate tiling section for the selection and installation of tiles.

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 2269.0	Plywood - Structural - Specifications
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
BRANZ	Good practice guide: Membrane roofing
BRANZ	Good practice guide: Tiling
BRANZ BU 583	Waterproof decks

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
ARDEX WPM 1000 Technical Data Sheet
ARDEX Undertile Accessories

Manufacturer/supplier contact details

Company:	**ARDEX New Zealand Ltd**
Web:	www.ardex.co.nz
Email:	ardexspec@ardexnz.com
Telephone:	0800 2 ARDEX (27339) 09-636 0005 Auckland 04-568 5949 Wellington 03-373 6900 Christchurch

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years	For ARDEX WPM 1000

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years	For installation of ARDEX WPM 1000

- ARDEX approved installer to provide this warranty on the ARDEX installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 NO SUBSTITUTIONS

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

1.7 QUALIFICATIONS

Waterproofing to be carried out by an ARDEX approved installer with experience in installation of adhesive fixed membranes. For a list of approved applicators visit www.ardex.co.nz or contact nearest ARDEX branch. Application to be strictly in accordance with current ARDEX technical literature.

NOTE: An LBP is required to carry out RBW. An LBP must do or supervise this work. They must work within the scope of their licence class.

1.8 SYSTEMS ARDEX PROJECT

Contact ARDEX with any relevant key dates and for a list of approved applicators. The contractor is to contact ARDEX prior to starting the contract.

Email:	ardexspec@ardexnz.com
Telephone:	0800 2 ARDEX (27339)

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

Quality control and assurance

1.10 QUALITY ASSURANCE

Maintain quality necessary to assure that work is performed in accordance with this specification and the qualifying requirements of ARDEX.

1.11 INSPECTIONS

~

2 PRODUCTS

Materials

2.1 UNDERTILE MEMBRANE

ARDEX WPM 1000 weldable undertile waterproofing membrane, a 1.2mm thick single ply rubber sheet with polypropylene filaments. Provides a fully bonded system for waterproofing external tiled or paved areas. Laps and corners heat formed and/or welded. Tiling adhered directly on the membrane with approved ARDEX tiling adhesives, or adhered to loose laid undertile drainage mat.

Components

2.2 ADHESIVES

Adhesives for use with ARDEX WPM 1000 for fixing to substrate:

ARDEX CA 750	Water-based contact adhesive. Recommended to use ARDEX SpeedTec Catalyst
ARDEX WA 98	Solvent-based contact adhesive

Adhesive to be recommended by ARDEX and suitable for the particular application and the relevant temperature and conditions.

Accessories

2.3 WELDING KIT

Leister Triac S hand held hot air gun kit or motorised Leister welding equipment such as Varimat or Uniroof, including a flat angled nozzle for seam welding and a rubber roller to ensure seams and welds are securely welded together.

2.4 ARDEX STB TAPE

ARDEX STB tape is a self-adhesive weldable uncured butyl tape with a fleece layer. It is used as a waterproof band for sealing transitions and connections from primary waterproofing layer. WPM 1000 welded on top.

2.5 RELEASE TAPE

ARDEX release tape is a 25mm wide pressure sensitive tape between two silicone release backings. For all joints in timber based sheet substrates, and junctions of timber based sheet substrates with other materials.

2.6 PREFORMED CORNERS

Internal and external corner detailing for ARDEX WPM 1000 undertile membrane system. 95mm x 95mm x 60mm.

2.7 UNDERTILE PROFILE

Right angle undertile profile used for edge detailing with ARDEX WPM 1000 undertile membrane system. 150mm x 70mm, 9m long (length made to order).

3 EXECUTION

Conditions - general

3.1 GENERALLY

Installation is limited to ARDEX approved applicators only. Refer to the ARDEX WPM 1000 Waterproofing Membrane Technical Datasheet for the correct procedures. Work and materials to current ARDEX requirements and installation instructions, BRANZ BU 583 Waterproof decks and BRANZ Good practice guide - Membrane roofing.

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.
Store all materials in a dry place, up off concrete floors, at temperatures between 10° C and 32° C. Do not store in direct sunlight. The products have a shelf life of two years from date of manufacture.
Materials must not be removed from the packaging until ready to use.
Reject and replace goods that are damaged or will not provide the required finish.

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 WEATHER

Lay ARDEX WPM 1000 membrane in fair weather, with ambient air temperature no less than 10°C. Installation must not be undertaken where the substrate surface temperature is below 5°C or above 35°C.

Installation - preparation

3.5 CHECK SUBSTRATE

Ensure that the substrate construction is well braced against movement and deflection and structurally sound. Ensure that the substrate fall complies, including correct fall to rainwater/water outlets to avoid ponding. Ensure that sheet materials are screw fixed to specifications, with screw heads flush and sheets spaced to provide for thermal movement or shock. Do not use the product in areas subject to hydrostatic or vapour pressure or rising damp. Complete any remedial work identified before commencing any work.

3.6 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 to bring the substrate to suitable condition. Membrane laying not to start until defects have been corrected.

3.7 ACCEPTANCE OF SUBSTRATE

To enable the ARDEX WPM 1000 system to work as intended and to the required standard:

- Confirm that the substrate, including sumps, rebated outlets and projections, is complete and properly constructed.
- Ensure the substrate is dry, clean and stable, with surfaces that are even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.
- All voids, cracks, holes joints and excessively rough areas must be filled to achieve an even and uniform surface. Substrate abutments, such as at wall/floor and wall/wall junctions, greater than 3mm must be installed as detailed and as set out in Technical literature.

Ensure whichever is the greater falls are provided:

- as shown in the drawings
- to the membrane manufacturer requirements
- minimum to NZBC E2/AS1, 8.5.1, - 1:30 (2°) for roofs, 1:40 (1.5°) for decks over plywood substrates
- 1:60 minimum for concrete decks
- away from the face of the building that they are accessed from

All floors must have adequate falls either built into the substrate or achieved with a bonded sloped sand/cement screed (minimum 15mm thick, equivalent wood float finish) prior to the installation of ARDEX WPM 1000 Undertile Membrane.

NOTE: Acceptance of the substrate by the membrane installer prior to application of the membrane is critical to the installation process.

Installation - substrate

3.8 STRANDFLOOR H3.1® SUBSTRATE

Strandfloor H3.1®, 20mm thick, Square Edge or Tongue & Groove.
Ensure Laminex New Zealand Strandfloor H3.1® is:

- H3.1 treated with a maximum period of exposure to the weather of 12 weeks
- installed as per manufacturer's instructions and BRANZ Appraisal 946 - Strandsarking for low slope membrane roofs
- provided with minimum 8mm clearance between panel edges and fixed objects such as bottom plates, columns, abutting concrete, etc.
- laid across joists with staggered joints (brick bond), with each cut sheet continuous over three joists minimum
- provided with continuous edge support at building perimeter, and panel edge support.
- maximum allowable spacing for support floor framing is 400mm for square edge sheets, and 450mm for tongue and groove diaphragm floors.
- fixed with construction adhesive to joists in conjunction with mechanical fixing. 50mm x 4.8mm (10 gauge) stainless steel countersunk head screws (unless diaphragm floor) or hot dip galvanised or stainless steel 60mm x 2.8mm annular grooved flooring nails positioned no closer than 10mm from sheet ends and edges (except Tongue & Groove panels - 15mm from panel edge to clear tongue)
- fixed at 150mm centres on sheet edges, and 200mm centres at intermediate supports.

Strandfloor H3.1® must be dry and the timber substructure to have a maximum moisture content of 18% when the membrane is applied. Consult with Strandfloor® manufacturer for correct testing technique. During the exposed period, do not allow water to pond on the surface. Remove water by sweeping. Do not directly cover panels with sheeting or apply liquid sealers to any surface. Panels should weather in their raw condition to allow release of absorbed moisture.

3.9 BOND BREAKER/TAPE

Install bond breaker/tape to AS/NZS 4858 and AS 3740. Applied over substrate joints to bridge and accommodate joint movement. Movement and control joints in the substrate must be transferred to tile finish.

3.10 MOISTURE ABSORBENT SUBSTRATE

Lay ARDEX WPM 1000 to cover the moisture absorbent dry-laid substrate on the same day the substrate is laid, or ensure that the substrate is kept covered and dry until ARDEX WPM 1000 is laid. Seal exposed ARDEX WPM 1000 edges at the end of each work period.

Installation - undertile waterproofing membrane

3.11 ADHESIVE

Surfaces to be dry and clean before application of the adhesive. Allow ARDEX approved adhesive time to activate prior to applying the membrane. On activation i.e. the point at which the adhesive will afford the highest bond strength, the surface of the adhesive starts to change. Refer to relevant ARDEX adhesive datasheets for installation instructions.

Carefully roll the ARDEX WPM 1000 into the coated surface and compress with a pressure roller. Fold back other half of the roll of ARDEX WPM 1000 and repeat the procedure.

At upstands secure the ARDEX WPM 1000 membrane with mechanical fixings or bar in accordance with ARDEX details.

3.12 ARDEX WPM 1000 APPLICATION

Roll out ARDEX WPM 1000 Undertile Membrane and cut to the measured length. Smooth the membrane on contact to minimise air entrapment beneath the membrane.

Horizontal sheets of ARDEX WPM 1000 Undertile Membrane must extend up behind wall or balustrade claddings at least 150mm. Wall sheets to overlap the 150mm upstand Ensure the membrane is laid tightly into all corners. At open deck edges, the membrane to turn down at least 70mm, with turn-down packed out from the cladding to form a drip edge. Weld seams and laps with the Leister Triac S hot air gun. Roll with a rubber roller to ensure seams and lapped are secure. Use robotic Leister machine for large areas to speed application process.

3.13 SEAM CHECK

Check seams once they have completely cooled using an approx 5mm wide probe with rounded edges.
A seam check is not a leak test but will help to identify weak welds.

3.14 PENETRATIONS

Form mould, weld and flash all upstands, downturns and penetrations to ARDEX details including raised, anti-ponding water deflectors on the upside of penetrations.

3.15 MOVEMENT JOINTS

Form and weatherproof movement joints as designed to ARDEX details.

3.16 JUNCTIONS

Check that adjoining walls and parapets are prepared ready for the installation of ARDEX WPM 1000 waterproofing membrane. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof deck.
Required work includes the following:

- Roofing installation neatly finished to all sides of openings and to all wall and parapet junctions.
- Installation of flashing (those required to be installed prior to installation of penetrating elements and/or wall linings).

Installation - tiles

3.17 INSTALL TILES - GENERAL

Installed membrane must be protected at all times to prevent mechanical damage.
Tiler to lay tiles in accordance with AS 3958.1 and BRANZ Good practice guide: Tiling. Compatibility of tile adhesive to be confirmed with ARDEX.
Movement and control joints in the substrate must be transferred to tile finish.

3.18 INSTALL TILES - OVER MEMBRANE

Tiles to be direct bonded to the ARDEX WPM 1000 Undertile Membrane using ARDEX approved tile adhesive, either ARDEX X 56 for timber substrates or ARDEX X 77 or X 18 for concrete substrates.

Completion

3.19 COMPLETION MATTERS

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

3.20 PROTECTION

It is the responsibility of the main building contractor to ensure all sub-trades likely to be working in the vicinity of the membrane are aware that a waterproofing membrane has been installed and all care must be taken to protect the membrane from damage. Provide the following temporary protection of the finished work:

- do not allow construction foot traffic on the ARDEX WPM 1000 installation after laying to avoid dirt and damage to the surface
- temporary covers until finishing/tiling completed

Commissioning

3.21 FINAL INSPECTION AND TESTING

Arrange for an inspection of the completed work. Where practical, flood test all horizontal applications with a minimum 50mm depth of water for 24 hours. Make good any lack of water tightness when the surface is completely dry. Ensure that an overflow is incorporated during the flood testing and that there are no load limitations that might prevent testing.

3.22 HANDOVER

Protect and maintain membrane until completion of the contract works.

4 SELECTIONS

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

Materials

4.1 ARDEX UNDERTILE MEMBRANE

Location:	Refer to drawings
Brand /Type:	ARDEX WPM 56 Timber
Substrate:	Standboard H3.1
Tiles:	Refer to appropriate section for tile type and size

4521UA UNO ALUMINIUM WINDOWS & DOORS

1 GENERAL

This section relates to the supply and installation of UNO Windows & Doors Limited range of exterior aluminium windows and doors for residential and light commercial buildings.

It includes:

- Window and door hardware
- Components and accessories to complete the installation

1.1 RELATED WORK

Refer to relevant GLAZING section(s) for glass type.

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:

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
NZBC E2/AS4	External moisture
NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1-AS2	Energy efficiency
NZBC H1/VM1-VM2	Energy efficiency
AS/NZS 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 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4211	Specification for performance of windows
AS/NZS 4420.1	Windows, external glazed, timber and composite doors - Methods of test - Test sequence, sampling and test methods
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
ISO 11600	Building construction - Jointing products - Classification and requirements for sealants
ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)
WGANZ	Guide to Window Installation - As described in E2/AS1 Amendment 10

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
UNO Brochures
UNO Care & Maintenance Guide
UNO Technical Details

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Manufacturer/supplier contact details
Company: Uno Windows & Doors Limited
Web: www.unowindows.co.nz
Email: spec@unowindows.co.nz
Telephone: 06 272 9080

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
2 years For UNO aluminium windows and doors material and workmanship
Powder coat and hardware warranty as offered by system suppliers.

- 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 (check with the manufacturer/supplier)

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
2 years For installation 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 (check with the manufacturer/supplier)

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Window and door installation carried out by UNO Windows & Doors Limited accredited installers.
Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

1.9 SHOP DRAWINGS

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

Shop drawings to show the general arrangement of the aluminium joining 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 cladding and lining
- Flashing details
- Sealants and air seals
- Non-standard fixing details including bracketing

And where required the following:

- Rebate sizes
- Dimensions of typical elements and of special sized and shaped elements
- Provision for the exclusion and/or drainage of moisture
- Provision for adjustment of fixings to ensure true alignment of windows/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

If requested provide the following additional information:

- Performance test reports

Submit shop drawings for review to ~.

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

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:
UNO Care & Maintenance Guide

Provide this information prior to practical completion.

Performance

1.11 PERFORMANCE - GENERAL

UNO windows and doors tested to AS/NZS 4420.1 comply with NZS 4211 and are suitable for use in Wind Zones up to and including Extra High as defined in NZS 3604. Refer to 1220 PROJECT for wind design parameters.

1.12 PERFORMANCE - THERMAL, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix E, Table E1.1.1 Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

1.13 PERFORMANCE - THERMAL

Thermal performance of windows & doors to NZBC H1/AS1-AS2 & NZBC H1/VM1-VM2. The construction R-value of windows & doors determined in accordance with Appendix E, E1 Vertical windows and doors:

- Determine the thermal transmittance of window & doors in accordance with ISO 10077-1.
- Determine the thermal transmittance of framing in accordance with ISO 10077-2.
- Determine the thermal transmittance of glazing using BS EN 673.

Refer to SELECTIONS for construction R-values.

2 PRODUCTS

Materials

2.1 ALUMINIUM

Rod, bar, solid and hollow shape aluminium and aluminium alloy to AS/NZS 1866.
Sheet and plate aluminium and aluminium alloy to AS/NZS 1734.

Window/door suites

2.2 UNO THERMAL WINDOW/DOOR SUITE

UNO thermal window/door suite comprises powder coated flat face aluminium extrusion frame with integrated polyamide 66 thermal insulator strips, glazing, hardware, furniture and reveals. Available with fixed, hinged, sliding, bifolding powder coated flat face aluminium extrusion stile and rail windows and doors with integrated polyamide 66 thermal insulator strips, and powder coated insulated aluminium extrusion hinged entrance door, available in various designs. Refer to SELECTIONS.

2.3 GLAZING

Refer to relevant GLAZING section(s) for glass type.

2.4 HARDWARE AND FURNITURE

Refer to SELECTIONS.

2.5 TIMBER REVEAL

18.5mm thick, H3.1 Radiata Pine finger jointed timber reveal to NZS 3602, available flush finished for architraves or grooved for wall linings with groove size to suit interior lining thickness. Reveal pre-primed for paint finish. Refer to SELECTIONS.

Weatherproofing

2.6 HEAD FLASHING

Powder coated aluminium extrusion head flashing of size and shape to NZBC E2/AS1 and NZBC E2/AS4. Where required for cladding over cavity head flashing completed with 10mm turn-ups to flashing ends.

2.7 BACKING ROD

Compressible, cylindrical closed cell polyethylene foam (PEF) backing rod. Hardness, grade, compression and UV weathering to NZBC E2/AS1 and NZBC E2/AS4. Refer to SELECTIONS.

2.8 SEALANT

Self-expansion polyurethane gun foam sealant, or single component flexible sealant Type F, Class 20LM, or Class 25LM to ISO 11600, or single component flexible sealant Type II Class A to TT-S-00230C to NZBC E2/AS1 and NZBC E2/AS4. Refer to SELECTIONS.

Fixings/fasteners

2.9 SUPPORT BAR - CLADDING OVER CAVITY

Extruded aluminium support bar to NZBC E2/AS1 and NZBC E2/AS4 with built in drainage and ventilation. Support bar to provide continuous support to window/door suite, size to suit cladding.

2.10 FIXINGS - SUPPORT BAR

10g x 50mm stainless steel screws, completed with nylon plugs when fixing into concrete.

2.11 FIXINGS - WINDOW/DOOR

8g x 65mm stainless steel screws, completed with nylon plugs when fixing into concrete.

Finishes

2.12 POWDER COAT

Thermosetting polyester powder coat to AS 3715. Refer to SELECTIONS.

3 EXECUTION

Conditions - generally

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.

Required preparatory may include but is not limited to the following:

- Wall underlay to openings finished and dressed off ready for the installation of window and door frames to NZBC E2/AS1 and NZBC E2/AS4
- Application of waterproof sealer to all door and window sills in concrete floor or concrete sill situations. For door sills only, apply a suitable membrane over the sealer.
- Installation of flashings (those which are required to be installed prior to windows/doors)
- Cladding neatly finished off to all sides of openings (those which are required to be installed prior to windows/doors)

Conditions - fabrication

3.4 FABRICATION REQUIREMENTS

Fabricate frames as detailed on shop drawings. Install hinges, stays and running gear, hardware and reveals as scheduled. Temporarily secure all opening elements for transportation. Account for all keys and deliver separately to the site manager.

3.5 TIMBER REVEAL

Groove timber reveals scheduled for grooves to suit interior lining thickness. Prime timber reveals on all surfaces to be painted.

3.6 SAFETY STAY

Fit safety stays to windows and doors scheduled for safety stays, and fit to windows and doors where safety stays are required to comply with NZBC F4/AS1 and NZBC F9/AS1.

Installation/application - generally

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 INSTALLATION REQUIREMENTS - TIMBER FRAMING

Install windows and doors and associated componentry to UNO Windows & Doors Limited requirements, the shop drawings and to comply with NZBC E2/AS1.

3.9 INSTALLATION REQUIREMENTS - LIGHT STEEL FRAMING

Install windows and doors and associated componentry to UNO Windows & Doors Limited requirements, the shop drawings and to comply with NZBC E2/AS4.

Installation - window/door suites

3.10 INSTALL SUPPORT BAR / SUPPORT ANGLE

Install support bar / support angles plumb, level and true to line. Fix at each end and at maximum 300mm centres between. When fixing to concrete install nylon plugs to manufacturer's instructions, drive fixings into nylon plugs. When fixing through membranes pre-fill fixing holes with silicone sealant.

3.11 INSTALL WINDOW/DOOR SUITE

Install window/door suite in opening without distortion, plumb and true to line. Install flat packers between opening frame and reveals at all fixing points, except between head reveals and lintels. Fix window/door suite through reveals into surrounding framing maximum 150mm from reveal ends and at maximum 450mm centres between. When fixing to concrete install nylon plugs to manufacturer's instructions, drive fixings into nylon plugs.

3.12 INSTALL HEAD FLASHING

Install head flashing to manufacturer's instructions and requirements, the shop drawings and to comply with requirements of NZBC E2/AS1 and NZBC E2/AS4 for the project's Wind Zone and cladding type.

3.13 INSTALL AIR SEAL

Remove loose material, dust and grease from gap between reveal and wrapped opening and mask adjoining surfaces. Install continuous backing rod to reveal and wrapped opening gap to depth required by sealant manufacturer. Fill remaining gap with sealant to manufacturer's instructions, tool sealant to form smooth fillet, remove excess sealant and leave clean.

3.14 INSTALL HARDWARE

Install all window/door hardware and furniture as scheduled. Install in accordance with UNO Windows & Doors Limited and the hardware manufacturer's requirements.

Completion & Commissioning

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

Performance

4.1 THERMAL PERFORMANCE - VERTICAL WINDOWS & DOORS

Window/Door Number:	Construction R-value: Refer to H1 Calculations

Refer to manufactures calculations

Window/door suites

4.2 UNO THERMAL WINDOW/DOOR SUITE

Window/door No:	Refer to schedule
Supplier:	UNO Windows & Doors Limited
Suite:	UNO Thermal Window/Door Suite
Door stile type:	~
Entrance door:	~
Reveal:	~
Sill:	~
Backing rod:	~
Sealant:	~
Finish:	~
Colour:	~

4.3 HARDWARE

Window/door No:	Type:	Brand/model:	Locking:	Finish/colour:
refer to drawings	Awning window handle	Aria Helix Double Tongue	n.a.	~
refer to drawings	Casement window handle	Aria Helix Double Tongue	n.a.	~
refer to drawings	Sliding window handle	Aria Endeavour	n.a.	~
refer to drawings	Hinged door handle	Aria Induro Lever	~	~
refer to drawings	Entrance door handle	~	~	~
refer to drawings	Window restrictor	~	n.a.	n.a.
refer to drawings	Door closers	~	n.a.	n.a.
refer to drawings	Door holdback	~	n.a.	~
refer to drawings	~	~	~	~

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4554VS VELUX OPENING & FIXED SKYLIGHTS

1 GENERAL

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

- operating systems
- accessories
- proprietary flashings

1.1 RELATED WORK

Refer to ~ for ~

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC H1/AS1-AS2	Energy efficiency
NZBC H1/VM1-VM2	Energy efficiency
AS/NZS 2208	Safety glazing materials in buildings
NZS 3604	Timber-framed buildings
NZS 4223.4	Code of practice for glazing in buildings - Wind, dead, snow and live actions
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames
AAMA 2605	Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)
CodeMark™ CMNZ10008 ver02	Velux Skylights
CodeMark™ CMNZ10009 ver02	Velux Roof Windows

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Current Sales Brochure and product datasheets
Installation instructions for GGU Roof Window and Flashing
Installation instructions for VS/VSE/VSS Skylight
Installation instructions for FS Skylight
Installation instructions for VCM curb mounted Skylight
Installation instructions for VCS curb mounted Skylight
Installation instructions for FCM curb mounted Skylight
Installation instructions for EDW flashing
Installation instructions for EDL flashing
Installation instructions for EKW flashing
Custom flashing guide (over 15º pitch)
Velux Skylights H1 Compliance Table
Velux Verified R-values for New Zealand
(Technical Manual - Velux Skylights and the Technical Manual - Velux Roof Windows.)
BRANZ Appraisal 968 (2023) - Velux Skylights
BRANZ Appraisal 969 (2023) - Velux Roof Windows

Manufacturer/supplier contact details

Company:	**VELUX New Zealand Limited**
Web:	www.velux.co.nz
Email:	info@velux.co.nz

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Telephone: 0800 650 445

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years:	For VELUX Skylights, Roof Windows, insulated glazing units and flashings
1 year:	For VELUX accessories (motorised units, controls, rods, blinds, insect screens)

- 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:

~ years:	For installation of VELUX Skylights

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

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

1.7 NO SUBSTITUTIONS

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

Compliance

1.8 COMPLIANCE - CODEMARK CERTIFICATE CMNZ10008

Velux Skylights meets the requirements of the NZBC when used within the conditions and limitations of their CodeMark Certificate of Conformity CMNZ10008.

1.9 COMPLIANCE - CODEMARK CERTIFICATE CMNZ10009

Velux Roof Windows meet the requirements of the NZBC when used within the conditions and limitations of their CodeMark Certificate of Conformity CMNZ10009.

1.10 COMPLIANCE - BRANZ APPRAISAL 968

Velux Skylights have been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of their BRANZ Appraisal 968.

1.11 COMPLIANCE - BRANZ APPRAISAL 969

Velux Roof Windows have been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of their BRANZ Appraisal 969.

Performance

1.12 PERFORMANCE - THERMAL, SKYLIGHTS

Thermal performance of skylights to NZBC H1/AS1-AS2 & NZBC H1/VM1-VM2. The construction R-value of skylight to be determined by Appendix E, E2 Skylights:

- Determine the thermal transmittance of skylights in accordance with ISO 10077-1.
- Determine the thermal transmittance of framing in accordance with ISO 10077-2.
- Determine the thermal transmittance of glazing using BS EN 673, considering the effects of horizontal or angled glazing on the heat transfer.

Refer to SELECTIONS for Construction R-values.

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1.13 PERFORMANCE, WIND, DEAD, SNOW, AND LIVE ACTIONS

The design wind pressures and snow loads to NZS 3604. Live loads and glazing design, for glass or equivalent plastics, to NZS 4223.4.

2 PRODUCTS

Skylights

2.1 SKYLIGHTS

VELUX Skylights; to CodeMark™CMNZ10008, either top hinged with INTEGRA motorised control (electric opening VSE or solar opening VSS), or manual opening VS, or fixed FS skylight.
For roof pitches between 15° to 90°.
Manufactured from high quality treated timber, prefinished frame and sash in white, semi-gloss paint. External cappings manufactured from aluminium profile with Kynar 500 PVDF coating to AAMA 2605. Refer to SELECTIONS for type, finish and accessories.

Components

2.2 FIXINGS

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

2.3 GLAZING - ALL SKYLIGHTS

VELUX proprietary insulated double-glazing unit, factory fitted. Unit comprises an inner pane of laminated glass, and outer pane of toughened safety glass with NEAT™ photo-catalytic coating to exterior face. Inside face of outer pane coated with Low-E³ coating. Cavity filled with Argon gas.

2.4 GLAZING - ROOF WINDOWS - DOUBLE GLAZED

VELUX proprietary insulated double-glazing unit, factory fitted. Unit comprises an inner pane of laminated glass, and outer pane of toughened safety glass with NEAT™ photo-catalytic coating to exterior face. Inside face of outer pane coated with Low-E³ coating. Cavity filled with Argon gas.

2.5 GLAZING - ROOF WINDOWS - TRIPLE GLAZED

VELUX proprietary insulated triple-glazing unit, factory fitted. Unit comprises an inner pane of laminated glass, a heat strengthened middle pane and outer pane of toughened safety glass with NEAT™ photo-catalytic coating to exterior face. Inside face of outer pane coated with Low-E³ coating. Cavities filled with Argon gas.

2.6 HARDWARE

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

2.7 FLASHINGS FOR MODELS FS/VS/VSE/VSS/GGU

For roof pitches between 15º to 90º.
VELUX proprietary flashing solutions to VELUX instructions.
For installations in trapezoidal profile metal and metal tile roofing, contact VELUX for additional instructions.
Custom made flashings in accordance with NZBC E2/AS1. Refer to section 4821 FLASHINGS for details. Contact VELUX for correct trim frame requirements.
Refer to SELECTIONS for type.

Finishes

2.8 FINISH

VELUX proprietary finishes.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

3.2 PRE-INSTALLATION REQUIREMENTS

Site measure during roof framing stage to ensure the VELUX proprietary Skylight / Roof Window and flashings can be installed correctly and in accordance with the installation instructions. Where a unit is installed adjacent to another unit confirm the set out distance between units in accordance with the installation instructions.

Refer to VELUX at www.velux.co.nz for installation details.

3.3 EXECUTION GENERALLY

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

3.4 HARDWARE GENERALLY

Factory fit all required and scheduled hardware.

3.5 RETAIN PROTECTIVE COVERINGS

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

Installation

3.6 GENERALLY

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

3.7 INSTALL UNITS

Install and fix the Skylight or Roof Window strictly in accordance with the manufacturer's installation instructions, CodeMark™CMNZ10008 with the Technical Manual - Velux Skylights andCodeMark™ CMNZ10009 with the Technical Manual - Velux Roof Windows.

Repack any thermal insulation around rough openings where disturbed by the installation to maintain continuity of thermal barriers.
When using VELUX flashings (EDW, EDL, EKW) with VELUX Skylights and Roof Windows, install as detailed by VELUX to make the installation completely weatherproof. Refer to VELUX at www.velux.co.nz for installation instructions.
If using custom flashings, ensure curb/upstand height and flashing meet NZBC E2/AS1 upstand height and flashing requirements. Contact VELUX for additional information.

3.8 ACCESSORIES AND OPERATING SYSTEMS

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

Completion

3.9 CLEAN FRAMES AND GLAZING

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

3.10 CONFIRM

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

4 SELECTIONS

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

Performance

Skylights

4.1 VELUX FS SKYLIGHT - FIXED

Location:	Refer to drawings
Brand:	VELUX

Model:	FS Fixed
Type/size:	M08, 780 mm x 1400 mm and SO6, 1140 mm x 1180 mm
Glazing:	~
Colour:	White, semi-gloss finish
Roof type/pitch:	Metal Roofing, pitch varies
Flashing:	Custom flashing
Accessories:	~

Components

4.2 VELUX FLASHING SYSTEM

Brand:	VELUX
Roofing type:	15 - 90 degrees
Roof pitch:	Varies
Flashing type:	Custom, to match unit/roof type
Colour:	Match to roof

4.3 CUSTOM FLASHINGS

Type:	Custom flashings to meet the requirements of NZBC E2/AS1. Refer to Section 4821 FLASHINGS for details. Contact VELUX for additional trim-out information.

4610VR VIRIDIAN GLASS RESIDENTIAL GLAZING

1 GENERAL

This section relates to the supply and fixing of **Viridian Glass** products for external and internal joinery in residential type buildings and includes:

- windows and doors
- frameless shower and bath screens
- splashbacks, wall linings
- mirrors and mirror frames
- shelving

1.1 RELATED WORK

Refer to ~ for ~

Documents

1.2 DOCUMENTS

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

NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1-AS2	Energy Efficiency
NZBC H1/VM1-VM2	Energy Efficiency
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
AS/NZS 2208	Safety glazing materials in buildings
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 4666	Insulating glass units
BRANZ BU 636	Protecting glass from damage

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Viridian Architectural Glass, Architectural Glass Guide

Manufacturer/supplier contact details

Company:	**Viridian**
Web:	www.viridianglass.co.nz
Email:	info@viridianglass.net.nz
Telephone:	0800 847 434

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years:	For insulating glass units
10 years:	For toughened glass
5 years:	For laminated glass

- 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.

Refer to the general section 1237 WARRANTIES for additional requirements.

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Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Viridian Glass**, products or systems.

Performance

1.6 THERMAL STRESS ANALYSIS

Obtain the glass manufacturer's thermal stress analysis for spandrel panels and for tinted, reflective and other solar control vision glasses for review before placing final order.

1.7 ENERGY EFFICIENCY

Provide glazing to comply with H1 Energy efficiency requirements of NZBC H1/AS1-AS2 and NZBC H1/VM1-VM2.

2 PRODUCTS

Components, general

2.1 JOINTING, PUTTY AND SEALING MATERIALS

Ensure jointing, putty and sealing materials compatible with glass substrates. Confirm compatibility with laminated glass, IGU's and coatings.

Components, aluminium and uPVC glazing

2.2 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.

2.3 SETTING BLOCKS

Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.2, NZS 4223.3 as modified by NZBC B1/AS1, 7.3.1, and NZS 4223.4. All external glazing to be wind and watertight on completion.

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 636.

3.3 GLASS CONDITION

All glass of accurate size with clean, 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**.

Conditions - human impact safety requirements

3.6 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 as modified by NZBC B1/AS1, 7.3.1, for thickness and maximum areas of safety glass.

3.7 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in NZS 4223.3, as modified by NZBC B1/AS1, 7.3.1, that also comply with the relevant requirements of AS/NZS 2208. Ensure material is permanently marked and if cut by the distributor or installer mark each piece to NZS 4223.3, 2.8 Identification.

3.8 CONTAINMENT

Edge cover to comply with NZS 4223.1, Section 4 Glazing, table 5. Otherwise to NZS 4223.3, 2.3 Edge cover.

Assembly

3.9 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.10 EDGE WORK AND BEVELLING

Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.

3.11 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.12 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

Application aluminium

3.13 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS 4223.1.

- Bead glaze to Section 4, **Glazing**.
- Channel glaze to Section 4, **Glazing**, Section 5, **Framed**, **Unframed**, **Partly FramedGlass Assemblies**.

3.14 INSTALL SAFETY GLASS

To NZS 4223.3.

3.15 INSTALL GLASS BALUSTRADES

Confirm/design and carry out installation to;

- Viridian Glass SSPS1.
- NZS 4223.3, 22 Barriers (Balustrades, fences, and screens) as modified by NZBC B1/AS1, 7.3.1.
- NZBC F4/AS1: Safety from falling, 1.0 **Barriers in buildings**.

3.16 INSTALL GLASS POOL FENCES

Confirm/design and carry out installation to;

- Viridian Glass SSPS1.
- NZBC F9/AS1 Means of restricting access to residential pools
- NZS 4223.3, 22 Barriers (Balustrades, fences, and screens) as modified by NZBC B1/AS1, 7.3.1.
- NZBC F4/AS1: Safety from falling, 1.0 **Barriers in buildings**.

Finishing

3.17 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface.

Completion

3.18 TRADE CLEAN

Clean off or remove safety indicators at completion of the building.

3.19 REPLACE

Replace damaged, cracked or marked elements.

3.20 LEAVE

Leave work to the standard required by following procedures.

3.21 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

Performance - wind

4.1 WIND ZONE - NON-SPECIFIC DESIGN

Building wind zone: ~ (as determined from NZS 3604, NZS 4223.4)

Glass by type

4.2 VIRIDIAN ENERGYSAVER™ - LOW EMISSIVITY (LOW E) COATED GLASS

Location:	~
Brand/type:	Viridian EnergySaver™
Coating:	Low-E on surface #2
Thickness:	~mm
Colour:	Clear

4711 THERMAL INSULATION

1 GENERAL

This section relates to materials installed, laid, hung or fitted as thermal insulation to the building fabric.

1.1 RELATED WORK

Refer to 4721 ACOUSTIC INSULATION for acoustic insulation.
Refer to 4161 UNDERLAYS, FOIL AND DPC for wall underlays, roofing underlays, foils and films.
Refer to roofing sections for roofing underlays.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BIB	Building Insulation Blanket (term used by some manufacturers)
EPS	Expanded polystyrene sheets

Documents

1.3 DOCUMENTS

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

NZBC H1/AS1-AS2	Energy efficiency
NZBC H1/VM1-VM2	Energy efficiency
AS/NZS 3000	Electrical installations (Known as the Australian/New Zealand Wiring Rules)
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
Health and Safety at Work Act 2015	

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:
~

Manufacturer/supplier contact details

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

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

~ years For ~

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

2 PRODUCTS

Materials

2.1 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.

Components

2.2 NAILS

Galvanized steel clouts, 25mm gauge.

2.3 STAPLES

Stainless steel gauge and length to suit application and to manufacturer's requirements.

2.4 WIRE NETTING

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting used to support the insulation.

2.5 PLASTIC STRAPPING TAPES

Proprietary plastic strapping tape, stapled over framing to retain insulation in unlined wall, ceiling and underfloor locations.
For drained cavities where stud spaces are greater than 450mm and only flexible underlay is used, strapping required to NZBC E2/AS1 9.1.8.5 **Wall framing behind cavities**.

2.6 ADHESIVE TAPE

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

3.4 HAZARD & RISK MANAGEMENT

To Health and Safety at Work Act 2015 and take all safety precautions necessary to reduce potential hazards and risks.

3.5 INSPECTION

Before starting installation of blankets and pads, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, netting, underlays and vapour barriers are in place.

Application

3.6 INSTALL INSULATION - GENERAL

Lay, install, fit and fix insulation without gaps, tucks, folds and over compaction to NZBC H1/AS1 or AS2 and insulation manufacturer's requirements. For all housing and buildings up to 300m², install in accordance to NZS 4246 sections 5 Walls, 6 Ceilings & Roofs, 7 Underfloor - Suspended Framed Floors and 10 Concrete Slab-on-Ground Insulation, for residential light timber or steel framed buildings. Allow insulation to re-loft/relax prior to installation. Do not cover vents. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

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.
Surface fittings & exposed insulation	200mm	This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Secure insulation.

INBUILT RECESSED HOT APPLIANCES

Appliance	**Minimum insulation clearance**	**Comments**

Electrical heaters	100mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Gas appliance exposed flame	200mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Excludes uncommon appliances, refer NZS 4246.
Gas appliance flues	75mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation. Excludes uncommon appliances refer NZS 4246.
Oil-fired appliances and flues	230mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Open fireplace opening	200mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Brick masonry chimneys	50mm	Clearance may be able to be reduced with non-combustible insulation. Secure insulation.
Metal chimneys & flues	75mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Solid fuel appliance	600mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.
Solid fuel appliance flue	600mm	Clearance may be able to be reduced with non-combustible insulation or with specific details from the appliance manufacturer. Secure insulation.

EXTRACTS, VENTS, PIPES & ROOF UNDERLAY

Application	**Minimum insulation clearance**	**Comments**
Ducted fan motors	50mm	Includes ducted rangehoods, extractors etc. Applies to the motor unit and electrical enclosures (not the ducts)
Ducted fan ducts	Abut	Excludes motor unit and electrical enclosures.
Unducted fan motors usually discharging to ceiling space	200mm	Includes unducted, rangehoods, extractors etc, discharging into roof space. To prevent debris falling into motor. Clearance may be able to be reduced, by providing a fixed barrier around the vent.
Passive vents (still in use)	200mm	To prevent debris falling through. Clearance may be able to be reduced, with more cohesive insulation, like some of the rigid plastic types or providing a fixed barrier around the vent.
Plumbing penetrations through floors	100mm	Keep gap between pipe penetration and floor insulation in case of leaks.
Roofing material/underlay	25mm	From underside of roofing or flexible roofing underlay, to prevent wicking

3.9 LAY WIRE NETTING - OVER PURLINS

Lay at right angles across the purlins with enough slack to allow insulation to retain its nominal thickness between. Tie edges of netting together with galvanized wire clips.

3.10 LAY WIRE NETTING - UNDER JOISTS / PURLINS

Lay at right angles across the rafters/roof joists (under purlins). Pull tight and fix.

3.11 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.

3.12 ADHESIVE TAPES

Fully seal all laps and all penetrations with adhesive tape.

3.13 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.

3.14 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.

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.

4 SELECTIONS

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

4.1 THERMAL BLANKET - WALLS

Location:	Exterior Walls
Brand:	Client Selection
Material/Type:	
R Value:	R2 (min)
Thickness:	90mm

4.2 THERMAL BLANKET - SKILLION ROOF

Location:	Roof
Brand:	Client Selection
Material/Type:	
R Value:	R4 (min)
Thickness:	165mm

4.3 THERMAL BLANKET - FLOOR

Location:	Ceiling
Brand:	Client Selection
Material/Type:	
R Value:	R3.2 (min)

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

Requirements

1.2 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 1: Durability Requirements of Nominated Building Elements and NZBC E2/AS1 Table 20 Material selection.

1.5 COMPATIBILITY REQUIREMENTS

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

1.6 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.

2 PRODUCTS

2.1 FLASHING MATERIALS

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

2.2 FLASHING FABRICATION

Fabricate flashings generally to NZBC E2/AS1, 4.0, from a ductile grade of metal designed for lateral strength by folding, stiffening or ribbing on external edges, having a maximum un-stiffened width of 300mm. Provide all hooks, hems, kick outs, bird's beaks, stop ends, soft edges and turn downs etc. to NZBC E2/AS1, 4.0, or as shown on the drawings.

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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.

2.5 JOINTS - SOLDER

Eutectic solder of 60% tin/40% lead using a suitable proprietary flux.

3 EXECUTION

Conditions

3.1 DELIVERY

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

3.2 STORAGE

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

3.3 HANDLING

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

3.4 SUBSTRATE

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

3.5 PROTECT

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

3.6 CONFIRM LAYOUT

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

3.7 CO-ORDINATE INSTALLATION

Co-ordinate installation of flashings with associated trades.

Application

3.8 INSTALLATION

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

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

3.9 FIXINGS

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

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

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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 JOINTING - SOLDER

Solder joints in galvanized steel and non-ferrous metals when specified with lead/tin solder. Clean joint ensuring it is dry and free of grease immediately prior to applying a proprietary flux. Lap the flashing 25mm in the direction of the water flow and fasten the lap with rivets or screws at 50mm centres. Completely sweat the joint to avoid leaving any flux residue. Wash down the joint to remove any trace of flux.

3.12 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

3.13 PROTECT

Protect new work from damage.

3.14 REPLACE

Replace all damaged or marked elements.

3.15 LEAVE

Leave work to the standard required for following procedures.

3.16 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 FLASHINGS

Type	Material and finish/colour
General flashings:	~
Window/doors:	
- Head:	~
- Sill:	~
Beam caps:	~
Cladding:	
- External corner:	~
- Internal corner:	~
Balustrade capping:	~
Garage door:	~
Meter box:	~
Chimney flue:	~
Soffit:	~
Wall/roof junctions:	~
Barge:	~
Apron:	~
Parapet capping:	~
Saddle:	~
Change of pitch:	~
Gutter apron:	~
Curved:	~
Roof penetrations:	~

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4852BA BELCANTO® ATTACHE BALUSTRADES

1 GENERAL

This section relates to the fabrication and installation of Belcanto Group Limited balustrade systems. It includes:

- Glass panel balustrades
- Aluminium panel balustrades
- Square vertical balustrades
- Round vertical balustrades
- Slat profile balustrades

Documents

1.1 DOCUMENTS

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

NZBC B1/VM1	Structure
NZBC B2/AS1	Durability
NZBC F2/AS1	Hazardous Building Materials
NZBC F4/AS1	Safety from falling
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: 2011	Structural design actions - Wind actions
AS/NZS 1170.3	Structural design actions - Snow and ice actions
AS/NZS 1170.5	Structural design actions - Earthquake actions
AS/NZS 1664.1	Aluminium structures - Limit state design
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow, and live actions

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

- PS1 - Design Producer Statement
- Drawings (as referenced in the producer statement)
- Structural Design Features Report

Manufacturer/supplier contact details:

Company:	Belcanto Group Limited
Web:	www.attachebalustrades.co.nz
Email:	projects@belcanto.co.nz
Telephone:	0800 BELCANTO (0800 23522686)

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For defect in workmanship

- 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 delivery.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For installation of Belcanto® balustrade

- 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 WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved and certified by Belcanto Group Limited. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

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:
Belcanto® Product Care & Maintenance information

Provide this information prior to practical completion.

Compliance information

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer / supplier warranty
- Installer warranty
- Producer Statement - Design from Belcanto Group Limited
- 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.

Compliance information

1.9 COMPLIANCE STATEMENT

Belcanto® balustrade designs prepared in accordance with:

- NZBC B1/VM1
- NZBC B2/AS1
- NZBC F2/AS1
- NZBC F4/AS1
- AS/NZS 1170.0
- AS/NZS 1170.1
- AS/NZS 1170.2
- AS/NZS 1170.3
- NZS 1170.5
- AS/NZS 1664.1
- NZS 4223.3
- NZS 4223.4

Performance - Wind

1.10 DESIGN PARAMETERS WIND

Design to be in accordance with the manufacturer's requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

Quality control and assurance

1.11 INSPECTIONS

~

2 PRODUCTS

Materials

Belcanto® Attache Balustrades - slat profile balusters

2.1 LIAISON ATTACHE BALUSTRADE

Powder coated aluminium components (grade 6063 T6) including 60 x 12mm vertical balusters spaced 80mm apart, 175 x 75 x 10mm thick PFC bottom channel and 72 x 13mm top rail. Grade 316 stainless steel screws.

Fixings

2.2 FIXINGS

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 or existing substrates 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.

3.5 INSTALLATION GENERAL

Install balustrade systems to producer statement requirements and Belcanto Group Limited instructions and requirements.

Completion & Commissioning

3.6 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

Belcanto® Attache Balustrades - slat profile balusters

4.1 BELCANTO® - LIAISON ATTACHE BALUSTRADE

Location:	Refer to drawings
Type:	Liaison Attache Balustrade
Supplier:	Belcanto Group Limited
Top rail height:	1104mm
Unit height:	1279mm
Unit width:	1200mm (standard)
Balusters	60 x 12mm slats
Fixing:	~
Powder coat colour:	~ Dulux Duratec® Powder Coat Range

PFC fixing: ~

4852SP SPECTRUM ALUMINIUM & GLASS BALUSTRADES

1 GENERAL

This section relates to the fabrication and installation of Spectrum proprietary balustrade systems. It includes:

- Aluminium balustrade system
- Aluminium / steel balustrade system
- Glass balustrade systems

1.1 RELATED WORK

Refer to ~ for ~

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.
The following abbreviations apply specifically to this section:

EPDM	Ethylene propylene Diene Monomer
LDPE	Low-density polyethylene
TPV	Thermoplastic Vulcanizate

Documents

1.3 DOCUMENTS

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

NZBC B1/VM1	Structure
NZBC B2/AS1	Durability
NZBC F2/AS1	Hazardous Building Materials
NZBC F4/AS1	Safety from falling
NZBC F9	Means of restricting access to residential pools
AS/NZS 1163	Cold-formed structural steel hollow sections
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: 2011	Structural design actions - Wind actions
AS/NZS 1664.1	Aluminium structures - Limit state design
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 8500	Safety barriers and fences around swimming pools, spas and hot tubs

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

- Spectrum Balustrade Brochures
- Spectrum Panel Assembly Drawings and PS1 - Design Producer Statements
- Spectrum Standard Fixing Details and PS1 - Design Producer Statements
- Spectrum NZBC B2 Durability Statement
- Spectrum Producer Statement - PS1 - Design, including Panel Assembly Drawing

Manufacturer/supplier contact details

Company:	Spectrum Aluminium (2011) Limited
Web:	www.spectrum.co.nz
Email:	info@spectrum.co.nz
Telephone:	0800 355 366

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

7 years	For material defects of Spectrum balustrade 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 delivery by Spectrum or authorised agents.

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 Spectrum balustrade 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 accredited by Spectrum. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

1.9 SHOP DRAWINGS

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

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

If requested provide the following additional information:
~

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

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:
Spectrum Maintenance Instructions

Provide this information prior to practical completion.

Compliance information

1.11 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:
- Manufacturer / supplier warranty
- Installer / applicator warranty
- Producer Statement - Construction from the applicator / installer
- Producer Statement - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

1.12 COMPLIANCE STATEMENT

Spectrum standard balustrade system designs prepared in accordance with:
- NZBC B1/VM1
- NZBC B2/AS1
- NZBC F2/AS1
- NZBC F4/AS1
- AS/NZS 1170.0
- AS/NZS 1170.1
- AS/NZS 1664.1

- NZS 4223.3

Performance – Wind (design by contractor)

1.13 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.

Quality control and assurance

1.14 INSPECTIONS

~	~

2 PRODUCTS

Materials - Fin Infill

2.1 SPECTRUM SEAMLESS FIN - BALUSTRADE SYSTEM

Aluminium fins attached to an adjustable backing system with an aluminium handrail, associated components and fixings. Material types include:

- 6060 T5/T6 aluminium
- 316 stainless steel fixings
- LDPE, EPDM

Refer to SELECTIONS for finishes and component options.

Accessories

2.2 PLASTIC PACKERS

45mm dia. x 1.5mm thick nylon spacers, 45mm dia x 3mm EPDM spacers, 45mm dia Aluminium Standoff (spacer) as required for specific application.

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 or existing substrates and confirm it is of the required standard for this part of the work.

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERAL

Install Spectrum balustrade systems to Spectrum Panel Assembly Drawings, Spectrum Standard Fixing Details, producer statement requirements and Spectrum requirements.

Completion & Commissioning

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

Materials - Fin Infill

4.1 SPECTRUM SEAMLESS FIN - BALUSTRADE SYSTEM

Location:	Refer drawings
Type/Brand:	Spectrum Seamless Balustrade
Fixing detail:	Refer details
Baluster type:	50mm x 15mm
Baluster centres:	115 max. ctrs.
Top handrail type:	Rectangular, 50mm x 15mm
Aluminium finish/colour:	refer drawings

4933 ALUMINIUM METALWORK

1 GENERAL

This section relates to the fabrication and installation of aluminium items of a general nature.

Related work

1.1 RELATED SECTIONS

Refer to ~ for ~.

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
BRANZ BU 567	E2/AS1 Flashing Requirements

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

1.3 MANUFACTURER DOCUMENTS

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

Copies of the above literature are available from

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

Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.
Metalworkers to be experienced in working with aluminium and the techniques specified.

1.5 SHOP DRAWINGS

Provide shop drawings showing:

- plans, elevations and sections
- methods of fixing
- methods of joint forming
- finishing techniques
- methods of fabrication and site assembly of large units.

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

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

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Grade 316 stainless steel self-tapping screws with type of head, length, gauge and thread to suit the work and its location.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.
Do not deliver any elements to the site which cannot be unloaded immediately into suitable storage conditions. Avoid distortion of elements during transit, storage and handling. Prevent surfaces rubbing together, and any contact with mud, plaster or cement. Keep protective coverings dry.

3.2 ROUTINE MATTERS

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

3.3 PREPARATION

Ensure location and substrate is ready to receive the elements and will allow work of the required standard.

3.4 FLASHINGS

Select and use sheet metals suited to the element, process or finish specified, jointing them as necessary to allow full development of their expected durability with a minimising of corrosion and to BRANZ BU 567.

Assembly

3.5 PROTECTION

During fabrication protect all surfaces which will be visible in completed work.

3.6 COLD FORMED

Ensure cold formed work is free from warping, buckling and fractures. Form bends with a brake press or by cold rolling.

3.7 CORNERS

Unless specified otherwise, mitre junctions of identical sections.

3.8 HOLES

Form without distortion of surrounding metal.

3.9 MOVING PARTS

When assembled, all moving parts must move freely and without binding.

3.10 CLEANING

Remove all burrs and sharp arrises which would be visible after fixing, or a hazard to the user.

3.11 WELDING OF ALUMINIUM

Grind flush visible welds.

Application

3.12 INSTALLATION

Locate plugs accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the specified standards, the reviewed shop drawings and installation details, including brackets, bolts, fixings, bedding compounds and sealants.

3.13 LOADING

Elements must not carry any structural load unless designed to do so. Do not use railings, balustrades, or similar elements as strutting or support when in place.

Assembly - sheet aluminium

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3.14 FABRICATE

Fabricate and assemble in a workshop wherever practicable.

3.15 MARK OUT

Mark out the work accurately, square and true to line allowing for correct radius folds and laps to give the dimensions required for neat, close fits when in place. Use marking methods that do not damage, deface or cause future corrosive attack to the sheet metal being worked.

3.16 CUT SHEETS

Cut sheets by mechanical methods leaving edges true to line, square, smooth and free from all burrs.

3.17 FORMING

Use mechanical methods wherever possible and form and fold sheets square and true to line and face, free of all deformation and defects. Minimise cold-working and stress build-up and their effects by limiting the amount of working and avoiding sharp radius bends (minimum 1 x sheet thickness).

3.18 PRE-ASSEMBLE

Pre-assemble in the workshop and match mark items being assembled or erected on site. Do not strain, twist, bend or open such items to force them into the correct position while assembling or erecting.

3.19 SEPARATION

Isolate dissimilar materials (metal and non-metal) in close proximity by painting the surfaces or fitting separator strips. Place isolators between aluminium and treated timber and cement-based materials. Do not use unpainted lead sheet in contact with or allow water run-off onto aluminium. Refer also to BRANZ BU 567.

3.20 JOINING ALUMINIUM SHEET

Use self-secured seams, aluminium pop rivets, bolts and welding as best suits the form and location of the work.

3.21 INSTALLATION

Locate fixings accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the installation details and complete with bedding compounds and sealants.

3.22 LOADING

Ensure all elements are fully supported unless designed to be self-supporting.

Finishing

3.23 PREPARATION FOR COATINGS

Before applying coatings remove all welding slag, weld spatter, anti-splatter compounds, paints, grease, flux, rust, burrs and sharp arrises. Make good all defects which would show after application of coating. Finish surfaces smooth.

3.24 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

3.25 COMPLETION MATTERS

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

4 SELECTIONS

4.1 ALUMINIUM METALWORK MANUFACTURED ELEMENT

300x50mm Powdercoated aluminium RHS canopy. Powdercoated in selected colour.

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5111H JAMES HARDIE® FIBRE CEMENT SHEET LININGS

1 GENERAL

This section relates to the supply and installation of **James Hardie®** Villaboard™ Lining and Hardie™ Groove Lining for:

- internal wall linings
- ceiling linings

1.1 RELATED WORK

Refer to ~ for ~.

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire
AS/NZS 2589	Gypsum linings - Application and finishing
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:
Villaboard™ Lining
Hardie™ Groove Lining
Fire and Acoustic Design Manual by James Hardie, May 2025
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:	Ask James Hardie™ on 0800 808 868

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For James Hardie® ~. (refer to James Hardie® product warranty)
15 years:	For accessories supplied by James Hardie® (refer to James Hardie® product warranty)
From:	Date of purchase

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 SAFE WORKING

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

1.7 COMPLIANCE

Fibre cement sheets to AS/NZS 2908.2.

2 PRODUCTS

Materials

2.1 PROFILED FIBRE CEMENT SHEET LININGS

James Hardie® Hardie™ Groove Lining treated cellulose fibre in a matrix of cement and sand autoclaved sheet.

Components

2.2 BATTENS, TIMBER

Minimum 45mm wide, 35mm deep timber with depth suitable for length of fasteners used.

2.3 PACKERS

3 - 4mm timber packers.

2.4 NAILS

6mm and 9mm linings:	40mm x 2.8mm galvanized flathead Hardie™ Flex nails
Over Gypsum plasterboard:	50mm x 2.8mm galvanized flathead Hardie™ Flex nails

2.5 SCREWS FOR POWER SCREW GUN DRIVING

Timber framing

6mm and 9mm linings:	Villadrive 6 gauge x 30mm self embedding screws or Hardie™ Drive self embedding stainless steel screws
Steel framing:	Steel 8 gauge x 32mm self embedding screws

2.6 WALL BOARD ADHESIVE

Polyurethane wallboard adhesive. Refer to James Hardie® product installation manual.

Accessories

2.7 CONTROL JOINTS SECTION

45mm x 10mm shaped PVC control joint or Rondo P35 jointer.

2.8 EXTERNAL CORNER SECTIONS

30mm x 30mm x 1.2mm PVC angle.

2.9 POLYETHYLENE TAPE

Self adhesive polyethylene for behind expressed joints and expressed control joints.

2.10 JOINT REINFORCING TAPE

52mm wide perforated paper tape.

2.11 BEDDING COMPOUND

Hardie™ Base Coat compound powder.

2.12 FINISHING COMPOUND

Hardie™ Top Coat premixed.

2.13 SEALANT

Silicone or polyurethane sealant. Refer to the James Hardie® installation manual.

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 MOISTURE CONTENT

Maximum moisture content of timber framing to NZS 3602.

3.4 PROTECT

Protect joinery, fittings and finishes already in place from water staining or damage from lining installation.

3.5 BUILDING

Ensure building is weatherproof before lining work commences.

3.6 STORAGE

Take delivery of products dry and undamaged on pallets, and keep on pallet. Protect edges and corners from damage and covered to keep dry until fixed.

3.7 HANDLING

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

3.8 SUBSTRATE

Do not commence work until the substrate is of the standard required by the relevant manufacturer's technical literature for the specified finish; plumb, level and in true alignment. Maximum moisture content of timber framing to NZS 3602.

Application

3.9 FIXING WITH BUTT JOINTS

Cut sheet using the appropriate method for the specified finish. Prepare and fix square edged sheets in accordance with James Hardie Installation Manual. Include flexible sealant in wet areas.
Joint width: 1 - 2mm

3.10 PROVIDE VERTICAL CONTROL JOINTS

Provide vertical control joints at 7.2 metre centres maximum for general application and 4.2 metres centres maximum for tiled applications. Provide acoustic sealant in walls having an acoustic rating.

3.11 PROVIDE HORIZONTAL CONTROL JOINTS

Provide horizontal control joints at 7.2 metres centres maximum for general application and 4.2 metre centres maximum for tiled applications.

3.12 PROVIDE EXTERNAL CORNER ANGLE

Provide perforated PVC external corner angle or paper faced rigid spine corner mould to external corners.

3.13 INTERNAL CORNERS

When used in tiling applications provide a Lumberlock Stud saver to framed internal corner prior to fixing of Villaboard™ Lining.
Provide perforated PVC corner mould, or paper faced rigid spine corner mould or solid blocking to internal corners.

3.14 FORMING HOLES

Required holes accurately formed and cut to James Hardie® requirements.

3.15 SILICONE JOINTS

Provide polyethylene tape behind joints finished with flexible sealant.

Levels of Finish

Refer to AS/NZS 2589.
Refer to SELECTIONS/drawings for required levels of finish.

3.16 LEVEL 0, 1 and 2 FINISHES

Refer to James Hardie® installation manual.

3.17 LEVEL 3 FINISH

Application:	For use in areas which are to receive heavy or medium texture (spray or hand applied) finishes or where heavy paper wall coverings are to be applied as the final decoration.
Jointing/setting:	Joints and corner joints will be set with Hardie™ Base Coat reinforced with perforated paper tape and Hardie™ Top Coat.
Finish:	This level of finish must be sufficiently smooth to accept vinyl, tiles or textured coatings without blemishes.

3.18 LEVEL 4 FINISH

Application:	This is generally the accepted level of finish for domestic construction. It is used where light textures or wall coverings and smooth textured finishes and satin/flat/low sheen paints are illuminated by non-critical lighting.
Jointing/setting:	Refer to flush jointing recommendations on page 11 James Hardie® Villaboard™ Lining installation manual.
Finish:	For use where light-texture coatings or wallpaper or other lightweight wall coverings are to be applied. For painted finishes in non-critical lighting areas flat and low-sheen textured paints are to be applied. Gloss and semi-gloss paints are not generally suitable over this level of finish as any minor blemish will show under critical light. The weight, texture and sheen level or wall coverings applied over this level of finish must be carefully evaluated. Joints and fasteners must be adequately concealed if the wallcovering material is lightweight, contains limited pattern, has a gloss finish, or any combination of these features is present. Unbacked vinyl wall coverings are not suitable over this level of finish.

3.19 LEVEL 5 FINISH

Application:	This level of finish is for use where gloss or semi-gloss paints are specified or where critical lighting conditions occur on satin, flat or low sheet paints.
Jointing/setting:	Typically all joints and corner joints will have tape embedded in Hardie™ Base Coat applied over all joints, angles, fastener heads and accessories. A thin skim coat of Hardie™ Top Coat must be applied to the entire surface to be plastered. The surface must be finished smooth and free of tool marks and ridges and special care must be taken with the application of the finishing compound to achieve a smooth, true surface suitable for these critical finishes.
Finish:	This level of finish is for use where gloss, semi-gloss, low-sheen or non-textured paints are specified or where critical lighting conditions occur.

Completion & Commissioning

3.20 COMPLETION MATTERS

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

4 SELECTIONS

Linings

4.1 JAMES HARDIE® HARDIE™ GROOVE LINING

Location:	Refer to drawings
Type:	James Hardie® Hardie™ Groove Lining
Thickness:	7.5mm
Fixing method:	~

4.2 FIXING BUTT JOINTS

Location:	~
Fasteners:	40mm x 2.8mm galvanized Hardie™ Flex nail

4.3 LEVELS OF FINISH

To conform to the following levels of finish:

Location	Finish level
Refer drawings	4

5113G GIB® PLASTERBOARD LININGS

1 GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber and steel framed walls and ceilings to form:

- standard systems
- superior finish quality systems
- bracing systems
- fire rated garage boundary wall systems
- wet area systems
- GIBFix® Framing systems

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section:
GIB® Site Guide (April 2024)
GIB® Noise Control Systems (September 2017)
GIB® Fire Rated Systems (September 2024)
GIB® Wet Area Systems (February 2021)
GIB Toughline® Aqua (July 2018)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIB Ezybrace® for Light Steel Frame Systems (March 2017)
GIBFix® Framing System (August 2016)
GIB Rondo® Metal Batten System (September 2024)
GIB-Cove®
GIB RocTape®
GIB® Goldline™ Platinum Tape-on Trims
GIB® UltraFlex high impact corner mould
GIB® Tough Systems (November 2014)
BRANZ Appraisal 289 (2024) GIB® Fire Rated Systems
BRANZ Appraisal 394 (2025) GIB® Noise Control Systems
BRANZ Appraisal 427 (2021) GIB® Wet Area Systems
BRANZ Appraisal 928 (2021) GIB EzyBrace® Systems

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.

Compliance

1.8 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.

1.9 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.

1.10 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

1.11 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.

2 PRODUCTS

Materials

2.1 GIB® PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS/NZS 2588. Refer to SELECTIONS for location, type, thickness and finish.
GIB® Standard plasterboard
GIB Wideline® plasterboard
GIB Ultraline® high quality surface plasterboard
GIB Fyreline® fire resistant plasterboard
GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard
GIB Aqualine® wet area plasterboard
GIB Toughline®
GIB Toughline® Aqua

Components

2.2 SCREWS

GIB® Grabber® drywall type screws as follows:

Grabber® type	**Used for fixing:**
High Thread	GIB Ezybrace® or Standard systems to timber
Self Tapping	Standard systems to light gauge steel or timber
Dual Thread Screws	GIBFix®, GIB Ezybrace®, or Standard systems, to light gauge steel or timber
Wafer Head Needle Tip	Light gauge metal to timber not directly under plasterboard
Pancake Head Drill Tip	Light gauge metal to light gauge metal directly under plasterboard

Refer to GIB® requirements for appropriate details.

2.3 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims
GIB® UltraFlex® high impact corner mould
GIB® Levelline® Tape on Trim

2.4 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.5 CONTROL JOINTS

GIB® Rondo® P35 control joints.
GIB® Goldline™ tape-on trims
GIB® plastic W-profile control joints.

Accessories

2.6 ADHESIVE

Timber frame and/or steel frame:
GIBFix® One ultra low VOC water based wallboard adhesive
GIBFix® All-Bond solvent based wallboard adhesive

2.7 JOINTING COMPOUND

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

2.8 JOINTING TAPE

GIB® jointing tape.

2.9 FIRE/ACOUSTIC SEALANT

GIB Fire Soundseal® ultra low VOC, mulit use acoustic sealant that resists passage of smoke and fire.

2.10 GAP FILLER

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.

3.4 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 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to **AS/NZS** 2589.

3.6 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide (Sept 2018).

Application

3.7 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide. Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.8 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.9 FORM FIRE RATED SYSTEMS

Form to GIB® Fire Rated Systems requirements.

3.10 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.11 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems

3.12 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide requirements.

3.13 INSTALL TAPE-ON TRIMS

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

Finishing

3.14 FINISHING GENERALLY

To GIB® Site Guide and AS/NZS 2589.

Completion & Commissioning

3.15 COMPLETION MATTERS

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

4 SELECTIONS

Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer drawings	GIB® Standard plasterboard	10mm	4
Refer drawings	GIB® Aqualine plasterboard	10mm	4
Refer drawings	GIB Braceline plasterboard	10mm	4

4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer drawings	GIB Aqualine® plasterboard	10 & 13mm	4

4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer drawings	GIB® Standard plasterboard	13mm	4

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer drawings	GIB Aqualine® plasterboard	13mm	4

4.5 GIB® FIRE RATED SYSTEMS

Refer to GIB®

Location / Type	Plasterboard type / Lining requirements	FRR / System specification	Finish Level
Refer drawings	GIB Fyreline	Refer drawings	4

4.6 GIB® BRACING SYSTEMS

Refer to:

- GIB Ezybrace® Systems

For bracing element location refer to drawn documentation.

Accessories

4.7 GIB® TAPE ON EDGE OR CORNER TRIMS

Brand/type: ~

4.8 GIB® EDGE PROFILES

Brand/type: ~

5123LS STRANDBOARD TIMBER BOARD LININGS BY LAMINEX

1 GENERAL

This section relates to the supply and fixing of Laminex® New Zealand Strandboard® engineered reconstituted wood panels for interior applications.
It includes:

- wall and ceiling linings
- partitions - in general areas including changing rooms and toilets
- wall bracing

Related work

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:

pMDI	Polymeric methyl diphenyl diisocyanate
VOC	Volatile organic compounds

Documents

1.2 DOCUMENTS

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

NZBC C/VM2	Protection from fire
NZS 3604	Timber Framed Buildings
AS/NZS 1859.1	Reconstituted wood-based panels - Specifications - Particleboard
ISO 5660-1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Heat release rate (cone calorimeter method)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Strandboard Technical Brochure (Nov 2023)
Strandboard BPIR
Strandboard Product Warranty
Strandfloor® Strandboard Fire Test Report
Strandfloor and Strandboard Safety Data Sheet
Strandboard VOC Certificate
Strandboard Formaldehyde Emissions Report

Manufacturer/supplier contact details

Company:	Fletcher Building Ltd
Trading as:	Laminex New Zealand
Web:	www.laminex.co.nz
Email:	info@laminex.co.nz
Telephone:	0800 303 606

Requirements

1.4 QUALIFICATIONS GENERALLY

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 - bracing

1.6 BRACING REQUIREMENTS

Wall bracing elements in timber framed buildings as part of a structural bracing system to meet the requirements of NZS 3604, Section 5 Bracing Design. Wall bracing elements in light steel framed buildings as part of a structural bracing system to meet the requirements of NASH Standard Part 2, Section 5 Bracing.

2 PRODUCTS

Materials

2.1 LAMINEX STRANDBOARD LINING

Strandboard 12mm thick engineered reconstituted-based wood panels to AS/NZS 1859.1. Manufactured from pMDI resin bonded reconstituted wood strands. Available in 2400mm x 1200mm and 3600mm x 1200mm panels. FSC-COC and PEFC-COC certified. Refer to SELECTIONS.

Components

2.2 NAILS AND SCREWS

Refer to SELECTIONS.

Accessories

2.3 ADHESIVE

Elastomeric construction adhesive or foaming polyurethane adhesive. Refer to SELECTIONS.

2.4 HOLD-DOWN BRACKETS

Galvanized steel hold down bracket. Refer to SELECTIONS.

2.5 WOOD FILLER

Wood dough type filler, tinted to match.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.
Moisture content: 18% maximum

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 FIX HOLD-DOWN BRACKETS - BRACING ELEMENTS

Fix hold down brackets to studs and bottom plate at bottom corners of the bracing element.

3.6 INSTALLATION - LININGS GENERAL

Fix panels vertically joints. Allow a 2-3mm gap between panels edges for expansion. Fully support all edges.

3.7 APPLY ADHESIVE

Apply daubs of adhesive along framing at 200mm centres.

3.8 FIX STRANDBOARD LINING

Fix at maximum 150mm centres around panel perimeter with minimum 10mm, maximum 15mm clearance from panel edges. Fix at maximum 200mm centres along intermediate supports. Finish fixing flush with panel surface.

3.9 FILL FASTENER HOLES

Stop nail and screw holes with wood filler using a flat bladed knife.

Completion & Commissioning

3.10 COMPLETION MATTERS

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

3.11 PROTECTION

Protect the surfaces of finished work if pre-finished or until coatings or coverings have been applied. Board surfaces should be primed or clear sealed immediately after fixing to minimise the effects of atmospheric moisture or direct sunlight and to resist marking during construction activities.

4 SELECTIONS

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

Materials

4.1 LAMINEX STRANDBOARD WALL LINING

Location:	Refer drawings
Supplier:	Laminex New Zealand
Brand:	Strandboard
Panel thickness:	12mm
Panel size:	as required

4.2 LAMINEX STRANDBOARD CEILING LINING

Location:	Refer drawings
Supplier:	Laminex New Zealand
Brand:	Strandboard
Panel thickness:	12mm
Panel size:	as required

Fixings

4.3 FIXINGS TO TIMBER FRAMING STUDS

Adhesive:	Sika Nailbond Premium
Mechanical fixing:	Galvanized 40x2.8mm gun fired nails

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

Documents

1.1 DOCUMENTS

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

NZBC C/AS1, C/AS2	Protection from fire
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

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.

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

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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.

4 SELECTIONS

4.1 INTERNAL TIMBER TRIM

Finish: Paint finish - refer to finishes schedule.

Member	Size	Treatment
Architrave	2293529 - Timber skirting 40x10mm SGL BEV JH PRECOATED 5.4M	H1.2
Skirting	2293529 - Timber skirting 60x10mm SGL BEV JH PRECOATED 5.4M	H1.2
Reveal	19mm rebated timber	H3.1

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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 including, but not be limited to:
Leaf size.
Opening direction.

Performance - doorsets

1.4 PERFORMANCE REQUIREMENTS

Refer to 5241 FIRE AND ACOUSTIC INTERIOR DOORS AND WINDOWS for fire and acoustic performance details.

2 PRODUCTS

Materials - door and window frames general

2.1 TIMBER DOORS AND WINDOWS

To NZS 3602. Moisture content 10-14%. To NZS 3610.

Materials - doors general

2.2 TIMBER

To NZS 3602. Moisture content 10-14%. To NZS 3610. Solid or hollow core.

Materials - doorsets

2.3 STANDARD DOORSETS, SIDE HUNG DOOR

Frames to profile as detailed and dimensioned, fitted with solid or hollow core door.
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.

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.

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3.6 FABRICATE DOORS

Fabricate doors in the factory, with provision for door furniture.

3.7 CHECK ALL OPENINGS

To NZS 3604.Check all openings on site for size and standard of execution before installing window or door frames. Installation tolerances of windows subject to earthquake design to comply with AS/NZS 1170.1.

Assembly

3.8 FABRICATION GENERALLY

Manufacture and fabricate frames and doors as detailed. Install hinges and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

Application - generally

3.9 FIXING FRAMES

Fix and assemble frames rigidly in place, plumb, level and true to line and face without distortion and with all opening sashes fully and easily operating. Fit architraves.

3.10 DISTORTION

Do not distort frames when wedging or other packing, or when tightening fixings. If necessary adjust packing and fixings to eliminate binding. Do not cut, plane or sand frames to remedy distortion.

3.11 FIXINGS

Fix frames so that nail heads are covered by applied stops and beads. Punch all nail heads below timber surfaces which will be visible in completed work. Ensure that at least one frame fixing is adjacent to each hanging point.

Application - doorsets

3.12 PROPRIETARY ELEMENTS

Fix in accordance with the door manufacturer's requirements.

3.13 INSTALLATION GENERALLY

Wedge frames into opening and fix through into the wall framing. Locate all wedges and fixing at hinge positions and opposite, with one fixing in the vicinity of the lock. Fixings concealed behind planted stops.
Hang doors on hinges, sliding or bi-fold gear as specified and to operate freely. Fit all hardware and door furniture.

3.14 TIMBER STUD WALLS - TIMBER FRAMES

Wedge into opening and nail through into the studs. All wedges and fixing to be at hinge positions and opposite, with one fixing in the vicinity of the lock.

3.15 BOTTOM CLEARANCE

Provide for specified floor coverings plus 5mm clearance at any point of swing. When floor covering is not specified, allow 25mm total.

For ventilated and/or air conditioned spaces allow 20mm clearance above finished floor coverings for supply/return air.

3.16 REMOVE DOORS

Remove doors from the frames if necessary to protect them, or for re-finishing, store safely and near completion refit them, all without any damage.

3.17 INSTALL PANELS

Prime rebates and beads, install sealant backing strips or silicone. Install dry beading to outside of panels as selected. Do not mitre corners of beads.

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

4.1 TIMBER DOORS

Finish:	Paint finish, refer to finishes schedule
Door type:	Hinged
Leaf size:	Refer to Door Schedule

Hardware

4.2 HARDWARE

Refer to Door Schedule

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5313KL RONDO SYSTEMS - PLASTERBOARD & SHEET CEILINGS

1 GENERAL

This section relates to the supply and installation of **Rondo Ceiling Systems.** It includes;

- Rondo KEY-LOCK Concealed Ceiling System
- Rondo XPRESS® Drywall Grid System
- Rondo Steel Stud Drywall Concealed Ceiling System
- Direct-fix or fully suspended applications
- Non-fire rated and fire-rated systems
- Bulkhead, curved ceilings
- Seismic and acoustic designs

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:

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:

NZBC B1/VM1	Structure general
NZBC B2/AS1	Durability
NZBC C/AS1	Protection from fire
NZBC C/AS2	Protection from fire
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: 2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2785	Suspended Ceilings - Design & Installation
NZS 4219	Seismic performance of engineering systems in buildings
NZS 4541	Automatic fire sprinkler systems
AS/NZS 4600:2005	Cold formed steel structures
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings 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 Professional Design Manual
Rondo KEY-LOCK® installation guide
Rondo XPRESS® Drywall Grid System Rondo brochure
Rondo Steel Stud Drywall Concealed Ceiling System in Design Guide
Certificate of Licence for New Zealand Made trademark - Licence No. 806965

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

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For Rondo branded products against defects in materials under normal use. In addition, Rondo warrants that the Rondo KEY-LOCK® Suspended Ceiling Systems will remain structurally sound for a period of 15 years.

- Provide this warranty on the manufacturer/supplier standard form
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.
Provide evidence of experience, listing completed projects of similar size and complexity.

1.7 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Installation by a manufacturer accredited installer, using the manufacturer technical services. Installers are to be members of the AWCINZ. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.
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.

1.9 AS BUILT DOCUMENTS

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

Provide the following as built documents and records:
~

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

Compliance information

1.10 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

1.11 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.

1.12 CERTIFICATION

Provide:

- Certificates and other evidence that the system complies with the standards of performance specified.
- Producer Statements.

1.13 FIRE RATING REQUIREMENT

Design the ceiling system so that together with the floor and ceiling lining system, it is to NZBC C/AS1 Appendix E, E3 Fire resistance and NZBC C/AS2, Appendix C, 5.1 Fire Resistance. Refer to SELECTIONS.

1.14 ENVIRONMENTAL REQUIREMENTS

Durability to NZBC B2/AS1.

Performance - Wind (design by contractor)

1.15 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the wind pressure parameters of AS/NZS 1170.2. Refer to general section 1220 PROJECT for general details.
Contact Rondo Building Services Pty Ltd for their internal engineering design service or to facilitate Producer Statement - Design (PS1).
Refer to SELECTIONS specific design performance requirements.

Performance - Seismic (design by contractor)

1.16 SEISMIC - SPECIFIC DESIGN

Design the system and its anchorages/fixings to resist the earthquake loads of the seismic zone in accordance with NZS 1170.5. Refer to general section 1220 PROJECT for general details. Contact Rondo Building Services Pty Ltd for their internal engineering design service or to facilitate Producer Statement - Design (PS1).
Refer to SELECTIONS specific design performance requirements.

Quality control and assurance

1.17 INSPECTIONS

~

2 PRODUCTS

Suspension system - Rondo KEY-LOCK suspended ceiling system

2.1 KEY-LOCK SUSPENDED CEILING SYSTEM

KEY-LOCK suspended ceiling system to AS/NZS 2785, hot-dip galvanized steel elements manufactured from G2 steel strip to AS 1397 including furring channels and snap in sections. Primary (Top Cross Rail) and secondary components (Furring Channel).

2.2 SEISMIC RESTRAINT

To AS/NZS 2785, 4.3.3 Seismic Restraint Types and/or suitable proprietary back braces for ceiling systems.

2.3 KEY-LOCK DIRECT FIX CEILING SYSTEM

KEY-LOCK direct fix ceiling system to AS/NZS 2785, including suspension depths of up to 200mm. Furring channels, Direct fix clips for fixing to timber, steel and concrete, to carry ceiling sheets, light fixtures and air distribution elements to comply with NZS 1170.5.
Provide diagonal bracing to provide lateral stability if required. Perimeter trim, expansion joints and seismic joints etc. to AS/NZS 2785, as required.
Hot-dip galvanized steel elements manufactured from steel strip to AS 1397.

2.4 PRIMARY SECTIONS

Rondo 25mm or 38mm top cross rail to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

2.5 FURRING BATTEN SECTIONS

Rondo 16mm, 28mm, or 35mm furring/batten sections to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

Components

2.6 DIRECT FIX CLIPS

Hot-dip galvanized steel elements manufactured from steel strip to AS 1397.

2.7 SECTION JOINERS

Hot-dip galvanized steel elements manufactured from steel strip to AS 1397.

2.8 RONDO WALL TRIM

Rondo wall trim sections to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

2.9 RONDO SUSPENSION RODS, BRACKETS CLIPS, RODS & ANCHORS

Rondo components to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

Accessories

2.10 FASTENERS SUSPENSION SYSTEM

Pop rivets or 8g-16 x 12mm (minimum) self drilling wafer head screws to join furring channels and C channels as detailed in Rondo Professional Design Manual and to Rondo Building Services Pty Ltd requirements.

2.11 FASTENERS DIRECT FIX

8g-16 x 25mm (minimum) self drilling wafer head screws for fixing to timbers detailed in Rondo Professional Design Manual and to Rondo Building Services Pty Ltd requirements.

2.12 SCREWS

25mm x 6 gauge non-rusting Type S self-drilling and self-tapping bugle head screws as detailed in Rondo Professional Design Manual and to Rondo Building Services Pty Ltd requirements.

Lining and Insulation

2.13 PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed to AS/NZS 2588. Refer to SELECTIONS for type and thickness.

2.14 LINING BOARD

Refer to SELECTIONS for type, thickness and finish.

2.15 INSULATION

Refer to SELECTIONS for type and thickness.

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 COMMENCING THIS WORK

Commencing this work means the substrate is accepted as allowing work of the required standard.

3.5 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 ceiling tiles below 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 systems 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 be to NZS 4219, and/or NZS 4541 for sprinklers.

3.6 SITE CONDITIONS

Do not begin installation until the building is closed in, fully glazed, the roof watertight, and mechanical and electrical duct work above the ceiling completed. To AS/NZS 2785, Appendix C, site Conditions, Installation and Inspections.

Installation generally

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 SETTING OUT

Set out the framing work true to line and square before starting erection.

3.9 INSTALL

Installation to AS/NZS 2785 minimum standards, and the systems Rondo Professional Design Manual and Rondo Building Services Pty Ltd requirements.

Allowance for support members:
- Space required by the loads on the system and the type of ceiling.
- For the installation of services and accessories, including ductwork, light fittings and diffusers.
- Additional back support or suspension members for the fixing of services and accessories to prevent distortion, overloading or excessive vertical deflection.
- For access for maintenance of services.

Allowance for a ceiling system where failure of any one suspension point does not cause a progressive failure of the ceiling.
Allowance for height adjustment with a length adjustment device at each suspension point, permitting length variation of at least 50mm.

If required, allow for notch grid members at the junction with the perimeter trim to make sure the ceiling lining lies flat on the perimeter trim. Do not attach the suspension system to the lip or flange of purlins.

Fix, erect and fit to finish rigid, plumb, square and true to line and face. Where components required cutting on site, use metal snips, fine-toothed band or hack saws. Adjust all suspension systems and clips by laser level until they are all level. Hangers and bracing are not to be fixed closer than 150mm to plenum building services.

Install all movement joints required.

Services support to conform to the following:
- If the service has not been designed to accept the ceiling load, do not fix suspension members to services (e.g. ductwork).
- If services obstruct the ceiling supports, provide bridging and suspension on each side of the services.
- Do not support services terminals on ceiling lining, unless specified.

3.10 BULKHEADS

Form bulkheads to manufacturer requirements. Diagonally brace at regular intervals to provide lateral stability. In addition to the dead load of the bulkhead, all bulkheads should be designed for the following minimum loads:
- 0.25 kPa laterally.
- 0.15 kPa vertically.

3.11 INSTALL SEISMIC RESTRAINTS

Install ceiling system seismic restrains and bracing as required to prevent lateral movement and resist the imposed horizontal seismic force, to AS/NZS 2785.

3.12 PENETRATIONS

To AS/NZS 2785 and NZS 4219 generally, with sprinkler systems to NZS 4219 and/or NZS 4541. Accommodate recessed light fittings, air conditioning outlets and other electrical and/or mechanical services that are fixed to or pass through the ceiling system. Provide independent support for these as necessary.

3.13 ISOLATE

Isolate dissimilar metals with neoprene sheeting, tape or pipe lagging.

3.14 INSULATION

Install insulation to insulation manufacturer and Rondo Building Services Pty Ltd requirements.

3.15 LINING

Fix and finish lining boards to manufacturer and Rondo Building Services Pty Ltd requirements. Install services before lining. Stagger sheet joins.

3.16 ACCESSIBILITY

Provide access to the ceiling system and the in-ceiling and above-ceiling services so that maintenance and removal of any part can be carried out without damage to the ceiling system or panels.

3.17 PROTECT EXISTING WORK

Protect adjacent existing work from damage during the installation.

Installation - Rondo KEY-LOCK Ceiling System

3.18 INSTALLATION

Install the Rondo KEY-LOCK suspension system to AS/NZS 2785, and the Rondo Professional Design Manual and KEY-LOCK® installation guide.
Screw-fix sheets to furring channel sections at the centres required by the ceiling lining manufacturer. Stagger joints and fully support on furring sections and primary sections at centres to suit the load and Rondo installation manual.
Refer to 5113 PLASTERBOARD LININGS for plasterboard and stopping specification.

Completion

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 www.rondo.co.nz
Substitutions are not permitted.

Performance - Seismic (design by contractor)

4.1 DESIGN PARAMETERS SEISMIC - DESIGN BY CONTRACTOR

Rondo KEY-LOCK Ceiling System

4.2 RONDO KEY-LOCK SUSPENDED CEILING SYSTEM

Location:	Refer drawings
Type/Brand:	KEY-LOCK Suspended Ceiling System
Acoustic Mounts:	~
Curved radius:	~
Top Cross Rails (TCR):	~
Furring Channels (FC):	~
TCR to FC Joiners:	~
Perimeter Trims:	~
Suspension Brackets & Clips:	To suit substrate and component selection, Contact Rondo Building Services Pty Ltd

Lining Configuration/Pattern:	refer drawings

4.3 RONDO KEY-LOCK DIRECT FIX CEILING SYSTEM

Location:	Refer to drawings
Type/Brand:	KEY-LOCK Direct Fix Ceiling System
Furring Channels (FC):	~
Perimeter Trims:	~
Fasteners direct fix:	~

Components

4.4 TRIM

Location:	Refer to drawings
Wall trim:	~
Bulkhead trim:	

5433 PLYWOOD FLOORS

1 GENERAL

This section relates to the use of plywood sheets for floors.

Related work

1.1 RELATED SECTIONS

Refer to ~ for ~.

Documents

1.2 DOCUMENTS

Documents referred to in this section are:

NZBC C/AS1, C/AS2	Protection from fire
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 2269.0	Plywood - structural - specifications
NZS 3604	Timber-framed buildings

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

Requirements

1.3 QUALIFICATIONS

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

2 PRODUCTS

Materials

2.1 PLYWOOD

Radiata pine veneer ply to AS/NZS 2269.0, face sanded, grade as scheduled.
H3 CCA treated to AS/NZS 1604.1, when used as a wet area substrate. Confirm compatibility with adhesives being used with the waterproofing membrane. F11 grade to be used for flooring.

Components

2.2 SCREWS

Counter-sunk screws, stainless steel for treated plywood, minimum Class 3 or stainless steel for untreated plywood. Refer to the plywood manufacturer's requirements for size and use.

15mm ply:	No. 8 x 40mm
17mm ply:	No. 10 x 40mm
19 - 21mm ply:	No. 10 x 45mm
25mm ply:	No. 10 x 50mm

2.3 ADHESIVE

Polyurethane adhesive to American Plywood Association specification AFG 01.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Moisture content:	18% maximum

3.4 SUBSTRATE

Do not commence work until the framing is plumb and level, in true alignment and to suit the floor manufacturer's requirements.
Ensure framing suits the required laying pattern.

3.5 EXPANSION JOINTS - LARGER FLOORS

Lay flooring to allow for a large expansion gap for large floor areas to manufacturer's requirements. Locate as shown, under internal walls where possible.

Application

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 SUPPORT AND JOINTS - SQUARE EDGE SHEETS

Fully support edges and joints on square edged sheets.

3.8 FIXING PLYWOOD SHEETS

Fix sheets to the plywood manufacturers requirements and NZS 3604, section 7.2.3, **Wood-based Sheet Flooring**. Lay sheets in a staggered layout, face-grain of sheet at right-angles to support and with sheets in square, true alignment and plane.

3.9 WET AREAS

Ensure plywood is structural grade treated to H3 or H3.2 (CCA treated) to AS/NZS 1604.1.
Plywood substrates must have moisture content not more than 18% before installing membrane.
With primed/sealed face and edges.

NOTE: Treated plywood must be allowed to breath for a minimum of 7 days before installation of membrane. Fixing must be to manufacturer's specifications.
LOSP treated plywood must not be used.

Requirements if used for:
Flooring: Stress grade F8, minimum thickness 18mm with framing at minimum 400mm centres both ways, or min 21mm with framing at 600mm centres both ways. Fixing, glue and stainless steel screws.
Floor Overlay: Stress grade 8, minimum thickness 12mm.

3.10 ADHESIVE FIXING

Apply a 10mm adhesive bead to joists.

3.11 FIXINGS

Minimum 10mm, maximum 15mm from the edge, 150mm centres along edges and 300mm centres on intermediate supports.

Completion & Commissioning

3.12 COMPLETION MATTERS

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

4 SELECTIONS

4.1 PLYWOOD - SQUARE EDGE SHEET FLOORING

Location:	Refer to drawings
Grade:	CD
Stress grade:	F8 or higher to AS/NZS 2269

Thickness:	19mm
Treatment:	H3 or H3.2 (CCA treated) to AS/NZS 1604.1
Fixing:	nail

4.2 SCREWS

Type/size/material:	Refer to structural

4.3 ADHESIVE

Type:	As recommended by plywood manufacturer

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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 ~ for ~.

Documents

1.2 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

2 PRODUCTS

Materials

Components

2.1 BENCHTOPS

As detailed on the drawings and as required for specified fittings and appliances.

2.2 CARCASE CONNECTORS

One-piece steel, straight deep-cut thread, fibre board screws with press fit plastic trim cap.

2.3 CARCASE FASTENERS

Knock down type centric sphere zinc alloy connectors with connecting bolts, sleeves and dowels, to suit each particular fastening location.

2.4 BUTT HINGES

Butt, broad butt, flush butt or overlay steel or brass, to suit the location, or as detailed.

2.5 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.

2.6 GLASS DOOR HINGES

All-metal zinc alloy body and metal/plastic glass cup, with automatic spring, screw-fixed and with matching door pulls.

2.7 FLAP HINGES

All-metal, flush-fitted and screw-fixed with no gap when the flap is down.

2.8 FLAP STAY

All-metal, slide/folding and screw fixed.

2.9 DRAWER RUNNERS

Under mounted type, precision running ball-mounted full extension, bright steel finish system.

Accessories

2.10 ADHESIVES

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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.

Conditions - site

3.6 TRANSIT

Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather.

3.7 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

3.8 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.

3.9 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.

3.10 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.

3.11 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.

3.12 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.

3.13 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

3.14 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.

3.15 PROTECT

Protect finished surfaces from damage, particularly benchtops.

Completion

3.16 REPLACE

Replace damaged or marked elements.

3.17 LEAVE

Leave work complete, clean and without blemish and to the standard required by following procedures.

3.18 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Refer to Kitchen plans and elevations for selection.

5521 HARDWARE

1 GENERAL

This section covers the supply and installation of door and window hardware and furniture.

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS.

Requirements

1.2 SUPPLIER

A specialist in the supply of hardware, employing an experienced architectural hardware representative available to assist during the course of the hardware installation.

2 PRODUCTS

2.1 DOOR HARDWARE

Refer to SELECTIONS for product selection.

2.2 WINDOW HARDWARE

Refer to SELECTIONS for product selection.

Components

2.3 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.

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

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Carry out cutting and fitting of the substrate necessary for installing any hardware unit before painting or finishing of that surface. Remove hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

3.7 INSTALL HARDWARE

Install each hardware unit in accordance with the hardware manufacturer's requirements using templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with all moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion

3.8 ADJUST

Adjust and check each operating hardware unit for correct and smooth functioning. Replace those units that cannot be adjusted if they do not function correctly. Clean units and adjoining surfaces upon completing their installation. Only use lubricant if and when recommended by the hardware manufacturer/supplier.

3.9 REPLACE

Replace damaged or marked elements.

3.10 LEAVE

Leave work with parts fully and freely working and to the standard required by following procedures.

3.11 REMOVE

Remove debris, unused materials and elements from the site.

3.12 PROTECT

Protect hardware units from damage or marking.

3.13 FINAL ADJUSTMENT

Where hardware is installed more than a month prior to project completion, return and make a final check and adjustment of hardware units to ensure they are operating correctly, fitted properly and are undamaged.

4 SELECTIONS

4.1 WINDOW & DOOR HARDWARE

Refer to Window and Door Sections for Hardware selection.

4.2 CABINET WORK HARDWARE

As detailed on joinery plans

5571 TIMBER STAIRS

1 GENERAL

This section relates to the fabrication and installation of interior timber stairs and landings.

Documents

1.1 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.

2.2 PARTICLEBOARD

Urea-formaldehyde resin bonded medium density particleboard to AS/NZS 1860.1.

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.

4 SELECTIONS

4.1 TIMBER STAIRS

Treads:	Refer to architectural drawings.
Risers:	Refer to architectural drawings.
Finish:	H1.2 / selected carpet finish

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5574 INTERIOR HANDRAILS & TIMBER BALUSTRADES

1 GENERAL

This section relates to the fabrication and installation of interior timber balustrades.

Documents

1.1 DOCUMENTS REFERRED TO

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

NZBC B2/AS1	Durability
NZBC F4/AS1	Safety from falling
NZS 3602	Timber and wood-based products for use in building

2 PRODUCTS

2.1 SOLID TIMBER COMPONENTS

Timber species, grade, installation moisture and treatment to NZS 3602, table 2, and NZBC B2/AS1. Refer to SELECTIONS/DRAWINGS.

2.2 HARDWARE

Handrail brackets, metal supports, angles and sundry fittings, all as shown and described on the drawings.

3 EXECUTION

Conditions

3.1 GENERALLY

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

Check site dimensions. Carry out machining within the practices recommended for the particular timber, wood product or pre-finished wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's recommendations. Work to be accurate, square and true to line and face.

Application

3.2 HANDRAILS

Fabricate and install the handrails as detailed, complete with all associated metal componentry and hardware. Unless otherwise detailed construct to comply with NZBC F4/AS1.

Completion

3.3 LEAVE

Leave work to the standard required by following procedures.

3.4 REMOVE

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

4 SELECTIONS

4.1 TIMBER HANDRAIL

Location:	Internal stairs
Timber:	Ø50mm selected timber
Finish:	Paint finish, selected colour.

4.2 ACCESSORIES

Finish: Stainless steel bracket

5811 SIGNS & DISPLAYS

1 GENERAL

This section relates to the supply and fixing of signs and displays, for internal and external applications.
It includes;

- Vinyl sign systems
- Engraved, individual letter, Braille, traffic and pylon sign systems
- Illuminated sign systems, general signs and emergency exit signs
- Custom design and made signs

Documents

1.1 DOCUMENTS

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

NZBC F6/AS1	Visibility in escape routes
NZBC F8/AS1	Signs
AS/NZS 1428.4	Design for access and mobility - tactile indicators
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS/NZS 2293.2:1995	Emergency evacuation lighting and exit signs for buildings - Inspection and maintenance
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 8603	Design and application of outdoor recreation symbols
NZS 9201.8	Model general bylaws - control of advertising signs
MOTSAM.1	NZTA Manual of traffic signs and markings - Part 1: traffic signs.
NZTA TCD	Traffic Control Devices Manual (TCD manual)

Note; MOTSAM 1 (& MOTSAM 2) is partly superseded by parts of NZTA TCD, so MOTSAM and TCD may have to be read together. In case of conflict NZTA TCD takes precedence.

Warranties

Requirements

1.2 QUALIFICATIONS

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

1.3 NO SUBSTITUTIONS

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

1.4 SAMPLES

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

	Sample A	Sample B	Sample C	Sample D
Sample description:	Unit numbering	Bin enclosure	Street numbering	Letterbox numbering
Sample type:	Portable sample for review	Portable sample for review	Portable sample for review	Portable sample for review

Performance

1.5 DESIGN - GENERAL

Signage to comply with NZBC F8/AS1 for escape routes, emergency related safety features, potential hazards and accessible routes and facilities for people with disabilities. Pictograms to NZBC F8/AS1, 2.4 **Pictograms.** Emergency illuminated signs also to NZBC F6/AS1 and AS 2293.1.

1.6 DESIGN - ADVERTISING

Design the signage to comply with NZS 9201.8.

2 PRODUCTS

Vinyl film graphics

2.1 VINYL FILM DIRECT APPLICATION

Vinyl film to NZS 4223.3,303.1 cut out to graphic requirements using computer based design, plotting and cutting. Applied by an approved applicator to any appropriate building surface on or off site. Refer to SELECTIONS for substrates, type and colour.

2.2 VINYL FILM ON A PLAQUE

Vinyl film cut out to graphic requirements using computer based design, plotting and cutting. Applied in the factory to a plaque, selected from a wide range of materials. The plaque can be fixed to any appropriate building surface on or off site. Refer to SELECTIONS for type, colour and plaque materials.

Engraved plaques

2.3 ENGRAVED PLAQUES

Engraving materials to graphic requirements using computer based design, plotting and laser engraving/cutting. Engraved recess can be colour filled with enamel. The plaque can be from a wide range of materials and fixed to any appropriate building surface on or off site. Refer to SELECTIONS for type, size, colour and plaque materials.

Individual letters

2.4 INDIVIDUAL LETTERS CUSTOM MADE

Individual letters, numbers or symbols to graphic requirements using computer based design and laser or router cutting. They can also be fabricated from metals and plastics. The letters can be from a wide range of materials and finishes, and fixed to any appropriate building surface on or off site. They can be illuminated in various ways. Refer to SELECTIONS for type, colour, materials, and illumination.

Outdoor recreation signs

2.5 OUTDOOR RECREATION SIGNS

Signs for outdoor recreation or information to NZS 8603. Signs located on public roads to be approved by the appropriate road controlling authority. Tourist signs on state highways to MOTSAM.1 and NZTA TCD.

Components

2.6 VINYL TAPE

Vinyl Tapes with dead stretch properties and chemical and abrasion resistance. The transfer resistant rubber adhesive system is to provide immediate adhesion properties.

2.7 LIQUID ADHESIVES

Structural and non structural strength adhesives to suit system requirements.

3 EXECUTION

Conditions

3.1 DELIVERY

Only deliver to the site signs that can be immediately unloaded in to suitable storage or be placed for direct installation.

3.2 INSTALLATION

Install to manufacturers requirements, firmly and securely in locations specified on drawings.

3.3 COORDINATE

Confirm appropriate fixing points needed for each sign have been provided. Do not proceed if the appropriate fixing points or services do not match the sign requirements.

3.4 SUBSTRATES

Ensure substrates and fixings will allow work of the specified standard. Ensure finishes are complete as appropriate.

3.5 MATERIALS, FITTINGS AND EQUIPMENT

New and undamaged, of the required standard and complying with the relevant Standards, Codes and Regulations.

3.6 SIGNAGE LOCATIONS

Signage locations shown on the drawings are their actual location, but subject to verification for final height and position. Clarify the location of all elements and units relative to surrounding materials and finishes. Confirm final positioning.

Application

3.7 MOUNTING SIGNAGE

Locate and fix, ensuring they are positioned as designed, and relative to plumb and level requirements.

Completion

3.8 REPLACE DAMAGED WORK

Replace damaged, cracked or marked elements.

3.9 LEAVE CLEAN

Leave units and fittings clean and in full working order, wiring concealed and fire protected as required and with adjacent surface finishes unmarked. Leave work to the standard required by following procedures.

3.10 ENSURE CORRECT OPERATION

Ensure work is operating correctly, with equipment clean and light bulbs and tubes operational.

3.11 PROTECT

Protect items from damage or marking.

4 SELECTIONS

Refer to the project signage schedules/drawings for details.

4.1 UNIT NUMBERING SIGNS

Manufacturer:	TBC by client
Model:	TBC by client
Materials:	TBC by client
Size:	75mm x 120mm
Illumination:	not required

4.2 LETTERBOX NUMBERING SIGNS

Manufacturer:	TBC by client
Model:	TBC by client
Materials:	TBC by client
Size:	approximate 35mm x 230mm
Illumination:	not required

4.3 STREET NUMBERING SIGNS

Manufacturer:	TBC by client
Model:	TBC by client

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Materials:	TBC by client
Size:	approximate 150mm x 300mm (each letter)
Illumination:	not required

4.4 BIN ENCLOSURE SIGN

Manufacturer:	TBC by client
Model:	TBC by client
Materials:	TBC by client
Size:	approximate 300mm x 450mm
Illumination:	not required

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6211 WALL TILING SYSTEMS

1 GENERAL

This section relates to the supply and installation of interior and exterior wall tiling systems:
It includes:

- Tiles
- Tile adhesives and grouts
- All relevant underlays, components and accessories necessary to complete installation.

1.1 RELATED WORK

Refer to 6221 FLOOR TILING SYSTEMS for floor tiling systems.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

WMAI	Waterproofing Membrane Association NZ Inc

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire
NZBC E3/AS1	Internal moisture
NZBC E3/AS2	Internal moisture
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives -Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for grouts
BS EN 12004.1	Adhesives for ceramic tiles. Requirements, assessment and verification of constancy of performance, classification and marking
BS EN 13888.1	Grouts for ceramic tiles. Requirements, classification, designation, marking and labelling.
WMAI	Code of Practice for Internal Wet-area Membrane Systems

Health & Safety at Work Act: 2015

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

~	~

Manufacturer/supplier contact details

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

Warranties - tiling

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	For ~

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
2 years For installation of tiling systems

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY - TILING SYSTEMS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.9 NO SUBSTITUTIONS

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

1.10 HEALTH & SAFETY - SILICA DUST

Comply with Health & Safety at Work Act:2015 and take all necessary precautions as recommended in WorkSafe guidelines for Respirable Crystalline Silica (RCS).

2 PRODUCTS

Materials

2.1 TILES

Refer to SELECTIONS.

Materials - preparation & underlays

2.2 WATERPROOFING MEMBRANE - INTERIOR

Refer to 6811 WATERPROOFING AND ACOUSTIC UNDERLAY SYSTEMS for waterproofing membranes.

Materials - adhesive and grout

2.3 TILE ADHESIVE

Tile adhesive, and if required primer, to suit particular location/use. To AS ISO 13007.1 and BS EN 12004.1. Refer to SELECTIONS.

2.4 PROPRIETARY GROUT

Proprietary grout to suit particular location/use. To AS ISO 13007.3 and BS EN 13888.1. Refer to SELECTIONS.

Accessories

2.5 MOVEMENT JOINT SEALANT

Neutral cured or acid-cured sealant to AS 3958.1, 2.7.5 Sealant. Refer to SELECTIONS.

2.6 TILE EDGE TRIMS

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Inspect tiles on delivery to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern and any tiles that are damaged.

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Ensure that the substrate, with the preparation called for in this section, are of the quality necessary to allow tiling of the required standard. Ensure all services and accessories are in place and located to suit the tile layout.

Ensure concrete or concrete masonry walls are fully cured and dry. Ensure new concrete has cured for 28 days or more.

If in doubt check for moisture content by hygrometer. Ensure moisture content is:
Concrete 75% relative humidity or less

3.4 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles, movement joints and other visual considerations of the finished work. Minimise in number of cut tiles and where possible, no cut tiles less than half size and only at the perimeter of the work.

3.5 TEMPERATURE

Unless otherwise specified by selected tiling installation product manufacturer, do not carry out tiling where the air temperature is below 5°C or substrate temperature is above 40°C.

3.6 EXTERNAL CONDITIONS

Ensure any areas of external tiling, waterproofing, floor levelling, grouting or concrete repair must be protected from hot windy conditions, rain and/or frosts during application.

3.7 LIGHTING

Light the tile work as closely and clearly as possible to that of the finished lighting, to ensure that differences in plane surface are highlighted during installation.

Installation/application

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 GENERALLY

Prepare surface and complete tiling installation in accordance with AS 3958.1 and if required complete interior waterproof membrane installation to sections 1-4 of WMAI Code of Practice for Internal Wet-area Membrane Systems as modified by NZBC E3/AS2.

Application - substrate preparation

3.10 PREPARE SUBSTRATES

Prepare backgrounds as described in AS 3958.1, Section 4. All surfaces to be structurally sound, dry, clean and free from movement, dirt, dust, oil, grease, wax and any other loose or contaminating materials. Concrete substrates should also be free of laitance, efflorescence, curing compounds and release agents.

Remove any projections or unevenness. Substrate material must be even and true with a maximum variation in plane of no greater than 4mm in every 2m, in accordance with AS 3958.1, section 4.

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Suitably prepare backgrounds and substrates in accordance with the manufacturer's instructions of the tiling installation products for the relevant substrate type.

3.11 PRIME SUBSTRATE

If required, surfaces should be primed as per manufacturer's instructions for the selected products and substrate types. Refer to SELECTIONS.

Application - waterproofing

3.12 INSTALL WATERPROOF MEMBRANE - INTERIOR WET AREAS

Refer to 6811 WATERPROOFING MEMBRANE AND ACOUSTIC UNDERLAY SYSTEMS for the installation of interior or exterior wet area membrane.

Application -tiling

3.13 FITTING TILES

Setting out, cutting and fitting of tiles to be as described in AS 3958.1, section 5. If not shown on drawings, confirm set out, bond and pattern before installation.

- Ensure cut edges are smooth and installed without jagged or flaked edges.
- Always use whole tiles or if tiles have to be cut the largest portion of a cut tile possible.
- Maintain the heights of wall tile work in full courses to the nearest dimension.
- Within allowed tolerances, ensure corners of tiles are flush and level with corners of adjacent tiles.
- Keep joint lines, including mitres, straight and of an even width.
- Fully bed trim units, moulded or shaped pieces and other accessories with an appropriate bedding material.
- Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.14 TILE FINISH AND JOINTS

Provide tile finish and joints, including tolerances, as described in AS 3958.1, 5.4.6. Joint widths to be suited to tile and to the manufacturer's instructions.

- Ensure finished surfaces are flat and true to a tolerance of ±4mm in 2 metres from the required plane.
- Lippage between adjacent tiles shall not exceed 2mm and where joint widths are less than 3mm wide lippage shall not exceed 1mm. For tiles ground flat, such as polished tiles, lippage shall not exceed 1.5mm.
- Ensure joint widths are consistent throughout the installation, measured at the tile face.
- Ensure joint alignment is consistent throughout the installation and to a tolerance of ±4mm in 2 metres from the detailed joint alignment.
- Clean surplus bedding material from joint spaces and tile surface.

3.15 ADHESIVE APPLICATION - THIN BED

Apply a thin bed of selected tile adhesive to the adhesive manufacturer's requirements, generally final bed thickness does not exceed 3mm. Install using the following methods:

Notched trowel method

- Adhesive application to be as described in AS 3958.1, 5.6.2(a) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness and rib using notched trowel. Select trowel square notch size to suit tile size and type, to achieve full coverage. Press tile firmly onto substrate and beat into place. Additional back buttering of tiles may also be required, usually required for tiles 400x400mm and larger.

Floating method

- Adhesive application to be as described in AS 3958.1, 5.6.2(b) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness. Apply tiles with a twisting or sliding action and tap back firmly into the floated bedding.

Buttering method

- Adhesive application to be as described in AS 3958.1, 5.6.2(c) and to adhesive manufacturers requirements. Apply adhesive evenly to the back of each tile with a flat edged trowel. Press tile firmly onto substrate and tap into place. This method is not suitable for mosaic tile

installation.

Tiles in awkward locations

- The buttering method may be required, or fixing might be necessary to achieve full bedding, even though the notched trowel method is used generally.

Ensure that the whole of the back of the tile is in good contact with the adhesive with no voids. Remove a tile periodically during installation to ensure correct coverage. Do not fix tiles over skinned adhesive.

3.16 INSTALL TRIMS

Accurately locate and fully bed edge trim units, dividing strips, moulded or shaped pieces and other accessories with an appropriate bedding material. Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.17 APPLY GROUTING

Remove any spacer inserts, prepare joints and apply grout in accordance with manufacturers requirements and as described in AS 3958.1, 5.7 Grouting. Ensure finish is uniform in colour, smooth and without voids, pinholes or low spots.

Application - movement joints

3.18 FORM MOVEMENT AND EXPANSION JOINTS

Install movement joints in accordance with AS 3958.1, 5.4.5 Movement Joints. Joints to go right through the tile and bed to the background, maintaining any waterproofing.

Movement joints to walls to be a minimum of 6mm wide and to be located:

- Over existing movement joints
- At junction between different background materials
- Where tiling abuts other materials, including sanitary fixtures and windows/doors frames.
- At inter-storey height horizontally and at 3m to 4.5m apart vertically.
- At internal vertical corners in shower compartments.

3.19 MOVEMENT AND EXPANSION JOINTS, INSTALL COMPOUND/SEALANT FILL

Carefully clean out the joint, if required install bond breaker or backing rod to control width/depth ratio, and fill with compound/sealant placed by gun. After the correct interval, finish the surface off smooth, and flush on flat areas or concave in corners, to the compound/sealant manufacturer's requirements.

Cleaning

3.20 CLEAN TILES

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

Completion

3.21 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials - Tiles

4.1 WALL TILES

Location:	Refer drawings
Supplier:	TBC
Tile type:	TBC
Tile colour:	TBC
Tile size:	~mm x ~mm
Grout colour:	TBC

Grout width:	~mm
Sealant colour:	TBC

Materials - adhesive and grout

4.2 GROUT

Location:	TBC
Grout type:	TBC
Colour:	Refer to relevant tile selection for grout colour
Grout width:	Refer to relevant tile selection for grout joint width

Accessories

4.3 TILE EDGE TRIMS

Location:	~
Brand/type:	~
Dimensions:	~
Finish/colour:	~

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6221 FLOOR TILING SYSTEMS

1 GENERAL

This section relates to the supply and installation of interior and exterior floor tiling systems.
It includes:

- Tiles
- Tile adhesives and grouts
- All relevant underlays, components and accessories necessary to complete installation

1.1 RELATED WORK

Refer to 6211 WALL TILING for wall tiling systems.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

WMAI	Waterproofing Membrane Association NZ Inc

Documents

1.3 DOCUMENTS

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

NZBC D1/AS1	Access routes
NZBC E2/AS1	External moisture
NZBC E3/AS1	Internal moisture
NZBC E3/AS2	Internal moisture
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
NZS 4121	Design for access and mobility - Buildings and associated facilities
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for grouts
BS EN 12004.1	Adhesives for ceramic tiles. Requirements, assessment and verification of constancy of performance, classification and marking
BS EN 13888.1	Grouts for ceramic tiles. Requirements, classification, designation, marking and labelling.
WMAI	Code of Practice for Internal Wet-area Membranes

Health & Safety at Work Act: 2015

1.4 MANUFACTURER/ SUPPLIER DOCUMENTS

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

Copies of the above literature are available from ~

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

Warranties - tiling

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years:	For ~

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

- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
2 years: For installation of tiling systems

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Warranties - waterproofing

1.7 WARRANTY - MANUFACTURER/SUPPLIER - FOR WATERPROOFING SYSTEMS

Provide a material manufacturer/supplier warranty:
~ years For waterproofing system

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.8 WARRANTY - INSTALLER/APPLICATOR - FOR WATERPROOFING SYSTEMS

Provide an installer/applicator warranty:
5 years: For installation of waterproofing systems

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.9 QUALIFICATIONS - TILING SYSTEMS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.10 QUALIFICATIONS - WATERPROOFING SYSTEMS

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

1.11 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.12 NO SUBSTITUTIONS

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

1.13 HEALTH & SAFETY - SILICA DUST

Comply with Health & Safety at Work Act:2015 and take all necessary precautions as recommended in WorkSafe guidelines for Respirable Crystalline Silica (RCS).

Compliance information

1.14 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer / supplier warranty -waterproofing membrane
- Installer / applicator warranty -waterproofing membrane

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

Performance

1.15 INTERNAL / EXTERNAL MOISTURE - WATERPROOFING SYSTEMS

Wet area membranes under tiled areas to comply with NZBC E2/AS1 for exterior applications, NZBC E3/AS1 & sections 1-4 of WMAI Code of Practice for Code of Practice for Internal Wet-area Membranes as modified by E3/AS2 for interior applications.

Performance - Slip resistance

1.16 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt from testing.

2 PRODUCTS

Materials

2.1 TILES

Refer to SELECTIONS.

Materials - preparation & underlays

2.2 FLOOR LEVELLING COMPOUND

Proprietary floor levelling compound. Refer to SELECTIONS.

Materials - waterproofing

2.3 WATERPROOFING MEMBRANE - INTERIOR

Proprietary interior wet area waterproofing system to AS/NZS 4858. Refer to SELECTIONS.

Materials - adhesive and grout

2.4 TILE ADHESIVE

Tile adhesive to suit particular location/use, and if required primer. To AS ISO 13007.1 and BS EN 12004.1. Refer to SELECTIONS.

2.5 PROPRIETARY GROUT

Proprietary grout to suit particular location/use. To AS ISO 13007.3 and BS EN 13888.1. Refer to SELECTIONS.

Accessories

2.6 MOVEMENT AND EXPANSION JOINTS - RIGID JOINTS

Either, proprietary aluminium/brass with rubber or foam and compound infill, or rigid stabilised PVC sides with flexible central section.
Refer to SELECTIONS.

2.7 MOVEMENT JOINT SEALANT

Neutral cured or acid cured sealant to AS 3958.1, 2.7.5 Sealants. Refer to SELECTIONS.

2.8 TILE EDGE TRIMS

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

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Inspect tiles on delivery to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern and any tiles that are damaged.

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Ensure that the substrate, with the preparation called for in this section, are of the quality necessary to allow tiling of the required standard and that all services and accessories are in place and located to suit the tile layout.

Ensure concrete floors are fully cured and dry. New concrete must have cured for 28 days or more.

If in doubt check for moisture content by hygrometer. Ensure moisture content is:
Concrete 75% relative humidity or less

3.4 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work. Minimise in number of cut tiles and where possible, no cut tiles less than half size and only at the perimeter of the work.

3.5 TEMPERATURE

Unless otherwise specified by selected tiling product manufacturer, do not carry out tiling where the air temperature is below 5°C or substrate temperature is above 40°C.

3.6 EXTERNAL CONDITIONS

Ensure any areas of external tiling, waterproofing, floor levelling, grouting or concrete repair must be protected from hot windy conditions, rain and/or frosts during application.

3.7 LIGHTING

Light the tile work as closely and clearly as possible to that of the finished lighting, to ensure that differences in plane surface are highlighted during installation.

Installation/application

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 GENERALLY

Prepare surface and complete tiling installation in accordance with AS 3958.1 and if required complete interior waterproof membrane installation to sections 1-4 of WMAI Code of Practice for Interior Wet Area Membranes as modified by E3/AS2 or exterior waterproofing to NZBC E2/AS1.

Application - substrate preparation

3.10 PREPARE SUBSTRATES

Prepare backgrounds as described in AS 3958.1, Section 4. All surfaces to be structurally sound, dry, clean and free from movement, dirt, dust, oil, grease, wax and any other loose or contaminating materials. Concrete substrates should also be free of laitance, efflorescence, curing compounds and release agents. Remove any projections or unevenness.

Concrete floor substrates, after any levelling compounds or screeds applied, must be even and true with a maximum variation in accordance with AS 3958.1 Table 4.3:

- For adhesive fixing, thin bed 5mm in every 3 m
- For adhesive fixing, thick bed 10mm in every 3 m
- For mortar cement fixing, 5mm in every 3m

Suitably prepare backgrounds and substrates in accordance with the manufacturer's instructions of the tiling installation products for the relevant substrate type.

3.11 PRIME SUBSTRATES

Surfaces should be primed as per manufacturer's instructions for the selected products and substrate types. Refer to SELECTIONS.

3.12 FLOOR LEVELLING

Ensure all existing surfaces are smooth and level. If levelling is required, prepare for and apply floor levelling compounds to manufacturer’s instructions.

Application - underlays

3.13 INSTALL WATERPROOFING MEMBRANE - INTERIOR WET AREAS

Install waterproofing membrane to manufacturers requirements and in accordance with NZBC E3/AS1 and sections 1-4 of WMAI Code of Practice for Interior Wet Area Membranes as modified by E3/AS2.

3.14 INSPECT & FLOOD TEST - INTERIOR WATERPROOF MEMBRANE

Prior to application of tiling over, visually inspect and flood test waterproof membrane system, in accordance to WMAI Code of Practice for Interior Wet Area Membranes, 4.0.5. Make good any damage that is identified in accordance with waterproof membrane manufacturer/supplier requirements.

Application –tiling

3.15 FITTING TILES

Setting out, cutting and fitting of tiles to be as described in AS 3958.1. If not shown on drawings, confirm set out, bond and pattern before installation.

- Ensure cut edges are smooth and installed without jagged or flaked edges.
- Always use whole tiles or if tiles have to be cut the largest portion of a cut tile possible.
- Maintain the heights of wall tile work in full courses to the nearest dimension.
- Within allowed tolerances, ensure corners of tiles are flush and level with corners of adjacent tiles.
- Keep joint lines, including mitres, straight and of an even width.
- Fully bed trim units, moulded or shaped pieces and other accessories with an appropriate bedding material.
- Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.16 TILE FINISH AND JOINTS

Provide tile finish and joints, including tolerances, as described in AS 3958.1, 5.4.6. Joint widths to be suited to tile and to the manufacturer's instructions.

- Ensure finished surfaces are flat and true to a tolerance of ±4mm in 2 metres from the required plane.
- Lippage between adjacent tiles shall not exceed 2mm and where joint widths are less than 3mm wide lippage shall not exceed 1mm. For tiles ground flat, such as polished tiles, lippage shall not exceed 1.5mm.
- Ensure joint widths are consistent throughout the installation, measured at the tile face.
- Ensure joint alignment is consistent throughout the installation and to a tolerance of ±4mm in 2 metres from the detailed joint alignment.
- Clean surplus bedding material from joint spaces and tile surface.

3.17 ADHESIVE APPLICATION - THIN BED

Apply a thin bed of selected tile adhesive to the adhesive manufacturer's requirements, generally final bed thickness does not exceed 3mm. Install using the following methods:

Notched trowel method

- Adhesive application to be as described in AS 3958.1, 5.6.2(a) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness and rib using notched trowel. Select trowel square notch size to suit tile size and type, to achieve full coverage. Press tile firmly onto substrate and beat into place. Additional back buttering of tiles may also be required, usually required for tiles 400x400mm and larger.

Floating method

- Adhesive application to be as described in AS 3958.1, 5.6.2(b) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness. Apply tiles with a twisting or sliding action and tap back firmly into the floated bedding.

Buttering method

- Adhesive application to be as described in AS 3958.1, 5.6.2(c) and to adhesive manufacturers requirements. Apply adhesive evenly to the back of each tile with a flat edged trowel. Press tile firmly onto substrate and tap into place. This method is not suitable for mosaic tile installation.

Tiles in awkward locations

- The buttering method may be required, or fixing might be necessary to achieve full bedding, even though the notched trowel method is used generally.

Ensure that the whole of the back of the tile is in good contact with the adhesive with no voids. Remove a tile periodically during installation to ensure correct coverage. Do not fix tiles over skinned adhesive

3.18 INSTALL TRIMS

Accurately locate and fully bed edge trim units, dividing strips, moulded or shaped pieces and other accessories with an appropriate bedding material. Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.19 APPLY GROUTING

Remove spacer inserts, prepare joint, apply and finish off grout to the manufacturer's requirements and as described in AS 3958.1, 5.7 Grouting. Ensure grout finish is uniform in colour, smooth and without voids, pinholes or low spots.

Application - movement joints

3.20 FORM MOVEMENT AND EXPANSION JOINTS

Install movement joints in accordance with AS 3958.1, 5.4.5 Movement Joints. Joints to go right through the tile and bed to the background, maintaining any waterproofing.

Joints, except those with reinforced edges, subject to traffic heavier than light pedestrian should not be wider than 10mm. Movement joints to floor to be located at:

- Over existing movement joints
- Intermediate movement joints to be provided to internal floors at approximately 4.5m centres where any floor dimension exceeds 9m or 6m if subjected to direct sunlight.
- Intermediate movement joints to be provided to external floors at approximately 4.5m centres where any floor dimension exceeds 4.5m.
- At perimeter where abutting perimeter walls, columns, curbs and steps. Also, where there is a change of conditions such as under-floor heating, substrate type or tile type.

3.21 MOVEMENT AND EXPANSION JOINTS, INSTALL RIGID JOINTS

Metal or plastic joints, refer to SELECTIONS.

Accurately locate as detailed and fix joints in situ, with the bedding, or on top of the bedding, to finish flush with the installed tile and to the tile manufacturer's requirements. Fit and fix rubber/rubber compound inserts to finish flush.

3.22 MOVEMENT AND EXPANSION JOINTS, INSTALL COMPOUND/SEALANT FILL

Carefully clean out the joint, if required install bond breaker or backing rod to control width/depth ratio, and fill with compound/sealant placed by gun. After the correct interval, finish the surface off smooth, and flush on flat areas or concave in corners, to the compound/sealant manufacturer's requirements.

Cleaning

3.23 CLEAN TILES

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

Completion

3.24 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials - Tiles

4.1 FLOOR TILES

Location:	Refer to drawings
Supplier:	TBC
Tile type:	TBC
Tile colour:	TBC
Tile size:	TBC
Grout width:	TBC
Grout colour:	TBC
Sealant colour:	TBC

Materials - preparation & underlays

Materials - adhesive and grout

4.2 GROUT

Location:	Refer to drawings
Type:	Adrex
Colour:	Refer to relevant tile selection for grout colour
Grout width:	Refer to relevant tile selection for grout joint width

6221A ARDEX TILING SOLUTIONS

1 GENERAL

This section relates to the preparation of floor and wall surfaces for tiling systems with ARDEX Tiling Solutions:

- Acoustic underlays
- Levelling screeds
- Primers
- Undertile heating
- Waterproofing systems
- Adhesives
- Sealants
- Grouts

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:

DTA	DTA 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 D1/AS1	Access routes
NZBC E3/AS1-AS2	Internal moisture
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS/NZS 4671	Steel reinforcing materials

Waterproofing Membrane Association Incorporated (WMAI) - Code of Practice for Internal Wet Area Membrane Systems

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

1.4 MANUFACTURER'S DOCUMENTS

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

ARDEX Tiling Solutions
BRANZ Appraisal 472 - ARDEX Undertile Internal Liquid Waterproofing Membranes
BRANZ Appraisal 473 - ARDEX Undertile External Liquid Waterproofing Membranes
BRANZ Appraisal 727 -ARDEX Undertile Sheet Membrane (WPM 750 and WPM 1000)

DTA New Zealand - Architectural Trims catalogue. Refer to www.dtanz.co.nz

Copies of the above literature are available from ARDEX

Web:	www.ardex.co.nz
Email:	info@ardexnz.com
Telephone:	0800 227339

Warranties - waterproofing

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For materials

- Provide this warranty on the ARDEX standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)

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- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
15 years For 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)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Warranties - tiling

1.7 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
10 years For materials

- Provide this warranty on the ARDEX 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.

1.8 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
5 years For 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)

- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.9 NO SUBSTITUTIONS

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

1.10 QUALIFICATIONS

Waterproofing work to be carried out by an ARDEX approved waterproofing applicator.
Tiling to be carried out by competent workers experienced with the materials and in the techniques specified.

1.11 DEFLECTION CRITERIA FOR SUSPENDED FLOORS

Check that the floor is rigid enough for the tiling. Deflection of suspended floors should not exceed 1/360th of the span under dead load and live load.

1.12 SYSTEMS ARDEX PROJECT

Contact ARDEX with any relevant key dates and for a list of approved applicators. The contractor is to contact ARDEX prior to starting the contract.

Web:	www.ardex.co.nz
Email:	info@ardexnz.com
Telephone:	0800 2 ARDEX (27339)

Performance

1.13 QUALITY ASSURANCE

Follow and complete ARDEX QA documents and submit to ARDEX on completion with request for warranty.

2 PRODUCTS

Materials -

2.1 FLOORING UNDERLAY

Fibre cement, 6mm to 10mm thick sheet of Portland cement, sand, fine cellulose fibre and water, with a smooth finish specifically intended as an underlayment for tiles.

2.2 ARDEX LQ 92

ARDEX LQ 92 is a cement-based underlay for levelling uneven concrete floors prior to tiling. When mixed with water, LQ 92 provides a smooth, pourable, free-flowing and self-smoothing material that can be applied to a thickness of 25mm down to a feather edge.

2.3 ARDEX MULTIPRIME - POROUS SUBSTRATES

ARDEX Multiprime is an internal or external primer suitable for porous substrates. Suitable for concrete, wood and fibre-cement sheet substrates. Alternatively. Contact ARDEX for recommendations.

2.4 ARDEX P9 - NON-POROUS SUBSTRATES

ARDEX P9 is a single-part, water-based primer for non-porous substrates. Contact ARDEX for recommendations.

Materials - Waterproofing

2.5 INTERNAL WATERPROOFING SYSTEM

Refer to SELECTIONS for option.

- ARDEX Superflex WPM 001, is a BRANZ Appraised, pre-mixed liquid waterproofing membrane specifically designed for use under tiles.
- ARDEX WPM 002 is a BRANZ Appraised, two-part liquid waterproofing membrane specifically designed for use under tiles especially in external applications. Suitable for permanent immersion.
- ARDEX WPM 750 is a BRANZ Appraised sheet waterproofing membrane for internal use under tiles.
- ARDEX WPM 155 is a BRANZ Appraised, rapid-drying, liquid waterproofing membrane for internal or external use.

Materials - Tile adhesives

2.6 ARDEX X 18

A superior, white polymer-fortified, cement-based wall and floor tile adhesive that has been specially formulated with mastic type properties. ARDEX X 18 is suitable for use with a wide range of substrates and tile types including permanent immersion and swimming pools.

2.7 ARDEX X 77

High performance, fibre reinforced, polymer modified floor and wall adhesive with Microtec Technology to give exceptional properties of adhesion. Suitable for use with natural stone, ceramic, porcelain and large format tiles and swimming pools.

Materials - Sealants - grouts

2.8 ARDEX SEALANTS

ARDEX SE acetic cure silicone is ideal for movement joints within a tiling system.
ARDEX ST neutral cure silicone is ideal for bond breakers or movement joints within a tiling system.
Sealants and back-up materials as described in clause 2.7 of AS 3958.1 and clause 2.6 of AS 3740.
Colours match some grout colours

2.9 ARDEX GROUTS

ARDEX FG 8 cement-based grout for joints 1mm to 8mm wide. Ideal for wet areas when mixed with ARDEX Grout Booster additive.
ARDEX FS DD cement-based, fine sanded grout for joints 1mm - 4mm.
ARDEX EG 15 epoxy grout with excellent stain and chemical resistance for joints 1.5mm to 15mm wide.

2.10 ARDEX GROUT BOOSTER

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A water-based, synthetic polymer grout additive formulated for use with cement-based grouts for improved adhesion strength, flexibility and abrasion resistance.

Components

2.11 EXPANSION JOINT, METAL AND RUBBER

DTA expansion joints available in Aluminium, Brass and Stainless Steel with either a polyurethane or Neoprene insert. All come in a large range of sizes and should be selected based on the flooring material used. The standard widths of expansion joint are 6mm and 10mm, larger custom sizes can be made to suit the requirements of each job.

3 EXECUTION

General

3.1 HANDLING AND STORAGE

Take delivery of packets of tiles undamaged and dry. Handle tiles with care to avoid chipping, soiling and damage. Store on hard level standings in non-traffic, non-work areas that are enclosed, clean and dry.

3.2 CHECK TILES

Check tiles to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern. Reject tiles that are damaged.

3.3 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.

3.4 SETTING OUT

Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.

3.5 PREPARATION OF BACKGROUNDS

Prepare backgrounds in accordance with AS 3958.1, section 4 and to the manufacturer's instructions for the selected substrate. See also the ARDEX Flooring manual by visiting www.ardex.co.nz/

Conditions

3.6 SERVICES AND ACCESSORIES

Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.

3.7 DO NOT START

Do not start laying tiles until concrete floors are cured, moisture content of floors is such that shrinkage is complete, thermal movement has been accommodated and the levels and surface finish will allow for tile laying of the required standard.

3.8 SUBSTRATE TEMPERATURE

Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.

3.9 MOISTURE CONTENT

Ensure the floor is dry and if in doubt check for moisture content by hygrometer. Do not proceed with tiling work until readings for the whole area show 75% relative humidity or less. Alternatively, see ARDEX moisture barriers.

Application

3.10 APPLICATION GENERALLY

Prepare backgrounds as described in AS 3958.1, Section 4. Suitably prepare backgrounds and substrates to the manufacturer's instructions to receive the bedded finish. Remove all dirt, dust, grease, oil, loose particles and any other form of contamination or deleterious material. Ensure that substrates are sound and dry.

Installation to be in accordance with AS 3958.1, Section 5, including setting out, fitting, movement joints, sealants, tile finish and joints, and grouting.

3.11 BACKGROUND MATERIALS

Ensure that the installation of background materials and substrate materials meets relevant standards and the manufacturer's instructions. Inspect background and substrate materials for any conditions unsuitable for tiling over. Do not commence work until the affected area is rectified. Confirm any specific preparation required for the adhesive being used.

3.12 FLOORING UNDERLAY

Underlay material: CFC sheet 6mm to 10mm

Locations:	In internal locations apply underlay over the following flooring backgrounds subject to movement - strip timber flooring (T&G); particleboard sheet flooring.
Installation:	Supply and install CFC to the manufacturer's recommendations.

Waterproofing

3.13 WET AREA WATERPROOFING

Provide waterproofing to wet areas in accordance with NZBC E3/AS1-AS2 and WMAI - Code of Practice for Internal Wet Area Membrane Systems

Material:	Refer to SELECTIONS
Installation:	Supply and install waterproofing membrane to the manufacturer's recommendations by an approved ARDEX installer.

Tiling

3.14 ADHESIVE APPLICATION METHODS

Ensure that the whole of the back of the tile is in good contact with the adhesive with no voids. Remove a tile periodically during installation to ensure correct coverage. Do not fix tiles over skinned adhesive.

Notched trowel method

- Adhesive application to be as described in AS 3958.1, clause 5.6.2(a). Notched trowel sizes shall be 4.5mm x 4.5mm x 4.5mm (mosaics) 6mm x 6mm x 6mm, 10mm x 10mm x 10mm, 12mm x 12mm x 12mm. Use an appropriately notched trowel to achieve full coverage.

Buttering method

- Adhesive application to be as described in AS 3958.1, Clause 5.6.2(c).

Tiles in awkward locations

- The buttering method may be required, or fixing might be necessary to achieve full bedding, even though the notched trowel method is used generally.

3.15 SETTING OUT

Setting out, cutting and fitting of tiles to be as described in AS 3958.1, clauses 5.4.2 and 5.4.3. Set out tiling as shown on the drawings. Confirm bond and pattern before installing. Provide even and correct falls to floor tiles where required, including falls to floor wastes. Ensure that a level finish is provided at wall lines. Where falls are not required ensure that the tiles are laid level.

3.16 TILE FINISH AND JOINTS

Provide tile finish and joints, including tolerances, as described in AS 3958.1, clause 5.4.6. Joint widths to be suited to tile and to the manufacturer's instructions.

3.17 MOVEMENT JOINTS

Provide movement joints as described in AS 3958.1, clause 5.4.5 and AS 3740, clause 3.13.7.

Depth:	Movement joints to go right through the tile and bed to the background.
Width:	Minimum 6mm.

Corner locations:	In wall tiling at internal vertical corners; in floor tiling at walls, columns, nibs, hobs and similar.
Interruptions:	Around sanitary fixtures, around fixtures interrupting the tile surface; at junctions with joinery fixtures, including window and door frames and built in cupboards; at changes in substrate or background.
Large areas:	In floor tiling provide joints at not less than 4.5 metres spacing in both directions and 3.5 metres externally. In wall tiling provide vertical joints at not less than 3.5 metres spacing along the length of a wall. In wall tiling, provide horizontal joints at each storey rise in the height of a wall. Over all existing expansion joints.

3.18 GROUTING

Grout tiling to AS 3958.1, clause 5.7.

3.19 SILICONE

Apply ARDEX SE acetic cure or ARDEX ST neutral cure silicone to movement joints between tiles, and at junctions to tiled walls and tiled floors. The silicone should only be fixed to two surfaces to allow movement. On flat joints use a polyethylene tape or release agent and on floor to wall joints greater than 10mm deep use a backing rod.

Completion

3.20 REPLACE

Replace damaged tiles or elements.

3.21 CLEANING

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

3.22 LEAVE

Leave work to the standard required by following procedures.

3.23 REMOVE

Remove debris, unused materials and elements from the site.

3.24 PROTECT TILES

Protect tiles from damage. Ensure tiles are not disturbed by foot traffic for at least 24 hours after laying and after grouting. Provide protection to tiles by laying sheet material such as insulating board for the period between completion of laying and completion of the contract works.

4 SELECTIONS

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

Underlays

Tile Selections

4.1 TILES

Location:	Refer to drawings
Supplier:	TBC
Type:	TBC
Pattern/number:	CE. SI
Colour:	tbc
Edging:	tbc

ARDEX system - residential floors & walls

4.2 ARDEX SYSTEM - FOR CERAMIC OR PORCELAIN TILES

Substrate Walls	Plasterboard
Primer:	ARDEX Multiprime
Levelling:	ARDEX LQ 92
Tile adhesive floor:	ARDEX X 18

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Tile adhesive wall:	ARDEX X 18
Grout:	TBC
Grout colour:	TBC
Silicone:	ARDEX SE
Silicone colour:	TBC

4.3 ARDEX SYSTEM - FOR LARGE FORMAT TILES

Substrate Walls	Plasterboard
Primer:	Ardex P 51
Levelling:	ARDEX LQ 92
Tile adhesive floor:	Ardex X 56
Tile adhesive wall:	Ardex X 56
Grout:	TBC
Grout colour:	TBC
Silicone:	ARDEX SE
Silicone colour:	TBC

4.4 ARDEX SYSTEM - WATERPROOFING

Waterproofing:	ARDEX WPM 155

Spares & maintenance products

6311 TIMBER STRIP, BLOCK & PLANK FLOORING

1 GENERAL

This section relates to the supply, laying and finishing of timber flooring as an overlay, including underlays over the existing substrate.
It includes:

- laminated timber
- solid timber

1.1 RELATED WORK

Refer to ~ for ~.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:
~

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire
NZBC C/VM2	Protection from fire
NZBC D1/AS1	Access routes
AS/NZS 1859.4	Reconstituted wood-based panels - Specifications - Wet-processed fibreboard
AS/NZS 1860.1	Particleboard flooring - Specifications
AS/NZS 2269.0	Plywood - Structural - Specifications

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Manufacturer/supplier contact details

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

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years:	For ~

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 years:	For ~

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

Performance

1.9 TESTING MOISTURE CONTENT

Sample and test the substrate to ensure that moisture content is within the limits specified. Provide a written record.

1.10 SURFACE FIRE PERFORMANCE

Flooring to be non-combustible or have a Critical Radiant Flux to NZBC C/AS2, Table 4.5. Refer to SELECTIONS.

2 PRODUCTS

Materials

2.1 TIMBER STRIP, BLOCK AND PLANK FLOORING

Refer to SELECTIONS for product selection.

2.2 TIMBER TRIM

Skirting, edge strip, reducer strip and nosing as detailed and to match overlay flooring.

Accessories

2.3 EXPANSION STRIPS

Coloured silicone flexible expansion sealant.

2.4 EXPANSION COVERS

Selected expansion covers as supplied.

2.5 ADHESIVE, DIRECT STICK

As required by the overlay flooring supplier and as not to cause cupping or curling of timber through moisture absorption from the adhesive.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Accept packs of timber and accessories undamaged and dry. Store on level, dry surfaces in non-traffic, non-work areas that are enclosed and dry. Avoid damage to timber.

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Check for moisture content by hygrometer. Do not commence laying flooring until readings for the whole area are within acceptable levels as follows:

Moisture content:	Timber substrate - 8 -12% for air conditioned buildings - 10 -14% for intermittently heated buildings - 12 -16% for unheated buildings
	Concrete substrate 60-70%RH

3.4 BEFORE COMMENCING WORK

Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, and in the case of air-conditioned buildings the air-conditioning operating for 6 weeks, before starting work.

3.5 PREPARATION

Check that the timber supplied is as specified, of a consistent colour and grain and sufficient to complete the work. Reject timber that varies widely in colour or grain. Reject timber that is damaged. Check the moisture content of the timber to ensure it is at the required level for the installation environment.

Check laminated strip and plank flooring to ensure it has been supplied at the moisture content recommended by the suppliers for the proposed location. Do not remove planks from packs until just prior to installation.

3.6 CARRY OUT THE WORK

Carry out the work to conform with this specification and in accordance with the timber floor supplier's technical requirements.

3.7 PROTECTION

Protect adjoining work surfaces and finishes during the installation.

3.8 LAYOUT

Before beginning the installation, confirm the proposed layout of the timber, grain direction, any other visual considerations of the finished work and specified expansion requirements relating to the specified product. Minimise in number with no cut planks less than half width and only at the perimeter of the work.

3.9 SURFACE TOLERANCES, DIRECT STICK

Substrate to have no deviations greater than 3mm over a 3 metre straightedge in any given direction and no abrupt variations greater than 1mm over 250mm.

Application - general

3.10 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - surface preparation - new

3.11 PREPARATION, NEW PLYWOOD OR PARTICLEBOARD

Clear substrate of debris, machine sand to make level, then vacuum to remove dust. Refer to allowable surface tolerances.

Application - installation

3.12 LAYING, DIRECT STICK

Apply adhesive approved by the flooring supplier, at the required spread rate. Follow requirements for open time, taking note of substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using approved techniques. Install the flooring strictly in accordance with the flooring supplier's stated requirements. Ensure the required expansion gap is left at perimeters and around fixed obstacles.

3.13 EXPANSION GAPS, PERIMETERS

Calculate expansion gaps strictly to manufacturer's requirements, to suit the environment, size of the installation and product type.

3.14 EXPANSION STRIPS

Apply coloured silicone flexible expansion sealant supplied by the flooring manufacturer to match the dimensions of the expansion gap flush with the finished flooring. Apply to flooring manufacturer's directions.

3.15 EXPANSION COVERS

Cover expansion joints using matching expansion joint covers supplied by flooring manufacturer.

Finishing

3.16 SURFACE FINISHING, UNFINISHED FLOORS

Allow the adhesive to cure fully and then finish the timber surface with five fine sandings.

3.17 CLEAN TIMBER FLOORING

Leave timber flooring surfaces free of adhesive, dirt and debris. Vacuum off, damp mop with a low-foam neutral detergent and allow to dry.

Completion

3.18 PROTECTION

Provide the following temporary protection of the finished work:
~

3.19 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 TIMBER TONGUE AND GROOVE FLOORING

Location:	Refer drawings
Brand:	Client selection
Species:	tbc
Size:	~mm x ~mm
Thickness:	~mm
Finish:	tbc
Moisture content:	tbc

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

1.1 RELATED WORK

Refer to ~ for ~

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire
AS/NZS 2270	Plywood and blockboard for interior use
AS/NZS 2455.1	Textile floor coverings - Installation practice - General

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Manufacturer/supplier contact details

Company:	Godfrey Hirst
Web:	https://www.ghcommercial.com/nz
Email:	~
Telephone:	~

Warranties

1.4 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.

1.5 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

1.6 QUALIFICATIONS

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.

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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.

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 Guide to tolerances, materials and workmanship in new residential construction.

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 LAYING TO STAIRS

Install on stairs in accordance with AS/NZS 2455.1.

3.16 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

3.17 PROTECTION

Provide temporary protection of the finished work.

3.18 SPECIAL PROTECTION

Provide Self Adhesive carpet protective film during finishes installation.

3.19 COMPLETION MATTERS

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

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4 SELECTIONS

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

Materials

4.1 UNDERLAY

Location	Brand	Type/thickness/weight
Refer to Floor Finish plans	tbc	

4.2 CARPET

Location	Brand/type/weight/code	Installation method
Refer to Floor Finish plans	tbc	

6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 RELATED WORK

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.
Refer to 6721 PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

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

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire
AS/NZS 2311	Guide to the painting of buildings
AS/NZS 2312.1	Guide to the protection of structural steel against exterior atmospheric corrosion by the use of protective coatings - Paint Coatings
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 9001	Quality management systems - requirements
SNZ TS 3404	Durability requirements for steel structures and components
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Guidelines for the management of lead-based paint
MPNZA	Specification manual
MPNZA	Health and Safety Programme

Health and Safety at Work Act 2015

1.4 MANUFACTURER'S DOCUMENTS

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

Copies of the above literature are available from ~

Web:	~
Email:	~
Telephone:	~

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS

Painters to be a member of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.

1.7 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

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Refer to WorkSafe: Guidelines for the management of lead-based paint for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

1.8 MATERIAL SAFETY DATA SHEET

Obtain from each paint manufacturer the material safety sheet for each product used. Keep sheets on site and comply with the required safety procedures.

Warranties

1.9 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

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

Performance

1.10 MANUFACTURER'S INSPECTION

Allow the paint manufacturers to inspect the work in progress and to take samples of their products from site if requested.

1.11 INSPECTION OF WORK

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

2 PRODUCTS

Materials

2.1 PAINT TYPES

Use the manufacturer's complete system and only the products specified.

2.2 MATERIALS GENERALLY

Use only the Manufacturer's products which are guaranteed for their consistency and performance under AS/NZS ISO 9001 and APAS approval, prepared, mixed and applied as directed in the Manufacturer's specification sheets, specification manuals and product data sheets.

2.3 THINNERS AND ADDITIVES

Only use thinners or additives within the stated limits for the particular situations specified.

Accessories

2.4 FILLERS

For recommendations on; fillers, stopping, paint strippers, cleaning agents, etching solutions, mould inhibitors, rust inhibitors, knotting and other commodities used for the surface preparation, refer to the manufacturer of the specified coating.

3 EXECUTION

Conditions

3.1 EXECUTION

To conform to manufacturer's requirements and those methods, practices and techniques contained in AS/NZS 2311, the MPNZA Specification manual, and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry.

3.2 PREPARE

Prepare surfaces to the coating manufacturer's requirements.

3.3 COATED SURFACES

Ensure that substrate surfaces are able to achieve the specified finish.

3.4 PRE-PRIMED SURFACES

Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.

3.5 BRUSH DOWN

Brush down surfaces immediately before application, to remove dust, dirt and loose material.

3.6 COMPATIBILITY

Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.

3.7 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.

3.8 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.

3.9 ANCILLARY SURFACES

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

3.10 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

3.11 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

Preparation - unpainted and pre-primed timber and wood based products

3.12 MOISTURE CONTENT

Ensure moisture content at the time of application is near to the equilibrium moisture content pertaining to the particular locality in which the timber is used, without any excessive moisture content gradient between core and surface.

3.13 PREPARING DRESSED TIMBER

Ensure dressed timber is smooth, free from raised or woolly grain, planing burrs or other machining defects. Slightly round or ease sharp edges to ensure they can be properly coated. Sand timber to bring up to a smooth finish along the direction of the grain. Sand timber back to new condition timber that has been weathered.

3.14 PREPARING ROUGH SAWN TIMBER

Thoroughly brush along the direction of the grain to remove dust and dirt.

3.15 PREPARING PRE-PRIMED TIMBER

Check pre-prime coat for damage, powdering, weathering or loss of adhesion. Where primer is sound, thoroughly brush along the direction of the grain to remove dust and dirt. If there is doubt, sand back and re-prime.

3.16 TIMBER SPECIES

Check that the preparation and paint system is suitable for the timber species.

3.17 PREPARING DAMAGE AND DEFECTS

Scrape clean loose or soft material holes, depressions, resin or gum pockets, knot holes, surface splits, checks, or any localised decay. Apply primer and/or sealer specified and fill these areas with linseed oil putty or other appropriate filler.

3.18 FIXINGS

Take timber fixings below the painted or clear finished surface. Leave corrosion resistant timber fixings flush with clear finished surfaces.

3.19 CLEANING

Remove grease and oil by wiping down with solvent or water-based degreasing agent. Remove resin by wiping down with solvent or water-based degreasing agent or heating and scraping. Remove sanding dust. Bad staining may be untreatable and require replacement of timber, discuss with paint manufacturer and main contractor.

Preparation - unpainted metal

3.20 PREPARING STEEL

All steel to AS/NZS 2312.1 and structural steel also to SNZ TS 3404.
Remove loose rust and mill scale by hand-tool or power-tool cleaning. Remove more adherent rust and scale by abrasive blast cleaning or pickling. Use chemical pre-treatment to remove the last traces of rust and to inhibit rust formation.

3.21 PREPARING ZINC AND ALUMINIUM-ZINC ALLOY COATED STEEL

Remove grease, oil and other solvent soluble contaminants by wiping and/or brushing with mineral turpentine or white spirit. Wipe with a clean solvent. Allow to dry and proceed immediately with the next operation.

3.22 PREPARING ALUMINIUM

Remove grease, oil and dust by wiping and/or brushing with mineral turpentine or white spirit. Wash thoroughly using water with a few drops of detergent, then wash with clean water. Allow to dry and proceed immediately with the next operation.

Preparation - unpainted linings

3.23 PREPARING FIBROUS PLASTER

Check for and remove release agents and other contaminants by washing with clean water or solvent and allow to dry. Fill cracks and surface imperfections with patching plaster and lightly sand smooth. Remove dust.

3.24 PREPARING PLASTERBOARD

Check that joints are prepared to a smooth level surface finish. Fill cracks and surface imperfections with the sheet manufacturer's required stopping compound and lightly sand smooth. Remove dust.

Preparation - painted surfaces generally

3.25 SURFACE PREPARATION

Refer to the Manufacturer's specification sheets and product data sheets. Carry out the preparatory work required by them for each of the substrates.

For interior surfaces such as paper faced plasterboard use the Manufacturer's recommended finishing compound as an aid to achieving a Level 5 finish.

3.26 MOULD

Sterilise surface mould by washing or sponging the whole surface with a one part sodium hypochlorite household bleach to three parts clean water solution. Allow bleach to act for 30 minutes and wash off with clean water. Wash cloths and sponges regularly in clean water. Reapplication may be necessary. Treat with anti-mould solution to the treatment manufacturer's requirements.

3.27 GAP FILLING

Fill cracks, holes, indented and damaged surfaces with putty, plaster filler, wood filler, or plastic wood, as appropriate and in accordance with the paint manufacturer's requirements. Allow to dry or set before sanding back level with the surface. Prime coat or seal the timber before using putty. Wet cement or gypsum base plasters before applying filler. Use only Portland cement base types, or water-insoluble organic-based gap fillers in exterior or wet areas.

Application - before applying final coatings

3.28 OFF-SITE WORK

Carry out off-site preparation and coating under cover, in a suitable environment and with adequate lighting. Store items both before and after coating in a clean, dry area, protected from the weather and mechanical damage, properly stacked and spaced to permit air circulation and to prevent sticking of surfaces.

3.29 PRIMING JOINERY

Before priming preservative treated timber ensure that any cut surfaces have been retreated. Liberally coat end grain, allow to soak in and then recoat. Ensure LOSP. treated joinery has dried sufficiently to lose odour.

3.30 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

3.31 CONCEALED METAL SURFACES

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

3.32 DOORS

Prime or seal and paint all six faces of doors before hanging.

3.33 BEAD GLAZING

Before glazing apply the first two coats, or the primer and one undercoat, to rebates of stained, varnished or painted joinery and beads.

3.34 PUTTY GLAZING

Follow putty manufacturers recommendations for application, drying, and painting. Ensure that the putty is fully protected by the coating system as soon as it is sufficiently hard.

Application - generally

3.35 PAINTING GENERALLY

Comply with the paint manufacturer's requirements and any additional requirements in this specification.

3.36 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

3.37 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- warm dry days without frost or heavy dews
- avoid painting in direct sunlight any surfaces that absorb heat excessively
- as far as possible apply paint in the temperature range 15°C to 25°C
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

3.38 SEQUENCE OF OPERATIONS

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Painting work to generally follow the following sequences:

- back painting and pre-installation painting, then post-installation exposed-face painting
- complete surface preparation before commencing painting
- apply paint in the specified sequence using the specified paint
- allow full drying time between coats to the paint manufacturer's requirements
- do not expose primers, undercoats and intermediate coats beyond manufacturers stated instructions before applying the next coat
- finish broad areas before painting trim
- ensure batch numbers of tins are matched for whole areas
- internally, paint ceilings before walls and walls before joinery, trim and other items

3.39 PAINT APPLICATIONS

Select brush, roller, or pad and apply paint to the requirements of the paint manufacturer and to obtain a smooth even coating of correct thickness, uniform gloss and colour.

3.40 DRYING TIME

Before handling or applying the next coat of paint, give each coat the full drying time as required by the paint manufacturer. Ensure that surfaces are dry and that condensation does not occur before the paint reaches surface-dry condition.

3.41 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Remove dust immediately before applying the next coat.

3.42 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the paint system specified.

3.43 EACH COAT

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

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

Completion

3.44 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at completion of the building works. Clean glass inside and out to a shining finish.

3.45 CLEAN EQUIPMENT

Use the Manufacturer's environmental wash system for the cleaning of water-based paint and plasters from brushes, rollers, plastering or spray equipment to separate the solids from the water component for safe disposal.

3.46 LEAVE

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

3.47 REMOVE

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

3.48 REPLACE HARDWARE

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

4 SELECTIONS

4.1 SELECTIONS

Refer to 6711 PAINTING EXTERIOR and 6721 PAINTING INTERIOR for selections.

6711 PAINTING EXTERIOR

1 GENERAL

This section relates to the preparation of exterior unpainted and pre-painted surfaces, and the application of exterior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.
Refer to 6721 PAINTING INTERIOR for interior paint systems.

Documents

1.2 MANUFACTURER'S DOCUMENTS

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

Copies of the above literature are available from ~
Web: ~
Email: ~
Telephone: ~
Facsimile: ~

Warranties

1.3 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

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

2 PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3 EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4 SELECTIONS

4.1 INSPECTION OF WORK

Stage	Coating system
~	

4.2 BACK PAINTING SCHEDULE

Paint 2 coats (including any pre-prime) to match exposed face coating.

Cladding type	Extent of back painting
~	~

Paint systems

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4.3 TIMBER / WEATHERBOARD - PAINT

Brand:	TBC by Client
Coating type:	Type, Preparation and coating requirements as per manufacturers requirements for subs

4.4 CONCRETE / FIBRE CEMENT / CEMENT PLASTER

Brand:	TBC by Client
Coating type:	Type, Preparation and coating requirements as per manufacturers requirements for subs

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6721 PAINTING INTERIOR

1 GENERAL

This section relates to the preparation of interior unpainted and pre-painted surfaces, and the application of interior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.
Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Documents

1.2 MANUFACTURER'S DOCUMENTS

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

Copies of the above literature are available from ~
Web: ~
Email: ~
Telephone: ~
Facsimile: ~

Warranties

1.3 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

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

2 PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3 EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4 SELECTIONS

4.1 INSPECTION OF WORK

Stage	Coating system
~	

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
~	~

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Paint systems

4.3 PLASTERBOARD

Brand:	TBC by Client
Coating type:	Type, Preparation and coating requirements as per manufacturers requirements for substrate and location

4.4 PLASTERBOARD - WET AREA

Brand:	TBC by Client
Coating type:	Type, Preparation and coating requirements as per manufacturers requirements for substrate and location

4.5 TIMBER SLATS / DOORS / FRAMES - PAINT

Brand:	TBC by Client
Coating type:	Type, Preparation and coating requirements as per manufacturers requirements for subs

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6746D DULUX POWDER & INDUSTRIAL COATINGS

1 GENERAL

This section relates to the preparation of surfaces, and the application of Dulux® powder coatings.

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.

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 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS 1627.2	Metal finishing - Preparation and pretreatment of surfaces - Power tool cleaning
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Abrasive blast cleaning
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications of aluminium and aluminium alloys.
AS 4506	Metal finishing - Thermoset powder coatings
AS/NZS ISO 9001	Quality management systems - Requirements
WorkSafe	Working Safely with Hazardous Substances (hazardous substances toolbox) www.hazardoussubstances.govt.nz/

Window & Glass Association NZ (WGANZ) documents:

PQAS	Powder Coating Quality Assurance System

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:
Dulux specification sheets and product data sheets

Copies of relevant literature are available from Dulux

Company:	Duluxgroup (New Zealand) Pty Ltd
Web:	www.duluxpowders.co.nz
Email:	powders.advice@dulux.co.nz
Telephone:	0800 800 975

Warranties

1.5 WARRANTY

Provide warranty for:

Top coat:	Alumi Shield™ Warranty:	Steel Shield™ Warranty
~	~	~

- 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

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Dulux powder coating product or associated accessories.

1.7 QUALIFICATIONS

To obtain warranties, applicator must be Dulux Accredited Powder Coater.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide Dulux powder coating manufacturer's maintenance instructions for the owner including frequency of cleaning.

Refer to Dulux DuSpec specification sheets and product data sheets for details or go to: www.duluxpowdercoatings.co.nz/information/care-maintenance/

Performance

1.9 QUALITY ASSURANCE

Maintain quality assurance programmes to AS/NZS ISO 9001 or other industry recognised quality procedures for powder coating and other specialist coatings as necessary to ensure that work is performed in accordance with this specification and the qualifying requirements of the contract documents.

1.10 HEALTH AND SAFETY

To accord with WorkSafe, particularly the Hazardous Substances Toolbox www.hazardoussubstances.govt.nz/

1.11 MATERIAL SAFETY DATA SHEETS

Visit www.duluxpowders.co.nz/datasheets-safety-data-sheets or telephone **Dulux Powder Coatings** (0800 800 975) for the material safety data sheets for every applicable product and comply with the safety procedures listed. Keep sheets on the site.

1.12 SAMPLES

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

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

1.13 CERTIFY COATINGS

Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to AS/NZS 1580.108.1

1.14 DULUX INSPECTION

Permit representatives of Dulux to inspect the work in progress and take samples of their products from site if requested.

2 PRODUCTS

Materials

2.1 POWDER COATING

Single coat polyester based powder coating for use on interior or exterior architectural aluminium products. Refer to SELECTIONS for system and colour.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-COATING/FINISHING REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for specified finish. Carry out such additional preparatory work as required to bring the substrate to suitable condition.

Preparation - generally

3.4 GENERALLY

Powder coat articles to AS 3715, AS 4506 and WGANZ PQAS for powder coatings on architectural aluminium, mild steel and galvanized steel products as specified by powder coating manufacturer.

3.5 SURFACE PREPARATION

Remove all foreign matter from metal surface to be powder coated. Remove scale, grease, cutting oil, welding splatter, grind off burrs, welding slag and sharp arises and all other defects that could affect appearance as specified by powder coating manufacturer.

Preparation - aluminium

3.6 SURFACE PRE-TREATMENT

Condition the surface to render it suitable for the selected coating to be applied. This pre-treatment should impart uniformity throughout all treated workpiece surfaces, irrespective of the source of the metal or the contaminants that might adhere.

Priming

3.7 PRIMING GENERALLY

Ensure substrate is clean and pre-treated to manufacturer's recommendations prior to priming commencing. Apply the relevant Dulux primer(s) as a system with Dulux polyester topcoat. Carefully prepare the steel or aluminium surface and apply Dulux primer to manufacturer's instructions.

Application - coating metals

3.8 APPLY DULUX POWDER COATING

Apply Dulux powder coatings to the recommended average thickness specified for the selected powder coating on architectural aluminium, mild steel and galvanized steel products.

3.9 REPAIR WORK

In situ repair work of powder coated aluminium or steel is only permitted after receiving written authority. All repair work to Dulux manufacturer's recommendations.

Completion

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

Exterior Powder coating - C4 High corrosion zone

4.1 DULUX POWDER COATING - EXTERIOR ALUMINIUM, C4 HIGH CORROSION ZONE

Environment:	Exterior - C4 High corrosion zone
Project type:	Residential <4 levels

Substrate:	Aluminium
Primer:	~
Top coat:	Dulux Duratec Zeus
Colour range:	Solid colour range
Colour:	Ebony
Finish:	Matt
DuSpec number:	NZPO00345

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 7151 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 B2/AS1	Durability
NZBC C/AS1-AS2	Protection from fire
NZBC G4/AS1	Ventilation
NZBC G12/VM1	Water supplies
NZBC G12/AS1	Water supplies
NZBC H1/AS1-AS2	Energy Efficiency
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
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 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: 2018	Plumbing and drainage - Water services
AS/NZS 3500.4: 2018	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation
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 4607	Installation of thermal storage electric water heaters: valve vented Systems
NZS 4617	Tempering (3-port mixing) valves
AS/NZS 5601.1	Gas installations - general installations
DIN 8077	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - Dimensions
DIN 8078	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - General quality requirements and testing.
Gas (Safety and Measurement) Regulations 2010	
Plumbers, Gasfitters and Drainlayers Act 2006	
NZ Backflow Testing Standard:	NZ Backflow Testing Standard 2011, Field testing of backflow prevention devices and verification of air gaps

1.3 MANUFACTURER DOCUMENTS

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

Copies of the above literature are available from ~

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

Warranties

1.4 WARRANTY

Provide warranty for:
2 years: For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.5 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.6 PIPEWORK LAYOUTS

~

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

1.8 HOT WATER TEMPERATURES

To NZBC G12/AS1, 6.14

Storage water heaters to store water at not less than 60ºC.

Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed:

- 45ºC - for early child hood centres, schools, elderly facilities, hospitals, psychiatric or disabled institutions.
- 55ºC - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

Performance

1.9 TESTING - TO NZBC G12/AS1

Test to NZBC G12/AS1, 7.5, **Watertightness**, for hot and cold water.

- Test to a pressure of 1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

2 PRODUCTS

Materials

2.1 COPPER PIPE

To NZS 3501 complete with copper-alloy compression fittings or crox type joints and seal ring compression joints complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to NZBC B2/AS1, Table 1 and NZBC G12/AS1, Table 1.

2.2 POLYBUTYLENE PIPE

Polybutylene tubing to AS/NZS 2642.1, AS/NZS 2642.2 and AS/NZS 2642.3 complete with fittings and accessories brand-matched with durability to NZBC B2/AS1, table 1 and NZBC G12/AS1, table1. Protect from sunlight.

2.3 POLYETHYLENE PIPE

To AS/NZS 4130 Series 1 complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to NZBC B2/AS1, table 1 and NZBC G12/ AS1, table 1. Except for solid black PE, protect from sunlight.

2.4 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, and table 2, Selection of Backflow Protection.

2.5 TEMPERING VALVE

Tempering valve to NZS 4617 to NZBC G12/AS1.

Materials - Hot water heating appliances

2.6 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305, ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.

Components

2.7 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZBC H1/AS1-AS2 and AS/NZS 3500.4.

2.8 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/VM1 or NZBC G12/AS1.

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

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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 NZBC G12/VM1 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing

3.10 JOINTING COPPER PIPE

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to NZBC G12/AS1.

3.11 JOINTING POLYBUTYLENE PIPE

Aluminium clamped, seal ring compression or push fit "O" ring seal jointing to pipe system manufacturer's requirements.

3.12 JOINTING POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to NZBC G12/AS1.

Application - Pipework installation

3.13 WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1.

3.14 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

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 NZBC G12/VM1 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.15 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to NZBC G12/VM1 or NZBC G12/AS1, table 7 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 NZBC G12/VM1 or NZBC G12/AS1.

3.16 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) to NZBC G12/AS1, 9.0.

3.17 IN-LINE FILTER

Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

3.18 PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Application - Hot water systems

3.19 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation. Valve-vented systems to NZS 4607.

3.20 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation.

3.21 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to NZBC H1/AS1-AS2 Energy Efficiency, 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.

3.22 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. Valve-vented systems to NZS 4607.

3.23 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.24 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

Installation - valves

3.25 INSTALLING BELOW GROUND ISOLATING VALVE

Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

3.26 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED

Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

3.27 INSTALLING BACKFLOW PREVENTION DEVICE

Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or NZ Backflow Testing Standard.

Completion

3.28 LABEL

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.29 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.30 REPLACE

Replace damaged or marked elements.

3.31 LEAVE

Leave work to the standard required by following procedures.

3.32 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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4.1 SELECTIONS

Refer manufacturers documentation, Pipeline documentation and plumbing & drainage plans / schematics for selections

Hot water systems

4.2 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

Brand:	Rheem, 31218015. Mains Pressure
Model size:	180L, 488x1720H, kW, Side entry. Tray - KOHCTRAY540

Valves and accessories

4.3 APPLIANCE ISOLATING VALVES - EXPOSED

Appliance:	Washing machine
Brand/type:	Refer to tapware selections

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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 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:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
Gutter	In this section includes spouting

Documents

1.3 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/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

1.5 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.

1.6 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.

Requirements

1.7 NO SUBSTITUTIONS

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

1.8 QUALIFICATIONS

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

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

Performance

1.10 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.

1.11 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.

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.

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 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.

3.7 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.

Completion

3.8 REPLACE

Replace damaged or marked elements.

3.9 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 METALCRAFT ROOFING GUTTER SYSTEMS

Profile:	125 Quarter Round gutter and Half Round gutter, refer drawings
Base material:	steel
BMT:	0.55mm
Coating system:	COLORSTEEL® Maxam™
Colour:	Ebony

7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrical automation
- security system
- complete with componentry
- electrically-powered fittings
- fire rated sealers, liners and accessories

1.1 RELATED WORK

Refer to ~ for ~.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.
The following abbreviations apply specifically to this section:

AFDD	Arc Fault Detection Device
ELV	Extra Low Voltage
GLS	general lighting service
IP	international (ingress) protection classification
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
SIA	security integration architecture
TPS	tough plastic sheathed
TCF	Telecommunications Carriers' Forum

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC F6/AS1	Visibility in escape routes
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1:2005	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)

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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
NZS 4514	Interconnected smoke alarms for houses
NZS 4246	Energy Efficiency - Installing bulking thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 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 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61643	Components for low voltage surge protection 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.

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:
~

Manufacturer/supplier contact details:

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

Warranties

1.5 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:	Warranty period

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

Requirements

1.6 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Workers and supervisors to be appropriately qualified to applicable legislative requirements. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.9 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.

1.10 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.

2 PRODUCTS

2.1 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).

2.2 DISTRIBUTION BOARD

Flush surface mount boards 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. Distribution boards to have 20% spare capacity for future additions and alterations.

2.3 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with AS/NZS 3190. MCBs to 4.5kA or 6kA rated.

2.4 SURGE PROTECTION

Protection for the homes appliances with IEC 61643 Class ll surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class lll surge protection to switched socket outlets.

2.5 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.

2.6 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.

2.7 SWITCHED SOCKET UNITS

10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to AS/NZS 3100, AS/NZS 3112 and AS/NZS 3113, single or multi gang as detailed.

2.8 CEILING ROSES

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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.

2.9 HOT WATER SYSTEM SWITCH

One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

2.10 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.11 FIRE & SMOKE ALARM SYSYEM

Refer to SELECTIONS.

2.12 LIGHT FITTINGS

Fluorescent and High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 230v rated, bayonet cap; Fluorescent triphosphor 2700K; CFL; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.

2.13 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.

2.14 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.

2.15 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to NZBC G4/AS1, and compliant with AS/NZS 60335.1.

2.16 EXTERIOR LIGHT FITTINGS

Using materials with superior UV protection, impact strength, and addition chemical resistance. Weather protection minimums:

- IP54 for protected areas under eaves or verandahs etc.
- IP55 for exposed areas not subject to pressurised water (hoses).
- IP66 for areas subject to pressurised water or major splashing.
- IP67 for inground lights
- IP68 for submerged pool fittings

Fire rated sealers and liners

2.17 FIRE RATED SEALERS AND LINERS

Sealants, collars, wraps, expanding foam, mortars and liners, used to seal around pipe, conduit and sleeve penetrations through fire and acoustic walls and floors. Refer to SELECTIONS for type.

Fire rated accessories

2.18 WALL BOXES AND SWITCH UNITS - FIRE RATED

Proprietary intumescent pad for plastic electrical sockets installed in plasterboard lined fire rated partitions providing an acoustic barrier and fire protection. Refer to SELECTIONS for type.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.3 DISTRIBUTION BOARD

Fit to AS/NZS 3000 and board manufacturer requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

3.4 CIRCUIT PROTECTION

Install MCBs at distribution board to AS/NZS 3000 to protect each final sub circuit.

3.5 EARTHING CONDUCTIVE STRUCTURE & MATERIALS

Earth all at risk structural metalwork and conductive building materials to AS/NZS 3000, 5.4.6, and the Electricity (Safety) Regulations 2010.
If they form part of the building, this includes:

- Structural steel frames or members
- Light steel framing
- Exposed conductive materials, like metal sink/tub or vanity benches etc, with attached electrical units or equipment

3.6 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

3.7 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.

3.8 ARC FAULT DETECTION DEVICE (AFDD)

To AS/NZS 3000 clause 2.9, AFDD on all final sub-circuits not exceeding 20A.

3.9 EARTH LEAKAGE PROTECTION

Install RCD protection to AS/NZS 3000.

3.10 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 ll protection at the switchboard, protect the device by a dedicated MCB.

3.11 RCD - RESIDENTIAL INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to AS/NZS 3000.

3.12 RCD-AFDD COMBINED - RESIDENTIAL INSTALLATIONS

Install a 30mARCD - 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 - SPECIFIC INSTALLATIONS

Install fixed wired RCD protected outlets (SRCD) in the following higher risk areas:

- Wet areas: bathrooms, laundries, kitchens.

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- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

3.14 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.15 CABLING

Install wiring systems to AS/NZS 3000. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.

3.16 CABLING CIRCUITS

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of 8 light switch units or 4 double or single switched socket units on any circuit. Minimum 2 lighting circuits per floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits.

3.17 WALL BOXES

Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.

3.18 SWITCHES AND SWITCHED SOCKET UNITS

Fit all switch units and socket units to the manufacturers requirements with heights and mounting directions as indicated in SELECTIONS.

3.19 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer requirements.

3.20 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.

3.21 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, 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.

3.22 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.

3.23 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.

3.24 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	Manufacturer 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

3.25 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.

3.26 ELECTRIC HOT WATER SYSTEM

For storage heaters, wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

3.27 SPACE HEATERS

Install to the heater manufacturer requirements, and to AS/NZS 3000. Fit neatly and without damage to surrounding finishes. Ensure control switches and thermostats are fitted to appliance, or otherwise connect to a control switch located adjacent to the heater and a remote thermostat.

3.28 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.

3.29 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturers requirements and installed in accordance with AS/NZS 3000
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.

3.30 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer recommendations:
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.

3.31 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.

Fire rated sealers and liners

3.32 SEAL ALL PENETRATIONS

Seal all penetrations, including in and around conduits and sleeves, in accordance with manufacturer instructions. For fire and/or acoustic rated elements, maintain the rating with the seal systems.

3.33 PROVIDE CABLE SLEEVES

Provide PVC sleeves formed from pipe sections, unless fire and/or acoustic systems require sleeves for other building elements and/or different material for the sleeve.

Fire rated accessories

3.34 INSTALL WALL BOXES AND SWITCH UNITS - FIRE RATED

Install proprietary fire rated wall boxes and switch units in accordance with manufacturer instructions.

Completion & Commissioning

3.35 COMPLETION MATTERS

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

3.36 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion.

~	~

3.37 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

~	~

4 SELECTIONS

Materials

8432BF BOUNDARYLINE FENCING & GATES

1 GENERAL

This section relates to the fabrication and installation of **Boundaryline** fencing and gates. It includes:

- Aluminium framed fences and gates with aluminium panels of rails and pickets
- Steel framed fences and gates with timber infill panels or slats
- Steel framed fences and gates with steel infill panels or slats
- Steel mesh fencing panels
- Associated componentry and accessories necessary to complete the system.

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:

CLT	Cross Laminated Timber

Documents

1.3 DOCUMENTS

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

NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Residential Pool Barriers
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
NZS 6806	Acoustics - Road-traffic noise - new and altered roads
NZS 8500	Safety barriers and fences around swimming pools, spas and hot tubs

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Boundaryline fencing and gates brochures
Boundaryline install guides
Boundaryline PS1 for compliance with NZBC F4 and NZBC F9 for selected styles of DuraPanel, SentryPanel, ColourPanel and Smartwall.
SmartWall acoustic report

Manufacturer/supplier contact details

Company:	Terranota Ltd trading as Boundaryline
Web:	boundaryline.co.nz
Email:	technical@boundaryline.co.nz
Telephone:	0800 003 006

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years	For ~

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- 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 NO SUBSTITUTIONS

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

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

- Boundaryline maintenance guidelines

Provide this information prior to practical completion.

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation for pool fencing and balustrades:

- Manufacturer / supplier warranty
- Installer / applicator warranty
- Producer Statement - Design compliance
- 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 - Pool fencing

1.10 SAFETY FROM FALLING

Balustrading design to Boundaryline Producer Statements.

2 PRODUCTS

Materials

2.1 DURAPANEL FENCE AND GATES

Open style, powdercoated 6063T5 aluminium fence comprising of pre-welded panels, with pickets and rails that are connected to 50x50 or 65x65mm SHS posts using sleeve brackets. Available in a range of styles and sizes with matching manual, automated, pedestrian, driveway and pool gates.

2.2 CONCRETE

Concrete to NZS 3104 for cast-in post footings, minimum compressive strength of 17.5 MPa.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

Installation/application

3.3 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.4 PRE-INSTALLATION REQUIREMENTS

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

3.5 SETOUT

Property boundaries are to be defined by legal survey pegs. Check location of underground services prior to digging. Measure out fence line using string line or laser level, and mark post centres. If the length of the fence line does not work out as multiples of the standard panel length, adjust the length of the last section, or the last few sections to suit and cut fence panels to fit. Any cut edges of steel or aluminium must be coated with zinc rich paint.

3.6 SAFETY FROM FALLING

Install balustrade fencing to Boundaryline PS1.

3.7 INSTALL POSTS - IN GROUND

Excavate post footings to diameter and depth defined in install guide. If required for fence style, screw posts together as per install guide. Set posts in concrete, plumb and true to line. Fill the hole with concrete, sloping the top of the concrete to ensure water drains away from the post.

3.8 INSTALL POSTS - BOLT DOWN

Fix post in place using fixings as per install guide.

3.9 INSTALL PANELS

For sloping or curved fencelines, panels are to be installed along with each post and braced until the concrete has set. For straight and level fencelines, install panels after posts are installed and concrete footings have set. Slide fixing brackets onto each rail (or clip brackets through panel for Green Screen), fit the panel in place ensuring it is level and screw to posts with supplied fixings.

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

Materials - Pool Fence and Gates

Materials - Fence and Gates

4.1 BOUNDARYLINE DURAPANEL FENCE

Location:	Refer drawings
Type/Brand:	DuraPanel Delta
Material:	Aluminium
Panel height:	950
Panel length:	2250
Raking:	Yes
Post size:	50 x 50
Rail size:	40 x 40mm
Picket size:	19 x 19mm
Powdercoat colour:	tbc

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